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2007 Issue 2

National Roads Authority
An tÚdarás um Bóithre Náisiúnta

seanda

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Cover image: A selection of bone button making artefacts from an early monastic site in Clonfad, Co. Westmeath. (John Sunderland)

Welcome to the

Second Edition Of *Seanda*

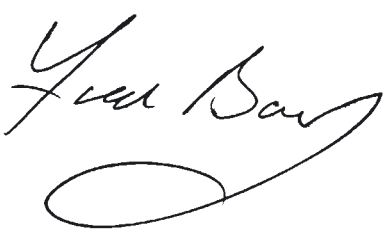
FRED BARRY, chief executive of the National Roads Authority

Fred Barry

The first issue of *Seanda* magazine, published in December 2006, was very favourably received. A number of people were kind enough to contact the NRA to pass on their compliments on the quality of the writing and the high production values. I would very much like to thank everyone who did so; their praise and encouragement is very important and much appreciated. Of all the literature produced by the NRA Archaeology Section, *Seanda* has certainly won the most enthusiastic praise and last year's contributors, and the various organisations they represent, are to be congratulated for communicating so successfully to a popular audience. Writing in this vein can be a demanding discipline as the authors do not have recourse to the shorthand of technical jargon and must make their work accessible and interesting to the widest possible audience. This task is far from easy, but reading through the current issue I'm sure you'll agree that this year's contributors have been equally successful in meeting this challenge. I would like to think that the publication of Issue 2 of *Seanda* has been eagerly awaited and trust that readers find it every bit as informative and entertaining as the inaugural issue.

Seanda (meaning antique or ancient) has expanded the range of literature disseminating the results of NRA-funded archaeological investigations. This issue consolidates on this expansion but also brings news of another significant NRA archaeology publication—the launch of *Monumental Beginnings: the archaeology of the N4 Sligo Inner Relief Road* by Ed Danaher (see page 6). This heralds the commencement of the new NRA Scheme Monographs series, a critically important endeavour that will bring the results of archaeological discovery on specific road schemes to the general public and professional archaeologists.

The scale of development-led archaeological investigations in Ireland has increased dramatically in the last decade. The consequent need for large numbers of qualified archaeologists has been keenly felt on national roads schemes and in order to meet the growing demand employers have recruited staff from all over the world. The vital contribution of this new international staff cannot be underestimated and, indeed, is reflected in the range of contributors to this issue of *Seanda*. While Ireland has produced many skilled archaeologists, we simply do not have enough personnel to meet the current demand. Archaeologists from overseas have contributed to the development of Irish archaeology in the past, but never in such numbers. We now have an opportunity to further enhance archaeological practice in Ireland by benefiting from the expertise, knowledge and experience of a truly multinational workforce. The forthcoming World Archaeological Congress to be held in Ireland next summer is therefore timely, and will have the committed support of the NRA Archaeology Section as it continues to ensure we follow international best practice.



PROJECT UPDATES

Life And Death In Monaghan: Exhibiting the results from the N2 Carrickmacross Bypass excavations 2003

'This site has given us a rare opportunity to glimpse into the distant past and get an idea of how the county's very first settlers lived and died.'

In March 2007 the public queued up, with a great sense of anticipation, to witness the opening of Monaghan County Museum's new exhibition, ominously entitled *Life and Death in Monaghan*. The doors were flung open and the crowds streamed in eagerly. They were not disappointed! Children, in particular, were entranced by the explosion of colour, images and artefacts that met them as they walked into the exhibition gallery. The months of hard work by Monaghan Museum, together with the NRA, paid off as the visitors marvelled at the story of life and death in the Monaghan area from the first Neolithic farmers to the rebellious times of the 1600s.

The exhibition, which ran until 26 October 2007, focused on the NRA-funded archaeological excavations that were undertaken during the summer of 2003, in advance of construction work on the N2 Carrickmacross Bypass. The key sites uncovered were: three Neolithic houses at Monanny (c. 3900–3600 BC); an early medieval (sixth–eighth century AD) double-ditched ringfort at Lisanisk; and a seventh–eighth century AD cemetery of nearly 20 bodies at Cloghvalley Upper. The Lisanisk ringfort appears to have played a significant role in the final days of the 1641–7 Uprising, and was deliberately razed to the ground after 1692 in the wake of the Williamite Wars. These new finds were complemented by many artefacts from the Museum's own collection, which provided the exhibition team with a great opportunity to showcase previously unseen archaeological objects.

The exhibition demonstrated a tremendous series of discoveries for County Monaghan, a county where very few archaeological excavations have been carried out to date. This lent extra significance to the finds and to the *Life and Death* exhibition, which combined site images, artistic impressions, human remains and reconstructions, including a scale model of a Neolithic house, to great effect. Taken together, the various elements of the display created an evocative interpretation of the story of lives and deaths in the Monaghan area, stretching right back to prehistory.

The public reaction to the exhibition and the story it tells has been phenomenal. Monaghan Museum ran a series of educational workshops based on the Museum's display, and school bookings ran to months in advance. The exhibition also became a key theme at the *Inscribed Histories—Burial Grounds, Folk Art and Archaeology* conference, held at Monaghan in June 2007. Local history groups from across the county contacted the Museum to do additional research into the exhibition topics.

Thanks to the NRA's promotion of *Life and Death in Monaghan*, RTÉ's *Nationwide* programme and *The Irish Times* contacted Monaghan Museum with a view to covering the event. The edition of *Nationwide* focusing on the displays, the Museum staff and local school involvement was aired in April 2007 and it generated even more interest at both regional and national levels. *The Irish Times* published a dedicated piece on the exhibition, describing Monaghan Museum as one of the main attractions of the county and the 'must see' for visitors to the town. For the local and regional community, this reinforced the fact that their Museum is something to have great pride in and to support. Accordingly, the Museum saw record-breaking numbers attending *Life and Death in Monaghan*, illustrating the public's appetite for good quality events and displays based on local heritage.

Liam Bradley, curator, Monaghan County Museum.

Life and Death in Monaghan exhibition at Monaghan County Museum. (Niall Roycroft)

New Routes to the Past: a new monograph is launched by the Archaeology Section of the NRA

New Routes to the Past—the fourth publication in the Archaeology and the National Roads Authority Monograph Series—was launched by Professor Emeritus Seamas Caulfield, University College Dublin, on 30 August 2007, at the Gresham Hotel in Dublin. This new book contains the proceedings of a one-day seminar on archaeological discoveries on national road schemes, which was held in the Chester Beatty Library, Dublin, in August 2006 as part of National Heritage Week. The monograph is aimed specifically at a popular audience and is written in an accessible, non-technical style and illustrated extensively with colour images. It contains papers outlining the archaeology uncovered on a number of schemes, including the N11 Gorey–Arklow Link Road, the N5 Charlestown Bypass, the N8 Mitchelstown Relief Road, the N25 Waterford City Bypass, the N7 Limerick Southern Ring Road (Phase II), the N6 Galway–East Ballinasloe PPP scheme, the N52 Mullingar–Belvedere Road Improvement Scheme, the M7 Portlaoise–Castletown/M8 Portlaoise–Cullahill motorway scheme and the M3 Clonee–North of Kells motorway scheme.

When launching the new publication, Professor Caulfield drew particular attention to the previously undocumented sites being identified throughout the country as well as to the hitherto unkown site types and artefacts discovered during the roads-building programme. He commented that the NRA was conducting very important archaeological work in uncovering what he playfully coined as 'Rumsfeldian archaeology', i.e. 'the archaeology we didn't know we didn't know'. Professor Caulfield also complimented the various contributors to the book, praising the enthusiasm with which each paper was written. He suggested that the writers might favourably be described as true *amateurs*, citing the Latin root of the word as meaning 'to love', because their love of their subject was clear for all to read.

New Routes to the Past, edited by Jerry O'Sullivan and Michael Stanley, is published by the NRA and is available through bookshops or directly from Wordwell Book Sales, Wordwell Limited, Media House, South County Business Park, Leopardstown, Dublin 18 (Tel: +353 1 2947860; email: helen@wordwellbooks.com).

Michael Stanley, NRA assistant archaeologist, Dublin Team.

Professor Emeritus Seamas Caulfield launching *New Routes to the Past* at the Gresham Hotel, 30 August 2007.


Rónán Swan, NRA head of archaeology (acting), and Professor Caulfield with the co-editor of the new monograph Michael Stanley, NRA assistant archaeologist, and one of its contributors, Brendon Wilkins of Headland Archaeology Ltd.


Contributors Thaddeus Breen, Paul Stevens and John Channing, all of Valerie J Keeley Ltd, admiring each other's work.

Photos: studiolab.ie

Project Updates

Fusing Art and Archaeology

The *Per Cent for Art* scheme is an innovative concept that encourages the inclusion of public art on all capital construction projects. The funding granted to the N4 Longford–Drumsna (Dromod–Roosky Bypass) dual carriageway by *Per Cent for Art* has led to the development of an unique art project, entitled 'eNfore Art'. Leitrim County Council Arts Office undertook to commission an art piece for the new road and artist Niall Walsh, along with a group of nine teenagers from the local area, was awarded the task of generating a concept for the artwork.

As a starting point, the artists involved met with archaeologist Caitríona Moore of Cultural Resource Development Services Ltd, director of the remarkable Edercloon trackway excavations in County Longford, which date from the Neolithic to early medieval period. In summer 2006, prior to the construction of the bypass, excavations were carried out at Edercloon. Caitríona presented these findings to the members of the 'eNfore Art' project. (See page 20 for an article by Caitríona Moore relating the results of the Edercloon excavations.)

From these trackway sites the artists have formulated a thought-provoking artistic concept. They propose to build a structure that will reflect a stratification of history, from the prehistoric toghers or trackways to the materials and techniques used in the construction of the current road. The art piece will endeavour to retain and to preserve aspects of the local archaeological and cultural heritage while linking them to the present. We greatly look forward to viewing this exciting work.

If you interested in finding out more about the 'eNfore Art' project, contact Leitrim County Council Arts Office (Tel: 071 9621694).

Orlaith Egan, NRA archaeologist, Mid-West Team.

A model of efficiency: introducing a new structure for the NRA Archaeology Section

From 2001 to 2006 the NRA had a small archaeological team, with the majority of archaeologists working for individual local authorities. Following a review, in January 2007 the NRA Archaeology Section was reorganised and a new regional structure was instigated, comprising four regional teams and a co-ordinating Dublin team. Four senior archaeologists lead each regional team and manage the archaeologists and assistant archaeologists based in nine National Road Design Offices (Donegal, Cork, Galway, Kerry, Kildare, Limerick, Meath, Waterford and Westmeath). The four regional teams are the Eastern Team, the North-west Team, the Mid-West Team and the Southern Team. The Head Office team is based in Dublin and is managed by the head of archaeology.

This new regional breakdown allows for a much more structured and consistent approach, which will ensure the Archaeology Section attains its overarching goal of effectively managing the archaeological works on NRA projects around the country. As the taxpayer funds all NRA archaeological work, this aim is particularly important. The reorganisation of the Archaeology Section has also included the formation of a management team that will oversee research, methodology, procurement, policy formulation and publication.

Rónán Swan, NRA head of archaeology (acting).

Wessex gold on the Tullamore Bypass?

Excavations in advance of the N52 Tullamore Bypass have uncovered a gold button cover that is potentially of international significance. This object would originally have been one of two button covers surrounding a perforated bead of shale or lignite. It was recovered from an isolated cremation burial at Screggan, Co. Offaly, which represents an older child, aged between six and eight years at death, and an adult female. Burned on the pyre with these individuals was an awl made from antler and the remains of a copper artefact, which was recovered as fragments of melted metal. Placed in the grave beside them was the gold button cover, of a type previously not found in Ireland and associated with a form of gold-working related to the Wessex Culture—an Early Bronze Age culture of central southern England.

Initial analysis by Mary Cahill of the National Museum of Ireland suggests that the closest parallels for this button find are from an inhumation in Radley, Berkshire, where two such button covers were recovered, along with a bronze knife and copper awl. The metal will undergo special analysis at the NMI to pinpoint its date and origin, but early suggestions are that it may be an English import. (Headland Archaeology Ltd would like to thank Mary Cahill for providing the information from her preliminary analysis of the object for this news item.)

Susan Lalonde, archaeologist, Headland Archaeology Ltd.

Roads, Resolution and Research: the NRA's contribution to National Heritage Week 2007

On 30 August 2007 the NRA Archaeology Section held its annual Heritage Week seminar at the Gresham Hotel, Dublin, which was fully booked in advance for the second year in a row. This year's seminar was entitled *Roads, Resolution and Research*. It was very well attended by members of the public and by professional archaeologists. In addition to presentations on individual sites discovered around the country, the seminar emphasised the research element of NRA-funded archaeological investigations, focusing particular attention on the Ballyhanna Research Project, relating to the N15 Bundoran–Ballyshannon Bypass, and on work being conducted as part of the M3 Research Framework. The wide range of speakers reflected this research theme and included archaeologists, historians, an archaeobotanist, an archaeozoologist, an analytical chemist and a biomolecular scientist.

Roads, Resolution and Research proved to be a very successful and interesting event, and even featured an unexpected 'show-and-tell' session from archaeobotanist Scott Timpany, who distributed sampling equipment and environmental samples around the room for people to examine first-hand.

The NRA would like to express its appreciation to all the speakers and the attendees for participating and helping ensure the success of the event. Abstracts and some extracts from all the presentations delivered at the seminar can be viewed online at: www.nra.ie/Archaeology/ArchaeologySeminar2007/. The proceedings of the seminar will be published in August 2008 as part of the Archaeology and the National Roads Authority Monograph Series.

Michael Stanley, NRA assistant archaeologist, Dublin Team.

Speakers at the *Roads, Resolution and Research* seminar: (left to right) Jonathan Kinsella, Auli Tourunen, Gerry Mullins, Michael MacDonagh, Tasneem Bashir, Sébastien Joubert, Sheila Tierney, Caitríona Moore, Eimear O'Connor, Scott Timpany, Mary Deevy, Anne Connon and Margaret Murphy. (Micheál Ó Droma also presented a paper but is absent from the photograph.) (studiolab.ie)

Mapping our knowledge: the creation of a unique database

Over the past 13 years hundreds of sites, spanning from Mesolithic to early modern times, have been excavated throughout the country as part of the national roads-building programme. Many previously unrecorded sites have been discovered, settlement patterns have been suggested, periods with previously scant information have been illuminated and a wide range of finds has been unearthed that expands, challenges and frequently redefines our view of Irish archaeology and our shared heritage. It has been clear for some time that it is essential to quantify and examine this new archaeological information. In response, an archaeological database has been designed and created through the collaboration of the IT Section and Archaeology Section of the NRA, and work on inputting the data is well underway.

The aim of this project is to generate a database of all archaeological sites uncovered as part of the roads programme since the establishment of the NRA in 1994. The database will contain information ranging from: the site details (year of excavation, road project details, site director, archaeological consultancy); the location of the site (townland, county, national grid references, height above sea level, landscape setting); characteristics of the site (type, identification technique); dating (time period, radiocarbon dates, dendrochronological dates); and site descriptions (summary of excavation findings, artefacts recovered, results of environmental analyses). Where applicable, it will also provide references to publications relating to individual sites. Where a site contains evidence from multiple periods, a separate database entry will be entered for each period in order to maximise the archaeological integrity of the database and its usefulness in carrying out specific searches.

It is envisaged that the database will become a valuable resource for professional archaeologists as well as for the general public. It will provide important baseline information and allow for comparison between site types, locations and dating periods of archaeological sites excavated. It will also facilitate site types being examined nationally to see what patterns emerge, which indeed might help in the future prediction of site locations in the landscape. Furthermore, it will provide basic information on the numbers of archaeological sites excavated along each road scheme. Obviously this will be an ongoing project because as the national roads programme continues, the database will continue to expand, but it is hoped to have the first tranche of final reports completed by the end of 2007.

Deirdre McCarthy, NRA assistant archaeologist, North-west Team.

Project Updates

A wooden bowl belonging to our prehistoric ancestors

During archaeological investigations conducted in 2004 for the N18 Ennis Bypass and N85 Western Relief Road, a fragmentary wooden bowl was found in Killow townland, Co. Clare, in peat near to a spread of burnt stone. The burnt stone spread partially overlay peat at the edge of a natural hollow and was recorded in two patches, with a total area of 200 m^2. It has been radiocarbon-dated to 1280–1010 BC, i.e. the Middle Bronze Age.

This wooden vessel has a maximum external diameter of 225 mm and a maximum internal diameter of 205 mm. The surviving portion of the bowl is 100 mm high and 10 mm thick. A very small sample of wood, weighing 250 mg, was taken from the edge of the bowl and radiocarbon-dated by the Radiocarbon Dating Laboratory at Queen's University, Belfast. The sample returned a date of 777–407 BC. The bowl was carved from ash, and as this tree species lives for no longer than 250 years, it can be stated with confidence that the bowl dates to the Iron Age (600 BC–AD 400).

Of the few dozen prehistoric wooden bowls discovered in Ireland, most were found by people digging turf in the north of the country. There are clear affinities between wooden bowls and cauldrons and these same vessel types made in bronze. Radiocarbon dating has shown that many wooden bowls were manufactured in the late prehistoric period. The bowl from Killow is similar in form to some of the other vessels from this period, but its incomplete survival means there is no evidence of the type of handle, if any, it possessed originally. This is unfortunate as the form of the handle is one of the chief means of characterising these bowls. The Killow bowl was likely to have been lathe-turned; toolmarks indicative of lathe-turning are not evident, but this is typical and probably reflects high-quality finishing by sanding or polishing. The fact that the Killow bowl is made from ash is unusual as the other examples are mostly of alder.

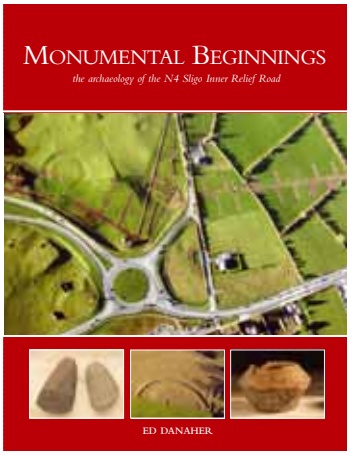
Given the lack of pottery in the Iron Age, wooden vessels must have played a significant role in daily life. Indeed, the fine manufacture of many of the wooden vessels from this period indicates that they were not merely a poor man's substitute for metal vessels, but were highly prized alternatives.

Final archaeological reports for all the sites excavated on the N18 Ennis Bypass and N85 Western Relief Road can be accessed at: www.clarelibrary.ie

Graham Hull, excavation director, TVAS (Ireland) Ltd.

Iron Age wooden bowl from Killow, Co. Clare, following conservation treatment. (TVAS [Ireland] Ltd)

Monumental Beginnings in Sligo



The NRA is proud to announce the launch of the first publication in its scheme-specific monograph series. This publication will detail the results of discovery and archaeological excavation along the route of the N4 Sligo Inner Relief Road. Investigations in 2003 by Archaeological Consultancy Services Ltd and initial testing and excavation by Mary Henry Archaeological Services Ltd in 2001 resulted in the discovery of a number of significant prehistoric sites, including that of a causewayed enclosure dating to the Early Neolithic period, around 4000 BC. These discoveries add to the archaeological heritage of a region already well-known for its upstanding monuments. An accompanying CD-ROM to the publication will incorporate final excavation reports and specialist reports.

Monumental Beginnings: the Archaeology of the N4 Sligo Inner Relief Road, by Ed Danaher, will be launched in December 2007 and will be available from Wordwell Book Sales, Wordwell Limited, Media House, South County Business Park, Leopardstown, Dublin 18 (Tel: +353 1 2947860; email: helen@wordwellbooks.com), and through bookshops.

Michael MacDonagh, NRA senior archaeologist, North-west Team.

The 2007 Awards for the Presentation of Heritage Research

Archaeologist Brendon Wilkins of Headland Archaeology Ltd was shortlisted for the Awards for the Presentation of Heritage Research for his account of an archaeological wetland site at Newrath, Co. Kilkenny (affectionately known as 'The Bog'), which was excavated prior to the construction of the N25 Waterford City Bypass. Brendon's presentation humorously touched on the arduous physical demands of wetland excavations. The main focus, however, was an account and interpretation of the archaeological remains (structures and artefacts), integrated with paleoenvironmental evidence to present a series of unique snapshots of the changing landscape and the ensuing human interaction on the banks of the River Suir, spanning a timeframe of five millennia from the Mesolithic period to the 19th century.

The aim of these annual awards is to encourage individuals active in all areas of heritage in Britain and in Ireland to communicate the results of their work and research to the wider public. This is of key importance in enhancing public awareness of the value and enjoyment of our past environment. Now in its sixth year, the event is organised by English Heritage and sponsored by heritage organisations in Britain and Ireland. (Archaeologist Matthew Seaver, CRDS Ltd, won the award in 2005 for his presentation on the excavation of a large medieval farming settlement at Raystown, Co. Meath, on the route of the N2 Finglas–Ashbourne road scheme.)

The awards took place on 13 September 2007 in the historic town of York, as part of the British Association's Festival of Science. The reception was held in the Department of Archaeology, University of York, located in a stunning medieval abbey. The shortlisted entrants presented their work and were judged by the audience and a panel of heritage professionals. The first prize awards of £1,000 each were presented to Professor Vincent Gaffney and Professor Dominic Powlesland by archaeologist and broadcaster, Julian Richards. Professor Gaffney (University of Birmingham) had presented an overview of an extensive study into the submerged North Sea landscape known as Doggerland. Professor Powlesland (Landscape Research Centre) presented an account of a wide-ranging aerial photography and geophysical survey project in the Vale of Pickering, Yorkshire, which revealed a high density of previously unidentified sites.

Two papers detailing the investigation of the wetland site at Newrath described by Brendon Wilkins are published in *New Routes to the Past*, Archaeology and the National Roads Authority Monograph Series No. 4. Information about the awards can be viewed online at: www.englishheritage.org.uk/server/show/nav.9060.

Freya Smith, NRA assistant archaeologist, Southern Team.

Brendon Wilkins (left) pictured with Julian Richards (presenter of BBC's *Meet the Ancestors*) at the awards reception in the Department of Archaeology, University of York.

Brendon Wilkins pictured with joint first prize award-winners Professor Dominic Powlesland and Professor Vincent Gaffney.

Photos: Freya Smith

A Cabinet of Curiosities in Co. Westmeath

Between 2004 and 2006 a series of archaeological excavations was carried out in advance of the N6 Kinnegad–Kilbeggan dual carriageway and the N52 Mullingar–Belvedere Road Improvement Scheme. Post-excavation analysis for both projects is now nearing completion and the results have produced some very interesting and exciting evidence. An exhibition to provide the public with a first-hand glimpse of the amazing discoveries is currently being developed by Valerie J Keeley Ltd, in conjunction with the NRA and Westmeath County Council. This exhibition will focus on the excavation results from three large sites at Clonfad, Ballykilmore and Rochfort Demesne, which date to the early medieval and medieval periods. It will explore various themes to portray life in both ecclesiastical and secular contexts. The highlight of the exhibit will be a selection of the artefacts unearthed at these sites, ranging from highly decorative objects, such as ring-pins and bone combs, to more mundane domestic items.

The exhibition will be held at Belvedere House, Co. Westmeath, between March and August 2008.

Orlaith Egan, NRA archaeologist, Mid-West Team.

Reconstruction drawing: John Murphy

A forgotten site:

Ballyhanna Church and Graveyard

Gráinne Leamy

Gráinne Leamy, NRA archaeologist (acting) with the North-west Team, reports on the conservation of the remains of a medieval church rediscovered on the N15 Bundoran–Ballyshannon Bypass.

In 2003–2004 some unexpected discoveries were revealed during archaeological works carried out before construction commenced on the N15 Bundoran–Ballyshannon Bypass. Work at Ballyhanna, on the outskirts of Ballyshannon town in County Donegal, led to the discovery of a substantial medieval graveyard and the foundations of a stone building, thought to be the remains of Ballyhanna Church. The last recorded mention of church lands at Ballyhanna was in the 17th century, but since that date its location had been lost from local memory.

Over 1,000 men, women and children were buried in a subcircular graveyard that measured about 40 m in diameter. Stone foundations exposed during the excavations are probably the remains of a church. The burials were placed in shallow graves around the south and east of the building. Most of the burials were interred in the Christian style: on their backs, with their bodies oriented east–west. They were excavated carefully during the archaeological works and removed, and are now being analysed as part of the Ballyhanna Research Project (see *Seanda* Issue 1, 2006).

Artefacts found on the site during the excavations confirmed that bodies were being interred in the graveyard during or shortly after the reign of Edward I (1272–1307). A silver penny found with one of the burials is evidence of this. Other coins from the reign of Henry IV, in the early 15th century, indicate that the graveyard was still in use at this time. A fragment of a bone comb, a small brass bell, pottery and beads discovered with a number of burials also confirm that the graveyard was in use between the 13th and 15th centuries.

The location of the church at a proposed junction off the N15 allowed—rather uniquely—a re-design of the junction layout to avoid impacting directly on the church. The foundations of the church have been conserved and a garden created on the site of the graveyard. The conservation project involved a consultation process with local interest groups, allowing the local community input into how the site could best be presented. Expert advice was also sought from the Office of Public Works and from Donegal County Council architects. It is hoped that the garden designed as a result of this process will be enjoyed by the people of Ballyshannon and visitors to the town into the future.

Ballyhanna during excavation, February 2004.

Site of Ballyhanna church and graveyard, which was officially opened on 15 July 2007 as part of the 'Flight of the Earls' commemorations in Donegal.

Site of Ballyhanna church and graveyard.

Photos: Gráinne Leamy

Revealing the treasures within: conserving the Viking Age weapons from the Woodstown warrior grave

James Eogan

James Eogan, NRA senior archaeologist with the Southern Team, gives an account of the conservation work undertaken on weapons from a Viking warrior grave discovered on the route of the N25 Waterford City Bypass.

In April 2004, while excavating at Woodstown on the route of the proposed N25 Waterford City Bypass, Ian Russell and a team of archaeologists from Archaeological Consultancy Services Ltd discovered a shallow, rectangular pit. It contained the corroded remains of a number of iron objects: a sword, a spearhead, an axehead, a shield boss (the metal projection at the centre of a shield that protects the hand of the person holding it) and a knife. It is likely that these weapons, and some other metal and stone objects found in the same pit, were buried with the body of an important Viking warrior to accompany his spirit on its journey to the afterlife. Unfortunately, the acidity of the soil in this part of Waterford meant that none of the warrior's skeleton survived. (A full account of the Woodstown site is given in a paper by Richard O'Brien & Ian Russell in *Recent Archaeological Discoveries on National Road Schemes 2004*, Archaeology and the National Roads Authority Monograph Series No. 2.)

This was a very exciting find as Viking warrior graves are rarely discovered in Ireland and only a few have been scientifically excavated. The National Museum of Ireland was immediately informed and staff from the conservation department came to the site and carefully lifted the objects from the soil, in which they had lain for over 1,000 years. They removed them to the Museum's conservation laboratory at Collins Barracks in Dublin, where some preliminary cleaning and stabilisation of the objects was carried out.

In the summer of 2006, Susannah Kelly and Claudia Koehler at the School of Archaeology in University College Dublin, undertook a major programme of conservation of the objects taken from the grave.

When iron objects are buried in the ground, they begin to corrode; the sword, spearhead, shield boss, axehead and knife were covered in thick layers of iron oxides and were barely recognisable. The aim of the conservation was to stabilise the objects so that they would not corrode further, to clean them and, where necessary, to repair them so that they could be put on

Archaeologists planning Viking warrior grave with iron sword *in situ*. (Richard O'Brien)

Conserved sword and spearhead at the *Migrants Mariners Merchants* exhibition.

Conservator Claudia Koehler removing iron oxide from the Viking sword.

display in the Waterford Museum of Treasures as part of the exhibition *Migrants Mariners Merchants: archaeological discoveries on the N25 Waterford Bypass*, which ran from October to November 2006.

Prior to commencing the cleaning of the iron sword, Claudia examined the X-rays taken in the Conservation Department of the National Museum to decide on the best approach. She opted to use a variety of hand tools (including brushes and scalpels) to remove the corrosion from the surface of the objects. While the corrosion products obscure the original shape of the object, they can contain evidence of organic materials, such as leather, cloth and wood, which were in contact with the object when it was buried. The conservation of these objects was, in effect, archaeological excavation on a micro scale.

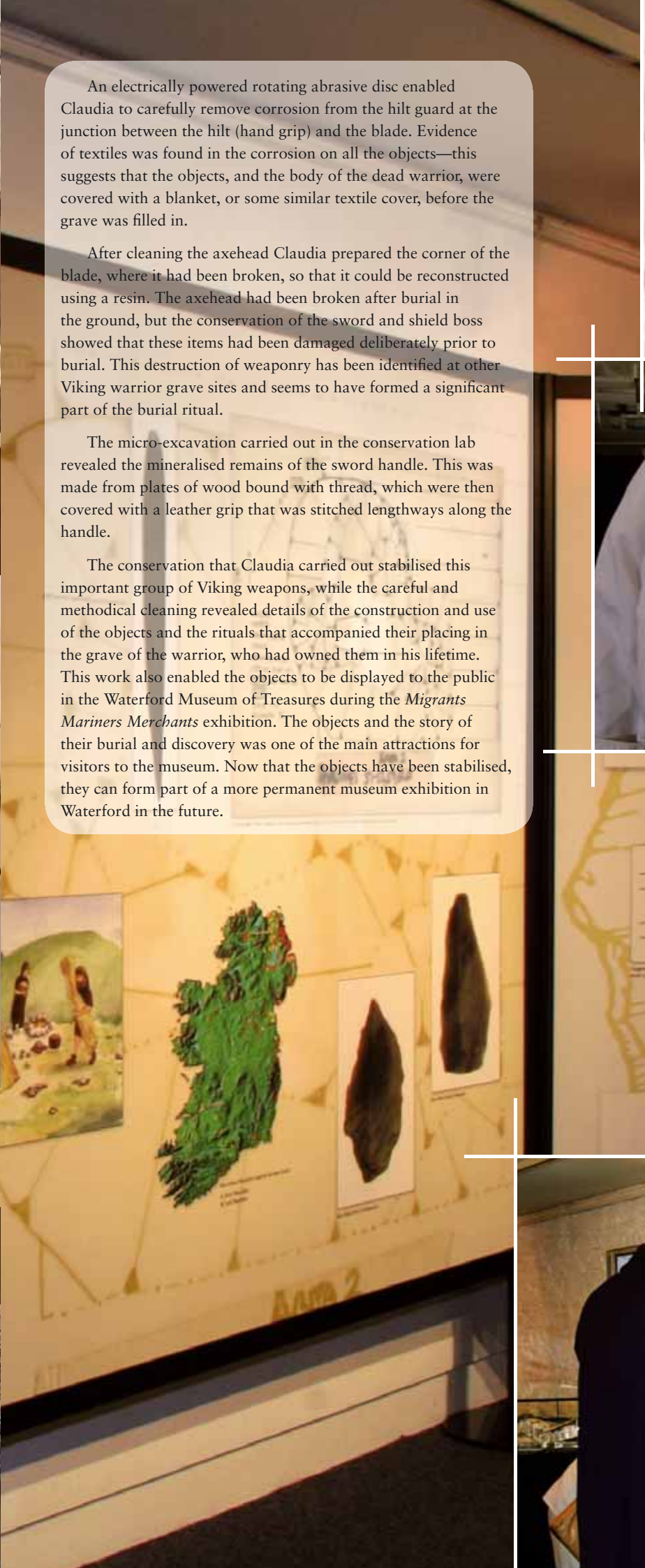
Knife and sword handle (superimposed) following conservation treatment.

An electrically powered rotating abrasive disc enabled Claudia to carefully remove corrosion from the hilt guard at the junction between the hilt (hand grip) and the blade. Evidence of textiles was found in the corrosion on all the objects—this suggests that the objects, and the body of the dead warrior, were covered with a blanket, or some similar textile cover, before the grave was filled in.

After cleaning the axehead Claudia prepared the corner of the blade, where it had been broken, so that it could be reconstructed using a resin. The axehead had been broken after burial in the ground, but the conservation of the sword and shield boss showed that these items had been damaged deliberately prior to burial. This destruction of weaponry has been identified at other Viking warrior grave sites and seems to have formed a significant part of the burial ritual.

The micro-excavation carried out in the conservation lab revealed the mineralised remains of the sword handle. This was made from plates of wood bound with thread, which were then covered with a leather grip that was stitched lengthways along the handle.

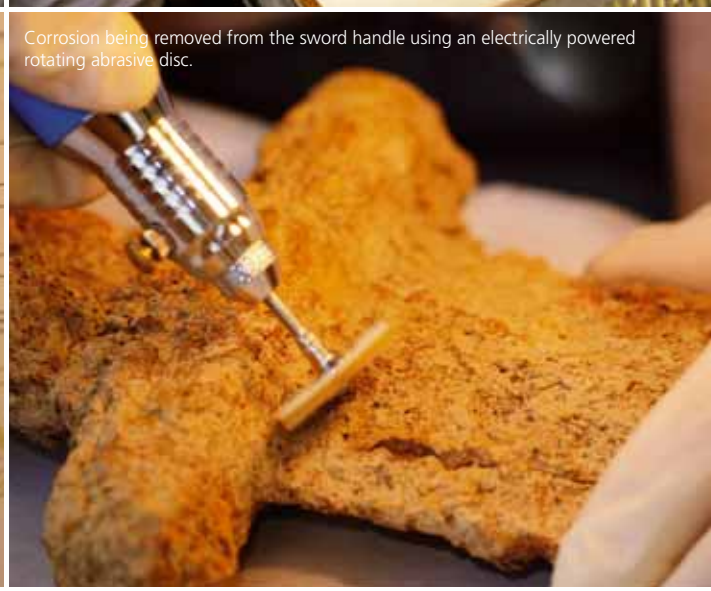
The conservation that Claudia carried out stabilised this important group of Viking weapons, while the careful and methodical cleaning revealed details of the construction and use of the objects and the rituals that accompanied their placing in the grave of the warrior, who had owned them in his lifetime. This work also enabled the objects to be displayed to the public in the Waterford Museum of Treasures during the *Migrants Mariners Merchants* exhibition. The objects and the story of their burial and discovery was one of the main attractions for visitors to the museum. Now that the objects have been stabilised, they can form part of a more permanent museum exhibition in Waterford in the future.



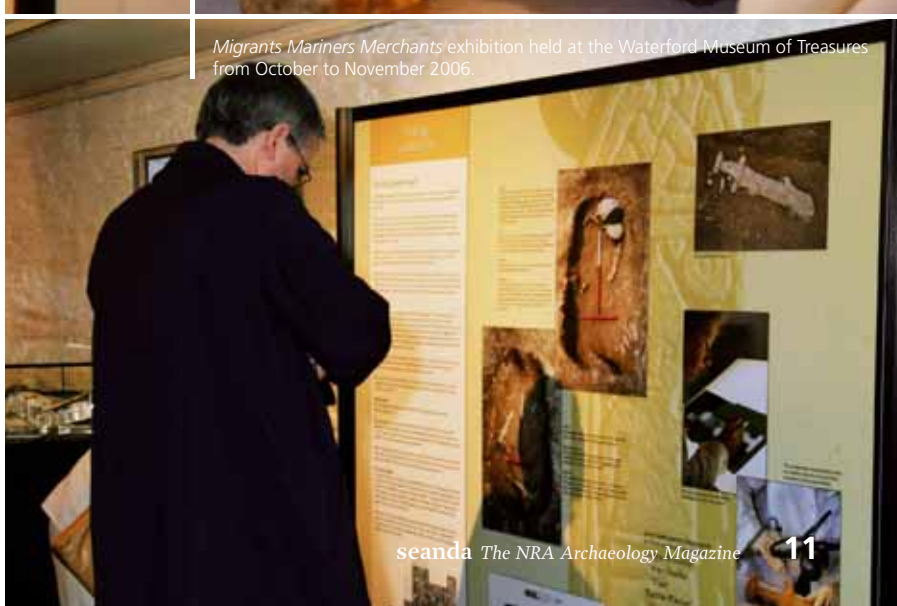
Drawing of projected outline of the axehead prior to its reconstruction.

Photos: studiolab.ie

Examination of National Museum X-rays prior to commencing the cleaning of the iron sword.



Corrosion being removed from the sword handle using an electrically powered rotating abrasive disc.



Migrants Mariners Merchants exhibition held at the Waterford Museum of Treasures from October to November 2006.

Past Lives in the Midlands:
archaeology unearthed on the N6 Kilbeggan–Athlone road scheme

Orlaith Egan

Orlaith Egan, NRA archaeologist with the Mid-West Team, provides on overview of archaeological discoveries on the N6 Kilbeggan–Athlone dual carriageway in counties Westmeath and Offaly.

Background

The N6 Kilbeggan–Athlone road scheme, which is currently under construction, consists of approximately 29 km of dual carriageway, located predominantly to the south of the existing N6, between Kilbeggan and Moate, and continuing north of the existing N6 between Moate and Athlone, through counties Westmeath and Offaly. All archaeological works—incorporating a desktop survey, aerial survey, geophysical survey, test-trenching and excavation—were carried out in advance of construction. The main test-trenching and excavations, involving over 150 archaeologists, commenced in July 2005 and were completed in May 2006 by Irish Archaeological Consultancy Ltd (IAC Ltd). A total of 61 archaeological sites were excavated; five of these were previously known, but the remainder had not been recorded in the past and were newly identified during test investigations. The project is currently at the post-excavation stage, during which specialist analyses will be carried out to assist in the interpretation of the various sites.

Discoveries

A range of interesting sites was uncovered, spanning from prehistoric to modern times and reflecting approximately 4,500 years of human activity in the midlands. The most prevalent sites discovered were *fulachta fiadh*, or burnt mounds, which accounted for over 70% of all sites discovered on the scheme.

Fulachta fiadh are the remnants of a process of heating water by placing stones in a fire and, once heated, transferring them into a water-filled trough. They usually consist of a mound of fire-cracked stones and a trough, which can be lined or unlined. The lining material can be timber, clay or stone slabs. In general, these sites are located adjacent to a water source. *Fulachta fiadh* are traditionally considered to be ancient cooking places, mainly dating to the Bronze Age. However, more recent interpretations as to their function have included sweathouses, brewing, soap-making, textile manufacture and other industrial processes.

Many of the *fulachta fiadh* excavated on this scheme consisted of the characteristic mound of burnt material, between one and three troughs and associated pits. Many of the troughs were timber-lined, evidenced either by planking or by stake-holes at the base. An interesting example was excavated by Ed Lyne at Seeoge, Co. Westmeath, on the edge of a wetland area. It consisted of a minimum of two troughs and several pits covered by burnt-mound material. A small quantity of animal bone and a stone tool known as a plano-convex knife were recovered from one of the troughs. An associated rectangular structure was also located adjacent to the *fulacht fiadh*. The artefactual evidence from this site may support the traditional view of a cooking-related function.

Two bone pendants recovered from the *fulacht fiadh* troughs at Burrow or Glennanummer.

Excavation of a *fulacht fiadh* in Burrow or Glennanummer townland, Co. Offaly, directed by Tim Coughlan, has produced evidence to suggest that the site functioned as a sweathouse. It consisted of a large burnt mound that covered three substantial features: a subrectangular trough, an oval trough and a circular pit 3.5 m in diameter. The latter feature had over 30 stake-holes at its base that may have supported a lightweight structure, which could have functioned as a sweathouse. All three features were interlinked so that water would flow from the primary subrectangular trough into the oval trough and finally into the circular pit or sweathouse. Two perforated bone pendants were also retrieved from the troughs.

Two Bronze Age habitation sites were excavated in the townlands of Creggan Lower, Co. Westmeath, and Tober, Co. Offaly, by Ed Lyne and Fintan Walsh. (Fintan Walsh discusses the site at Tober in the next article.) Both sites produced evidence of a series of structures, pits and hearths. Artefacts recovered during the excavations included several flint items, pottery sherds and a spindle whorl.

Other prehistoric sites from the scheme include two cremation burials excavated by David Bayley at Moyally, Co. Offaly. In addition, three metalworking sites were excavated by David Bayley and Tim Coughlan at Moyally and Tonaphort, Co. Westmeath, revealing possible bowl furnaces and hearths, which may have been used for smelting or smithing. The latter sites have yet to be securely dated and could date from the Bronze Age to the medieval period.

The largest excavation on the scheme was of a large, multiperiod site at Cappydonnell Big, Co. Offaly, south of Horseleap, which is discussed in greater detail by excavation director Tim Coughlan (see page 16). The principal feature at Cappydonnell Big consisted of

an irregular, lozenge-shaped enclosure, previously documented as a ringfort. The enclosure has a large ditch and an internal bank, with a causeway entrance to the north, and is believed to date from the medieval period. An earlier phase of activity was uncovered within the main enclosure, comprising a possible barrow and a cist burial, which date to the prehistoric period. Further post-excavation analysis will aim to enhance our interpretation of this perplexing site.

A fine example of a limekiln, excavated by Ed Lyne at Kilbeg, Co. Westmeath, reflects our more recent industrial heritage. It consisted of a conical or cylindrical cut dug into the side of a hill, within which a brick-built furnace shaft was constructed. The stone façade, or masonry casing, and arched entrance were constructed in front of this. This type of limekiln was commonly constructed in the 18th to mid-19th centuries and is likely to be associated with Correagh Cottage Demesne.

Post-excavation analyses are currently in progress and will undoubtedly yield an interesting and tantalising picture of settlement in the Irish midlands over several thousand years.

Fulacht fiadh trough excavated in Burrow or Glennanummer townland, Co. Offaly.

Possible sweathouse at Burrow or Glennanummer.

Photos: IAC Ltd

Brick-built furnace shaft of limekiln at Kilbeg, Co. Westmeath.

Stone façade and arched entrance of the Kilbeg limekiln.

Tracing the Bronze Age in Tober

Fintan Walsh, an excavation director with Irish Archaeological Consultancy Ltd, describes the remains of a Bronze Age settlement excavated on the N6 Kilbeggan–Athlone dual carriageway.

Background to the excavation

The prehistoric settlement site at Tober, Co. Offaly, was located in a low-lying, sheltered spot that lies immediately adjacent to a country road and is surrounded by undulating farmland. The site is approximately 3.5 km south-east of Moate town in County Westmeath.

The Tober site was identified during archaeological test-trenching by Irish Archaeological Consultancy Ltd in the summer of 2005, in advance of the construction of the N6 Kilbeggan–Athlone dual carriageway. These investigations revealed a concentration of pits and post-holes within a confined area, the boundaries of which are defined by the way-leave of the proposed road to the west and by the existing country road to the east. Excavation works undertaken in the winter of 2005 confirmed the presence of a well-defined structure with ancillary features, including refuse pits, hearths and fences.

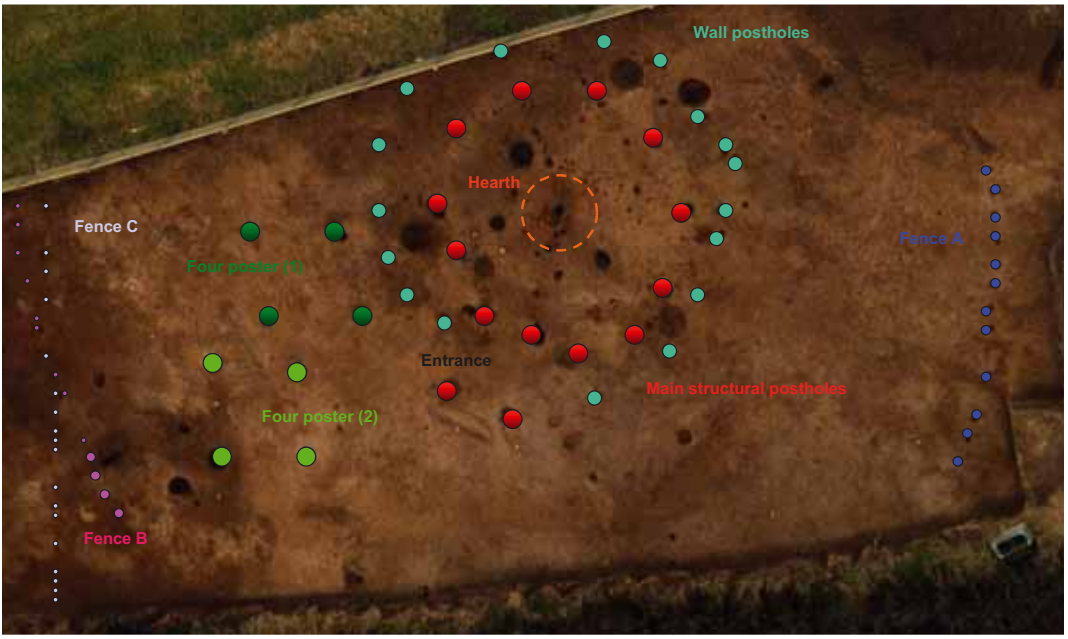
Excavation works along the route of the proposed road uncovered numerous *fulachta fiadh*, a site type traditionally defined as an ancient cooking place and prevalent during the Bronze Age. The sites discovered during this project displayed a range of interesting architectural traits and associated features, including timber-lined troughs and troughs with distinctive overflow gullies. A small number of these sites had associated areas of structural remains (post-holes, stake-holes and hearths), some of which may have defined small shelters/huts or perhaps racks for hanging foodstuffs. In spite of these finds, the question remained as to where the people who frequented these 'cooking areas' had lived; the site at Tober may have been such a place.

Excavation discoveries

Central to the archaeological remains at Tober was a distinctive ring of large, well-defined post-holes, 7 m in diameter. Judging by the packing arrangement and post-pipe diameters within them, the post-holes would have contained posts averaging 0.20 m wide. An outer ring of smaller post-holes enclosed these. In addition, there was an arrangement of two larger post-holes at the south-east, external to the outer circle of posts. Central to both rings of post-holes was a very large hearth (c. 3 m in diameter), with associated stake-holes. A number of small refuse pits were also located within the main ring of post-holes.

The arrangement of these archaeological features can be best interpreted as a circular building with internal roof supports. The roof supports are defined by the ring of large post-holes; the wall is defined by the outer ring of smaller post-holes. It is likely that this wall would have been in the form of wattle-and-daub with a thatched roof. The large posts at the south-east of the building may have defined a porch entrance. The hearth had distinctive layers of burnt clay and charcoal.

Internal hearth, during excavation.



Annotated aerial view of the Bronze Age settlement at Tober.

Photos: IAC Ltd

Sandstone spindle whorl recovered from house.

Tober Bronze Age house, during excavation.

The associated stake-holes may have been the basis for a series of spits over the fire. There was also a suggestion of internal divisions within the building in the form of lines of stake-holes, perhaps distinguishing areas for sleeping or storing food.

Associated features

There was an enclosing element to the site that was defined by a series of stake-holes to the north and south of the building. This suggests the presence of a surrounding wattle fence, which would have delimited the immediate area of the settlement. The fence also enclosed a number of isolated pits and two 'four-poster' structures that were defined by a roughly square arrangement of large post-holes. These two structures could be interpreted as either permanent animal pens, or perhaps as elevated grain silos.

Finds

A small quantity of prehistoric pottery was recovered from the fills of two post-holes of the building's superstructure. Dr Eoin Grogan, an expert on prehistoric pottery, has commented that the pottery sherds from Tober constitute the remains of at least three Late Bronze Age domestic vessels.

A small quantity of flint and other stone objects was also uncovered at Tober. The flint pieces were all natural chunks. However, a flat sandstone spindle whorl, with a small central perforation 12 mm in diameter, was recovered from a pit within the projected floor area of the main building.

Further work

A programme of post-excavation analysis is currently in progress. This will establish comprehensive dates for the site and will give us a much clearer picture of the environment at Tober during the Bronze Age.

Aerial view of enclosure and double ring-barrow at Cappydonnell Big, Co. Westmeath, facing south. (studiolab.ie)

The enigma of Cappydonnell Big

Aerial view of double ring-barrow, facing south-east. (studiolab.ie)

Tim Coughlan, an excavation director with Irish Archaeological Consultancy Ltd, recounts the preliminary findings from one of the largest and most enigmatic sites excavated on the N6 Kilbeggan–Athlone dual carriageway.

Introduction

Excavations in advance of the N6 Kilbeggan–Athlone dual carriageway commenced at Cappydonnell Big, Co. Offaly, in October 2005 and were completed in April 2006. The area of excavation measured approximately 60 m north–south by 80 m east–west. The main feature of the site was a probable medieval enclosure, previously documented as a ringfort. The excavation results suggest that activity took place here during a number of periods and that the medieval enclosure is actually located on the site of an earlier monument. The interior of the enclosure consisted of a flat platform and in this area the remains of a possible Bronze Age ring-barrow, possible associated post-holes and a stone-lined cist were identified. Additional medieval features—possible industrial pits with an associated rectangular structure and numerous post-medieval cultivation furrows and isolated pits—were also excavated here.

Prehistory

A circular enclosure, c. 14 m in diameter, was identified at the top of a natural gradual incline. The enclosure consisted of a ditch c. 2 m wide and 1 m deep. Within this was a smaller enclosing ditch c. 7 m in diameter, 0.4 m wide and 0.2 m deep. It is thought that this may represent the site of a possible Bronze Age double ring-barrow (an earthen burial mound generally dating to the Bronze Age and the Iron Age). The ditch was disturbed during medieval times to accommodate a large industrial furnace, with an associated area of stone metalling. Part of a human skull was found within the lower fills of the barrow. This bone may have been disturbed by the later activity in the vicinity, therefore its association with the barrow is unclear.

To the north of these features was a stone-lined cist that appeared to contain a disturbed cremation. Small sherds of possible prehistoric pottery, with impressed decoration, were recovered from the fills of the cist. A number of post-holes were also identified between the cist and the possible barrow, although no definitive pattern has been determined.

Medieval period

The probable medieval enclosure measured approximately 50 m north–south by 50 m east–west and in shape is best described as an irregular lozenge. The suggested dating of this structure is based on its large size and its shape. A ditch 4 m wide and 1.5 m deep, with an internal bank, forms the enclosure. The material dug out to create the ditch was used to build the bank, which, for the most part, survived intact. The bank was built on the side of the existing incline to create a flat platform within. On the north side there was a causewayed entrance and it appears that this section of the bank may have had a stone façade on either side of the entrance. Remnants of similar stone-facing were evident along the inner side of the enclosing ditch at the north-eastern and north-western projecting corners. In this regard it seems reasonable to argue that this was probably a high-status site, imposing itself on the landscape to the north, which contains a motte (a Norman fortification consisting of a round earthen mound with a flat top).

It is unclear if the enclosure was ever fully completed, as there is no evidence of any large structure within that would merit such a substantial enclosure. Archaeologist John Bradley, NUI Maynooth, has suggested that the Cappydonnell Big enclosure may have been a Gaelic Irish site, which would explain why there was little or no medieval pottery recovered during the excavation. The site has proven difficult to classify; post-excavation research into other, similar site types is continuing in an effort to understand this puzzling enclosure.

There appears to have been a subsequent phase of possible medieval industrial activity, particularly in the east of the enclosure. This includes the previously mentioned furnace and metalled surface. The material excavated from here was charcoal-rich and contained a considerable amount of burnt human and animal bone. It also contained 19 amber beads and small amounts of metal and slag. A number of pits, which appeared to have functioned as furnaces, were identified to the east and north, although only trace amounts of slag were recovered. Further analysis of samples from these features will be required to determine the precise nature of the activity. The pits were subsequently backfilled with stone/rubble, suggesting that there may have been some contemporary clearance on the site.

A collection of post-holes and three hearths in the south of the site may have formed one or two possible structures that cut through the bank and are thought to be broadly contemporary with the industrial pits. However, these structures and the pits did not appear to be of a large enough scale to be contemporary with the main enclosure. An abundance of charred seed remains was recovered from the hearths and other features on the site and radiocarbon dating of this material will help provide a more definitive chronology of activity at the site.

Post-medieval period

The north-west area of the enclosure interior contains a number of probable plough furrows.

Stone façades at north-west inner edge of external ditch and west-facing side of the entrance (top left).

These curve somewhat, following the line of a slightly deeper probable boundary that extends from the entrance in the north of the enclosure to the eastern part. It seems unlikely that the site would have ever been cultivated because it is quite stony, but it is possible that this activity may be associated with the enclosure being set aside as a plot. It may have been subdivided into a garden/cultivation area and an area for grazing, etc.

Other isolated features of possible post-medieval date were identified across the site. A number of predominantly linear agricultural features and other possible features were identified in the area to the west of the main enclosure. The area to the south-west revealed a corn-drying kiln, which was later filled with large stones and probably used as a soak pit. Some human remains were also identified just below the sod. There was no obvious grave cut and the remains had been badly disturbed. It is probable that they represent an individual who was not afforded a formal burial. Analysis and dating has yet to indicate if these remains are contemporary with the previously mentioned human skull from the barrow.

Conclusion

The results of the excavations at Cappydonnell Big have produced something of an enigma. The excavation uncovered very few artefacts directly associated with the main features on the site. Due to the shortage of significant finds, a conclusive dating of Cappydonnell Big will largely depend on environmental analysis. While it is hoped that radiocarbon dating will resolve some of the issues and confirm the prehistoric elements of the site, the main enclosure, in particular, continues to pose more questions than it answers. It contains some of the elements of a number of site types—platform ringfort and moated site are just two potential classifications—but fails to fit comfortably into any specific category. The dearth of artefacts and datable material from the substantially sterile ditch fills adds to this problem. Hopefully the conclusion of all specialist analysis and scientific dating during the project's post-excavation phase will supply sufficient information to resolve this enigma.

Mid-excavation view of stone-lined cist containing disturbed cremation burial. (IAC Ltd)

A site visit with a difference

Mary Deevy

Mary Deevy, NRA senior archaeologist with the Eastern Team, reports on a M3 site visit with a difference.

Of the many site visits to the excavations on the M3, including school tours and open days, one particular visit stood out. After all, it's not every day a caped superhero arrives on site with a special request! The superhero in question was 'Satman', one of the 'Super Doopers' who appear on the programme *Sattitude*, on RTÉ 2's *The Den*, every Saturday morning. Satman (a.k.a. Brian Ormond of *You're a Star*) was accompanied by 12-year-old Ronan Bennett, who had written to *Sattitude* in the hope that his dream of working on an archaeological dig for a day could come true. Ronan spent a day in February in the company of excavation director Steve Linnane and supervisor Alistair Clarke of Archaeological Consultancy Services Ltd, learning what working on an excavation is all about. Ronan's visit was televised by RTÉ in March of this year and Ronan has kindly written an account of his day on-site.

On a break from filming Brian Ormond and Ronan examine archaeological artefacts with Alistair Clarke.

Site supervisor Alistair Clarke introduced Ronan to the various recording techniques used on site, such as photography.

Ronan also learnt a lot about making television programmes with the *Sattitude* crew.

My experience as an archaeologist

Ronan Bennett, a schoolboy from Cork, provides an account of his visit to the archaeological excavation at Baronstown, Co. Meath.

In January 2007 I wrote a letter to 'The Super Doopers' of *Sattitude* asking them to make me an archaeologist for a day and that's where it all began. On the morning of Valentine's Day, my Dad and I were off to Dublin for the best day of my life. When we arrived at the RTÉ studios, Yvonne, our guide for the day, greeted us and we were off to my dig at Baronstown.

Archaeologists and Satman (one of the Super Doopers) were already at work when we arrived on-site. After my meeting with Satman I met Steve, one of the archaeologists, and he told me what I had to wear, including a safety jacket, hardhat and special boots. After that the camera was rolling and Steve talked me through the safety rules as I had to be careful because the ground was muddy. At the top of the dig I met Alistair, one of the supervisors. Alistair told me about a geophysical survey report, which was very interesting. Archaeologists use geophysics to find out what might lie underground before they begin digging. I was then invited to participate in the dig and I got to excavate a site with other archaeologists, which was fun. I was then shown some of the artefacts that had already been located, including animal skulls, jewellery, glass and iron, which was extremely interesting. All of those finds needed to be documented. I was then shown some of the tools they used every day, such as trowels, shovels, tape measures and line levels. To my surprise, at the end of the day I was given a toolbox containing all the tools, my own document sheets and hardhat. I am now working on my own dig in the garden at home. It was truly the best day of my life.

Ronan and Satman give a big-thumbs up to their day on-site with excavation director Steve Linnane and his team.

Photos: studiolab.ie

Right on track at Edercloon

Caitríona Moore, an excavation director with Cultural Resource Development Services Ltd, reports on an exciting wetland site discovered at Edercloon, Co. Longford.

When archaeologists began excavating in a small area of reclaimed bog at Edercloon, Co. Longford, little did they know that they were embarking on five months of excavation that would reveal some of the most remarkable discoveries ever made in Irish wetland archaeology.

Edercloon lies just south of the County Leitrim border and the village of Roosky. The excavation, which ran from April to August 2006, was undertaken by Cultural Resource Development Services Ltd (CRDS Ltd), on behalf of Leitrim County Council and the NRA, in advance of the N4 Longford–Drumsna (Dromod–Roosky Bypass) road scheme. Archaeological deposits at Edercloon had first been identified the previous February during centreline testing, which revealed several deposits of worked wood beneath the surface of a reclaimed field. The following April, 28 excavation trenches were opened over an area measuring 170 m by 30 m, revealing 48 wooden structures lying between 0.01 m and 2 m below the field surface.

Toghers and platforms

The structures found at Edercloon consisted of wood and occasional stones, the former being perfectly preserved due to the lack of oxygen in the bog and the high watertable. The most numerous site type found was the togher, or trackway, of which 25 were excavated. These varied from simple short paths comprising a single layer of wood to dense structures with multiple layers, some over 1 m deep. All of the toghers were built almost entirely of brushwood, roundwoods and pegs. Planks and large split timbers were largely absent. The toghers at Edercloon range in date from the Neolithic to the medieval period and of the 25 excavated, 13 were oriented north–south. This alignment is significant because it does not represent a route through the bog from dryland to dryland—a common goal of many toghers—but instead leads directly into and out of the surrounding wetlands.

Also excavated at Edercloon were five platforms of varying size, all comprising square or rectangular areas of brushwood and roundwoods, in some instances pegged securely in place. Like toghers, platforms are found throughout Irish raised bogs, but their function is often difficult to interpret. It is likely that they would have provided reasonably dry, stable areas in which a variety of activities, such as hunting game, gathering plants or rituals, could have taken place. Two of the Edercloon examples were directly associated with toghers and of the five, three have been radiocarbon-dated to the Bronze Age and one to the Iron Age.

The final site type encountered at Edercloon consisted of 18 discreet deposits of wood—referred to as 'archaeological wood' to distinguish it from natural deposits of wood occurring in bogs. These were generally small, irregular deposits of worked and unworked wood, many of which are likely to have been related to the toghers and platforms in the area. Large concentrations of these site types have been identified throughout the midland raised bogs by surveys conducted by the former Irish Archaeological Wetland Unit. However, the density of structures at Edercloon was quite remarkable, with toghers frequently criss-crossing each other and platforms overlapping one other. Ironically, in order to excavate such a complex of structures it was necessary for the archaeologists on-site to build their own network of paths and platforms.

Artefacts

While the structures excavated at Edercloon were themselves extraordinary, the size and range of the artefact assemblage was truly astounding, especially as toghers with associated finds are relatively rare. A total of 51 objects was recovered, 46 of which were directly associated with toghers or platforms. The remains of nine wooden vessels were found within seven sites, which have been radiocarbon-dated to the Bronze Age, Iron Age and medieval periods. All were carved from alder wood and consist of bowls, tubs and a trough, the latter being the only intact item. (Environmental specialist Dr Ingelise Stuijts identified all of the wood species cited in this article.)

Another significant group of objects was the partial remains of three wooden wheels that were discovered in three different structures. One is a portion of an alder block wheel, of which similar finds are known, but the remaining two constitute a new type in Ireland. Made from alder and ash, they are in fact fragments of wheel rims, almost like wooden tyres. Both show signs of wear indicative of use, the evidence for which even includes gravel embedded in their outer surfaces. A hazel roundwood with oval perforations carved into each end was also found close to one of the wheel rims. While its function is uncertain, it is interesting to speculate as to whether this object could have an association with the wheel fragment, perhaps forming part of a cart or bridle trappings.

Another extraordinary and exciting discovery was that of two spear shafts that lay close together at the base of a togher. Made of yew wood, both had been broken before deposition.

Six very curious, almost identical objects were recovered from within two toghers. Consisting of short lengths of brushwood with a curved, spiralling shape, they were initially thought to have been the

Yew spear shaft. (John Sunderland)

Background: Elevated view of the excavations at Edercloon. (CRDS Ltd)

result of carving or whittling. However, examination of these objects by Dr Stuijts has revealed that they are in fact two individual pieces of hazelwood that have been trained to grow around each other in a spiral formation, with the two pieces becoming fused together. No parallels are known for these artefacts, but more remarkable still is the occurrence of the identical items in association with trackways dating from different prehistoric eras: a Bronze Age site radiocarbon-dated to 1206–970 BC and an Iron Age site radiocarbon-dated to 390–170 BC. Could this be evidence of an enduring local tradition or industry dedicated to creating these, conceivably decorative, pieces?

Other finds included numerous lengths of carved and dressed pieces of wood that may have functioned as tool handles, clubs or walking sticks. One of the most enigmatic artefacts found was a piece of sloe wood, just over 1 m in length, which had been worked to a point at each end and was covered with approximately 300 individual toolmarks. A practical function for this object has not yet been ascertained, but it is certain that its creation required a great degree of skill and deliberation. This can also be said of a split timber of ash into which were cut six equidistant rectangular notches. Into these notches and at the intact terminus of the timber were inserted tiny wooden dowels or pegs, five of which have been identified as sloe (x 2), ash (x 2) and apple type (x 1).

The artefacts discovered at Edercloon are of outstanding quality, but it is their quantity that is truly surprising. While the inclusion of fragmentary wooden objects is known in togher construction, it has not previously been seen to occur in such abundance. Toghers and platforms in raised bogs do not typically yield such high numbers of artefacts, possibly because they were generally temporary structures that would sink into, or be enveloped by, the bog within a relatively short period of time. As such, there would have been little time for artefacts to accumulate through casual loss, disposal or ritual deposition. The lack of finds might also be a result of the specific functions of these sites.

Conclusion

The recovery of 51 artefacts from Edercloon, coupled with the sheer density of structures, makes this complex one of the most significant wetland archaeological sites ever excavated in Ireland. A lengthy and detailed post-excavation programme of research and analysis has now begun and plans for a comprehensive publication relating the results of this work are well advanced. The findings from Edercloon have much to teach us, not only about the archaeology of wetlands but also about the knowledge, beliefs and culture of those people who accessed and used them.

Above: Beautifully carved wooden bowl with perforated handles. (John Sunderland)

Below: Hazel fragment with a separate piece of hazel trained to grow in a spiralling formation around it. (John Sunderland)

Difficult conditions for archaeologists excavating an Iron Age togher. (CRDS Ltd)

First edition Ordnance Survey map (sheet Galway 97) showing the 'lost' site of Carrowkeel as a circular earthwork. (Ordnance Survey Ireland)

Search and discovery on an east Galway road scheme

Jerry O'Sullivan

Jerry O'Sullivan, NRA archaeologist with the Mid-West Team, reports on the site-detection methods used on the N6 Galway–East Ballinasloe PPP scheme.

The archaeologist who excavates for pure research—and there are still a few—has the good fortune to choose his/her excavation site. The work is led by a question: 'Who built the stone forts of the Atlantic seaboard?' or 'Were our early monastic sites originally secular settlement enclosures?' The first challenge for this kind of archaeologist is to identify the key research question; the second challenge is to find a site that has the potential to provide the answer.

In contrast, the archaeologist who makes a living by excavating on development sites (of which there are very many more than of the other sort) does not usually choose the sites on which he/she will work. It is decided by somebody else, who wants to build a hotel, a supermarket or a new road. Any large-scale development presents an opportunity for archaeological discovery, and this fact is recognised by the planning authorities. It is common for the planning conditions imposed on large developments to include provision for an archaeological investigation of the affected site. What might be discovered, however, is often a matter of chance. Therefore, the development archaeologist starts out with the single, simple question: 'What am I likely to find?' It takes a big toolkit to answer that simple question. The purpose of this article is to illustrate how various methods of discovery are deployed on large development sites, using examples from recent work on the 56 km long N6 Galway–Ballinasloe road scheme.

The combined methods of preliminary investigation on a development site are known as 'archaeological assessment'. Its aims are generally to ascertain the presence, character, condition, extent and significance of whatever may be discovered on the site. Published national heritage policy and evolving good practice agree that some or all of the following methods can be combined: desk study, field inspection, aerial reconnaissance, underwater survey, geophysical survey, metal-detecting and test excavation. The assessment for our Galway scheme was a big project in itself; when completed, 36 archaeological sites had been identified for full manual excavation.

Desk-based study

This means taking an inventory of everything that is already recorded about a given study area and trying to make some deductions from this paper evidence. Some of the available records are kept by national institutions, like the National Museum of Ireland (NMI), the Archaeological Survey of Ireland or the Royal Irish Academy; others are found in local libraries; and the Internet is becoming an increasingly useful source of local information, too. Early maps are especially important as they offer a bird's-eye view of the landscape at a particular time; however, they are very selective in what they include and are seldom very accurate in terms of scale or location.

Early maps were used at the reconnaissance stage to identify some of the archaeological sites that were subsequently investigated fully. One example is the early 19th-century estate cottage at Moyode, which is described in another contribution to this issue of *Seanda* by Tom Janes and Conn Murphy. When some oblong humps and bumps were observed during field inspection of the route, the archaeologists knew they were the remains of three buildings shown in that location by the first edition Ordnance Survey (OS) map. Test excavations soon confirmed this. (The first edition OS maps were compiled in the 1830s and printed at a scale of 6 in. to 1 mile, or 1:10,560. They are the first accurate set of maps covering the whole country at a relatively detailed scale.)

A much older site was identified from map evidence elsewhere on the route, at Carrowkeel. This was shown as a circular enclosure on the first edition map, but had disappeared by the time a new edition was produced in the 1920s. The enclosure had been ploughed away in the course of modern farm improvements. Certainly there was nothing to be seen by field inspection, but geophysical survey was able to detect that the enclosure ditch still survived beneath the grass and also to indicate that other features survived within the enclosure. Test excavation confirmed this and discovered that the enclosure had been a burial ground in the medieval period. Eventually, over 100 human skeletons were recorded and retained for analysis.

Locating newly discovered features in the field using GPS survey equipment. This equipment tracks the orbits of space satellites overhead and uses them to calculate its own position on the Earth's surface. (Galway County Council NRDO)

Field inspection

In attempting to know and understand any landscape, there is simply no substitute for donning some good raingear (or sun cream) and boots, packing a flask and map and getting out there to spend a few days walking about. Simply meandering about in a thoughtful frame of mind is of little use in itself, however. Archaeological field inspection, or fieldwalking as it is also known, should be systematic, intensive and recorded. This meant visiting every part of every field that would be affected by the road and making notes on aspect, land use and vegetation. Any features of possible archaeological origin were especially noted, photographed and recorded on annotated maps or using digital survey equipment. As well as looking for new sites and monuments, fieldwalking is also an opportunity to check the condition of previously recorded ones.

Several archaeological sites were discovered by fieldwalking. These included an early medieval farmstead enclosure, or cashel, at Coolagh. The walls of the enclosure and of a large roundhouse in the interior were upstanding to several courses in height, but were partly overgrown by hazelwood scrub. Although the site was in a populous rural area quite close to Galway City, it was not previously recognised and was not identified by any map or archaeological record.

Another early medieval site was discovered by field inspection at Mackney, near Ballinasloe. This was originally a very large circular earthwork, but—in contrast to the site at Coolagh—was in poor condition and had almost entirely disappeared from the landscape. A curvilinear bump in a pasture field caught the eye of the archaeologist who was on field inspection in this sector. The site was located on a prominent piece of ground, with good views down the Suck river valley, and this made it seem especially interesting. A geophysical survey had been conducted in this area but, surprisingly, the feature did not stand out in the results. However, subsequent test excavations confirmed that it was the surface expression of a levelled ringfort—as the archaeologist doing the field inspection had correctly surmised. The lesson here is that no one method of assessment is completely reliable in all cases: a combination of methods is more likely to yield the best results.

The remains of a roundhouse within the early medieval cashel at Coolagh. (Galway County Council NRDO)

The 'tell-tale' bank remnant at Mackney seemed quite unimpressive when it was first recognised in the field, but investigation of the site discovered a very large ringfort with a deep surrounding ditch. (Hany Marzouk)

Aerial reconnaissance

On this part of the N6 aerial reconnaissance was not used at the assessment stage because a series of vertical aerial photographs had already been specially commissioned for the scheme. Instead, aerial photography was used at a later stage in the project to record individual excavation sites in their landscape settings. The following example is a striking lesson in how an aerial perspective can make sense of puzzling fragments on the ground. Segments of simple, earth-cut ditches had been discovered by test excavations at several locations across a low hilltop at Rahally, near Kilconnell. A large area within the footprint of the new road was stripped of topsoil and more ditches were found. They were located on both sides of the hill summit along a 450 m-long section of the road. The possibility that these were remnants of a complex hillfort with several enclosing ditches was considered by the excavation team, but the overall plan remained unclear until all of the available aerial photographs were examined again. As well as the excavated ditch segments, aerial photography revealed some other tell-tales in the landscape, including an odd, curvilinear segment in the local rural road and visible 'scars' in the surfaces of surrounding pasture fields where there had once been banks and ditches. The overall plan was now clearly evident and amounted to one of the biggest prehistoric hillforts recorded to date in Ireland.

Underwater survey

Lakes and bog pools were special places in some periods of prehistory. In Bronze Age times collections of valuable metal objects were frequently deposited for whatever watery gods were being supplicated/honoured. In Iron Age times victims of ritual murders were buried in bogs to enforce territorial boundaries. And in all periods, fording places became accidental repositories of the objects lost by people wading or riding across the shallows.

The new N6 road will cross the River Suck at Pollboy. There are several natural fault-lines in the bedrock on the riverbed and these form natural weirs that can be forded easily in summertime, when the water is low. At nearby Kellysgrove there had been a previous underwater survey by the NMI, in 1991, when part of the river was being deepened by the Office of Public Works for leisure craft. The NMI divers recovered Neolithic axeheads, medieval swords and an early 19th-century musket. We hoped for a similar haul of treasures at our crossing-place in Pollboy when underwater archaeologists inspected the riverbed using metal-detectors. They recorded the locations of dozens of metal objects, but, unlike the assemblage from Kellysgrove, all of these were pieces of modern debris with no archaeological significance whatever.

Geophysical survey

Geophysical survey has been called 'seeing beneath the soil' by one of the main experts in the field. Geophysical survey uses equipment that identifies irregularities, or anomalies, in the soil's natural magnetism. Sometimes these anomalies are of archaeological origin, and this can be confirmed by test excavation. Examples might include buried foundations, tunnels or other voids, backfilled ditches or intensive burning. A large, intense fire will affect the natural magnetism of the adjacent soil particles and even when grass has recovered and concealed the site of the burning, this effect will stand out very clearly in the geophysical surveyor's map of the magnetic anomalies.

The desk study did not find any records for early brickmaking at Brusk and the field inspection failed to recognise this site, though there were some anomalous humps and bumps on the ground. In the geophysical survey results, however, these humps and bumps stood out very strongly as 'hot spots' and the surveyors suggested, correctly, that they represented an industrial activity in which firing or heat was an important part of the process. Subsequent excavation discovered a small group of Victorian brick clamps. These were very simple structures. They consisted of a quantity of hand-made bricks and sods of peat stacked together and allowed to burn slowly for several days until the bricks were 'fired' or hardened.

Metal-detecting

Metal-detecting was also used, in a terrestrial context, on the site of the Battle of Aughrim (1691). The route of the new N6 was chosen to avoid the main part of the battlefield, south of Aughrim village, and instead skirted the village on the north side. It is believed that some of James II's cavalry was stationed here, behind his main line, in anticipation of battle. The cavalry never engaged; instead, the infamous Brigadier Henry Luttrell led them in a retreat from the battlefield. The unprotected infantry were left

behind to be slaughtered in what was a very heavy defeat of the Jacobites by the army of William of Orange.

The route, known today as 'Luttrell's Pass', lies along tilled fields on either side of a minor rural road. These fields were examined in a systematic and recorded survey using metal detectors. The metal-detecting team walked the ground at regular intervals in parallel transects. The locations of any 'hits' were marked with flags and recorded using GPS equipment. At each findspot the metal object that had caused the 'hit' was excavated from the ploughsoil by hand and the object was labelled and boxed for further examination off-site.

Hundreds of metal objects were recovered in this way. They included several musket balls, as well as a fragment of a mortar shell, and one of the 'gun money' coins minted in Ireland by James II to pay his troops. The remaining objects were mostly modern debris, so that the proportion of the total assemblage relating to the battle was very small. This method of assessment was useful nonetheless because it confirmed the established historical narrative of the battle. The musket balls and mortar shell probably represent skirmishing and/or overshooting, but certainly do not represent a pitched battle. So the area now known as Luttrell's Pass really was behind the Jacobite line, away from the main combat area.

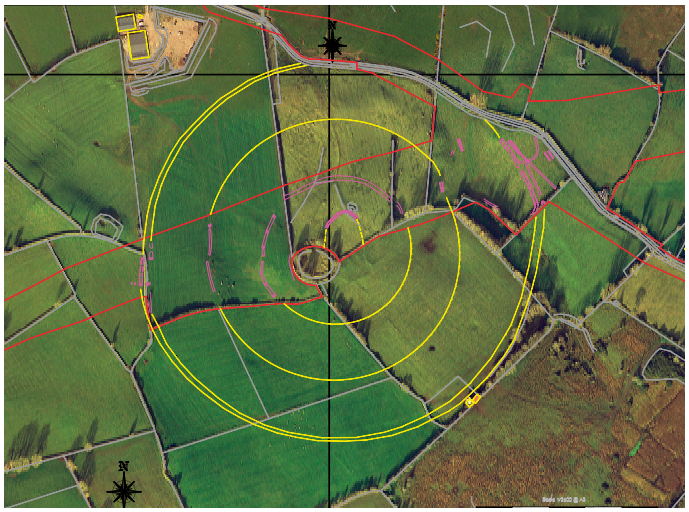
Test excavation

When all other methods have been tried, it is time to put trowel, spade and machine excavator to work. Test excavation by hand opens a keyhole on a known or suspected site; machine excavation opens a series of keyholes in areas where there are no suspected sites, but where something might be discovered by random excavation. In the latter case, it is important to open enough trenches to be confident that no large or significant archaeological site has been missed.

Archaeologists disagree about the optimum amount of testing. It is important to strike a balance between discovery of all the significant sites, on one hand, and best value for time and money, on the other. Most archaeologists agree that trenches amounting to about 10% of the total area should be opened in any one field. If there are suspected archaeological remains there, then more trenches may be opened and if there are also some visible upstanding remains, then the work is most likely to be done by hand and not by machine. Full manual excavation is the usual sequel where significant archaeological remains are found by testing, though sometimes the features can be preserved *in situ* instead.

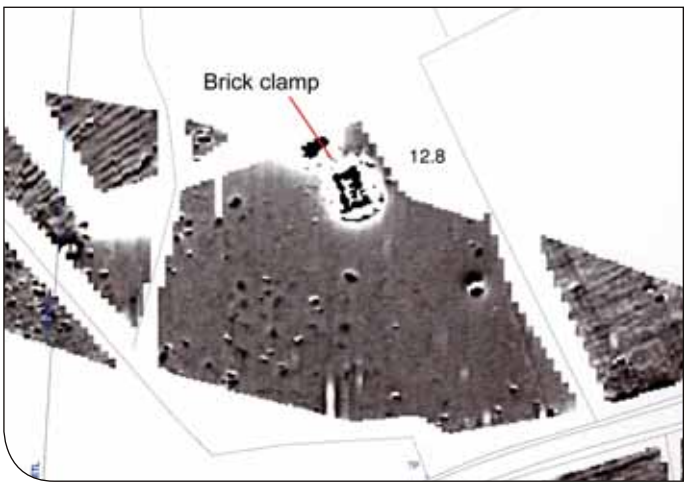
Criss-crossing the countryside with machine-cut test trenches in the hope of finding something may seem a crude investigative method. It would be more accurate to describe it as systematically cutting trenches in all areas to avoid missing anything. In this case, it worked at least as well as all other available methods combined. About half of the 36 sites excavated on the N6 Galway–Ballinasloe scheme were discovered by test excavations in 'blank' fields. These sites mostly consisted of plough-truncated remains, sheared off at the base of the ploughsoil, but also included two sites with prehistoric worked timbers preserved in bogland. Their date range spans from the Bronze Age to the medieval period.

The small circular earthwork on the hill summit at Rahally is an early medieval ringfort. The much larger and much older prehistoric hillfort surrounding it is concealed in the modern landscape. (Galway County Council NRDO)



The concentric enclosure ditches of the hillfort at Rahally are traced here in yellow. The excavated segments are shown in pink and correspond to the part of the monument that will be directly affected by the new road. (CRDS Ltd)

Archaeological divers examine the riverbed at the Suck crossing using a metal detector. (Galway County Council NRDO)



The buried remains of a Victorian brick clamp stand out with striking definition in the results of an archaeological geophysical survey at Brusk. (ArchaeoPhysica UK)

One of several musket balls recovered by metal-detecting at Luttrell's Pass, Aughrim. This example has been rolled to make it spin when fired, thus maximising the potential damage on impact—a 17th-century version of the 'dum dum' bullet, which is banned in modern warfare. (Galway County Council NRDO)

Recording machine-cut test trenches on the N6 route. (Galway County Council NRDO)

These Bronze Age worked timbers, preserved in a peat bog in Killescragh, were recorded on one of the numerous sites discovered by random machine-cut test trenches in an area with no known archaeological remains. (Galway County Council NRDO)

This early medieval ditched enclosure at Treanbaun was not previously recorded and there were no surface traces of the monument. It was discovered by random, machine-cut test excavations. (Galway County Council NRDO)

In Brief
GUN MONEY

Gun money, or brass money, was a short-lived currency used in Ireland between 1689 and 1692, when the deposed Catholic king James II waged a divisive war in Ireland to regain the thrones of England and Ireland from his Protestant daughter, Mary II, and son-in-law, William of Orange. In March 1689 James landed with a French fleet at Kinsale, Co. Cork, accompanied by a following of French, Irish, English and Scottish supporters. James soon realised that there was insufficient coinage and raw bullion available in the country to fund his campaign. So, in June 1689 he ordered the minting of copper and brass sixpences at 61 Capel Street, Dublin, using two confiscated minting presses (the Duchess and James presses). His aim was to temporarily issue, as legal currency, coins struck from cheap metals pending his successful re-accession to the throne, when he would then redeem the holder of the coins with the appropriate value in gold and silver.

The new coins were designed with the bust of James and the legend 'IACOBVS II DEI GRATIA' (Latin for 'James II by the grace of God'). The opposite side had the king's royal crown symbols, his initials (J R for Jacobus Rex, Latin for 'James the King') and the value of the coin denoted as VI (sixpence). The perimeter of the coin face was inscribed with 'MAG BR FRA ET HIB REX 1689' (signifying 'Great Britain, France and Ireland King 1689'). Shillings and half crowns were minted shortly thereafter and followed the same general design. As the cost of his campaign grew, James required up to 13 tonnes of copper per month for coin production. To keep production going, cannons, church bells and even old kitchen furniture were melted down for use, hence the term gun money, or brass money. It was the defeat of James at the Battle of the Boyne in July 1690 that began the demise of the gun money currency, which finally collapsed in February 1692, when William III, having defeated the remnants of James II's armies in the Siege of Limerick, proclaimed the formal demonetisation of the currency.

Ken Hanley, NRA archaeologist, Southern Team.

Transition at Treanbaun: ritual evidence from the Neolithic to the Bronze Age

Marta Muñiz Pérez, an excavation director with CRDS Ltd, reports on a complex of potential ritual features that appear to bridge the Neolithic–Bronze Age transition.

A prehistoric site was identified in Treanbaun townland, Co. Galway, during pre-development testing on the proposed route of the N6 Galway–East Ballinasloe PPP scheme. The site, which was situated on a tongue of land bordered by two streams and surrounded by wetland, was excavated between February and May 2006. Excavation of a site identified in Rathglass townland, approximately 500 m to the west and atop the same natural ridge, was completed during the same period. Both sites contained prehistoric cremations, consisting of small quantities of cremated human bone deposited in simple pits (token cremations). Bronze Age cremations were also identified at a second site excavated in Treanbaun townland, c. 750 m to the east. An early medieval enclosure containing the remains of 31 skeletons was also identified at this site.

Three well-defined areas were identified on the first site at Treanbaun: the remains of a post-built structure were uncovered on the western part of the site (Area A); the remains of a possible palisade enclosure were exposed at the centre of the site (Area B); and, finally, up to 15 cremation pits were identified on the eastern part of the site (Area C).

The structure identified in Area A consisted of a series of post-holes, stake-holes and pits. A number of large post-holes enclosed a circular area measuring 14 m in diameter, indicating the remains of a substantial structure. The density of the post-holes suggested the structure may have been repaired and/or rebuilt several times. A group of shallow pits containing charcoal and ash, as well as a small deposit of heat-shattered fragments of granite, was found within it. Granite is not the native bedrock of the area, so the stone must have been selected deliberately from among locally available glacial erratics and transported to the site. Some form of pyrolithic activity was presumably taking place (e.g. heated stone may have been inserted into a water-filled pit to produce steam). Outside and to the east of the structure the shattered fragments of a pottery vessel with chevron decoration were recovered.

Circular slot-trench for wooden palisade in Area B. (Hawkeye)

The most striking feature was located near the centre of the site, at the highest point (Area B). This consisted of the remains of a circular slot-trench enclosing an area c. 20 m in diameter. Packing stones had been placed along the entire length of the slot-trench and stake-holes were exposed at closely spaced intervals set into the base of the trench, suggesting a vertical timber palisade. A break of c. 8 m in the slot-trench to the south-west indicated an entrance point. A number of shallow pits were identified within the structure. A curvilinear feature was located on the southern side of the interior, positioned parallel to the gap in the palisade. This may have supported a timber screen, perhaps blocking any direct line of sight from the entrance to the interior.

Area C was located immediately to the east of Area B. The most significant features identified in this area were 15 possible cremation pits. All contained large amounts of charcoal and ash and minute quantities of crushed burnt bone. A significant range of finds was recovered from within, including long transverse arrowheads of flint, flint convex scrapers and small sherds of burnt pottery.

A preliminary assessment of the stone artefacts conducted by specialist Dermott Moore indicates that the collection is very unusual—if not unique—in this part of the country. A total of 502 pieces of chert and 73 pieces of flint were recovered. Almost one-third of that assemblage consists of micro-debitage and fine fragments, which together with the presence of struck flakes and small cores suggest that knapping of chert and flint was carried out on the site (i.e. stone tool production using percussion or pressure). The worked pieces recovered from the cremation pits were of a very high quality.

The site at Treanbaun contains elements that appear to be characteristic of a phase between the Final Neolithic and the Early Bronze Age (c. 2500 BC). The location of the site, occupying a natural 'island' in the landscape, is also significant, as it would have reduced the need for defensive enclosing features. The association of structures, enclosed spaces and funerary features suggest the site may have had a significant ritual function; the absence of domestic refuse and the presence of a small quantity of high-quality finds would support this assumption.

Reading the ashes: charred plant material from two ringforts in County Galway

Mary Dillon, Penny Johnston and Martha Tierney of Eachtra Archaeological Projects outline the results of environmental analysis conducted on samples from ringforts on the N6 Galway–East Ballinasloe PPP scheme.

What is charred plant material?

Charred plant material, including charred wood (charcoal) and charred seeds, is one of the most common types of environmental evidence retrieved from Irish archaeological sites. The reason it is so commonly found is that it does not decay in the same way as organic material, as in certain conditions burning can convert plant material to inert carbon.

How do we collect it from site?

Most of the plant material survives as tiny seeds or fragments of charcoal, so it is impossible to retrieve an unbiased sample by hand. Therefore, large samples of bulk soil are usually taken from archaeological deposits and processed using a water flotation system in order to collect charred plant remains; most charred plant material floats in water.

What are the most common types found in Irish archaeological deposits?

The most common charred plant materials found on Irish archaeological sites include various types of charcoal (particularly from oak, ash and hazelwood) and cereal grains (most frequently wheat, oat and barley). There is a bias towards the preservation of cereals above other seed types because fire was often used in processing cereals to help remove chaff, in order to make spoilage during storage less likely and to harden the grain so that it was easier to grind. In general, fire was only applied to other plants accidentally. As a result, the multitude of other plants that must have been used in settlements—for floor, bed and roof covering, as leafy vegetables, as animal fodder, etc.—are under-represented in the record.

Studying charred plant material

Charred plant material can reveal interesting details about aspects of life in the past, such as the wood types used in construction of houses, the crops grown, what crop type had most social or economic value, the wood fuel type used in metalworking, the fuel type used in domestic hearths and so on. These were the questions and issues we sought to address in examining the charred plant remains retrieved from two recently excavated ringfort sites at Mackney and Loughbown 1 in County Galway.

Processing samples for retrieval of plant remains. (John Sunderland)

Examining charred seeds. (John Sunderland)

Ringforts at Mackney and Loughbown 1

Mackney and Loughbown 1 were excavated by Finn Delaney and Nik Bower (Eachtra Archaeological Projects) in 2006, prior to construction of the new N6 Galway–Ballinsaloe road. Mackney was located 5 km north-east of Aughrim and 1.5 km south-west of Ballinasloe; Loughbown 1 was located 3 km east of the village of Aughrim.

The enclosure at Mackney measured approximately 58 m in diameter and consisted of a single bank and ditch. Inside the ringfort were a large souterrain, a metalworking area, post-holes, a house and pits. The excavation uncovered a long sequence of settlement and occupation activity, and the site was later reused as a place of burial and cultivation. Radiocarbon dates indicated occupation between the eighth and 17th centuries.

At Loughbown 1 the ringfort measured 63 m east–west and 60 m north–south, with evidence for two concentric ditches found during excavation. The ditches encompassed a souterrain, possible kilns, iron working, post-holes and pits. Other elements of the site included a possible post-medieval forge and medieval iron working. Radiocarbon results indicated occupation ranging from the fifth to the 14th centuries.

Charcoal

Both ringforts had evidence for metalworking and at both sites these contexts were very heavily dominated by oak charcoal. At Loughbown 1 oak formed 98–99% of the charcoal from metalworking contexts, while at Mackney all the industrial hearths had a high percentage of oak (70%). Ring patterns in the charcoal indicated that it came from mature wood, such as trunks and large branches. Historically, oak was one of the preferred woods for making charcoal as it is slow burning and gives out substantial heat. Charcoal, rather than wood, was the preferred fuel for industrial firings because it allowed greater control over the rate and temperatures at which the fires burned. Although it is not possible to distinguish the difference between burnt wood fuel and burnt charcoal, it seems likely that the charred wood from metalworking contexts at Mackney and Loughbown 1 was from deliberately prepared charcoal. In addition, the selected raw material for making this charcoal was probably mature oak timber.

At Loughbown 1 oak represented only 50% of the total identified charcoal from the site, and ash was also frequent in these samples. Other important charcoal types came from hazel, apple type and sloe/cherry. This indicates that a good variety of different wood types were identified at the site. The results from Mackney were quite different: after oak, the next most common wood type was hazel, which made up just 9% of the fragment count. In general there is no evidence to suggest that other tree/timber types were significant at Mackney. It is possible that the prominence of oak charcoal indicates a high status settlement; oak was referred to as the 'Tara of all trees' in the annals and access to oak woodlands had important benefits, such as the availability of good quality timber, acorns and bark. Both sites had other indicators, too, that they were high-ranking sites, i.e. the size of the ditch at Mackney (up to 3 m deep in places), the concentric ditches at Loughbown 1, and the souterrains and metalworking evidence found at both sites.

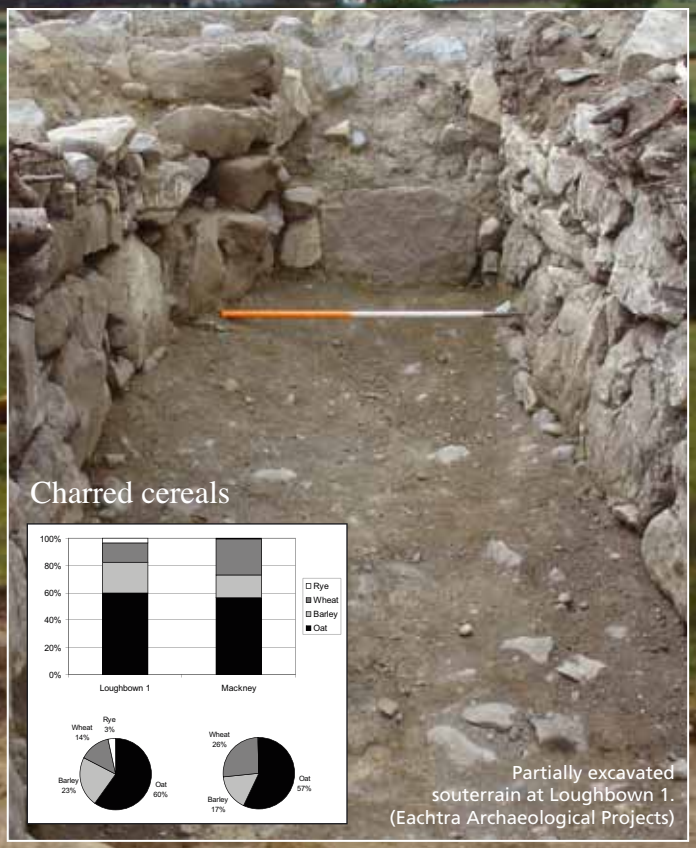
Another interesting aspect in the charcoal studies is the absence of some types of tree from the charcoal record. We know from regional pollen studies at Mongan Bog, Co. Offaly, c. 20 km away, that trees such as alder and birch were probably available in the surrounding area, but the charcoal evidence indicates that they were scarcely used. These trees may have been growing in boggy and wet inaccessible land, or they may have been avoided deliberately for cultural reasons.

Charred seeds

The analysis of charred macroplant remains from Loughbown 1 and Mackney indicated that oats, barley and wheat were found in abundance, and that rye was found only in small amounts. Barley formed roughly a fifth of the cereal assemblages from Loughbown 1 and Mackney. Hulled rather than naked barley was the most common type found. Wheat made up a quarter of the assemblage of cereals

Aerial view of the ringfort at Mackney during excavations. (Hawkeye)

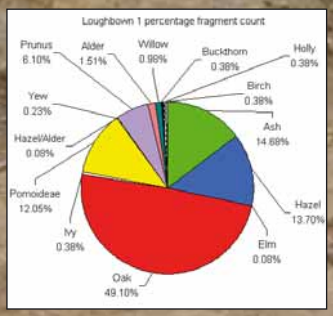
Background: Aerial view of the ringfort at Loughbown 1 during excavations. (Hawkeye)

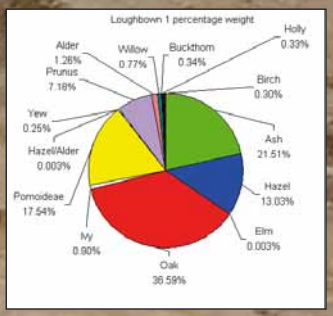


Partially excavated souterrain at Loughbown 1. (Eachtra Archaeological Projects)

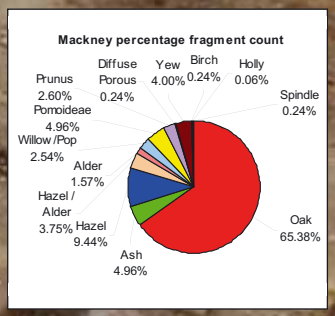
Entrance to the souterrain at Mackney. (Eachtra Archaeological Projects)

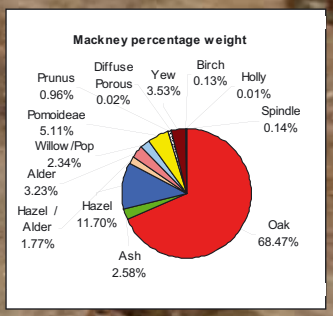
Charcoal from Loughbown 1





Charcoal from Mackney





from Mackney and roughly only one-sixth of the assemblage from Loughbown 1. Where identifiable, the wheat grains were usually classified as bread wheat. Oats were the most common grain types recovered from both sites. There are several different oat species known from Irish archaeological deposits, but there was no chaff from Mackney or Loughbown 1 to indicate which oat types were harvested at these sites.

All these cereal foods were used to bake bread or unleavened bread cakes, but cereals were probably also used for making meals, porridges, gruels and soup bases. Historical texts indicate that most cereal types were used as tribute and as there are indications of high status at both ringforts, it is possible that some of the cereal burnt at these sites may have been sent to the site as tribute.

The samples from Mackney contained a significant number of large legumes—mostly peas. Smaller legume seeds were also recovered in large amounts, probably clovers and vetches. Their presence suggests the practice of crop rotation, which involves the use of nitrogen-fixing plants, such as legumes, to rejuvenate the soil. Evidence of this form is usually found in late medieval contexts in Ireland, in particular from areas associated with Anglo-Norman agriculture. It is very unlikely that such intensive methods of arable farming were in use in the early medieval period when the ringfort was initially occupied, and most of the legume-rich samples probably date to the high and late medieval phases of occupation at the site.

Summary of results

In general, the large amount of different wood types in the assemblages from Loughbown 1 and Mackney give us a good indication of the trees that were present in the environment at the time as well as the large number of different tree types utilised by the settlement. Cereal such as wheat, barley and oats were all found at the sites in significant amounts. Rye was found only in very small amounts and was not recognised as an important crop at either site. Peas indicate that cereals were not the only crop types exploited in the region, and the recovery of large quantities of clovers and vetches are perhaps indicative of intensive agricultural practices during the later stages of occupation at Mackney.

An Unusual Burial at Ballygarraun West

Pat Randolph-Quinney, lecturer in Forensic Anthropology at the University of Dundee, details analysis of a possible 'charcoal burial' discovered on the route of the N6 Galway–East Ballinasloe PPP scheme.

In September 2005 human skeletal remains were discovered in Ballygarraun West townland, c. 2 km south-west of Athenry, in east County Galway. The site was initially identified by geophysical survey, which suggested the presence of multiple pit features. These were subsequently tested and excavated by archaeologists John Lehane and Eoghan Moore on behalf of Valerie J Keeley Ltd. During this process a single isolated inhumation was uncovered, and analyses of the grave contents and environmental remains have revealed an unusual example of early medieval burial practice.

The grave comprised a simple east–west-aligned subrectangular cut, 1.5 m long and 0.8 m wide, which had been heavily disturbed by ploughing. Several large, weathered stones were scattered above the grave fill, possibly representing the remains of a covering cairn. This probable cairn appeared to delineate the grave cut. The grave contained the fragmentary bones of a single human skeleton, which had been placed in an extended supine position (i.e. lying flat on the back), with the head to the west and the arms and legs extended along the sides of the body. The inhumation was found to be lying directly on a shallow bed of carbonised plant matter. This layer was made up of alder and hazelwood, together with various cereal grains identified by environmental specialist Mary Dillon as black bindweed, barley and wheat; the plant matter does not appear to have been burnt directly in the grave. Instead, it was scattered before the deposition of the body. No grave goods (jewellery, pottery, etc.) were recovered, though a large worked piece of naturally shed red deer antler was placed over the pubic region of the individual.

The Ballygarraun human remains during excavation.

The human remains were badly decomposed and in very poor condition—having been broken up by ploughing and weathered by the corrosive action of plant roots—with the effect that less than half of the skeleton survived. Thankfully, enough bone was present to allow for a determination of the gender, approximate age at death and stature (living height) of the person buried in the grave. The shape of the bones of the pelvis and chin suggested the individual was female. The degeneration (wear and tear) of the joint surfaces of the pelvis suggest she was well into her late forties or early fifties at the time of death. Measurements taken on the surviving leg bones allowed for an estimation of living stature at around 1.41 m tall (4 ft 8 in.). The woman displayed age-related skeletal conditions consistent with mature adulthood, including spinal osteoarthritis and heavy wear of the grinding surfaces of the teeth. She also displayed a build-up of mineralised plaque deposit on the cheek teeth and chronic inflammation of the supporting bone around the roots of both the upper and lower molar teeth; these two factors are generally indicative of poor oral hygiene.

Radiocarbon dates were obtained from the human bone and underlying burnt material and indicate that the woman died sometime between the early fifth to mid/late seventh centuries (AD 432–661), and is therefore broadly

Photos: VJK Ltd

The underlying charcoal and burnt grain layer following removal of the skeleton.

contemporary with the spread of Christianity in Ireland. The symbolism of the burial, especially the presence of scattered charcoal and grain, is interesting in the light of these early dates.

So-called charcoal burials are a phenomenon of the medieval period, occurring in Britain, Sweden, Denmark, Norway, Iceland, Greenland, Ireland and France. In this type of burial a layer of charcoal (usually oak) is present in the grave fill, either under or over the body, or occasionally encapsulating it completely, and is often associated with high-status burials (predominantly of males) in cathedrals and churches. Most post-date the Ballygarraun burial, dating from around AD 700–1100, though early examples with charcoal are known from Merovingian France (Mazerny, Ardennes-sur-Meuse, dating from the sixth to seventh centuries) and with charred grain from Anglo-Saxon contexts in southern England (fifth to seventh centuries). Whilst charcoal burials do occur in Ireland, they are so far known only from the church of St Peter's in Waterford, which is of much later date. In this instance the burial rite is thought to be a Christianised version of an earlier pagan practice from Scandinavia and England, which is perhaps unsurprising given Waterford's connections with the two regions.

Does Ballygarraun represent an early Irish example of a charcoal burial? Possibly it does, although there are differences in the form of the grave, the lack of high-status grave goods and the sex of the deceased compared to 'classic' charcoal burials. Certainly the burial can be considered as a pagan rather than Christian act—a ritual that took place during the time of transition to a Christian belief system in Ireland. In particular, the presence of burnt grain has parallels with Anglo-Saxon burials and a handful of Irish burials. The use of grain within these contexts is seen by scholars (such as Dr Elizabeth O'Brien) as a symbolic act associated with the purification of the dead. The burning of grain in this way was condemned by the early Church as a pagan ritual, which would suggest that the people who buried the Ballygarraun woman did not care for, or were unconcerned by, the opinions of the Church. That they were pagan is further suggested by the placement of red deer antler over the woman's pelvis; this rite is not unknown during the pagan–Christian transition, as evidenced by a female burial of similar date with red deer antler (though without charcoal) from Eelweir Hill, Lehinch, in east Offaly.

The Ballygarraun burial has clear parallels with southern English and Irish burial deposits of similar and later date, though the exact meaning behind the ritual remains unknown. Continued fieldwork and synthetic research may shed some light on these enigmatic mortuary practices, expressions of a pagan belief system during the rise of Christianity in Ireland.

Red deer antler recovered from the pelvic area of the burial, showing cut marks and working.


The remains of the three-roomed cottage, looking south.

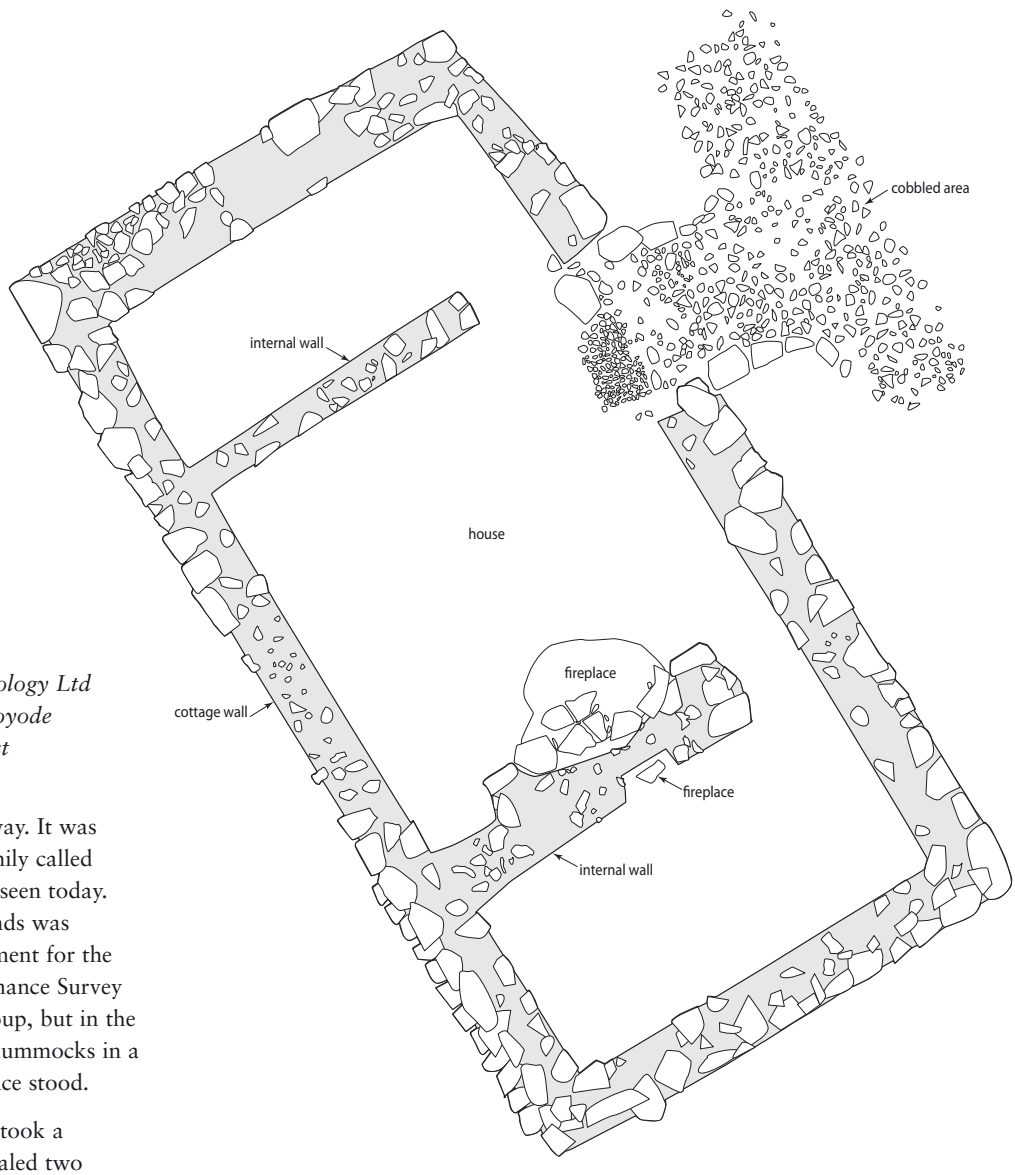
Moyode–
an estate cottage near Athenry


Crop storage shed, looking north.

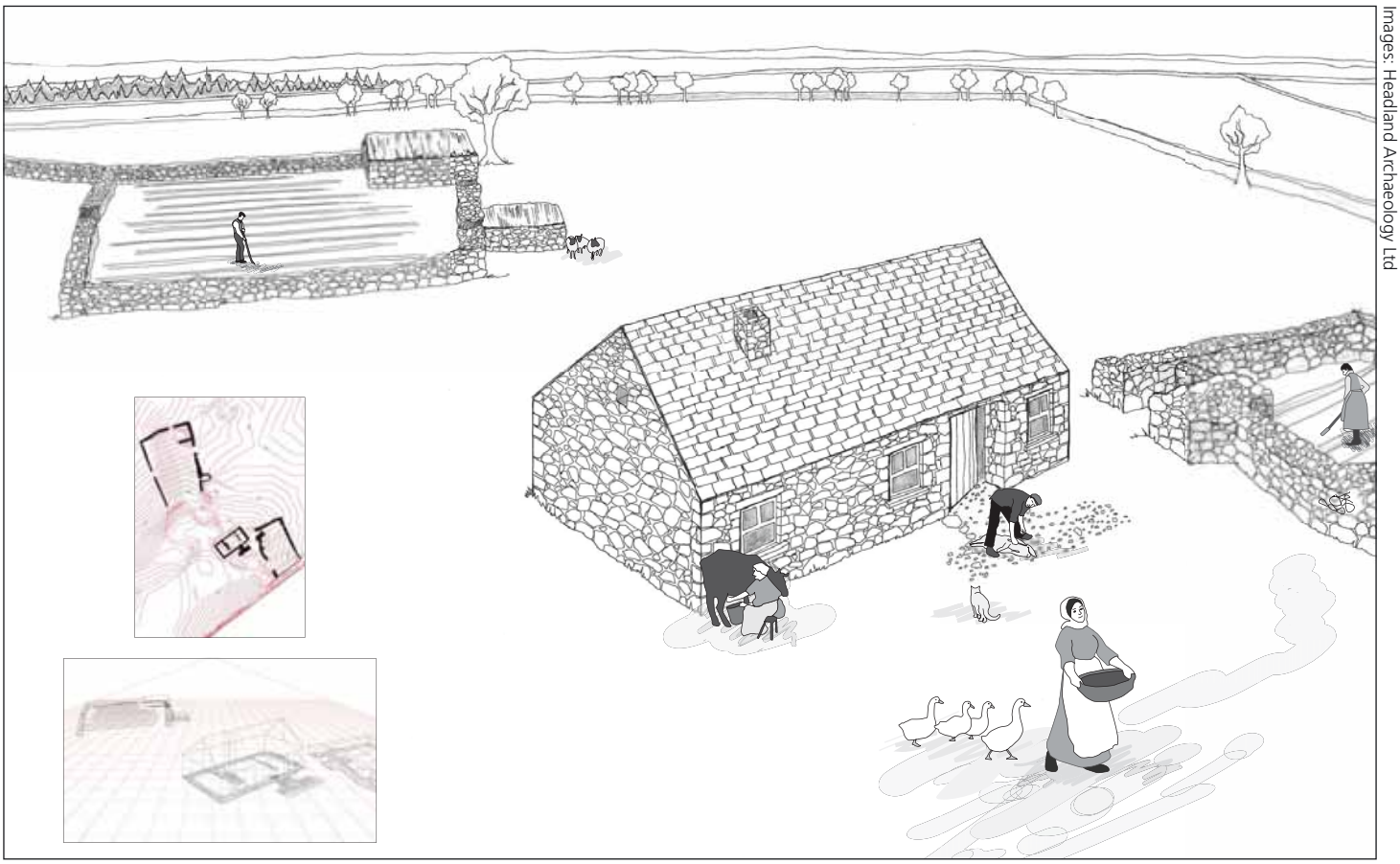
Tom Janes and Conn Murphy of Headland Archaeology Ltd describe an early 19th-century estate cottage on Moyode Demesne, excavated as part of the N6 Galway–East Ballinasloe PPP scheme.

Moyode is about 3.5 km east of Athenry, Co. Galway. It was once the country seat of a wealthy east Galway family called Persse, and the ruins of Moyode Castle can still be seen today. The site of a more modest house on the Persses' lands was identified during the Environmental Impact Assessment for the N6 scheme. This appeared on the first edition Ordnance Survey (OS) map of 1838 as a small, roadside building group, but in the field could be identified only as a group of grassy hummocks in a pasture field, indicating where the buildings had once stood.

Tom Janes of Headland Archaeology Ltd undertook a full excavation of the site in spring 2006. This revealed two stonewalled fields associated with a three-roomed cottage. Other building remains included the rubble remnants of a second building, possibly a shed or byre, south-west of the cottage and also a crop storage shed. The locations of all three structures corresponded with those depicted on the first edition OS map.



Plan of the cottage.

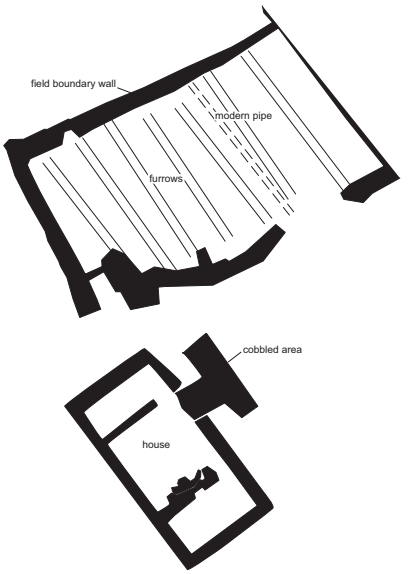


Images: Headland Archaeology Ltd

Reconstruction drawing of the dwelling house and farmstead of a tenant of the Moyode estate, Co. Galway.

When the grassy topsoil that had grown over the site was stripped away, the extent of the cottage was revealed by the low remnants of mortared rubble walls, plastered on the interior. The walls were built directly onto the underlying ground surface, with no foundations. The building was 35 m long overall, with internal dimensions of 10 m by 4.5 m. The cottage floor was a layer of lime-based plaster 0.06 m thick. The external doorway was identified by a cobbled threshold facing towards the roadway. This external doorway opened directly into the main, central room, with no evidence for a porch or lobby. The other two rooms were bedrooms—or perhaps a bedroom and a small parlour—at either end of the building. There was a simple fireplace in the main room and a smaller fireplace in one of the end rooms. A fragment of an iron cauldron, an iron chain—presumably to suspend pots over the fire—and the partial remains of a teapot were among the finds recovered from the layer of collapse around the main fireplace. Other finds included table and kitchen wares of 18th- and 19th-century date—probably imported from industrial towns in the English midlands—clay tobacco pipes and farm tools of local manufacture.

These building remains at Moyode represent the dwelling house and farmstead of a tenant of the Moyode estate. Although depicted on the first edition OS map, the buildings are absent from the second edition of 1895. A national survey of rateable lands in Ireland in the 1850s, known as *Griffith's Valuation*, records the buildings as being a 'herd's house and land', leased from Burton Persse, the owner of the Moyode estate at that time and one of the wealthiest landowners in east Galway. There is no other record of the tenants who inhabited the buildings, so this excavation casts a light on their living conditions that is otherwise unavailable from written sources.



Overall site plan.

Archaeologists excavating and recording the horizontal mill at Kilbegly, Co. Roscommon. (VJK Ltd)

Kilbegly mill:

work in progress

Neil Jackman, an excavation director with Valerie J Keeley Ltd, reports on an important wetland excavation on the N6 Ballinasloe–Athlone road scheme.

In March 2007 the remains of a fantastically well-preserved early medieval mill were identified in Kilbegly townland, Co. Roscommon, during archaeological testing on the N6 Ballinasloe–Athlone road scheme. This type of mill, which has a horizontal millwheel, is known as a horizontal mill. The features preserved at Kilbegly include post-and-wattle mill-race channels, a millpond, a complete wooden flume (the chute that fed water on to the wheel), the preserved lower floor of the undercroft, or wheel-pit, and the tail-race (the channel that carried water away from the millwheel).

At the time of writing, the mill is currently being excavated by the author, in conjunction with timber specialist Caitríona Moore. Artefacts retrieved thus far include a bell-shaped wheel hub, paddles, withy ropes and even the remains of some possible straw thatch from the roof of the mill-house. Personal artefacts have also been recovered, such as fragments of lignite bracelets, pieces of leather and a well-preserved copper-alloy ring-pin.

A more comprehensive article on the excavation results will be published once the post-excavation analysis has been concluded.

The baseplates of the flume and undercroft following removal of the upper timbers. (VJK Ltd)

Detail of one of the wheel paddles. (studiolab.ie)

The remains of the lower floor of the undercroft, or wheel-pit. (VJK Ltd)

The end of the flume within the undercroft. (VJK Ltd)

The complete wooden flume. (VJK Ltd)

Embarking on the long journey into the pas

Kate Marie Hearne, graduate archaeologist with Tramore House Regional Design Office, offers an account of her early days as a professional archaeologist.

From an early age I always loved the outdoors and did not mind mud too much! Growing up on a farm meant I had plenty of exposure to the latter. I think I was also particularly lucky because there was a ringfort in a neighbour's field. It was fondly known in the local area as the '*lios*' and I spent many summer days exploring its overgrown banks and ditches, imagining who constructed it and what had happened within its ramparts all those centuries ago. My fascination was deepened further when I was told numerous stories about '*na sioga*'—fairies who protected it! Added to this was the fact that, as children, our father, who was a farmer, instilled in us not only a love of the land but an acknowledgment that the very landscape around us was a living, breathing environment. We learned that this was an environment that boasted a long, rich past, laden with stories, some of which were passed down through successive generations orally, others that had faded with the passing of time and were left to be pieced together by uncovering the traces our ancestors left on the landscape. And so, an appreciation of the land and a desire to unearth its story was born.

From those modest beginnings on a muddy farm in County Waterford, I went on to develop my interest in the past at NUI Galway, where I embarked on a four-year degree in Archaeology. This was a wholly positive and challenging experience and it equipped me with the skills and knowledge necessary to embrace a professional career in archaeology, which brings me to today. More than one year on from my final exams, I am now in the position of graduate archaeologist with Waterford County Council in Tramore House Regional Design Office. Fifteen months ago I was taken on as a student archaeologist. My first duty was to catalogue finds that were found during excavations on the N8 Cashel Bypass. At the time I was immediately struck by the difference between being an archaeological student and being a professional archaeologist. Only a few weeks previously I had described artefacts, such as polished stone axeheads and flint arrowheads and scrapers, in a sports hall—the temporary examination centre in NUI Galway—and now I was responsible for cataloguing them for posterity under the guidance of the archaeologists in Tramore House. I realised then that instead of the detached act of reading and learning about archaeology, I would be actively working in it. This also meant that, in a

Kate Marie (left) assisting in the excavation of the 3,800-year-old Collared Urn discovered during test excavations on the route of the Waterford Airport road. (James Eogan)

st … first steps in professional archaeology

Background: Kate Marie fieldwalking along the route of the proposed N80 Whitemills road scheme in County Carlow. (Freya Smith)

small way, I felt a part of preserving the past and of ensuring that the landscape, which I had so fondly grown up with, would see its story told. It was a huge novelty, which, thankfully, has not yet worn off!

The first few months in Tramore House were particularly enjoyable because of the staff there. The teamwork and cooperation between the engineers and the archaeologists created a fantastic learning environment for a student. In particular, the assistant and project archaeologists made it their business to explain the everyday workings of commercial archaeology, as well as answering any queries in relation to specific aspects of archaeology. Excavations were in full swing on the N9 Waterford–Kilkenny road scheme, so I was brought out on-site on numerous occasions, which gave me a firmer understanding of the processes involved in excavation, from the different techniques employed on archaeological sites to the behind-the-scenes management of such works. This is an area that recent archaeological graduates are most unfamiliar with and it highlights the value and merit of student/graduate placements within organisations like the NRA and local authorities. Placements provide students and graduates with an opportunity to watch the progress of various sites where, potentially, a wide number of archaeological features will be unearthed. Furthermore, it may provide an opportunity to attain on-site, practical experience while having the support of experienced archaeologists to obtain advice from and with whom to share feedback. Indeed, in my case, I spent a number of days participating in the excavation of a vertical watermill in Killoteran, Co. Waterford. More recently, I have been closely involved in the organisation and implementation of archaeological testing on the Waterford Airport road improvement scheme. This hands-on experience has given me the opportunity to improve and develop other areas, such as interpersonal and organisational skills. Furthermore, I was fortunate enough to assist in the excavation of an Early Bronze Age Collared Urn burial, which proved an exciting and unforgettable experience.

This aspect of archaeology was also very evident during an exhibition in the Waterford Museum of Treasures in October 2006, organised by the archaeologists based in Tramore House. The exhibition, entitled *Migrants Mariners Merchants*, showcased the archaeological discoveries made during excavations of the N25 Waterford City Bypass. My participation in the exhibition consisted of the cataloguing, labelling and presentation of the fascinating artefacts put on display. This involvement made it all the more satisfying to see the interaction between the people of Waterford, Kilkenny and beyond with their past. The sheer number of visitors eager to learn about their ancestors was remarkable. For me, it highlighted the extent to which people feel a deep connection with their landscape and their past; an exhibition like this allows people to reaffirm that link.

After 15 months working in archaeology I have found that there is nothing more rewarding than the realisation that, as archaeologists, we bridge a gap between the past and the present. That is to say, we are mediators, endeavouring to piece together fragments that can offer a coherent story of an otherwise hidden past. Additionally, as we do not function in isolation, the present-day cooperation between the engineering and construction industry and the archaeological community has aided the preservation of that past.

For me, the transition from the position of student archaeologist to that of a graduate archaeologist has been an extremely exciting passage. It has, however, made me aware that it is only the beginning of a longer journey, the culmination of which will result in a deeper understanding, appreciation and respect for the past. It is a journey in which we archaeologists actively participate in order to preserve the past, so that its story can be retold for future generations.

Visitors to the *Migrants Mariners Merchants* exhibition examine the Vase Urn worked on by Kate Marie. (studiolab.ie)

Cleansing Body and Soul?

James Eogan, NRA senior archaeologist with the Southern Team, reports on the excavation of a prehistoric sweathouse on the N25 Waterford City Bypass.

Saunas are popping up all over the country as an integral part of 'day spas' attached to hotels and leisure centres. It is unlikely that any of the 21st-century sybarites who indulge in these luxurious facilities consider that they are doing something that at one time is likely to have had a deep spiritual meaning and that connects them to their ancestors in the later Bronze Age, 2,600 years ago—as a discovery during archaeological excavations in advance of the N25 Waterford City Bypass has shown.

Test-trenching in Rathpatrick townland, near Slieveroe, Co. Kilkenny, revealed a large mound of heat-shattered stone and charcoal in a poorly drained area close to a small stream. The team of archaeologists from Headland Archaeology Ltd, under the direction of Catríona Gleeson, initially presumed that they were dealing with a run-of-the-mill burnt mound, or *fulacht fiadh* site. As excavation progressed, however, it became clear that as well as 'normal' cooking-sized troughs, on its western side the mound of burnt stone and charcoal covered evidence for much more interesting activity.

The main feature was a 5m diameter circular structure, the floor of which was about 0.4 m below the surrounding ground-level. Thirty-six stake-holes were found spaced regularly around the periphery of the sunken area. No evidence was found for any flooring material. At the eastern side, where the ground sloped upwards, two steps were cut into the subsoil, giving access to the sunken area; the steps coincide with a gap in the stake-holes. Close to the top step was a rectangular, bath-like pit, 3 m long and 2 m wide. Immediately south of the steps a pit formed an annex to the sunken area, and the two were separated by a slight ridge of subsoil and a number of small stake-holes. The excavators found a hearth less than 1 m upslope from the pit, to the south-east.

We believe that the sunken area would have been covered by a hemispherical, tent-like structure. Hazel charcoal was identified in the fill of some of the stake-holes; radiocarbon dating of a sample of this charcoal has shown that it came from a hazel tree that lived in the seventh and eighth centuries BC. Hazel rods, being long and flexible, would have been ideal for forming the framework needed to cover the area. The roof could have been made from hides or blankets, thatched with rushes or straw, or covered with sods. It is assumed that the small pit cut into the side of the structure was also covered by the roof. Stones heated in the fire could be easily carried with a tongs, or rolled downslope into the pit, where they would have radiated a significant amount of heat inside the covered area. If, as happens in modern saunas, water was sprinkled on the hot stones, steam would have been created and the temperature inside the covered area would have risen accordingly. Once the occupants of the sweathouse had enjoyed their steam-bath, they could climb the two steps and plunge into the pool outside to cool down.

Elevated post-excavation view of the sweathouse and associated features at Rathpatrick, Co. Kilkenny. (Headland Archaeology Ltd)

We do not know if this sweathouse was used for the purely functional purpose of ensuring personal cleanliness—the occurrence of small bronze blades interpreted as razors in some Middle Bronze Age burials suggests that men became more concerned with their outward appearance at this time, between 800 and 1,000 years before the construction of the sweathouse at Rathpatrick—or if its use was associated with some complex ritual or symbolic bathing.

Sweathouses are a feature in many cultures in the northern latitudes. The best-known form is the Finnish *sauna*, the present-day Russians still choose to relax in the *bania* and the native peoples of North America built sweatlodges. Closer to home, geographer E Estyn Evans and antiquarian W G Wood-Martin recorded the use of drystone-built sweathouses in counties Sligo, Cavan and Antrim in the 19th century.

Parallels can be drawn between the sweathouse uncovered at Rathpatrick, on the N25 Waterford City Bypass, and a variety of ethnographic examples. In Ireland, sweathouses were used for medicinal purposes; Evans records that, in particular, they were beneficial for people suffering from rheumatic pain. In a parallel with modern custom, he also records that young women on Rathlin Island, Co. Antrim, went to the sweathouse to 'improve their complexions before paying a visit to the Lammas Fair at Ballycastle'. However, these 19th-century Irish examples differed from their Bronze Age antecedents in their manner of heating: Evans records that they were heated directly by lighting fires in the interior, prior to use.

The external appearance of the Rathpatrick sweathouse must have been similar to sweatlodges built by Native Americans. Those

sweatlodges were built by pushing long, flexible branches, such as willow, into the ground, then bending them over and tying them together to make a hemispherical frame. The frame was covered with blankets or skins; more permanent lodges were covered with sods or daub. A pit was dug internally—either near the door or in the centre of the lodge—as a receptacle for the hot rocks that were used to heat the sweatlodge. The rocks were heated on a fire outside the sweatlodge and then carried inside on forked sticks.

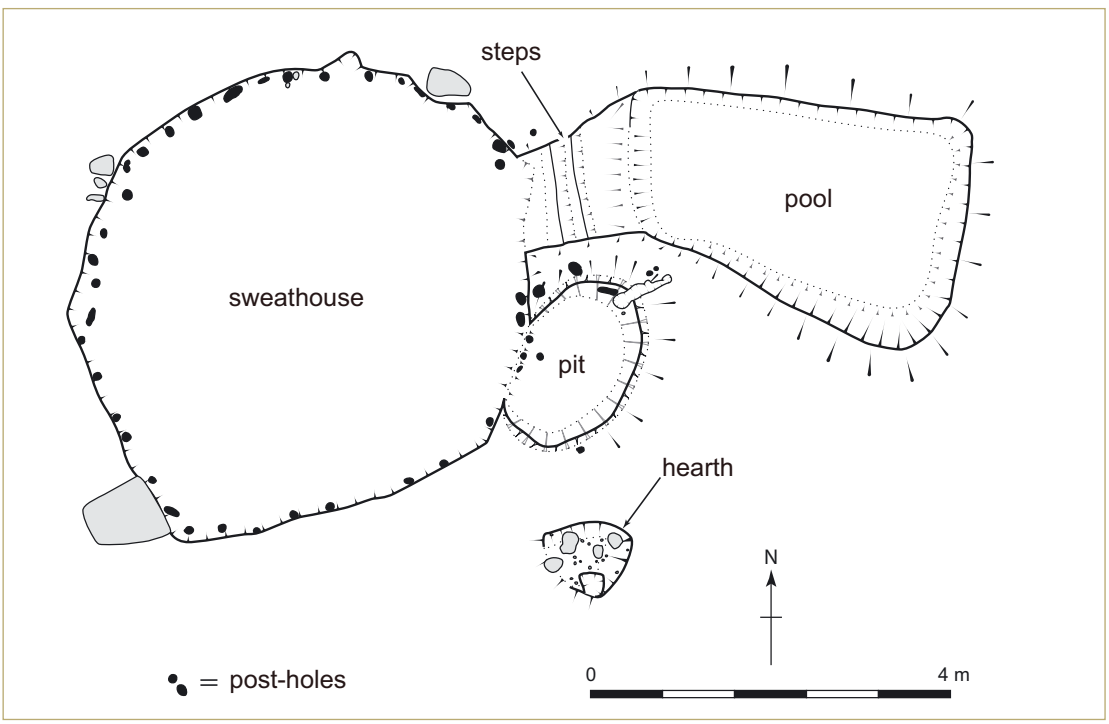
In many cultures where they are recorded sweathouses are associated with rites of passage at significant milestones in a person's life. In Finland and Russia it was a place where women gave birth. In North America the Sioux used sweatlodges for their ritual of purification (*inapi*). In Russia, before marriage a bride and groom went through separate purification rituals in the *bania*, but once the marriage ceremony was completed, they entered the *bania* together. Sweathouses are also linked to rituals associated with death in Russia. The mourners at the funeral took a communal bath in the *bania* after the funeral, in the belief that the soul of the departed would be warmed on its journey to the afterlife; this ritual bath was repeated 40 days after the funeral. In anthropological terms sweathouses are the locations where people cross social and spiritual boundaries, or where the normal boundaries are broken down. This aspect of their use is reflected in their physical siting at liminal (from the Latin *limen*, meaning threshold) locations in the landscape, such as at lakesides, beside streams on the edge of marshy areas, or on the fringes of, or in, forest clearings. Ethnographically they are also associated with individuals who are believed by their communities to have access to specialised or restricted knowledge, often of a religious, magical or otherworldly type.

A photograph (c. 1890) of a Native American sweatlodge in Montana, it is constructed from a framework of pliable branches and appears to be covered with blankets. Photo courtesy of the National Museum of the American Indian, Smithsonian Institution (N13775 detail). Photo by Fred E Miller.

Reconstruction of the sweathouse in use. (Jonathan Millar, Headland Archaeology Ltd)

The features excavated at Rathpatrick can be convincingly interpreted as the remains of a sweathouse. This is significant for a number of reasons. First, it suggests that some of the thousands of burnt mounds spread across the Irish landscape may have had a more complex use than the cooking function traditionally ascribed to them. At a superficial level it demonstrates a desire for cleanliness and hygiene in the Late Bronze Age. At a more profound level, if we follow the lead given by the ethnographic analogies, it is plausible that the Rathpatrick sweathouse was a structure that was of considerable social and spiritual significance to the community that built it. It may have been used to reinforce familial identities and as a place to enact group ceremonies. Restriction of access to the interior of a sweathouse may have been a way of emphasising differences in social standing between different members of the community. The location of the Rathpatrick sweathouse and burnt mounds in general re-emphasises the importance that our Bronze Age ancestors placed on wetland and watery environments and how these landscapes, which in modern terms are marginal areas, may have played a much more central role in the lives of those ancestors.

The identification of the Rathpatrick sweathouse not only adds a new type to the slim catalogue of Late Bronze Age monuments, it also adds another piece to be fitted into the emerging jigsaw of social and spiritual complexity in later Bronze Age Ireland.



Plan of the sweathouse and associated features. (Headland Archaeology Ltd)

Stage 1: Initial exploratory excavation

Archaeological Excavation:
a performance in three acts

Rónán Swan

Rónán Swan, NRA head of archaeology (acting), discusses the process of archaeological excavation as practised on NRA road schemes.

Recently there has been a great deal of discussion surrounding archaeological excavation and what it actually means. Depending on your viewpoint, a variety of terms have been adopted to describe archaeological excavation, whether it is the quasi-legal 'preservation by record', the pejorative 'destruction by documentation' or the language of cultural heritage management 'resolution'. What these terms share in common is a desire to define archaeological excavation.

Archaeological excavation is firmly rooted in a regulated and policy-driven environment, wherein it is recognised that the archaeological record is a finite resource that requires careful and considered management. In this context, all developments that will have a potential or known adverse impact on the archaeological heritage are required to follow a set procedure. First, every effort is made to avoid developmental impacts on the archaeological heritage. In the context of road construction, this entails re-routing the road, if necessary. If that is not possible, then consideration is given to preservation *in situ* (i.e. in its original position). Finally, if that will not work, then government policy—as expressed in the 1999 document *Framework and Principles for the Protection of the Archaeological Heritage*—requires that 'the approach of preservation by record be applied'. In order for preservation by record to be considered a viable option, the relevant bodies and authorities must be satisfied that the development is necessary and that neither redesign nor relocation are possible. However, authorities must be satisfied that a balance is struck between all competing factors, particularly in the context of development applications.

In many ways this view of archaeology as a finite resource is mirrored in the academic context. Archaeologists are concerned with past human behaviour, as represented by their material remains, and to assess this archaeologists seek to study contemporary activity, along with changes over time. Archaeology can be studied at a variety of scales, from the specific (e.g. a potsherd) to the local (e.g. a Bronze Age house) to the regional and the national. While landscape surveys can be extremely useful in developing models of activity over large areas, they are not sufficiently fine-tuned to provide information about specific changes at the lowest scale—of the object, the feature and the structure. On the other hand, there is a limit to the information archaeological excavation can offer about the wider landscape context. However, excavation provides the most reliable evidence for an examination of human activities at a particular period in the past and changes in those activities from period to period; the evidence gathered from archaeological excavation needs to be placed within these wider contexts to be fully appreciated and utilised.

On NRA road schemes, an assessment of the archaeological potential is essential. In terms of route design, both known monuments and areas of archaeological potential are identified and mapped. The route options can then be designed to minimise impact on the known archaeology. Unfortunately, it is not feasible to design every single road so that it avoids impacts on known archaeological sites. Where it is not possible, extensive measures are adopted to minimise those impacts, such as topographical surveys, geophysical surveys and detailed historical and archaeological assessments. Following these, the archaeological site is fully excavated, prior to road construction.

Of course, while this approach works very well for known sites, it cannot address undocumented sites that are absent from the archaeological or historical

Progress photographs taken at Gortmakellis, Co. Tipperary, on the M8/N8 scheme, during excavations directed by Eoghan Moore of Valerie J Keeley Ltd. (Gavin Duffy, AirShots Ltd)

record and do not have obvious surface expression within the landscape. For these, a different strategy is required. Identifying 'unknown archaeological sites' involves extensive test-trenching along the entire routeway. Typically, a centreline test trench is excavated along the length of the road scheme, with lateral trenches cut at regular intervals across the width of the landtake (approximately every 15–20 m).

All sites on national road schemes are typically excavated in the same way, regardless of whether they were previously 'known' or 'unknown'. While it is a key objective to excavate the totality of a site, this is limited by the extent of the road—in accordance with the policy of avoidance, only the area of the site being impacted by the road will be excavated.

Generally, once a site has been identified following the assessment phase, the area is topsoil-stripped to uncover the site's full extent and to ensure that there are no additional features associated with it. A pre-excavation plan is drawn up and a number of exploratory test pits are excavated to determine the depth and character of the archaeological features. The purpose of this is to try to determine the number of individual features and also to identify those features that are the latest in date (in other words the most recent); these features are excavated first. The site archaeologists will determine the chronology by noting which features are cut by other features: those that are not cut or disturbed by others are likely to be the most recent. In this way it is possible to dismantle/disentangle the evidence and write the narrative of the archaeological site. Each feature is allocated a unique number, which will be used on photographs, plans and record sheets and to track all artefacts and samples taken from that feature or, indeed, from individual layers from that feature. The chronology of any site is determined not only by tracking inter-cutting features but also through the analysis of vertical section faces, which show the sequence of activities on a site.

Once all the features have been fully excavated and all archaeological deposits and layers removed, we are left with a series of intersecting cuts in the underlying natural subsoil, which can be almost maze-like in appearance. There is nothing of archaeological interest remaining on the ground now. It is at this point that the site archaeologist starts the post-excavation analysis, which will help them to reconstruct past activity and interpret it. Some sites may have a very simple biography of use followed by abandonment; at other sites this pattern may be repeated several times or, alternately, several changes in the use of a site (e.g. occupation to ritual to industrial to agricultural) may be visible; while at others again there may have been only one phase of use, but multiple functions. It is these questions that are foremost in the mind of the archaeologist, who uses a variety of analyses to reconstruct and write the story of the site.

Ultimately, archaeological excavation is not an end in itself: it is best imagined as the first act of a play, with the post-excavation phase being the second act and the publication being the third act. But of course, as with all plays and films, these acts can be re-interpreted and re-imagined over time.

Aerial view of the site at Clonfad, Co. Westmeath, from west. (VJK Ltd)

Clonfad 3: a unique glimpse into early monastic life in County Westmeath

Paul Stevens, an excavation director with Valerie J Keeley Ltd, describes the excavation of an early medieval monastic site on the N6 Kinnegad–Kilbeggan dual carriageway.

Excavation carried out in late 2004 and early 2005 revealed a large monastic enclosure site at Clonfad, close to Lough Ennell in County Westmeath. Subsequently designated Clonfad 3, this site produced very significant evidence of monastic life and work in the early historic period. The excavation work followed archaeological assessment, testing and geophysical survey undertaken by Cultural Resource Development Services Ltd, which took place in advance of construction of the new N52/N6 link road from Tyrrellspass to Mullingar. A number of significant artefacts were found at the site, including unique evidence of early medieval handbell production and the largest collection of metalworking waste material from this period found in Ireland to date.

Clonfad is situated on a low hill surrounding low-lying, marshy land, south-east of Lough Ennell, which historically formed the western border of the ancient kingdom of Meath. Clonfad was originally called *Cluain Fáda Fine,* probably meaning Finnians' Long Meadow, and lent its name to the parish. Historically, it was said to be founded in the sixth century by St Finnian of Clonard. The historic accounts also record a fire in AD 887, which destroyed the church and the relics within. During the Anglo-Norman period the size of the site was reduced substantially, but it remained in use as a parish church. This was replaced by a later stone church and graveyard, which still survives adjacent to the site of the excavation and roughly in the centre of the earlier monastic enclosure. Burial in this graveyard ceased in 1969; gravestones there date back to 1793.

During the second half of the first millennium monasteries in Ireland were important centres for trade, craft and food production. The early monastery was made up of a series of enclosures known as *valla*, built around a central interior that usually contained a wooden church. The monastic complex was organised to house the needs of the monks, clerics, laypeople, craftsmen and pilgrims who would have lived and worked there.

Approximately one-tenth of the total area of the early monastic enclosure site was excavated. A section of two concentric enclosure ditches surrounded the central walled graveyard and church, which was not excavated because it lay outside the road corridor. The outermost ditch measured 200–220 m in diameter, 3 m in width and 1.7 m deep. The inner ditch measured approximately 100–110 m in diameter, 2.8 m in width and 1.3m deep and joined up with a stream to the south. Radiocarbon dates show the inner ditch was backfilled before AD 803–856. The interior of this site produced wells, refuse pits, cobbled areas, furnaces, kilns, a possible workshop building and also a child burial.

Clonfad 3 produced one of the largest metalworking assemblages recovered from an Irish site of this date and type. It also included the unique discovery of evidence for the production of wrought-iron handbells. Pieces of a large crucible were identified by specialist Dr Tim Young as a mould for the brazing of what are known as Type 1 wrought-iron handbells. These handbells formed an important symbol in the Celtic Church between the seventh century and the 10th century. Although widely distributed across the area of influence of the Celtic Church (Ireland, Scotland, Wales and north-west England), they are most common in the south midlands of Ireland. A thin, non-ferrous metal coating on the iron bells has yet to be studied in detail, but according to Dr Young, the Clonfad evidence suggests, for the first time, that it was applied by brazing. (Brazing is the making of a joint between two metal surfaces by fusing a layer of brass or high-melting solder between them. The purpose of the brazing in this case is not simply to make a structural join, but to make the metal of the bell continuous across the join so that it 'rings' properly.) Other material attributable to iron-working, particularly smithing hearth cakes, together with iron tools, rotary grinding/sharpening stones, large *tuyères*, baked clay, vitrified clay and amorphous iron slag and bog ore deposits, was also recovered.

A number of large metalworking furnace bases were excavated at Clonfad. The earliest furnace on the site has been radiocarbon-dated to AD 656–732. During the early medieval period the stream was used as a dumping ground for the waste material; 1.7 tonnes of iron slag was recovered from the streambed.

Copper-alloy pin with detached ring. (John Sunderland)

Moulds for making fine bronze objects were discovered at the site. Copper-alloy ingots, scrap and fine objects such as ring-pins were recovered together with pyramid-shaped crucibles and stone moulds, which may have been used to melt down scrap to be remoulded into objects. It is likely that much of the fine metalwork was for church plate and composite items, such as shrines, although material may also have been produced for the wider community.

In total over 600 finds were recovered, with a range typical of early historic sites excavated in the past. The majority of these artefacts were recovered from the lower backfills of the large outer enclosure ditch, which produced over half of the assemblage. This indicates that the outer ditch and stream, at both ends of the site, were used as a rubbish dump. Finds were also recovered from wells and pits inside the monastic enclosure and these included personal items such as knife blades, metal ring-pins, belt buckles, bone pins and needles, antler combs and a lignite bracelet. A small number of later, medieval finds were also found alongside drying kilns—used for drying wheat, barley and rye grains—as well as rotary quern-stones, indicating that the site was still in use in the Anglo-Norman period. Post-medieval and modern finds included 17th-century 'gun money', wine bottles, earthenware pottery, clay tobacco pipe stems, coins, china and even a motorbike tyre!

Evidence for the manufacture of bone and antler artefacts is very common from early medieval sites, and this is especially true at Clonfad. Bone and antler finds included fragments from all the stages necessary for making both antler combs and perforated bone discs or buttons. Comb making was indicated by the presence of cut antler tines, flat rectangular blanks and finished articles. Perforated discs were made using jaw and shoulder bones. Faint circular incisions on some pieces are followed by deeply scored elements on others, to complete perforated discs or buttons. Bone off-cuts were also found. A type of bone object known as a weft-beater, used in textile manufacture, and a pair of iron shears indicate that wool and textile production was also carried out on the site.

Although this excavation examined approximately only 10% of the total enclosure site, it has produced evidence of multi-period ecclesiastical and secular occupation, as well as a very large and significant assemblage of early medieval artefacts. The site's history probably stretches from the sixth century and it continued to be in use as a burial place to some extent up until the 1960s. This excavation produced a probable trivallate enclosure larger in size than the monastic site at Nendrum, Co. Down, which is 183 m in outer diameter, and half the size of the monastic site at Armagh, which is estimated at between 480 m and 360 m in outer diameter, with a middle ditch surrounding the summit of the hill measuring 200 m in diameter.

Clonfad has given us a considerable insight into early monastic life in Ireland. Significant evidence of iron-working, handbell-making, ornamental bronze-working and bone- and antler-working, as well as textiles processing, has been uncovered. Nonetheless, many questions remain as to the wider nature of the site, the level of influence and trading network, the date range of the site's occupation(s) and the nature and extent of the industrial processes that took place at this site. Much work is still left to do on the iron-working activity, which may have important implications for the wider study of early Irish metalworking. Analysis is ongoing, but a significant programme of analysis and dating will be completed in 2007 and the results are awaited with great anticipation.

Selection of bone artefacts relating to button making. (John Sunderland)

Through the valleys and hills: travels on the N7

Paul O'Keeffe

Paul O'Keeffe, NRA assistant archaeologist with the Mid-West Team, provides an overview of new archaeological discoveries in County Tipperary on the N7 Nenagh–Limerick HQDC.

Extensive archaeological testing of the route of the new 35.7 km N7 Nenagh–Limerick HQDC (High Quality Dual Carriageway) was carried out between February and March 2006, resulting in the identification of a large number of archaeological sites ranging in date from the Neolithic to the medieval periods. TVAS (Ireland) Ltd, Headland Archaeology Ltd, the former UCC Archaeological Services Unit (ASU) and Aegis Archaeology Ltd began excavation of these sites in July 2006, which is largely complete one year on.

The lands through which the new road passes occupy, for the most part, a low-lying valley of undulating pastureland, flanked to the south-east by the Slieve Felim and Silvermines mountains and to the north-west by the Arra Mountains. This rolling terrain is broken only by the presence of three substantial wetlands—Drominboy, Annaholty and Cappadine bogs—with Lough Derg and the River Shannon forming a natural barrier to the north-west. There is considerable evidence for prehistoric activity from the Neolithic period onwards throughout this region, such as the well-known megalithic tombs at Shanballyedmond and Baurnadomeeny, near Rearcross, as well as stone axeheads recorded from Birdhill and Annaholty.

Neolithic period

Our knowledge of the Neolithic period has increased dramatically through excavations conducted by Hillary Kelleher, ASU, over the past 12 months at a Neolithic ritual mound in Tullahedy, south-west of Nenagh. Here, approximately 127 (both complete and fragmentary) polished stone axeheads were found, as well as quantities of prehistoric pottery and worked flint and chert. The mound was partly enclosed by a palisade on its west and north-west sides, while settlement was evidenced by two post-and-slot structures set within a large hollow that had been cut into the eastern slope of the mound. Tullahedy did not exist in isolation: it formed part of an extensive Neolithic landscape around Nenagh, for which previous evidence had been uncovered during archaeological works for the N7/N52 Nenagh Bypass in 1997–2001. This revealed further evidence of Neolithic activity in Lahesseragh, Knockalton, Drummin and Richmond.

Bronze Age house in Carrigatogher Harding. (Markus Casey)

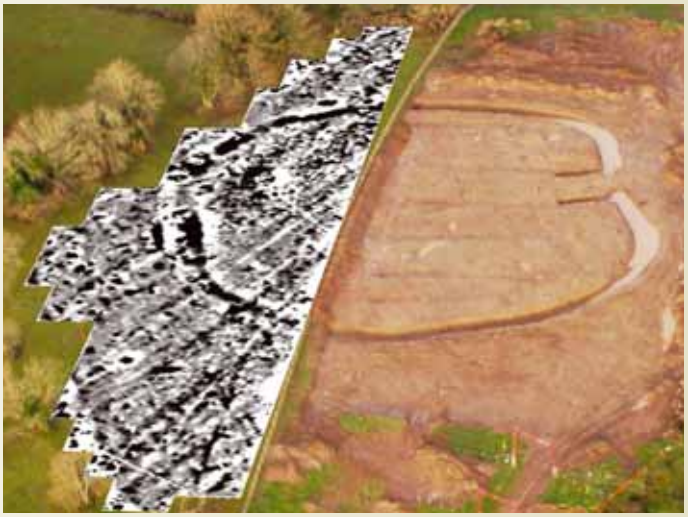
Bronze Age

Current evidence suggests that Bronze Age settlement was largely concentrated on the well-drained slopes of north-west Tipperary. House sites have previously been recorded in Lahesseragh, Benedin, Lissatunny and Knockalton Upper, indicating a continuity of settlement in these areas from the Neolithic onwards. The expansion of settlement during the Bronze Age is indicated by the identification of seven additional settlement sites on the new N7, suggesting a more widespread dispersal of settlement than hitherto known. The new sites (excavated by Kate Taylor, TVAS [Ireland] Ltd, and Liam Hackett, Headland Archaeology Ltd) are located west of Tullahedy in Ballywilliam, Carrigatogher Abbott, Carrigatogher Harding and Carrigatogher Ryan, comprising 11 definite structures and one other, probable structure.

Fulacht fiadh in Annaholty. (AirShots Ltd)

These structures were roughly circular in plan and situated on south-/south-east-facing slopes. Five were substantial structures (interpreted as houses), indicated by slot-trenches and post-holes, which were 6.9–11.6m in diameter. Three houses occurred in isolation, with one displaying evidence of up to three phases of reuse. Possible ritual activity associated with another is suggested by the presence of a number of external pits, which contained 45 sherds of prehistoric pottery (representing at least three vessels) and small quantities of cremated bone. Perhaps the people were marking their territory by placing their dead near their houses? An impressive Bronze Age house in Carrigatogher Ryan was defined by a substantial slot-trench and numerous post- and stake-holes. A curious annex or 'porch' feature, consisting of two arcing slot-trenches, extended from the entrance. A porch feature was also found in another, smaller structure. A similar structural arrangement was recorded in Carrigatogher Harding, less than 1 km to the south-west. The only notable difference between these sites was that the entrance of the larger house in Carrigatogher Harding was oriented north-west, whereas its equivalent in Carrigatogher Ryan was oriented south-east. Radiocarbon dating will hopefully determine whether these houses were contemporary.

Enclosure in Carrigatogher Harding. (Markus Casey)



Enclosure in Gortybrigane. (Photo: Markus Casey/Geophysical greyscale plot: Target Archaeological Geophysics)

Not surprisingly, *fulachta fiadh* were the most common form of Bronze Age monument discovered on the new road, with 35 excavated in total, as well as eight burnt mounds (with no troughs). These were concentrated primarily in marginal wetland areas and along the valley of the Kilmastulla River/Ballynahinch area. A number of *fulachta fiadh* and burnt mounds were also located in close proximity to all of the Bronze Age settlement sites. The most noteworthy of these, just 40 m south-west of the structures in Carrigatogher Harding, was excavated by Markus Casey, TVAS (Ireland) Ltd, and was unusual in that all of the burnt stone material was deposited in a deliberately cut hollow, measuring approximately 20 m by 18 m by 1.2 m. At its base was a stone-lined trough, connected to an adjacent stream via a narrow channel. Well-preserved wooden stakes and posts were retrieved from both trough and associated post-holes. A spectacular *fulacht fiadh* was discovered on the periphery of Thornhill bog and was excavated by Liam McKinstry, Headland Archaeology Ltd. A low mound of burnt stones overlay a shallow, subrectangular trough that had been lined with clay. The sides had been further revetted with stones and rough wooden planks. Its base was also wood-lined, while an arrangement of more finely shaped planks, held in place by wooden pegs, led from the trough to a stone-lined spring.

The Kilmastulla–Ballynahinch area would also appear to have been a focus of ritual activity in the Bronze Age, with standing stones recorded in Clonalough, Garraun and Cappadine. Other funerary monuments, such as barrows and tumuli, are also well represented, particularly along the lower foothills of the Silvermines Mountains and Keeper Hill. Just 350 m south-west of Ballinahinch village, a possible ploughed-out barrow or ring-ditch was excavated by Kate Taylor. It was a roughly circular, ditched enclosure, 20 m in diameter, situated on an east-facing slope. The entrance, denoted by a break in the ditch, was oriented approximately north-east. The principal internal feature was a large central pit that contained cremated bone and possible incised stones. A cluster of four smaller cremation pits was located in the south-east portion of the enclosure and further cremations were located outside. It is perhaps significant that this possible barrow was situated only 40–50 m north-west of a series of five probable Bronze Age houses, also excavated by Kate Taylor. Four

of these were circular in plan, while the fifth was subrectangular; central hearths were recorded in at least two cases. A single cremation burial was also identified in the townland of Gortybrigane, a short distance to the west, while further north, six possible cremations were excavated by Liam Hackett in Carrigatogher Harding. The latter example was also located in close proximity to a number of *fulachta fiadh* and a house site (see above). The close association of settlement sites, *fulachta fiadh* and funerary activity clearly shows that an extensive Bronze Age landscape, only now being revealed, lies hidden in this part of north Tipperary.

Early medieval period

Another aspect of the N7 archaeological investigations is the extensive evidence for previously unrecorded early medieval settlement. Twelve substantial enclosures, all of which had been completely ploughed-out, were discovered and excavated. These ranged from univallate enclosures (i.e. defined by a single bank and ditch) approximating in size to the average ringfort (30 m), to larger high-status sites, indicating occupation by prosperous hierarchical communities. What is particularly striking is the density of these settlements. Within a 2km length of the road, from Ballywilliam north-west to Carrigatogher Harding, three large enclosures of probable early medieval date were discovered, in a location where only one upstanding ringfort was known. Of these, the enclosure in Carrigatogher Harding was of especial interest.

This circular bivallate enclosure, excavated by Kate Taylor, was centred on a natural gravel platform with a stream flowing between the inner and outer enclosure ditches. The outer ditch enclosed an area approximately 80 m by 70 m and continued beyond the roadtake. The remains of a large rectangular structure, defined by a foundation trench and large post-holes, were found in the west of the enclosure. Internal industrial activity was indicated by the presence of a metalworking area on the north-east bank of the stream; while externally, to the south, a corn-drying kiln was found. The inner enclosure was considerably smaller, measuring approximately 42 m in diameter. Its interior area had been heavily truncated by the later reuse of the site as a burial ground. There were 67 grave cuts in total, but only a small quantity of human bone and teeth were found, presumably due to the acidic soil conditions. The fact that these graves were located almost exclusively within the inner enclosure suggests that either the enclosure (or part thereof) was upstanding at the time, or that its existence lived on in local memory. This reuse as a burial ground may also indicate that it had ecclesiastical rather than secular associations. Former ecclesiastical sites were often reused as burial places for suicides or unbaptised children because the local community still regarded them as consecrated ground. The possibility that the stream running through the enclosure is fed by a nearby holy well (St Patrick's Well) may suggest that the site was ecclesiastical in nature.

An enclosure identified in the townland of Gortybrigane (south of Birdhill) and excavated by Trish Long, Headland Archaeology Ltd, was the most impressive example of a high-status secular settlement on the scheme. It consisted of a univallate enclosure situated on a north-east-facing slope that afforded extensive views of the River Shannon. Internally, the remains of three post- and stake-built structures were recorded, as well as three earth-cut, figure-of-eight corn-drying kilns. A stone disc and rotary quern fragment were found close to these features. Surface finds within the enclosure, such as worked flints and a polished stone axehead fragment, may indicate that the location had been the focus of Neolithic activity, perhaps suggesting that the site enjoyed a long history of occupation, owing to its panoramic setting. Of particular interest was a causewayed entrance feature, which was oriented to the north-east and, unusually, flanked by two parallel ditches. Geophysical survey conducted beyond the road by Target Archaeological Geophysics revealed the full extent of the enclosure, with another entrance on the south-western perimeter.

Medieval period

Known evidence for medieval settlement in close proximity to the new N7 is most densely concentrated in the Nenagh area. Recorded monuments include no less than two motte-and-bailey sites, three tower houses, three hall-houses (or strong houses) and three deserted settlements. The deserted settlement of Ballintotty is associated with the nearby tower house of the same name. A hall-house was identified c. 250 m north-west of the tower house. Hall-houses appear to originate in the 13th century and are described as two-storey, rectangular buildings with a defensive ground floor and first-floor entrance. They are sometimes associated with earthworks and/or churches. Excavations carried out by Frank Ryan, Aegis Archaeology Ltd, revealed a possible settlement ancillary to either the hall-house or tower house, in the form of a 60 m-wide, multiphase ditched enclosure, as yet undated. At least two phases of medieval activity were clearly discernible. The earliest phase was represented by a rectangular enclosure measuring 34 m by 30 m, with an entrance on its northern side. This was later superseded by a much larger enclosure, measuring 60 m^2. Both phases were characterised by a lack of clearly defined structural evidence, but animal bones, quern-stone fragments and iron artefacts (including a possible knife) were recovered. Corn-drying kilns were recorded within both enclosures, perhaps suggesting that the site served a primarily industrial purpose associated with either the tower house or hall-house. A metal-detection survey of the enclosure did not reveal coins or other metal artefacts, and no medieval pottery was recovered. If the site is early medieval in date, then perhaps it served as the Gaelic precursor to the later Anglo-Norman intrusion in the early 12th century? At a later stage in the site's history a mother and child were interred in one of the enclosure ditches, while another individual was buried in front of the entrance—an eerie end to an enigmatic site.

Conclusion

Post-excavation works on the 150 archaeological sites discovered on the new road are currently underway. It is hoped that palaeoenvironmental studies of the wetlands traversed will compliment the results of this work and act as a catalyst for future research into the fascinating past of the north Limerick/Tipperary region.

Multiphased enclosure in Ballintotty, with Ballintotty tower house on the extreme left. (Markus Casey)

If the shoe fits: a new find from Annaholty Bog, Co. Tipperary

Richard O'Brien

Richard O'Brien, NRA archaeologist with the Mid-West Team, laces together a new discovery from the N7 Nenagh–Limerick HQDC with a previous find made over 60 years ago.

Finds from bogs are common—we only have to remember the startling recent discovery of the Fadden More Book of Psalms, found hanging from the end of a peat-excavator's bucket, to realise the importance and fragility of such material. Between 1941 and 1947 there were five finds made in and around Annaholty Bog, which borders north Tipperary and east Limerick. These finds included the blade of a bronze spearhead, a stone spearhead, two portions of stone axeheads and a leather shoe. Three of these finds were bought by the National Museum of Ireland (NMI) from a John Madden, Ballyhane, Birdhill, Co. Tipperary, in 1943/44. However, it is the leather shoe that is of interest here as a second shoe has recently been recovered from the same bog during archaeological excavations in advance of the N7 Nenagh–Limerick road scheme. Could we have a matching pair?

On 8 August 1941 the Limerick county surveyor, Mr T F Ryan, 82 O'Connell Street, Limerick, presented the NMI with a leather shoe found in Annaholty Bog. In the NMI Topographic Files there is a rough sketch of the shoe. The shoe's file number is 1941:1042 and its habitat is Museum C28:23. This was the first of a number of finds from Annaholty, but after 1947 nothing more was discovered here, or at least nothing was reported to the Museum.

As part of the new N7 road scheme, monitoring of the extraction of peat from Annaholty Bog has been underway since April 2007. This work, carried out by TVAS (Ireland) Ltd, is time-consuming and often laborious, but it does have its moments, and Thursday, 31 May was one of them: monitoring supervisor Joe McCooey discovered a leather shoe.

A preliminary examination by leather footwear expert Dáire O'Rourke suggests that the shoe dates from the 10th to 12th centuries AD. It appears to be a composite wrap-around or turn-shoe, as it was made inside-out and then turned around for wear. This type of shoe is typical of the period, but is more usually found in an urban environment. The shoe has a separate leather sole and upper, which indicates that it is not a native variety (these are normally made of a single leather piece), but rather a fashion introduced during the early medieval period.

Perhaps the wearer was crossing the bog toward Toreheen Island—a large, gravel island that protrudes through the peat on the northern side of Annaholty Bog. There are three recorded monuments in the townland: TN031-049 (a children's burial ground), TN031-050 (a rectangular enclosure) and TN031-090 (a togher/trackway). The latter site was discovered and excavated during reconstruction of the existing N7 in 1950. The blade from the bronze spearhead discovered from the Toreheen Island area in June 1947 was recovered from a turf bank 3 ft deep, which originally may have had '… 10ft of turf over it'.

We can imagine, then, two scenarios. A native wearing the latest in fashion crossing the bog and losing his/her shoe, or a newly arrived settler, perhaps an Anglo-Norman, suffering the same loss. After 1,000 years or so, it is a stretch of the imagination to envisage the original wearer losing both shoes in the same location, and then these being rediscovered on separate occasions more than 60 years apart. Nonetheless, we will compare the old and the new shoe as part of the continuing story from Annaholty—and see if a matching pair can be identified!

The Annaholty shoe after conservation treatment. (studiolab.ie)

The 'lost castle' of Castlecranna?

Margaret MacNamara, an excavation director with TVAS (Ireland) Ltd, describes an excavation on the N7 Nenagh–Limerick HQDC that may help rediscover a castle.

Excavations undertaken by TVAS (Ireland) Ltd on the route of the N7 Nenagh–Limerick HQDC have identified a wealth of archaeological sites of prehistoric and historic date. As part of this project, excavations were conducted in Castlecranna townland, Co. Tipperary, in May and June 2007. The townland name contains within it evidence of the former presence of a castle here, and nearby Cranna House has been suggested as the most likely candidate for its location. The 'lost castle' is documented in the 1654–6 Civil Survey, which refers to 'the walls of a Castle out of repayre'. The evidence found to date indicates that the Castlecranna excavations may have rediscovered remains associated with this castle.

Excavations at Castlecranna have revealed an enclosure defined by a steep-sided, flat-based, subcircular ditch, 2.5 m wide and 1.5 m deep. Its entrance was to the south-east: post-holes and stake-holes uncovered here probably served as part of a wooden doorway. Enclosed within the ditch was a trapezoidal structure comprised of shallow slot-trenches and a central post-hole. Large pits (with evidence of *in situ* burning), post-holes and stake-holes were also found within the enclosure.

A number of interesting finds were recovered during the removal of topsoil from the site and subsequent metal-detecting of the excavated soil, or spoil. An Elizabeth I silver shilling (1560–61) was recovered from the interior of the enclosure, not far from where a James I coin (1606) was found during the testing phase. Metal detection of the spoil yielded six more silver coins from the reigns of King John (early 13th century), Elizabeth I (two further shillings), Charles I (pre-1649), a possible Spanish 'piece of eight' (1572–1778) and a Victorian sixpence (1878). Other metal finds included six lead musket balls, two copper-alloy objects that may derive from side-arms, and eight buttons. These finds lend credence to the suggestion that Cranna House was indeed the site of the former castle.

The musket balls were examined by archaeologist Damian Shiels (Headland Archaeology Ltd) and from his initial review it would appear that at least three calibres are represented. If contemporaneous with the bulk of the coinage from the site, it would seem that the ammunition most likely dates from the mid- to late 17th century, possibly associated with the Eleven Years War (1641–52) or the War of the Two Kings (1688–91). The largest ball, which is probably derived from a musket, is impacted heavily, suggesting it hit a solid surface, such as a stone wall, at high velocity. Four medium-sized examples may represent ammunition from a lighter weapon, such as a carbine. The smallest ball is clearly pistol shot, which is significant in that during this period it was a weapon generally employed by cavalry and officers. It would appear that the assemblage consists of both fired and unfired material, indicating that the locality was the scene of either an engagement during the above-mentioned conflicts or was used as a training area for troops. Further analysis is required to confirm what weapons may have been used at Castlecranna, but Shiels has suggested that if other, as yet unidentified, objects from the site are verified as being military in nature, it will confirm Castlecranna as an important discovery for the archaeological identification and interpretation of small-scale conflict sites from this period in Ireland.

It could be that the subcircular ditch is associated with the lost castle of Castlecranna, and may even be a precursor to it. Unfortunately, none of the finds was from the ditch fills or other features, and they may simply reflect the passage of people through the townland over a number of centuries and generally indicate plantation activity in the area. It is hoped that radiocarbon-dating and the retrieval of other small datable finds through the sieving of soil samples will allow for the accurate dating of this interesting monument.

Photos: Selection of coins, lead musket balls and a copper-alloy object from Castlecranna. (TVAS [Ireland] Ltd)

Revolutionising our understanding of

Prehistoric Basketry

Maria FitzGerald

Maria FitzGerald, NRA archaeologist with the Eastern Team, describes Late Mesolithic fish baskets excavated at Clowanstown on the M3 and what they reveal about the development of basketry technology in Ireland.

A series of well-preserved wooden baskets was discovered at Clowanstown, Co. Meath, c. 4 km north of Dunshaughlin, at a site excavated as part of the advance archaeological investigations for the M3 Clonee–North of Kells motorway scheme. Archaeologist Matt Mossop carried out the excavation on behalf of Archaeological Consultancy Services Ltd and he has interpreted the earliest structures on-site as the remains of a Late Mesolithic mooring/fishing platform and the baskets as the remains of conical fish baskets. Other finds from the Late Mesolithic period include butt-trimmed Bann flakes (leaf-shaped stone implements characteristic of this period). Five upstanding Neolithic burnt mounds indicate later activity on the site. These were identified during testing in 2004, and were in fact what first brought this location to the attention of archaeologists.

The site at Clowanstown is located on the edge of a raised bog, but at the end of the last Ice Age this would have been a small lake. Coring and analysis of the peat by environmental specialist Dr Ben Geary, Birmingham University, showed that sediments had begun to accumulate and fill in the lake prior to the raised bog growing on the site. During the Mesolithic period (7500–4000 BC) people subsisted by fishing, hunting and foraging. Clowanstown would have provided an ideal location for these activities as fish and waterfowl were available from the lake itself, as well as plants and animals from the surrounding woodlands. However, evidence for the presence of these early settlers is often very elusive because the wet areas gradually became concealed by bog. Additionally, the people who lived at that time mainly used organic materials for structures and objects of everyday life, which as a result are generally perishable and rarely survive to the present day.

In this context, the revelation of a beautifully preserved basket from a very early level on the site was an extraordinary and unexpected discovery. The first basket was found in a flattened state, embedded in the peat, and appeared to be very delicate and finely made. It measured 1,120 mm long and 400 mm in diameter at the wider end, and was made using a twined technique (see below) whereby pairs of transverse wefts (the horizontal elements of any woven item) are worked together to bind the longitudinal strands, or warps, in place. The wider end of the basket was finished with a double row of strands, presumably to provide a firm edge. The basket tapered from a wide to a narrow, pointed end and was probably conical-shaped originally, but had become flattened over time. The photo below shows a Bamba tribesman from Mali, in West Africa, with a similar fishing basket. These baskets are still used by thousands of Bamba tribesmen during their sacred ritual fishing festival, held at Antigo Lake each year. The basket from Clowanstown

Bamba tribesman with fishing basket. (Alain Buu)

Double-twined edge of one of the baskets. (John Sunderland)

Pawel Wolff and Joanna Kurkowicz illustrating the baskets. (John Sunderland)

is relatively small and could have been used to scoop fish out of the lake by hand or, alternatively, could have been placed within a weir. Some large stones appear to have been used to weight the basket in position, which may suggest that the basket was stored in the lake when not in use.

This first basket recovered from Clowanstown has returned a radiocarbon date of 5210–4970 BC. Following on from the initial discovery, additional baskets of the same form were discovered at similar levels on-site. In total, the final basket assemblage from Clowanstown comprises four largely intact baskets and multiple small fragments and strands. The baskets are all made from small twigs measuring 2–8 mm in diameter, which, given their delicate and flexible appearance on-site, initially suggested that they might have been made from the locally available rush or juncos. However, environmental specialist Susan Lyons (Headland Archaeology Ltd) examined the elements of the baskets and found that the twigs were alder, birch and rosaceae. These are common to marginal woodlands and all were identified from the pollen cores at the Clowanstown site, indicating that wood from the immediate environment was selected and exploited for use in the baskets. All the shoots were aged between one and two years old, thus providing flexible and durable materials suitable for fish baskets.

Prehistoric baskets from Ireland

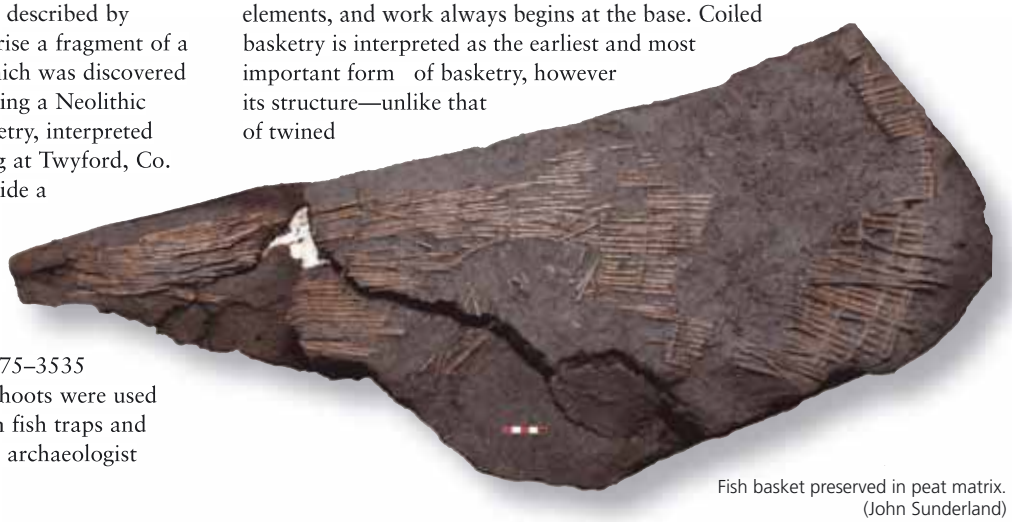
The Clowanstown baskets can be added to a small assemblage of possibly prehistoric baskets from Ireland that were described by archaeologist Joseph Raftery in 1970. These comprise a fragment of a basketry bag from Aghintemple, Co. Longford, which was discovered wrapped around a polished stone axehead, suggesting a Neolithic date for the basket. Two other coiled discs of basketry, interpreted as the remains of a bag, were recovered from a bog at Twyford, Co. Westmeath, and eight circular mats were found inside a round-bottomed wooden bowl at Timoney, Co. Tipperary.

A more recently discovered fragment of basket from Carrigdirty Rock, Co. Limerick, in the Shannon Estuary, can also be added to this group. This returned a radiocarbon date of 3875–3535 BC. As in the Clowanstown baskets, young alder shoots were used to make the Carrigdirty basket. A series of wooden fish traps and a basket fragment were also recently discovered by archaeologist Melanie McQuade (Margaret Gowen & Co. Ltd (MGL)) at very deep levels near the North Wall Quay, Dublin. This fishing station was dated to the Late Mesolithic period. The small fragment (600 mm by 300 mm) was made using rods averaging 18 mm in diameter bound by transverse strands, and the basket was radiocarbon-dated to 5930–5740 BC.

Basketry technique

Basketry is one of the oldest crafts and the term is generally applied to woven, three-dimensional items. In prehistoric Europe basketry methods have been used to make clothing (such as hats), matting, fish baskets and other containers. In structure, baskets are closely related to textiles: both were made by interlacing strands of threads by hand. In contrast to textiles, baskets are generally made from unspun fibres of local vegetation. However, the main difference between the crafts came at a later stage, when special textile fibres, such as flax or wool, were grown and collected. In baskets, the short lengths of materials and their relative rigidity gives rise to a self-shaped product, while the stiffness of the materials also makes the use of a loom unnecessary because the elements naturally remain in position during construction.

Three main techniques were important in prehistoric basketry—coiling, twining and plaiting or interlacing. Up until the recent finds from Clowanstown and North Wall Quay, all known prehistoric Irish baskets were made using the coiling technique. A coiled basket is made by sewing a stationary, coiled, horizontal element, or set of elements, and work always begins at the base. Coiled basketry is interpreted as the earliest and most important form of basketry, however its structure—unlike that of twined



Fish basket preserved in peat matrix. (John Sunderland)

Laser scan of a basket. (Liverpool Conservation Technologies)

Hega Hollund micro-excavating a basket. (studiolab.ie)

and plaited basketry—is considered to have little affinity with weaving as the coils are sewn together rather than interlaced with the sewing strip.

In contrast, the recently discovered baskets from Clowanstown and North Wall Quay were made with the twining technique. The Clowanstown baskets were made by open twining, with predominantly S-twisted wefts, but occasional Z-twisted wefts where the central bar of the letter S or Z denotes the direction of twist. Twined baskets are assembled by passing pairs of wefts around fixed vertical elements called warps. The Clowanstown baskets are classified as open-twined baskets because the weft rows are placed at intervals along the warps. This technique is more comparable to true weaving as two sets of elements are interlaced. However, these twined baskets considerably pre-date the earliest extant finds of woven fabrics by several thousand years. Their appearance indicates that experimentation with interlacing systems was occurring in Ireland from the Late Mesolithic period and reminds us once again that our understanding of cultural and technological development can be revolutionised by new discoveries.

Recording and conserving the baskets

Due to the importance and fragility of the Clowanstown basketry assemblage, the baskets were extensively recorded in advance of conservation. The artefacts have been photographed by John Sunderland and drawn by Pawel Wolff and Joanna Kurkowicz.

Additionally, Liverpool Conservation Technologies scanned the baskets using non-contact laser-scanning as part of the recording process. The purpose of the scanning was to produce extremely accurate 3D digital records of each of the fish traps. The baskets were recorded to an accuracy of +/- 0.1 mm, and through the resulting computer models the fish traps are preserved and archived for the future and can now be studied without any risk to the artefacts themselves.

This large-scale and sensitive conservation project is being carried out by Arch Con Labs, MGL. Brigid Gallagher, assisted by Hega Hollund, carried out the initial lifting and micro-excavation of the baskets. Conservation of objects as delicate and rare as these is a project of careful research and experimentation. The initial experimentation was carried out by Brigid and is now being further developed and implemented by Karina Morton for MGL, in consultation with conserver Roly Reid of the National Museum of Ireland (NMI). The baskets are being conserved in the peat stratum on which they were discovered, which will provide support and also provide a context for the objects when they are eventually displayed. It is anticipated that the baskets will be freeze-dried by the NMI in autumn 2007 and, pending the success of the project, will be stable for future exhibition and research.

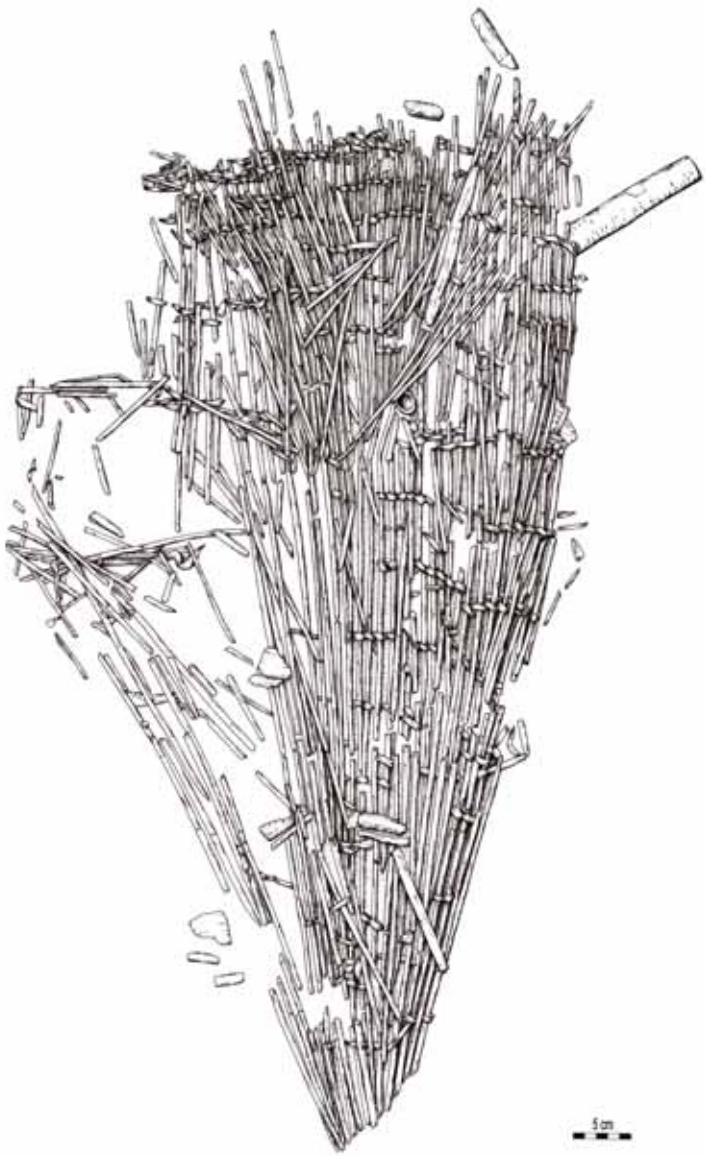


Illustration of one of the baskets. (ACS Ltd)

The Elusive Iron Age:

a rare and exciting site type is uncovered at Lismullin, Co. Meath

Aidan O'Connell, excavation director with Archaeological Consultancy Services Ltd, reports on the excavation of a unique post enclosure at Lismullin, Co. Meath, which was recently declared a National Monument.

Archaeological excavations in advance of the Dunshaughlin–Navan section of the M3 Clonee–North of Kells motorway scheme have revealed the presence of a large, post-built ceremonial enclosure dating to the early Iron Age (sixth to fourth century BC) in the townland of Lismullin. The post enclosure has been declared a National Monument and the Minister of the Environment, Heritage and Local Government, in consultation with the National Museum of Ireland (NMI), has issued ministerial directions pertaining to its full excavation within the road corridor. A committee of experts—comprising representatives from the National Monuments Service of the Department of Environment, Heritage and Local Government, the NMI, the Department of Archaeology NUI Galway, the School of Archaeology UCD and the NRA—has been set up to advise on the excavations, and a range of techniques, including geophysical surveys and geoarchaeological studies, are being employed in tandem with the excavations to ensure that the maximum amount of information is obtained. Full archaeological excavation of the site within the road corridor was ongoing at the time of writing and was expected to be completed by early November 2007.

The site

Lismullin 1 is located 850 m to the north-east of the existing N3, about halfway between Navan and Dunshaughlin. It is 2.1 km north-east of the Hill of Tara and bounded to the north-west by the River Gabhra. The total area under investigation covers 27,360 m². In addition to the enclosure, a range of features dating to the Early–Middle Neolithic, the final Neolithic/Early Bronze Age, the later Bronze Age, the medieval period and the post-medieval/early modern period have been identified (see *Prehistoric Ritual* and *Early Medieval Land Use* panels).

Iron Age ceremonial enclosure

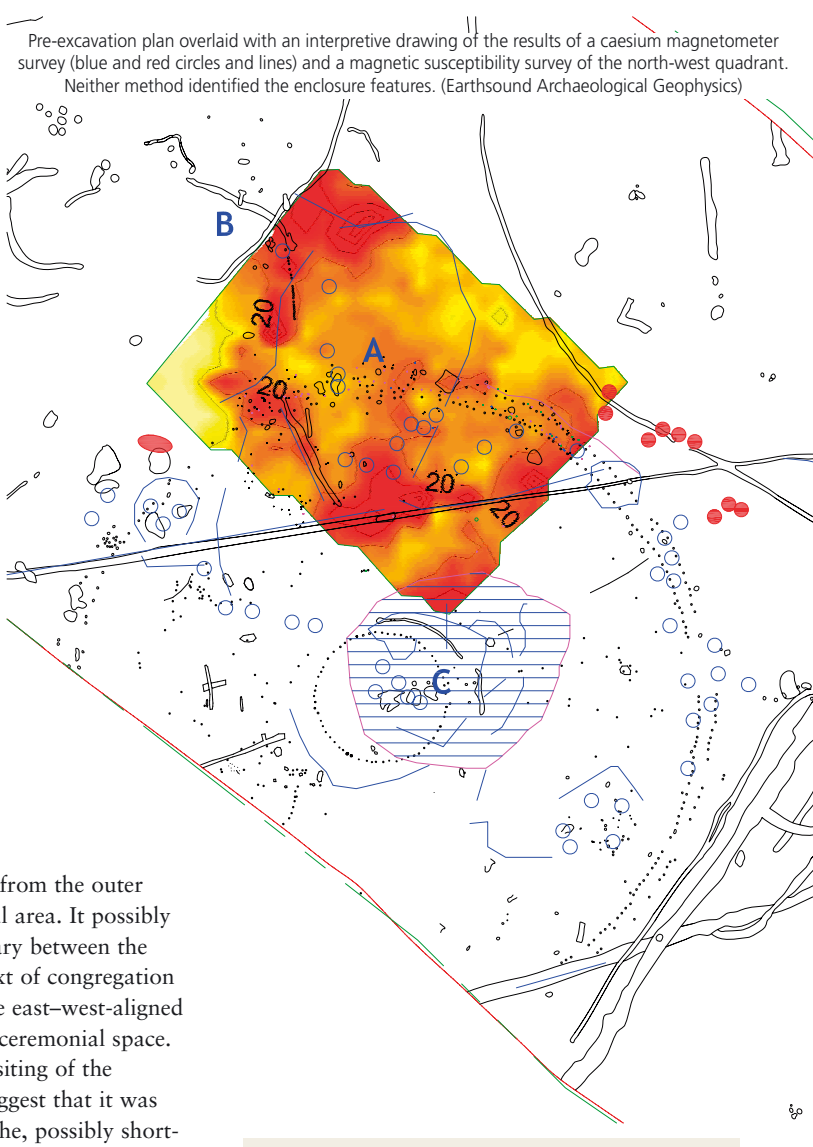
The post enclosure occupies a natural, saucer-shaped depression at the west of the site, surrounded on all sides by a ridge of higher ground. Both the enclosure and this high ridge extend beyond the south-western site boundary. There are three surviving enclosure elements: an outer enclosure, 80 m in diameter, defined by a concentric double ring of post-holes; a central inner enclosure, defined by a single ring of closely spaced post-holes; and an east-facing entrance comprised of an avenue of widely spaced post-holes.

The two outer enclosing rings are 1.5–2 m apart and the individual post-holes are arranged at 0.4–1 m intervals (averaging 0.6 m). The excavated post-holes from the outer enclosure average 0.21 m in diameter and 0.2 m in depth, but range from smaller examples less than 0.15 m in diameter to larger post-holes that are up to 0.29 m wide. Charcoal from post-pipes (the voids left once the posts have rotted away) associated with two of the post-holes has been radiocarbon-dated to 520–380 BC and 490–370 BC, placing the enclosure firmly within an early Iron Age context.

The enclosure entrance is located at the east and is defined by a gap in the (outer) double ring, with a slightly funnel-shaped avenue of post-holes narrowing towards the inner circle. At a point about 4 m from the inner circle a slot-trench traverses the avenue. This may have supported a screen that would have restricted the view from the entrance-way into the inner enclosure. The inner ring has a diameter of 16 m and a number of internal features, including three possible pits that appear to have charcoal-rich upper fills and are oriented towards the eastern entrance.

Archaeologists cleaning the outer enclosure stake-holes in preparation for preliminary drawing. (Mary Deevy)

Geoarchaeologist Steve Lancaster, Headland Archaeology Ltd, examining the soil profile at Lismullin with one of the site supervisors. (Maria FitzGerald)



Pre-excavation plan overlaid with an interpretive drawing of the results of a caesium magnetometer survey (blue and red circles and lines) and a magnetic susceptibility survey of the north-west quadrant. Neither method identified the enclosure features. (Earthsound Archaeological Geophysics)

There are additional clusters of post-holes, stake-holes and pits located between the inner and outer enclosure elements, but no clear patterns have been identified. A range of artefacts has been recovered from the enclosed area, including a fragment of a rectangular stone chisel or adze—which came from the subsoil surface within the northern area of the enclosure—Middle Bronze Age domestic pottery collected from a pit between the two outer rings and numerous sherds of later Bronze Age coarse ware pottery from four pits on the enclosure interior.

The Lismullin enclosure appears to represent a single phase of construction and a relatively short period of use. It seems that the rings of posts were free-standing as there is no indication of a slot-trench between them to support a timber or wattle facing. In addition, the use of large numbers of relatively small posts and their close spacing suggests there would have been little need to additionally define the enclosed area or its circular manifestation.

The choice of location is important. The enclosure occupies a discreet, sheltered position with the surrounding higher ground giving the effect of a natural amphitheatre. Recent aerial topographical survey at the site has demonstrated that the enclosure occupies the lowest point in this natural hollow, rather than its exact centre, which suggests that the activities taking place within the enclosure could be viewed from the outside. The purpose of the possible blocking screen (if it is associated with the enclosure) at the end of the entrance-way may have been to restrict the movement and/or view of people from the outer enclosure to the central area. It possibly defined a solid boundary between the area used in the context of congregation and procession (i.e. the east–west-aligned avenue) and the inner ceremonial space. The construction and siting of the Lismullin enclosure suggest that it was custom-built to serve the, possibly short-term, needs of its builders; a monument tailormade for a particular set of events in a carefully chosen landscape setting.

Ceremonial enclosures elsewhere

Post enclosures form components of a variety of ritual and ceremonial sites in the middle Iron Age, including Sites A and B at Navan Fort, Co. Armagh, Dún Ailinne, Co. Kildare, Raffin, Co. Meath and the Rath of the Synods at Tara, Co. Meath. The Rath of the Synods may be of particular importance due to its proximity to Lismullin: the second phase of activity comprises three apparently successive circular timber palisade enclosures, 25 m, 16.5 m and 30 m in diameter, which have very general similarities to the inner enclosure at Lismullin. Despite this apparent similarity in construction, the differences between these sites and Lismullin are striking. The deliberate choice of a discreet landscape setting is in stark contrast to the location of other Iron Age ceremonial enclosures on prominent hilltops. In addition, the use of relatively small posts at Lismullin is very different from the large timbers characteristic elsewhere, most strikingly at the 'forty metre structure' at Navan Fort. Furthermore, the use of free-standing timber as the apparently sole construction medium at Lismullin differs

Prehistoric Ritual

A sequence of prehistoric pits was uncovered at the south-east of the Lismullin site. The three earliest phases are undated. These were succeeded by a series of small pits, three of which may have contained wooden posts to support a superstructure or platform. A range of round-bottomed Neolithic pottery, including Early Neolithic Carinated Bowls (3850–3700 BC) and Middle Neolithic broad bowls (3500–3000 BC), was found in these features and associated with small quantities of possible human bone fragments. These were succeeded by a larger, oval pit containing sherds of Beaker pottery (final Neolithic/Early Bronze Age) in association with a broken Bronze Age polished macehead. All of these pits were sealed by a thin clay deposit, which contained what may be small fragments of cremated human bone. Although the exact function of these pits remains unclear in advance of post-excavation analysis, the occurrence of the pottery and the macehead in association with the human bone fragments indicates that they were of a ritual nature.

Further final Neolithic/Early Bronze Age activity at the site consisted of a small pit at the northern corner of the site that contained 204 sherds of domestic Beaker pottery. A small ring-ditch located at the south-east of the site is as yet undated, but may prove to be broadly contemporary with either the Bronze Age pits or the later post enclosure.

from the complex of earthworks and slot-trenches to be found elsewhere. This serves to underline the unique nature of Lismullin and its significance in the Irish archaeological record.

The Broader Landscape

The site is located c. 500 m from Rath Lugh, a defended enclosure, which dominates the south-eastern views from Lismullin. In addition, a defended enclosure at Rathmiles is 1.9 km due west of the Lismullin enclosure entrance, while the Hill of Tara is visible 2.1 km to the south-west. The sites at Rath Lugh and Rathmiles, together with defended earthworks known as Ráith Lóegaire and Ringlestown Rath and a linear earthwork at Riverstown, have been interpreted as defensive outposts on the periphery of the Tara hinterland, dating to the final few centuries BC and the first few centuries AD. Ceremonial activity at this time was centred upon the Hill of Tara. The earlier date of the Lismullin enclosure, its contrasting construction and siting and its location on the opposite side of the Gabhra Valley would suggest a discreet separation of ceremonial activity within the Tara landscape.

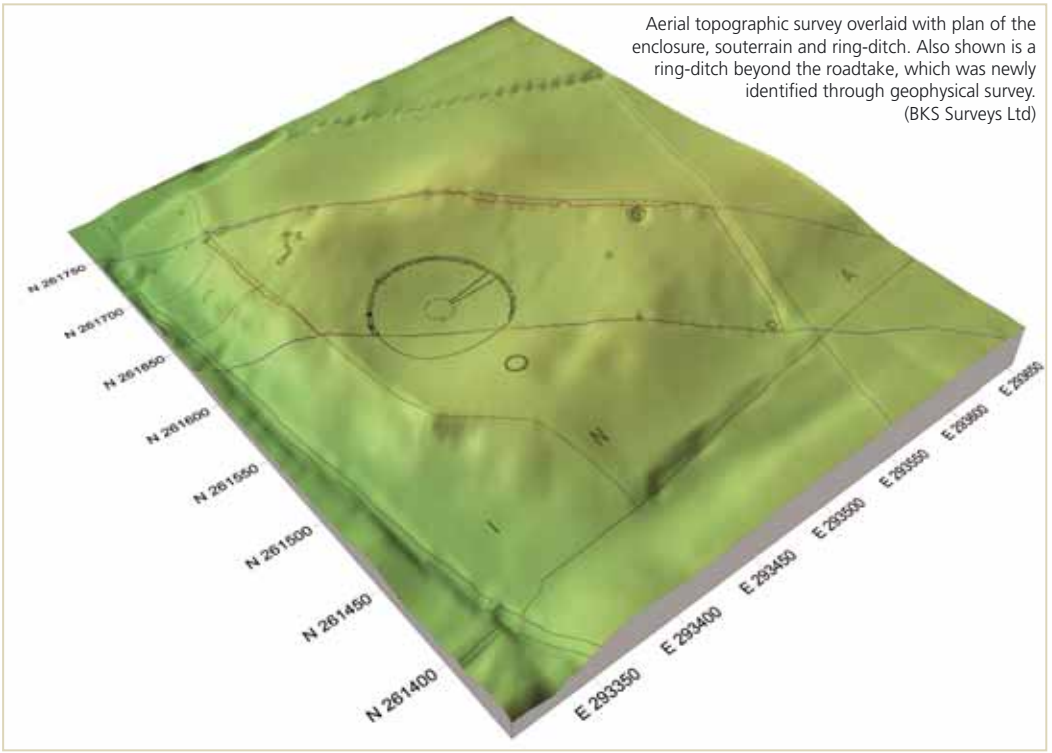
In addition, the skeletal remains of a medium-sized dog were deposited in a crescent-shaped pit or kiln located 65–70 m south-east of the post enclosure. Dog burials are known from both Iron Age and early medieval sites. It is possible that the burial of the Lismullin dog may have had ritual significance associated with the Iron Age ceremonial activities at the site; at the time of writing, radiocarbon dates for the dog burial are pending.

Conclusion

The Lismullin post enclosure is one of the most exciting archaeological discoveries of recent times. A striking feature of the site is its deliberately chosen landscape setting. That this discreet area within the Tara landscape was revisited and reused over a number of millennia can be seen in the recorded features dating to the Early and Middle Neolithic, the Early Bronze Age, the early Iron Age and the early medieval periods. Furthermore, the vast majority of the prehistoric activity, although somewhat episodic, appears to have been of a ritual or ceremonial nature. This further emphasises that the prehistoric inhabitants of the Gabhra Valley perceived this area as a special place. By the early medieval period the focus of activity at the site had assumed a more functional nature. This can be inferred from the probable exploitation of local tillage resources and their processing in some of the various kilns on the site. The souterrain may have been used to store the dried grain and safeguard it, and the local landowners, in times of danger and attack.

Thus far, the Lismullin excavations have offered us a tantalising glimpse at the archaeology and early history of the area. It is to be anticipated that the completion of the excavations and the subsequent programme of post-excavation analysis and publication will significantly enrich and broaden our knowledge of this rich archaeological landscape.

(Directors Excavation Progress Reports detailing the progress of the Lismullin excavation can be viewed online at: www.nra.ie/Archaeology/NationalMoumentatLismullin/)



Aerial topographic survey overlaid with plan of the enclosure, souterrain and ring-ditch. Also shown is a ring-ditch beyond the roadtake, which was newly identified through geophysical survey. (BKS Surveys Ltd)

Photo: Mary Deevy

Archaeologists excavating and recording stake-holes, with box section (foreground) through two of the stake-holes.

Early Medieval Land Use

A souterrain was located at the brow of the north-west-facing slope at Lismullin, overlooking the River Gabhra. This drystone-built, underground structure was entered from the south-east, on the brow of the hill, and consists of two passages with a complex of inbuilt creep-ways and defensive stepped features terminating with a chamber or room at the end of each passage. In addition, 13 clay-cut kilns were recorded across the site. While some have the classic figure-of-eight shape associated with cereal-drying kilns of early medieval date, there is enough variety in their construction to suggest that when post-excavation analysis has been completed, a more diverse date range and variety of functions may become apparent. Interestingly, a projecting ring-headed pin of possible late Iron Age date was recovered from the backfill of an elongated kiln adjacent to the north side of the post enclosure.

Aerial view of excavated Bronze Age ring-ditch and early medieval ringfort, looking east. (Hawkeye)

Seeing the light at Garretstown, Co. Meath

General site plan of Garretstown with geophysical greyscale plot. (ACS Ltd/GSB Prospection)

Stuart Rathbone, an excavation director with Archaeological Consultancy Services Ltd, describes cutting-edge scientific technology used to date a site at Garretstown, Co. Meath.

The archaeological potential of what became known as Garretstown 2 was first identified during the assessment phase of the M3 motorway scheme by geophysicists from GSB Prospection. Their instruments detected a complex of linear features forming a subrectangular pattern at a site located about 1 km north-west of Dunshaughlin. Assessment of the geophysical data suggested that the site may have been a moated site (an Anglo-Norman defended farmstead defined by a rectangular or square ditch and an internal bank); the route of the road was diverted to pass to the north-east of the interior of this potentially significant find. Test-trenching of the altered route identified a small number of probable archaeological features located immediately adjacent to the enclosure, and in February 2006 excavation began in this area.

The features examined consisted of a series of large, curvilinear ditches extending from the eastern side of the subrectangular enclosure, a series of smaller ditches forming subdivisions, a number of small corn-drying kilns, two ring-ditches of impressive depth (one circular, the other subcircular) and—to the consternation of the director—one-third of the circuit of a large ringfort ditch protruding from the edge of the roadtake at the north-east.

Unfortunately, as the excavations progressed a very noticeable pattern emerged: an absolute lack of finds, animal bone or charcoal from any of the major features. The form of the features suggested that the site consisted of two Bronze Age ring-ditches, which had probably surrounded earthen burial mounds, known as barrows, an early medieval ringfort and an early medieval or medieval field system extending from the subrectangular enclosure. Three major phases of recutting were identified in the ditches of the field system. However, with the exception of the ringfort ditch, which produced a reasonable quantity of animal bone, and charcoal-rich layers in the kilns, the features could not be dated by the usual means. Several months into the excavation this problem was becoming rather critical. It was at this point that something surfaced from the dark recesses

of the author's memory—a half-remembered university lecture on Optically Stimulated Luminescence (OSL) dating.

OSL is a dating technique based on the principles of radiometric decay, like the far more familiar radiocarbon or C14 dating method. With OSL dating, it is the small grains of quartz present in ditch sediments that are dated, rather than dating the approximate time of death of a plant or animal whose remains are recovered from a particular context, as in radiocarbon dating. OSL is an analysis of the approximate time-span since the quartz grains were last exposed to light. Using this method it is possible to directly date the deposition of sediments within archaeological features. It was decided to investigate the viability of using this method at Garretstown 2, which eventually led us to discuss the problem with Jean-Luc Schwinninger at the Luminescence Dating Laboratory at the Research Laboratory for Archaeology and the History of Art, University of Oxford.

In August 2006 one of Jean-Luc's assistants flew to Ireland to collect samples from Garretstown 2 and took readings of the localised levels of background radiation. Eight samples were taken in all—three from the ringfort ditch, two from ditches belonging to the field system and three from one of the ring-ditches. It was decided to use one of the samples from the ringfort to demonstrate the accuracy of the method when compared to a radiocarbon date from an animal jaw bone from the same context. The radiocarbon-dating result was not given to Jean-Luc. The other sample that was initially dated, which was taken from the circular ring-ditch, was thought to be Bronze Age in date.

Beta Analytic in Florida, USA, conducted the radiocarbon dating of the bone from the ringfort, and this provided a date of AD 650–780. Several months later Jean-Luc provided a date from the same context: AD 467–727. While this date range is twice the length of that provided by radiocarbon dating (260 years as opposed to 130 years), there is an overlap of 77 years between AD 650 and 727. The second sample obtained from a fill deep within the ring-ditch returned a date of 1724–1364 BC, placing it within the Middle Bronze Age. Two further dates have now been requested from samples taken from different parts of the field system, to establish whether it belongs to the early or later medieval period.

Had this technique not been used it would have proved very difficult to proceed with analysing the results from this excavation. Our concepts of function are often intimately bound to chronological considerations. Thus a circular ditch from AD 700 is perceived to be of a very different character from a circular ditch dating from 3000 BC, even though the physical resemblance may be rather close. These dates therefore allow us to confidently organise the archaeological features at Garretstown 2 into chronological order: two Bronze Age ring-ditches (possibly round barrows), an early medieval ringfort and an early medieval or medieval field system.

The process of obtaining these dates has proved rather illuminating. That the determination of the function of the archaeology depended on acquiring scientific dates rather than resulting from information gained about their physical nature through excavation is, frankly, a little depressing. Nonetheless, the potential of OSL dating was amply demonstrated and while it is unlikely to ever replace our reliance on radiocarbon dating, in certain circumstances it does hold considerable potential. Individual contexts can be targeted for dating, irrespective of their inclusion of suitable organic material or datable artefacts. Also, problems such as the 'old wood effect' (when the age of a wood sample may be greater than the age of the layer or structure in which it is found) and the possibility of residual or intrusive artefacts are avoided, although the method does have its own set of problems, relating to contamination.

Basic Principles of OSL dating

The particular advantage of luminescence dating is that the method provides a date for the archaeological artefact or deposit itself, rather than for organic material in assumed association. In the case of OSL sediment dating, suitable material (sand or silt-sized grains of quartz and feldspar) is usually available throughout the site. When ionising radiation (predominantly alpha-, beta- or gamma-radiation) interacts with an insulating crystal lattice (such as quartz), it triggers a net redistribution of electronic charge. Electrons are stripped from the outer shells of atoms and, though most return immediately, a proportion escape and become trapped at 'meta-stable' sites within the lattice. These are held in place until exposed to light or heat whereupon they become 'free' and return to their normal state, but in order to do this they must lose energy, which they do by emitting light.

If sediment at the base of a ditch, for example, is exposed to light, all of the trapped electrons will be released and this effectively resets the radiometric 'clock'. When the sediment becomes buried and is no longer exposed to light, the meta-stable sites will slowly fill up with electrons at a rate determined by the local level of background radiation. If a sample of this sediment is carefully removed during excavation, without exposing it to light, the age since the sediment was deposited can be calculated.

To obtain a date using this method, a portion of the sample is first exposed to a known dose of radiation and then illuminated. The amount of light given off is observed and this is used to create a dose response curve. Another part of the sample is then illuminated and the amount of emitted light is compared to the dose response curve, which allows an estimate of the total absorbed radiation dose. Once measurements have been made to establish the levels of background radiation in the location where the sample was taken, this can then be used to calculate the approximate age of the sediment. The error limits on the dates obtained are typically in the range of ± 3–8%, although recent technical developments now allow luminescence measurements to be made with a precision of ± 1–2%, in favourable circumstances.

In Brief
RING-DITCH

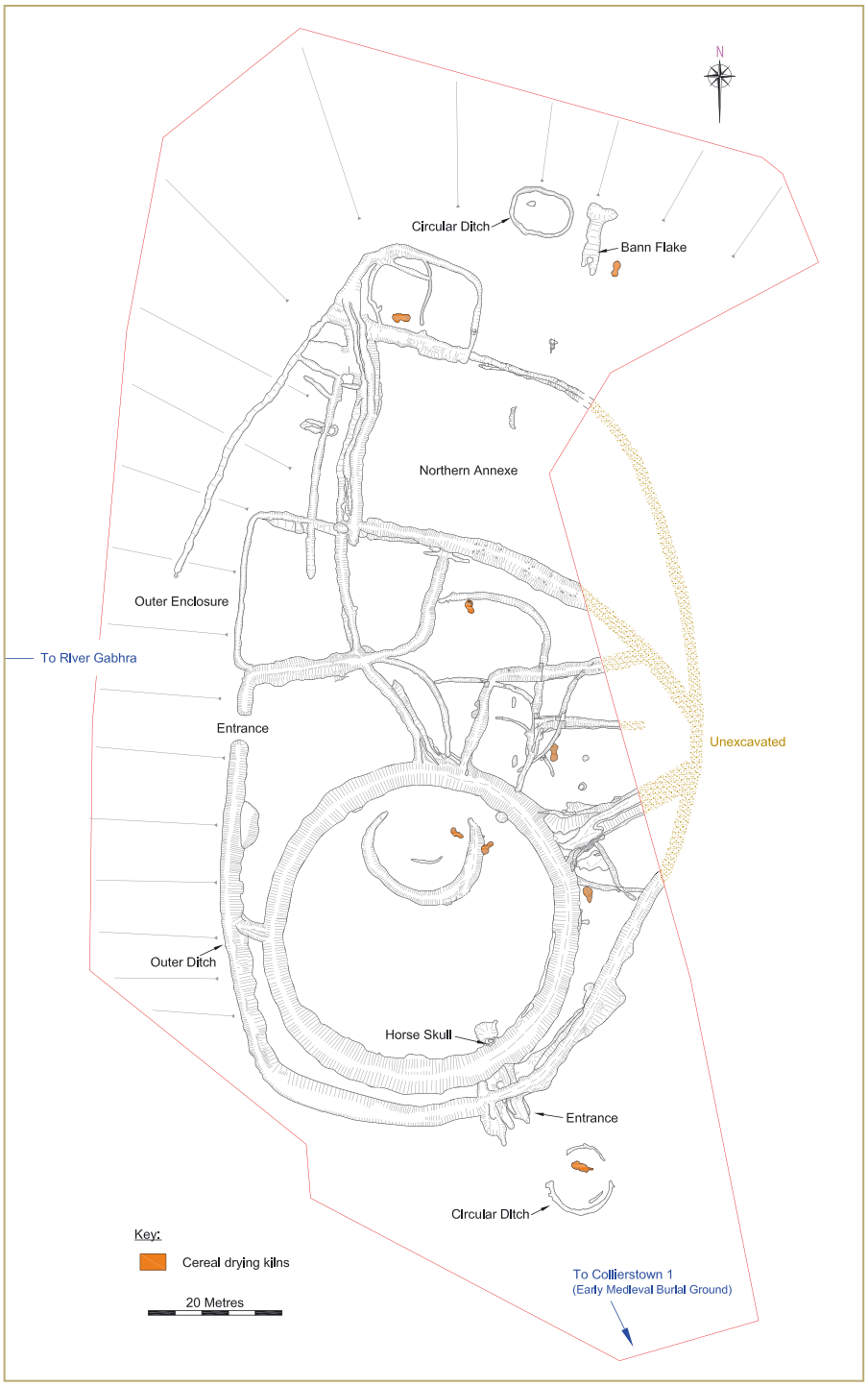
The basic form of a ring-ditch is a circular ditch. Excavated examples have been found to encircle an area averaging 8 m across. In some examples the ditches form a complete circuit, in others an entrance gap was left. Entrances most commonly face eastwards. The soil from digging the ditch was used to build an internal or external bank, or a central mound. Ploughing and natural erosion have removed the above-ground features, leaving the silted-up ring-ditch as the only evidence of these sites. Where mounds and banks survive, archaeologists classify these monuments as various types of barrow.

Ring-ditches were predominantly used as places of burial. The first examples were built in the Early Bronze Age, around 2000 BC. During the Bronze Age they became the most common form of burial monument and our ancestors continued to build them through the Iron Age, until the coming of Christianity. The earliest and latest ring-ditches enclose inhumation burials, however the majority of burials at ring-ditches were cremations. Burials were generally placed in the enclosed area, but in later prehistory the focus of burial extended to the ditch. At this time it also appears that ring-ditches were constructed that did not have their primary use as burial monuments—they may have functioned as cenotaphs. Another pattern that emerges in the Late Bronze Age is the practice of constructing ring-ditch cemeteries, often sited in prominent locations in the landscape—frequently close to natural boundaries, such as rivers.

James Eogan, NRA senior archaeologist, Southern Team.

Fort Baronstown?

Exploring the social role of an impressive ringfort on the M3



Post-excavation plan. (ACS Ltd)

Steve Linnane, excavation director, and Jonathan Kinsella, archaeological researcher, both with Archaeological Consultancy Services Ltd (ACS Ltd), propose an interesting interpretation of a ringfort at Baronstown, Co. Meath.

Introduction

In early medieval Ireland (AD 400–1000) many people—particularly relatively prosperous farming families or powerful lords—lived in enclosed settlements (often defined by banks and ditches) known variously by archaeologists as ringforts or raths. Literally tens of thousands of these ringforts are known in the Irish landscape today, testifying to population growth and intensification in settlement and agriculture from about the seventh century AD onwards. Interestingly, these ringforts often vary in appearance and form: from small, simple, single-banked enclosures to large, complex sites with multiple banks and ditches. Archaeologists believe that, to some extent, such variations may indicate that they were inhabited and used by people of different social status or roles within the community. Discovering who these people were and their role in their society is one of the detective tasks of the archaeologist.

Baronstown ringfort was a previously unknown, large, early medieval enclosure discovered in advance of the M3 Clonee–North of Kells motorway. Buried underground, with its banks probably worn down by centuries of ploughing since it was abandoned (possibly in the 11th or 12th century), the site was only discovered when geophysical surveys were carried out during the Environmental Impact Assessment. Excavation of the site took place between September 2006 and April 2007. The site, as revealed by these excavations, consisted of a circular, ditched enclosure surrounded by a second outer ditch, which had the effect of expanding the site considerably to the north. Seven cereal-drying kilns and two small oval enclosures (possibly houses) were situated outside these main enclosures.

The primary enclosing element was an impressive ditch, approximately 4 m wide and 3 m deep—significantly wider and deeper than

many ringfort ditches. In some ways the site is typical of an early medieval ringfort, but some aspects suggest that Baronstown also played a role in defence and military strategies in the locality. Post-excavation analysis is ongoing, therefore this article is a preliminary assessment of the evidence; future interpretations may change once the results of radiocarbon dating and environmental analyses are available.

Baronstown and its surrounding contemporary landscape

Baronstown enclosure occupied a prominent position in the landscape, with commanding views to the north, west and east. A good location is common enough for ringforts—demonstrating the interest people had in providing themselves with a good view over their lands and cattle and in watching their neighbours in the near-distance. However, some ringforts—like Baronstown—are particularly prominently located, which often seems to have been because the builders decided to build and occupy a site that provided greater defensive capabilities—in this case, both for the enclosure and for settlements in the locality.

What about the surrounding landscape? Baronstown townland today is small, bounded by the townlands of Cabragh, Skreen, Collierstown and Ross. These townlands have a wide range of evidence for early medieval settlement and burial. Cabragh borders Baronstown to the north and west and contains a souterrain and an earthwork, which was marked 'fort' on the first edition (1837) Ordnance Survey map. The earthwork is no longer visible, but may well have been a ringfort. Skreen lies to the north and east of Baronstown and a ringfort, church and enclosure site are recorded in that townland. The Skreen enclosure site may represent the remains of a small, univallate ringfort (i.e. defined by a single bank and ditch). Skreen is also recorded in early historical documents, which assert that it was plundered by both the Irish and the Scandinavians between the 10th and 12th centuries, testifying to the endemic nature of war and conflict in early medieval Ireland.

Ross, bordering Baronstown to the south, contains a probable early medieval ringfort, which was excavated by Ken Wiggins, ACS Ltd, in advance of the M3 works. No contemporary features were uncovered within the enclosure and finds were minimal, including a moderate amount of animal bone, small quantities of unworked wood, a copper-alloy stick-pin and a polished copper-alloy ring. Another ringfort is recorded in Collierstown, which borders Baronstown to the south-west. A forgotten early medieval cemetery site was also discovered here and excavated by Rob O'Hara, ACS Ltd.

Moving away from Baronstown's bordering townlands, there is a noticeable lack of upstanding early medieval settlement evidence to the east, west and south. There are no contemporary sites within 5 km to the east, while just two ringforts are recorded at Trevet Grange, within approximately the same distance to the south. The Hill of Tara is situated c. 2.5 km to the west of Baronstown. Written evidence from approximately the seventh century unequivocally cites Tara as the mythical capital of Ireland, while its title later became synonymous with the high-kingship of the country. However, although it was of great mythical and political importance, the hill itself may not have been occupied in a conventional sense in the early medieval period. In fact, the Hill of Tara and the lands further to the west contain no upstanding monuments that can be shown to be contemporary with the Baronstown ringfort. It is only when we move northwards that a variety of early medieval domestic, ecclesiastical and farming activity becomes apparent in the form of ringforts, souterrains, a church and cereal-drying kilns. Baronstown, then, can most easily be interpreted in terms of its immediately surrounding settlement and burial landscape.

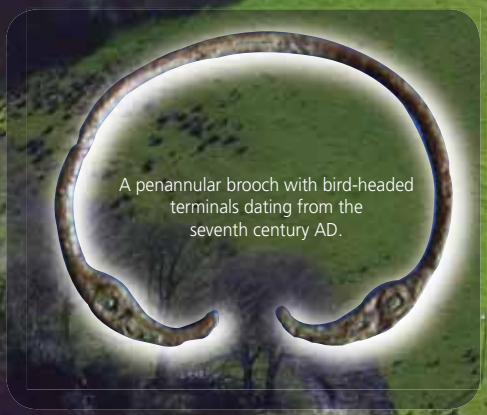
The findings at Baronstown

Given its impressive scale and deliberately prominent location, Baronstown seems likely to have been a ringfort designed to play, to some extent, a defensive or military role. Oddly, however, the artefact assemblage was relatively small. The remaining finds included two brooches—suggesting that its inhabitants had access to portable wealth—a spiral-ringed loop-headed pin, some iron knives and a range of well-preserved wooden artefacts, including barrel staves and a wooden bowl. One penannular brooch, with bird-headed terminals, and the spiral-ringed loop-headed pin demonstrate that the enclosure was in use during the seventh century. However, what is unusual about the Baronstown objects is that they seem mostly to be high-status objects (jewellery), with little of the ordinary finds that would be left from daily domestic and small-scale industrial activities (e.g. iron slag, evidence of textile and crafts or quern-stones for the grinding of grain). There was a lot of animal bone, which of course could have been deposited over a long period of time and may not indicate feasting at one event, but it at least shows that people lived and ate there for some time. Looking at the scale of the defences, the high-quality finds (few as they are) and the prominent siting, it is possible that Baronstown was a distinctive place—a defensive fort, possibly—used occasionally, perhaps at times of danger, by a social group with access to labour, wealth and economic resources.

Elsewhere in Ireland there are comparable early medieval enclosures that demonstrate similar landscape, morphological and material culture evidence to Baronstown. These sites include Ballycasey Beg and Beal Boru, both in County Clare, and Narraghmore, Co. Kildare, which were excavated by Anna Casey, the late P J O'Kelly and Tom Fanning, respectively. What they share with Baronstown are: a defensive location, occupying high-vantage points over the lower-lying terrain; impressive defences taking a variety of forms, including wide and deep ditches, tall banks and palisades; and a general lack of occupation evidence in the form of houses and artefacts. It seems likely, then, that there were some early medieval enclosures in Ireland, like Baronstown, that were primarily intended as military or defensive fortresses (the absence of weaponry is hardly significant, as it is infrequent from most early medieval sites).

If we accept that Baronstown was a defensive or military-type ringfort, is there anything else we can use to understand its role? Its occupation in the seventh century—as indicated by the bird's-head brooch—allows us to refer to contemporary early Irish laws (e.g. c. AD 700) that describe the role of the *aire forgill* and the *aire ard,* who were high-ranking lords with military functions. One of these functions was to keep livestock away from *túath* borders, so their enclosures were usually located centrally within the kingdom. In early medieval Irish society a lord could command military service from his clients, who lived nearby. The penannular

Background: Aerial view of Baronstown post-excavation, from the north. (studiolab.ie)



A penannular brooch with bird-headed terminals dating from the seventh century AD.

Photo: ACS Ltd

brooch—possibly manufactured locally or further afield, such as at Dunadd in Scotland, where brooches of this type were manufactured and which was the early medieval, Irish-ruled royal site of the Scottish Dalriada—is significant because generally only the highest-ranking members of early medieval society had access to such items. It may be that the brooch was made locally—perhaps at the metal workshop on Moynagh Lough crannog where a similar brooch was found—and distributed throughout the kingdom of Brega or, if produced in Scotland, reflects processes such as gift-exchange and tribute between dominant social groups in Ireland, Scotland or even Anglo-Saxon England.

The combined archaeological, historical and cartographic evidence suggests that Baronstown was either one of the dwelling places or, more likely, a fortification of a high-ranking lord. These were powerful and wealthy men, who played a military role for the wider community in that could both alert and call upon their clients and labourers in the neighbouring ringforts in Cabragh, Skreen and Collierstown in times of danger. The location of the defensive ringfort meant that the people within the surrounding enclosures were easily accessible, and probably visible, from this central vantage-point.

At a more regional level, it is interesting that the Baronstown enclosure occupied a secure and roughly central position within the modern barony of Skreen, which approximately corresponds in size to the early medieval *túath* or demesne of Tara. Legal references associate lords, such as the *aire forgill* and *aire ard*, with the responsibility for the protection of livestock, so Baronstown and its neighbouring ringfort were usefully centrally placed within their own kingdom and sufficiently removed from neighbouring *túath* borders to offer such protection. The ringfort in Ross, located close to the south of Baronstown, demonstrated no occupational evidence and produced only two finds; it may have functioned exclusively as a livestock enclosure. It seems plausible to suggest that Baronstown's occupants were responsible for the safety of the animals within the Ross enclosure, while the outer enclosure at Baronstown also offered protection to livestock. It may also be the case that the people of this local community were buried within the cemetery at Collierstown. The cemetery expanded in size from the fifth or sixth century and its status appears to have changed from approximately the seventh century, when children began to be buried there. The entrance to the Baronstown ringfort faced the cemetery and there may have been a direct relationship between its occupants and their deceased ancestors.

Conclusion

Our task as archaeologists is to use a range of archaeological, historical and landscape evidence to explain sites like the Baronstown enclosure and to try to understand how its inhabitants related to the people in the surrounding settlements. Sometimes, we put the pieces of the jigsaw together quickly to see how they fit: our first proposal is that Baronstown was once an early medieval defensive or military fortress, which served both its wealthy owners and the wider community. However, much remains to be done at Baronstown as site plans and features are analysed, environmental samples are processed, radiocarbon dates obtained and other archaeological work is done. Our proposal here fits the evidence uncovered so far, but watch this space as the detective work continues!

Topsoil sieving at Boyerstown 1, prior to full excavation.

Opening the door on a Medieval Settlement at Boyerstown 1

Kevin Martin

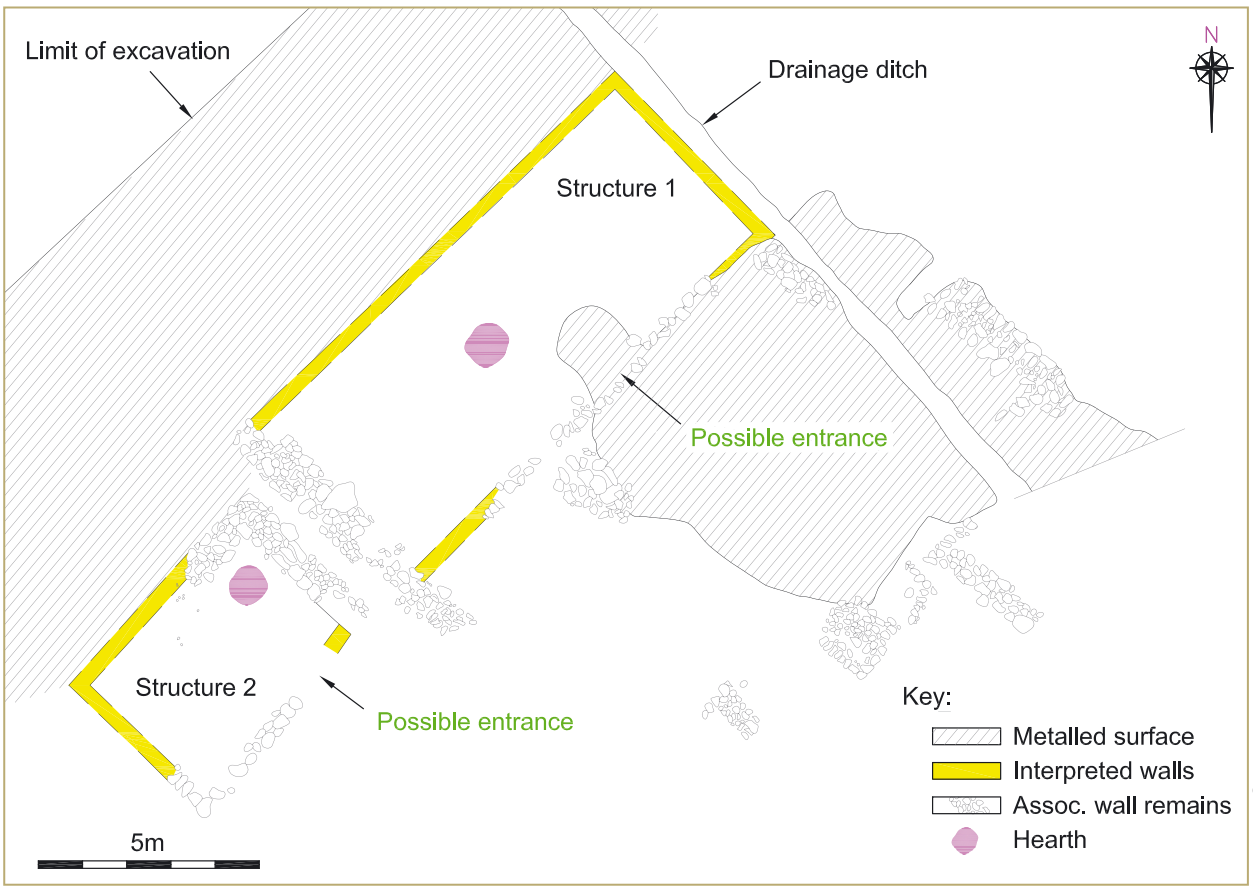
Kevin Martin, NRA assistant archaeologist with the Eastern Team, reports on his excavations at Boyerstown, Co. Meath.

In 2004 archaeological testing by Archaeological Consultancy Services Ltd, as part of the M3 Clonee–North of Kells motorway scheme, uncovered the remains of a drystone-built wall and associated deposits at Boyerstown, located approximately 3 km south-west of Navan along the N51 Athboy Road. Artefacts uncovered during the testing included green glazed pottery and suggested that the wall remains were medieval in date. Topsoil assessment took place at what was subsequently designated Boyerstown 1, prior to full excavation. Similar assessments were also carried out on various archaeological sites along the M3, with the purpose of informing the method of topsoil removal. Overall, the results from these assessments were disappointing in that most of the artefacts found were modern in date and unrelated to the underlying archaeological remains. Uniquely, however, the topsoil assessment at Boyerstown 1 achieved impressive results.

In 2006 the initial metal-detection survey of the site uncovered a total of 420 metal artefacts, which included a highly decorated medieval ring brooch (described by Mary Deevy in Issue 1 of *Seanda*, 2006), copper-alloy belt buckles, iron knife fragments and a large quantity of iron nails. Based on the amount of medieval metal artefacts recovered, it was subsequently agreed that the topsoil should be subject to further metal detection and should be removed by hand and sieved. This process began in May 2006 and continued for approximately four months. The topsoil sieving and metal detection proved to be a huge success and produced a staggering 7,600 artefacts.

The archaeological remains on the site extended over an area measuring approximately 300 m by 50 m. Following full topsoil removal, the remains of two drystone-built structures and associated drystone walls were uncovered. The structures were built directly next to one other and were contemporary. Their remains survived to a wall height of approximately 0.5 m. The larger of the buildings, Structure 1, measured 13 m by 5.5 m. Structure 2 measured 6 m by 4.5 m. They were constructed directly onto the natural ground surface, with no evidence for the use of foundation trenches to support their walls. A hearth area in each building was excavated and included a number of associated stake-holes.

Owing to the limited structural remains it was difficult to establish the exact layout and nature of the buildings. It also became apparent



Images: ACS Ltd

Plan of the structures and associated remains.

during the excavation that a number of the fragmentary wall remains may have constituted additional structures. Some of the stone artefacts found in the area revealed a number of clues as to what the buildings may have looked like. Two punch-dressed corner stones (quoin stones) found in a nearby stone deposit indicate the use of high-quality stonework in the buildings' construction. According to former State chief archaeologist David Sweetman, the punched character of the stone dresswork is also suggestive of a mid-13th-century date. Furthermore, the large numbers and varying sizes of iron rivets and nails found in direct association with the walls suggest that the buildings may have had a wooden upper floor, or a part-wooden construction.

The structures were surrounded by a large, cobbled yard that extended up to 5 m in width. Numerous pits, stone-lined gullies and drains were constructed in this yard to drain water away from the vicinity of the buildings. It was frequently noted that on the wettest days during the excavation, the structures and areas around them were always the driest parts of the site, indicating that the drains and gullies performed their intended functions very efficiently.

Beyond the cobbled yard numerous inter-cutting gullies, large pits, wells, water sumps and drains were cut into the ground surface in a further attempt to manage water and control drainage in the areas surrounding the houses. One of these large ditches contained an extended human skeleton along its base. A series of parallel hand-cut furrows, spaced 1 m apart, were excavated close to the settlement. They were contemporary with the buildings and provide evidence for ridge-and-furrow agricultural activity on the site.

The artefacts recovered from Boyerstown 1 total nearly 11,000 items. The majority of these were medieval pottery, including local green glazed wares, coarse and cooking wares and imported Ham Green and Saintonge pottery. Preliminary analysis of the pottery by specialist Niamh Doyle suggests an occupation date from sometime during the 12th–14th centuries—well within the Anglo-Norman period. The assemblage also contained a large quantity of high-quality metal finds, including silver medieval coins, decorated mounts, a number of ornate brooches and a silver crucifix pendant. The finds not only illustrate everyday domestic medieval life at Boyerstown but also provide a more personal connection with its former residents, by the jewellery and adornments that they wore and treasured.

Geographically, the site was well situated along the Navan–Athboy road and would have offered its residents access to the nearby market centres of Navan, Kells and Trim. Given the quantity of medieval pottery from the site, which included imported pieces from Britain and mainland Europe, they would also have had access to the larger market centres of Dublin and Drogheda. This may explain the origin of some of the highly decorated metal artefacts recovered.

One of the most frequently asked and, as yet, unanswered questions about the site is: who lived at Boyerstown 1? The historical sources researched to date have not identified the individuals or families who lived there. Consultant historian Margaret Murphy, who is currently researching the medieval history of the site and its environs, has tentatively suggested an ecclesiastical link with the Episcopal manor of the Bishop of Meath. It is believed that the bishop's residence/palace was situated approximately 2 km north-west of Boyerstown 1, at Ardbraccan. The present-day Ardbraccan House is thought to have been built over the former residence of the Bishop of Meath. This would mean that Boyerstown 1 may have been the residence and farm of a tenant of the bishop, or that of a manorial officer.

The archaeological evidence suggests that the site was occupied for at least two centuries before being abandoned. One reason for its abandonment may be found in the historical sources, which record intensification in raiding activities by the O'Neills and the O'Donnells in the Navan area during the 15th and 16th centuries. The remains uncovered at Boyerstown 1 represent a very important window into the medieval past of County Meath, and Navan in particular. The discovery of a rural medieval settlement with such a large artefact assemblage is unprecedented in Ireland. Post-excavation analysis is currently ongoing and a more detailed picture of life at Boyerstown 1 will be revealed by the results of this work.

Photo centre: Close-up of conserved silver crucifix pendant.

The system of preventive archaeological research in Ireland—

a Polish viewpoint

Daria Rosińska, a Polish archaeologist working with Archaeological Consultancy Services Ltd, offers her view of archaeological practice on Irish national road schemes.

The preamble of the European Convention on the Protection of the Archaeological Heritage, signed in 1992 in La Valetta, states that 'the European archaeological heritage … is seriously threatened with deterioration because of the increasing number of major planning schemes, natural risks, clandestine or unscientific excavations and insufficient public awareness'. There is no doubt that in trying to fulfil their moral obligation, archaeologists and European governments should organise the effective management of this diminishing resource. The archaeological preventive research (commonly termed 'rescue archaeology') conducted on road schemes constitutes a very important component of this system.

In the last 10 years the pace of Irish archaeological research has increased spectacularly. In response to the rapidly growing number of developer-funded excavations, the number of archaeologists has grown significantly and numerous archaeological companies have emerged. To help meet the demand for archaeological services, a substantial number of archaeologists have been recruited from overseas, among them the present author. Like many Polish archaeologists, I came to Ireland not only for economic reasons but mostly because I was attracted by the rich archaeological heritage. During 21 months working with Archaeological Consultancy Services Ltd (first as a site assistant, then as a supervisor), I was fortunate enough to participate in particularly interesting excavations on the M3 project, e.g. the Iron Age post enclosure at Lismullin. This experience enhanced my archaeological knowledge and allowed me to observe how Irish archaeology deals with the challenge of preventive research.

Preventive archaeology is altering the face of archaeology in general. This is unavoidable in countries like Ireland and Poland, where the infrastructure is changing very dynamically and an extensive archaeological investigation on a vast area impacted by development is vitally needed. The market economy is entering archaeologists' area of interest so they have to act as businessmen—properly managing their skills, money and time. Archaeologists must find a way to protect the heritage and conduct research while facilitating socio-economic development. It is absolutely essential to find a wise compromise. In Ireland I have had the unique opportunity to observe developers and archaeologists working very well together in realising each other's goals. Through efficient legislation and numerous modern solutions, Ireland has developed a very good system that effectively preserves the archaeological heritage at every stage, starting from planning, through testing and excavation to post-excavation analysis and publication of the results.

The launch of a *Code of Practice* between the NRA and the Minister for Arts, Heritage, Gaeltacht and the Islands in 2000 provides a clue to the success. Ultimately, this document helped create permanent positions for archaeologists within the NRA and ensured that archaeology became an integral part of the road-planning process. Archaeologists are now established members of road design teams and oversee all archaeological implications of road schemes. They actively participate in creating route options and establishing the preferred route, which then undergoes an Environmental Impact Assessment (EIA). During the EIA archaeologists carry out in-depth research into the area to be affected by a proposed road, and part of this work is more detailed field-walking, aerial and geophysical survey and refined historical research. Nowhere else in Europe is advance archaeological work for major developments being carried out on such a scale. In many countries, e.g. in France and Poland, the lines of major roads were decided without consulting archaeologists, despite possessing very good databases of known sites. Moreover, the role of monuments curator is often reduced to that of passive bystander rather than being a partner in the planning process. As a result, many sites are excavated needlessly. And yet the site excavation is only one of many research approaches. Rescue excavation should be adopted only as a last resort: this is the preferred option for both development and archaeology. Our goal is not only to understand our heritage but also to protect as much of it as possible for future generations of researchers.

When preservation *in situ* is not feasible and the excavation of the site is the only alternative, the biggest concern is to accomplish this task according to the best practice. To allow ample time and resources for the appropriate excavation of all sites on a road development an extensive testing regime is applied along the entire route corridor. In most countries, that kind of investigation only takes place at previously known sites. In Ireland, a machine under archaeological supervision digs a trench along the centreline, with a number of offset trenches every 15–20 m. This system helps identify all sites in advance of construction and allows time to better prepare for excavation. To establish the extent and nature of identified deposits, a whole range of non-invasive (fieldwalking and aerial survey, geophysical survey and metal-detecting) and invasive (hand- or machine-excavated test trenches) techniques can be applied.

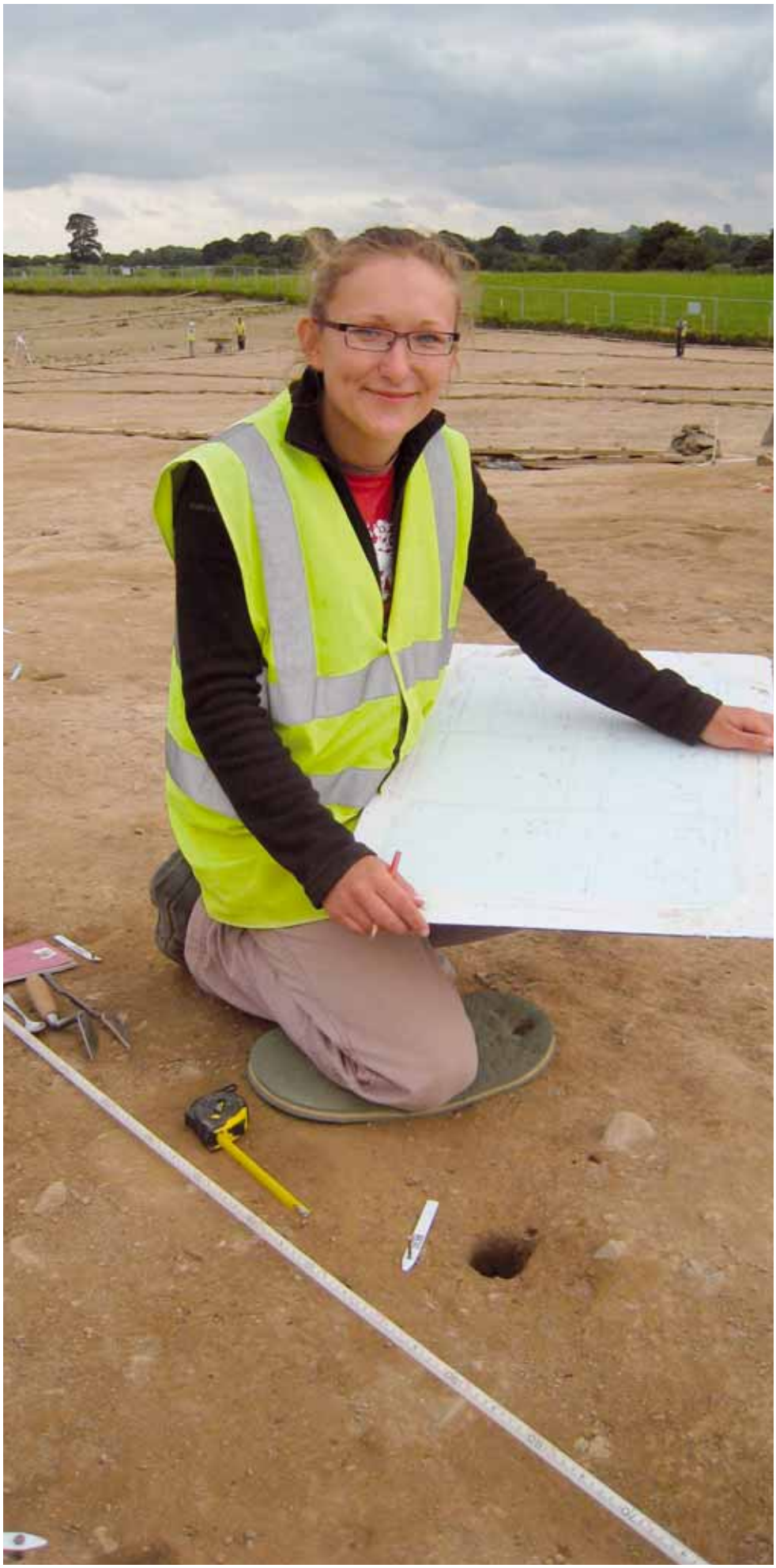
Modern research methods are in day-to-day use during excavations. Nevertheless, the quality of the research depends not only on the methods applied or the use of new technologies, but also on the professionalism of the archaeologists, who should recognise the constant need to raise their qualifications. The appropriate standard of research is very important, but also very difficult to control. In the majority of European countries scientific institutions are in charge of archaeological research on road schemes, which guarantees a high quality of investigation. In Ireland, the preventive research is entrusted to commercial archaeology companies; permitting only licensed archaeologists to direct excavations ensures adequate standards. Moreover, a larger number of site assistants and supervisors are employed on Irish sites. Despite the recent increase in the number of archaeologists working in Ireland, limited professional competition and

difficulties recruiting qualified personnel still pose serious problems. To help resolve this a substantial number of archaeologists have been recruited from overseas (mainly from Sweden and Poland). Foreign archaeologists are attracted here by the rich heritage and attractive employment conditions. Nonetheless, in many cases they are not prepared to work abroad and may need specific training.

The last, equally important stage, of research involves specialist analysis of all the data and materials recovered during the excavation and publication of the results. The fact that the developer, in this case the NRA, is also involved at this stage is a very significant and positive element of the Irish system. The NRA is funding the post-excavation work of numerous researchers. In the case of the M3, this work is being guided by an Archaeological Research Framework with the objective of placing the results into a wider archaeological, historical and environmental context, as well as transforming all data into knowledge about the past.

The NRA is also dedicated to the dissemination of information not only to archaeologists but to the general public. In addition to various monographs detailing some of the most interesting sites, a variety of media—the Internet, regional and national seminars and many forms of printed materials (brochures, posters, etc.)—are used to fulfil this purpose. The public can also have a closer look at the work of archaeologists during the open days that are organised frequently on sites around the country. By applying such fast and effective methods of public information archaeologists can promote a positive image of the profession and combat the stereotype of the archaeologist as 'treasure-hunter' , which will hopefully lead to a revitalisation of public interest and greater care of archaeological resources.

The whole range of solutions applied in Ireland shows that cooperation between archaeologists and developers can be fruitful, allowing road construction while respecting national and international legislation protecting archaeological heritage. Archaeologists receive the necessary time and resources to enhance our knowledge of Ireland's past. For the author, and for many archaeologists from overseas, the extensive archaeological investigations on Irish roads has also created the unique possibility to develop their professional skills and get to know the rich culture and beautiful landscapes of this very hospitable part of the globe.



Daria working at the Iron Age post enclosure at Lismullin, Co. Meath, on the M3. (Mary Deevy)


Elevated view of Ballybannon ringfort: note cropmark to left, outside roadtake. (Headland Archaeology Ltd)

An exciting array of finds from the Carlow Bypass


Noel Dunne

Noel Dunne, NRA archaeologist with the Eastern Team, provides an overview of the archaeology investigated in advance of the N9/N10 Carlow Bypass.

A 20 km transect through the countryside to the north-east, east and south of Carlow town has added significantly to the inventory of sites for the county and introduced new site types to Carlow's archaeological record. Headland Archaeology Ltd excavated 64 sites, under the direction of Colm Maloney, Liam Hackett, Linda Hegarty, Angus Stephenson, Aine Richardson and Joanne Hughes.

One such new site type was uncovered on a south-west-facing slope in Russellstown townland—a very significant Early Neolithic settlement comprising a rectangular house set within a subrectangular enclosure. (Elspeth Logan describes the settlement in more detail in the next article.) On the north-east slope of the same hill, in Burtonhall Demesne townland, approximately 100 features apparently covered a wide date range, from Neolithic to relatively modern times. A rectangular house, measuring 11 m by 6 m, was indicated by linear foundation trenches, post-holes and circular pits. Seven of the pits contained substantial numbers of struck flints, including thumbnail scrapers and debitage. Three contained pottery, provisionally dated to the Late Neolithic/Early Bronze Age, including two sherds of Grooved Ware. Part of a polished stone axehead appears to have been placed deliberately in the base of one pit. This sheltered slope served agriculture and minor industrial activities in medieval and post-medieval times, including corn drying, charcoal-production and granite quarrying; relevant finds included medieval pottery sherds and a riveted bone comb.

Another rectangular prehistoric house was uncovered in Busherstown townland. At least 8 m long and 6.2 m wide, its western end extended beyond the roadtake. Linear foundation trenches and substantial post-holes outlined the house, which may have had wattle-and-daub walls. Post-holes indicated an internal wall, parallel to the eastern end wall, and an aisled layout. Prehistoric pottery was recovered from the trenches and a pit in the north-east corner yielded human bone and fragments of a pot provisionally identified as a Middle Bronze Age Cordoned Urn (this was not interpreted as an Urn burial by excavation director Angus Stephenson). Further upslope was a ring-ditch forming an almost perfect circle, 6 m in diameter. A centrally placed pit contained two flecks of burnt bone and a little


Prehistoric house foundations at Busherstown. (Noel Dunne)

One of four Bronze Age ring-ditches at Busherstown. (Noel Dunne)

charcoal. The ditch contained large amounts of charcoal, small pieces of red ochre and frequent clusters of cremated remains. In all, 10 cremation pits of Middle Bronze Age-type were located over the slope; one contained pottery; an associated hearth contained burnt bone.

At the northernmost end of the Busherstown site, half of a large, subcircular settlement enclosure lay within the roadtake. It had a diameter of c. 32 m and a north-west entrance. Internally, c. 20 pits/post-holes were excavated. No conclusive pattern was discernible, but some may have formed part of a rectangular structure. At least two pits represented cremation burials; one contained fragments of crude pottery provisionally dated to the Bronze Age. Pits outside the enclosure contained charcoal and burnt bone fragments; two appear to have been intercutting cremation deposits.

In Tinryland townland, two possible prehistoric roundhouses were located about 35 m apart. Both had diameters of c. 7 m and were evident from post-holes, with further post- and stake-holes indicating linear internal divisions. Six cremation pits were discovered, all producing burnt bone; one yielded pottery sherds. More recent activity included 22 medieval or later charcoal-production pits, largely subrectangular in shape, and post-medieval land-division ditches. A cluster of pits and post-holes uncovered in Rathcrogue townland may incorporate evidence of two more, possibly Bronze Age roundhouses.

Some sites were devoted exclusively to burial and ritual. An unenclosed, flat cremation pit cemetery in Ballyhade townland consisted of six pits, two yielding prehistoric pottery sherds. (Liam Hackett describes a similar cemetery in Ballybar Lower townland elsewhere in this magazine.) A complex in Ballybannon townland incorporated four ring-ditches and eight cremation pits. Three of the ring-ditches, and seven of the pits, occupied a central area of the site. The pits contained deposits of burnt bone fragments, while one contained an upstanding pot, provisionally identified as a Middle Bronze Age Cordoned Urn, which contained a dense deposit of burnt bone fragments and soil. One ring-ditch contained an internal cremation pit. Later features included two keyhole-shaped corn-drying kilns, probably medieval.

Another prehistoric site type encountered frequently was the *fulacht fiadh*. Generally regarded as Bronze Age cooking sites, these differed significantly in size, shape and artefacts, suggesting alternative make-up, use and date. One site in Ballyburn Lower townland incorporated a large, funnel-shaped depression with a flat

Ecclesiastical access road with 17th-century Busherstown House in the background. (Noel Dunne)

base. It had a diameter of 5.5 m and a depth of 1.1 m. A double ring of stakes midway down the slope respected the water table and indicated the original presence of a covering structure or tent. Formerly, the whole of the interior would have been filled with water, possibly ruling out a sauna function. The fills suggested the water

Medieval limekiln at Moyle Big. (Noel Dunne)

was heated using hot stones; they contained disarticulated horse and cow bone, a red deer antler and stone tools. It may have been used for bathing or for soaking materials, such as leather. Other pits or sump-holes, drainage and feeder channels were found nearby, all located within a typical ploughed-out spread of fire-cracked stone and charcoal, with similar material and silts forming the pit fills.

A burnt mound in Busherstown incorporated a large pit feature, 9 m in diameter and 1.65 m deep. A timber platform was located directly to the south-east: it probably provided access to, and a working platform beside, the standing water. Numerous pits and stake-holes indicated further structures. A stone axehead was recovered—unfortunately, not from a sealed or definite context. Another deep, flat-bottomed pit was revealed under a ploughed-out *fulacht fiadh* spread in Rathcrogue.

The removal of a burnt mound spread in Ballybar Lower exposed an elaborate arrangement of interconnecting pits allowing gravity-fed water to be channelled downslope from an artificial reservoir to fill other pits, before feeding directly into a stream to the south. A possible sluice would have dictated water flow. Finds included a tanged chert arrowhead, other worked chert and flint objects, worked timbers, a wooden shovel, a leather fragment, an antler pick, disarticulated animal bone, medieval pottery and a possible medieval horseshoe. The elaborate arrangement of features suggests the site is not a typical *fulacht fiadh,* possibly associated with leather or mineral processing, or food production. The predominantly medieval finds point to at least extensive use of the site during that period.

A Late Mesolithic Bann flake (a leaf-shaped stone object) came from a *fulacht fiadh* mound in Johnstown townland. Additional Bann flakes and other stone artefacts found indicate that Mesolithic communities, engaged in hunting, fishing and gathering, occupied Carlow prior to the arrival of more settled farmers in the Neolithic period.

Progressing to historical times, the route passes between an Early Christian ecclesiastical site (a church, graveyard and bullaun stone) and a late 17th-century house in Busherstown. Surprisingly, most of the evidence from excavations here was prehistoric in date, although some features could relate to the ecclesiastical site. A curving ditch excavated along the eastern edge of the roadtake for a distance of 70 m is probably part of the outer ecclesiastical boundary. Cut into the granite bedrock, it was generally 2 m wide by 1 m deep, but up to 4 m wide in places. A roadway leading towards the church and passing immediately to the north of the 17th-century house is marked on the Ordnance Survey (OS) first edition mapping and is now quite evident on the ground as a distinct hollow-way. The roadway was revealed as a 4 m-wide band flanked by parallel rock-cut ditches, each 1 m wide by 0.5 m deep. It was interrupted by three quarries backfilled with relatively modern rubbish. The area of the old road was probably used as a granite quarry after it became disused as an access route.

In Ballybannon townland, a medieval moated site lies north-west of the road corridor, while on the opposite side an irregular quarry site is marked on the OS mapping as 'Ballybannon Mote (Site of)'. Excavations uncovered a possible trackway aligned on the moated site and part of a shallow-ditched, subcircular enclosure. A keyhole-shaped, medieval corn-drying kiln was located within the enclosure, but may not be contemporary with the site. It contained large amounts of charred grain and plant material. The uppermost fill of a large pit or kiln, outside the enclosure, yielded a tiny, early medieval bronze brooch. Approximately 300 m to the south-west, a portion of a previously unknown ringfort was uncovered. It had a diameter of c. 30 m and was defined by a deep enclosing ditch. The perimeter of the larger portion of the site, which lay outside the road corridor, was evident during the prolonged dry spell of summer 2006 as a green semi-circle in a field of ripening corn.

In Moyle Big townland, cartographic and documentary sources indicate that 12th-century Kellistown castle originally lay a short distance to the south-east of the roadtake. Excavations here revealed an associated medieval landscape, including agricultural and minor industrial activities—ditches, pits, hearths, simple bowl-furnaces and a limekiln. Finds included local coarse pottery and imported glazed ceramic wares, metal and stone objects and two fine bone combs. The medieval archaeology was complicated by a background of prehistoric activity and by post-medieval features, including tillage, drainage and boundary ditches. The prehistoric activity was represented by the truncated remains of a possible ring-ditch and by stray finds, including a stone axehead, a barbed and tanged arrowhead, other lithics and pottery sherds.

As already documented, many of the excavations incorporated evidence of medieval agricultural and industrial activities. Also investigated were post-medieval features, including landscape features such as a culverted stream on Burtownhall Demesne and a tree- and bank-lined avenue associated with Johnstown House. Two inhumations were uncovered, both of which are probably post-medieval. One, from Cloghristick, represented an adult male, aged 25–35 years at death, in a shallow east–west grave. The second, at Ballybar Upper, was oriented north–south and cut into the base of a similarly oriented ditch. It represented the poorly preserved remains of an individual, possibly female, 18–25 years at death.

Elevated view of Neolithic house. (Noel Dunne)

Uncovering Carlow's Oldest Farmstead

Elspeth Logan

Elspeth Logan, NRA assistant archaeologist with the Eastern Team, describes evidence of an Early Neolithic settlement identified on the N9/N10 Carlow Bypass.

The remains of seven possible prehistoric house structures were found during excavations on the N9/N10 Carlow Bypass. Three structures, consisting of subrectangular foundation trenches and large post-holes, were located at Burtonhall Demesne, Busherstown and Russellstown; four possible roundhouses were also found, two at Tinryland and two at Rathcrogue. The best preserved of the houses, and the focus of this article, was an enclosed Early Neolithic dwelling at Russellstown. Linda Hegarty of Headland Archaeology Ltd directed the excavation of the site between February and April 2006. It is likely that the enclosure and the house are contemporary, but clarification of this awaits radiocarbon-dating results and the completion of artefact analysis. Excitingly, though, pottery recovered from the site suggests that this settlement may represent the oldest house found in County Carlow to date.

Site location

The Russellstown house and enclosure were located approximately 5 km north-east of Carlow town. A portion of the house and the enclosing ditch were located inside the roadtake, on a small plateau on a south-west-facing hillslope, in a field of pasture. There are no known archaeological monuments in the immediate vicinity. The area forms part of what would have been demesne land associated with Russellstown Park House, which was demolished in the first half of the 20th century. The first edition Ordnance Survey 6-inch map depicts a tree-ring landscape feature near the Neolithic house site: this may have modified any remains of the prehistoric enclosure.

The Russellstown farmstead

Initial testing revealed possible Neolithic settlement evidence in the form of post-holes, cremation pits, several flint and chert flakes and a flint, leaf-shaped arrowhead. Pits containing metalworking evidence and possible medieval and post-medieval field boundaries represented later activity. Subsequent excavations revealed the house and the large enclosing ditch surrounding it.

As the house extended beyond the roadtake, its full size is unknown; the excavated portion measured 8.5 m by 6 m. The remains consisted of a north-east–south-west-aligned foundation trench, with a maximum depth of 0.48 m. The trench width varied from 0.38 m to 0.9 m. A possible entrance, represented by a gap in the trench, was identified along the southern side. Within the foundation trench were the remains of posts, a burnt plank wall and packing stones. There is evidence to suggest that the walls were burnt *in situ*; alternatively, the timbers may have been pre-treated/charred to preserve them from rotting. Two large post-holes, which probably held roof supports, were uncovered inside the house; packing stones had supported both. Other internal features included a number of shallow pits and a patch of oxidised clay that may be the remains of a hearth.

The enclosing ditch was 1.42 m wide and 0.8 m deep; a 56.7 m portion of it was excavated within the roadtake. Inside the enclosure, along with the house structure were a variety of pits and post-holes with no obvious pattern or function. Outside the enclosure were more pits, including three cremation pits, one possible cremation and a small pit containing a flint arrowhead. These were mainly located to the west of the site, on a slight, west-facing slope. There were also numerous pits containing slag, showing that later metalworking took place at the site. A number of these were clustered at the south side of the enclosure.

Finds

The site yielded two polished stone axeheads, one arrowhead and approximately 500 sherds of prehistoric pottery. The pottery has been

preliminarily examined and suggests a multiperiod site, dating from the Early Neolithic to the Early Bronze Age.

The fill of the house foundation trench contained numerous sherds of Western Neolithic pottery, flint implements, a possible honestone (used for sharpening tools), some burnt bone fragments and several unworked pieces of quartz. (Western Neolithic pottery is an early pottery style characterised by plain, round-bottomed vessels with markedly angular shoulders and straight, or almost straight, necks. Its presence represents the principal dating evidence for assigning the site to the Early Neolithic period.) This material seems to have been placed deliberately between the timber planks and the packing. One of the roof-support post-holes contained a sherd of Neolithic pottery, a piece of flint and a piece of chert. In addition, Neolithic pottery, flint and grinding stones were recovered from the shallow pits on the interior. Just outside the southern wall of the house was a possible cremation pit containing burnt bone, pottery, flint and chert.

Carbonised grain, flint and possible Early Bronze Age pottery were recovered from the enclosing ditch. It also contained a metal object and a green glazed tile fragment, which are likely to have been deposited there as a result of later furrow disturbance. One of the pits, situated between the enclosure and the house, contained charcoal, burnt bone, two pieces of flint and a small, polished, stone axehead. A second stone axehead was found in the fill of a subcircular cremation pit, located to the north-west of the dwelling and outside the enclosure. This pit also contained 10 sherds of prehistoric pottery.

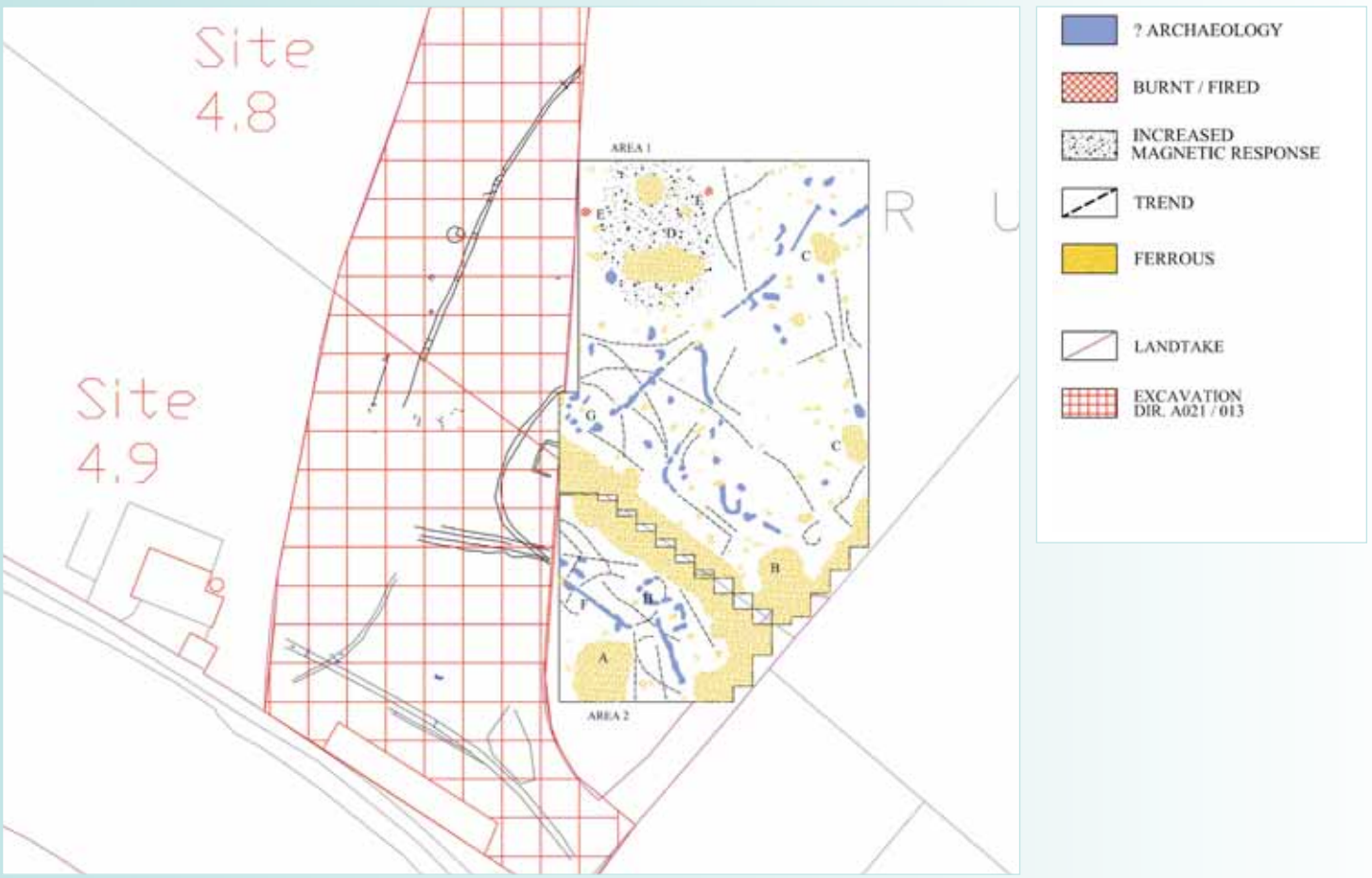
Geophysical survey

In May 2006, upon completion of the excavation, John Nicholls and Dan Shiel of Target Archaeological Geophysics carried out a geophysical survey of two fields to the east, beyond the roadtake. The results seem to indicate that the enclosure was subrectangular and may have been up to 60 m wide and 70 m long. Additionally, the survey identified two possible structures (G & H) and the possible remains of a field system and/or further settlement enclosures, represented by several linear trends (low-level magnetic responses). Unfortunately, the results in the area adjacent to the house are unclear due to the presence of concrete and steel fence-posts, which could not be removed at the time.

Conclusion

The excavation of part of this extensive settlement and the geophysical survey results show that the house and the general location may have been inhabited for more than 2,000 years: from the Early Neolithic to the Early Bronze Age. The site was predominantly domestic in nature, but had certain aspects of ritual use as well. The slight evidence of possible field systems and the other structures within the enclosure are tantalising. Further work on the site will entail environmental analysis, radiocarbon dating, metallurgical analysis and identification of the bone, stone artefacts and the pottery. The publication of the excavation results should prove to be an interesting addition to our knowledge of this site type in Ireland and, in particular, to our knowledge of the Neolithic archaeology of County Carlow.

Elevated view of Neolithic house and enclosure. (Noel Dunne)



Interpretive drawing of geophysical survey results. (Target Archaeological Geophysics)

Making a small point: miniature arrowheads from Ballybar Lower

Liam Hackett, an excavation director with Headland Archaeology Ltd, reports on some 'small finds' from the N9/N10 Carlow Bypass.

Headland Archaeology Ltd excavated a prehistoric site at Ballybar Lower, Co. Carlow, in August 2006 as part of the advance archaeological works for the Carlow Bypass. The site consisted of three cremation burials, four token cremation burials, six figure-of-eight corn-drying kilns and assorted pits.

The burials can be classed as an unenclosed, flat cremation pit cemetery of Bronze Age date. Similar sites have been excavated at Templenoe, Killoran and Lisheen in County Tipperary, and at Ballybannon and Moyle Big in County Carlow. One of the burials stood out from the others in terms of its form and attributes. It contained more than 2 kg of cremated bone—a quantity that is rare in prehistoric terms, although similar to what might be expected from modern cremation practices. The body had been burned and the bones collected, washed, crushed and then deposited in a shallow pit, adjacent to a double cremation burial that was treated similarly. The treatment of the remains immediately suggests that these individuals had been specifically marked out from the rest of their community, and perhaps held high-status positions within it.

Analysis of the remains yielded much information, despite their treatment prior to burial. The individual buried in the shallow pit was a middle-aged adult (30–39 years of age), probably male, and his skeletal remains exhibited signs suggesting that he had engaged in heavy manual labour throughout his lifetime. Other evidence gleaned from the analysis suggests that the individual wore copper-alloy jewellery at the time of cremation. The condition of the skull bones suggests a form of headgear, which slightly lessened the effects of the fire during the cremation process in comparison to the remainder of the skeleton.

The most striking aspect of this burial was the presence of two miniature tanged arrowheads amongst the deposit of burnt bone. These arrowheads were made of locally sourced igneous rock, possibly andesite, and were not designed for use (the ballistic capabilities of such minute points would have been negligible). Also, the tanged parts of the arrowheads were too small to be hafted to a shaft that could be loosed with any degree of accuracy. It is, therefore, reasonable to assume that these arrowheads were symbolic representations of the actual items, deposited *post-mortem* to denote the importance and social standing of the buried individual. While the manufacture of miniature artefacts is known from prehistoric times, it is usually associated with larger objects, such as axeheads and maceheads. The scaling down of items that are already small would seem to be a new revelation in Bronze Age funerary practices and will require further analysis and study in the future. The enormous amount of excavation work currently being carried out at the site is unearthing previously unknown practices that will hopefully enlarge our understanding of those who came before us. Post-excavation analysis is ongoing, and the results of radiocarbon dating, which are pending, will help to shed light on this singularly interesting find.

Miniature arrowheads from Ballybar Lower, Co. Carlow. (Headland Archaeology Ltd)

No bones about it:
burnt mounds along the N9/N10

Auli Tourunen, archaeozoologist with Headland Archaeology Ltd, queries the apparent lack of animal bones recovered from burnt mounds.

Burnt mounds, or *fulachta fiadh*, are one of the most frequently encountered site types on road schemes in Ireland. They generally date from the Bronze Age, but some have been dated to the Neolithic and medieval periods. A typical burnt mound consists of one or more troughs associated with a low, horseshoe-shaped mound of heat-shattered stone and charcoal-stained soil. The trough would have been filled with water, which was then heated by placing hot stones into it. A variety of functions have been proposed for these sites, but traditionally they are believed to be the remains of ancient cooking places. Curiously, however, generally few animal bones are recovered during the excavation of burnt mounds.

The explanations for the lack of faunal remains have ranged from acid soil to scavenging animals to the specific function of these sites. However, the stated lack of bones from burnt mounds seems to be, at least to some extent, only partly true. Animal bones—both burnt and unburnt—were recovered from a number of burnt mounds along the Carlow Bypass section of the N9/N10 Kilcullen–Waterford Scheme: Prumplestown–Powerstown in counties Carlow and Kildare. The sites were excavated by Headland Archaeology Ltd.

As different activities create contrasting assemblages of animal bones, faunal studies can help to differentiate the functions associated with vaious features. Different anatomical parts are discarded during successive phases of carcass-processing. In principle, bones with little meat around them (such as skulls and mandibles or lower jawbones) are left in the initial place of slaughter, while more meaty bones are transported for cooking and consumption. In practice, the pattern is more complicated: bones and antlers may be used for raw materials; butchery could have been carried out in several phases.

It is possible to test the existing theories regarding the functions of burnt mounds by examining bone evidence. If burnt mounds were utilised as deer cooking pits, it follows that deer bones would be present. Tanning, on the other hand, is often indicated by the presence of lower leg bones, usually left attached to the hides during this process. Long bones cracked open for the extraction of marrow can be a sign of grease production.

A total of 10 burnt mounds containing animal bones were excavated along this road scheme, in the townlands of Burtonhall Demesne, Ballyburn Lower, Tinryland, Ardnehue, Johnstown, Prumplestown Lower and Busherstown. Sometimes the presence of bone can be investigated only through the examination of soil samples. In Carlow, two sites (Busherstown 1 and 3) in which no visible animal bones were recovered during excavation yielded burnt bone from the soil samples. The largest number of specimens were recovered from Busherstown (probably Bronze Age) and Johnstown (as yet undated), Co. Carlow, with 578 and 102 fragments respectively. The other sites included smaller numbers of bones or teeth, often represented by only a few fragments.

The species distribution pattern is similar at each of the sites: cattle bones dominate the assemblage, followed by horse and red deer, with some bones of pig and sheep also present. It seems that none of these sites was used for cooking deer. When deer bones were found, they derived from antlers and the lower part of the leg, and therefore may relate to artefact manufacture or tanning rather than to cooking. The presence of skulls and mandibles indicates that animals were slaughtered at the cooking site; it is, of course, more convenient to let the meat walk to

Photos: A selection of animal bones recovered from burnt mounds excavated on the Carlow Bypass. (Headland Archaeology Ltd)

the right spot than to carry the dead weight around. The bone material (from both Busherstown and Johnstown) included plenty of limb bones, but just a few vertebrae and ribs. Only one bone—a horse humerus (the bone extending from the shoulder)—showed signs of the bone having been cracked for marrow. Many of the shafts were complete, therefore it seems unlikely that these bones were used for grease extraction.

Let us consider other forms of evidence. Burnt mounds are places with access to water and, by association, boiling water, and are often located away from settlement sites. Many sites have produced stone tools, such as scrapers and whetstones. Associated features include pits and post-holes. The bone evidence indicates that large domestic animals were slaughtered and processed on these sites. It seems likely that some sites were used for tanning the hides and processing the antlers, and possibly also the horns. Tanning requires water (but not boiling water) and scrapers. Antler and horn needed to be soaked and, in some methods, boiled in water before processing. At the time of writing, no fish or bird bones have been recovered, despite extensive sampling.

What about the meat, then? The small number of vertebrae and ribs may indicate that these pieces were carried away from the site after slaughtering. As these parts are more fragile, however, further data is required before concluding that their absence is certain. It seems likely that the burnt mound sites in Busherstown and Johnstown were used for the primary butchering of carcasses, i.e. stripping the meat from the long bones and transporting the spinal column, with meat still attached, to another location for consumption. Meat could have been preserved or consumed immediately. As Dr Finbar McCormick, an archaeozoologist at Queen's University, Belfast, has observed, the slaughter of livestock produces a large amount of meat, which is difficult for a small group of people to consume before it rots. The options were either to organise a feast or to preserve part of the meat. Prehistoric communities were likely to store food by drying, smoking or burying it in anaerobic conditions (a good example of the latter is the occurrence of bog butter).

Many questions remain unanswered. Not all burnt mound sites in Ireland show the predominance of cattle. For instance, the only identified species in burnt mounds excavated by the Lisheen Mine Archaeological Project in County Tipperary was sheep or goat. The lack of bones from most sites around the country may be due to the cleaning process: bones were usually discarded to the margins of the site and therefore not preserved. However, sometimes cleaning could have been carried out during the filling of the trough or pit.

Additional animal bones associated with burnt mounds have been recovered from current excavations on other sections of the N9/N10, generating sufficient additional data for what will amount to a representative regional study of Carlow and Kildare. Only further excavation and study will allow us to analyse the relationship between animal bones and burnt mounds, coupled with examining soil acidity, associated environmental data and the dating of sites and their location in the landscape.

GLOSSARY	
Anglo-Norman	The Anglo-Normans were the descendants of the Normans, who ruled England following the conquest by William of Normandy in AD 1066. In AD 1169 Ireland was invaded by the Anglo-Normans.
Archaeological feature	Any component of an archaeological site, such as a post-hole, pit, wall, ditch, or any deposit that may have accumulated on-site.
Artefact	Any movable object that has been used, modified or manufactured by humans.
Beaker pottery	A type of pottery drinking vessel introduced from the Continent and associated with the Beaker Period, from the later Neolithic to the Early Bronze Age.
Bowl furnace	A small, open-air, bowl-shaped furnace, in which the flames are fanned by bellows. Used for heating minerals and metals, or for making glass.
Bronze Age	The period (c. 2400–600 BC) that succeeded the Neolithic and saw the introduction of bronze in the making of tools and weapons.
Bullaun stone	A large boulder with an artificial basin-like cavity on its upper surface used to grind various substances or to hold water. These are frequently associated with early ecclesiastical sites.
Carinated Bowl	A type of Neolithic pottery vessel with a hemispherical bowl that has a distinct shoulder, or carination, generally having a curved neck.
Collared Urn	A type of Bronze Age pottery vessel with a flat base, a conical body and a heavy overhanging rim or collar.
Cordoned Urn	A type of Bronze Age pottery probably derived from Collared Urns (see above). The outer face is decorated with applied cordons or raised ribs.
Cremation	The practice of burning the bodies of the dead. In prehistory the ashes were commonly placed in a pottery vessel and buried in a pit.
Debitage	Detached pieces of stone from larger stone cores that are discarded during the process of stone tool production.
Fill	A term used to describe the individual layer(s) of material contained within archaeological features, such as post-holes, pits or ditches.
Fulacht fiadh	A site, generally dating from the Bronze Age, consisting of a horseshoe-shaped mound of burnt stones, a hearth(s) and a trough(s). These sites were used to heat water for a variety of possible purposes. Also known as ancient cooking places.
Geophysical survey	Geophysical survey is the most effective way to see beneath the ground surface without having to disturb the ground. The survey instruments measure anomalies or changes in the soil's properties, such as magnetic susceptibility and electrical resistivity. These anomalies can be caused by the presence of iron artefacts, kilns, ditches, stone walls or hard-packed floor surfaces.
Global Positioning System (GPS)	A Global Positioning System, or GPS, provides a longitude and latitude for a position on the ground by reference to satellites. It thus allows for the accurate and rapid survey and mapping of surface archaeological features.
Grooved Ware	A type of Late Neolithic pottery consisting of flat-bottomed, tub-shaped pots, some decorated with parallel grooved lines.
In situ	Archaeological artefacts are said to be *in situ* when they are found in the location where they were last deposited, i.e. undisturbed and unexcavated.
Inhumation	The name given to the burial custom of laying a body in a grave.
Iron Age	Final period of prehistory, beginning around 600 BC. In this period iron superseded bronze for the manufacture of tools and weapons.
Lignite bracelet	A bracelet made from polished lignite, or jet. Lignite is soft, brownish-black coal in which the alteration of vegetable matter has proceeded further than in peat, but not as far as in bituminous coal.
Medieval	Period succeeding the Iron Age, which in Ireland is dated from the advent of Christianity in the fifth century up to the 16th century AD.
Mesolithic	The Middle Stone Age, c. 7000–4000 BC, when Ireland was first settled by early hunters and foragers.

Moated site	An Anglo-Norman defended homestead consisting of a square or rectangular enclosure defined by a bank and a broad, flat-bottomed ditch.
Motte and bailey	An Anglo-Norman military stronghold comprising a large, steep-sided earthen mound, flat on top and surrounded by a ditch, with an adjoining rectangular or oval enclosure, called a bailey, defined by a bank and outer ditch.
Neolithic	The New Stone Age, c. 4000–2400 BC, the period preceding the introduction of metalworking and characterised by the beginnings of farming.
Quern-stone	A large stone used for grinding grain into flour. The four main categories of querns found in Ireland are the saddle, beehive, disc and pot querns.
Radiocarbon dating	Also known as Carbon 14 or 14C dating. A scientific method of dating by measuring the decay of the radioactive isotope Carbon 14, which is present in all organic material.
Ring-barrow	A barrow is an earthen burial mound, generally dating to the Bronze Age and Iron Age. Ring-barrows are the most common form and consist of a low, circular mound of earth, 15–20 m in diameter, surrounded by a ditch with an external bank.
Ring-ditch	A small circular enclosure defined by a ring-shaped ditch, which is often associated with prehistoric burials. Many have been discovered to be ploughed-out barrows.
Ring-pin	An early medieval dress or cloak-fastener, usually of copper alloy, with a swivel ring inserted through a perforation or loop at the top of the pin. The ring of the pin is sometimes decorated.
Post-hole	The void or soil-filled hole where a post once stood.
Post-medieval	The period after the medieval period, often taken to be the period after the dissolution of the monasteries in the mid-16th century.
Prehistoric	Any period for which there is no contemporary documentary evidence.
Tuyère	Also known as a blowing hole. A nozzle in a furnace through which air is injected.
Smithing hearth cake	The fused residual material, or slag, forms during the smelting or refining of metals, which usually formed on the hearth wall just beneath the blowing hole.
Souterrain	A long, narrow, stone-walled subterranean passage, usually with a slab roof. Some have small chambers off the main passage.
Spindle whorl	A small, perforated disc of stone or pottery used as a weight attached to the end of a spindle (a metal rod or wooden stick) for spinning yarn or thread from wool, cotton, or other material.
Stick-pin	A straight pin of metal, bone or wood, often with an ornamented head. Worn as a dress accessory and typically early medieval in date.
Vase Urn	A type of Bronze Age pottery consisting of small, hand-made, well-decorated vases.

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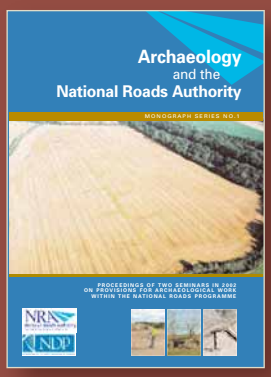
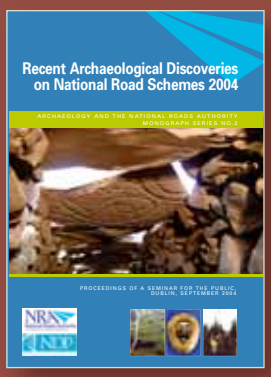
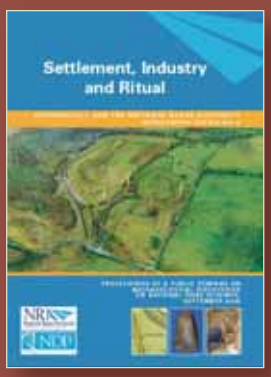
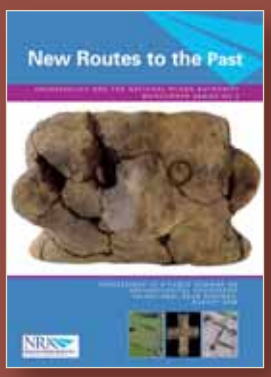


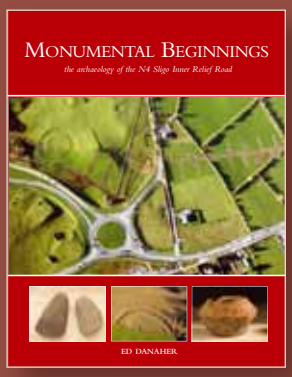






Archaeology and the National Roads Authority Monograph Series

The NRA initiated its Archaeology and the National Roads Authority Monograph Series in 2003 to publish the papers given at its annual archaeology seminars. In common with the seminars, the monographs are presented in an informal, jargon-free and easily understood format and contain numerous colour illustrations. The fifth monograph in the series is currently in preparation.



MONUMENTAL BEGINNINGS:

The archaeology of the N4 Sligo Inner Relief Road

by Ed Danaher

To be published 6 December 2007

'In one of the most important discoveries of the last 50 years, archaeologists have uncovered traces of the earliest Neolithic causewayed enclosure in the whole of Ireland and Britain.This 6000- year-old Continental-style monument, built by some of Ireland's earliest farmers, re-opens the debate about the beginnings of farming in Ireland. Application of the latest techniques for analysing radiocarbon dates has revealed the national and international significance of this site. The volume will be a 'must-read' for anyone interested in Stone Age Ireland.

But Monumental Beginnings does not deal only with the earliest Neolithic. Among the 30 sites excavated along the N4 SIRR are some late Neolithic pits containing Grooved Ware—still a relatively rare kind of pottery in Ireland. Bronze Age activity includes several cooking sites (fulachta fiadh), round houses, and a pair of graves that contain parts of a unique and fascinating stone necklace, dating from around 1650 BC, that shows us how the prehistoric inhabitants of Sligo were au fait with wider fashion trends.

All this and more is to be found in this beautifully produced, promptly published volume. It is often said that the boom in Irish developer-funded archaeology means that we will have to rewrite the textbooks. Here is one of the key sources of information that will help us to do just that.'

Alison Sheridan,
Head of Early Prehistory,
National Museums of Scotland

All of the above publications are available through bookshops, or directly from Wordwell Books (www.wordwellbooks.com or tel: +353-1-2947860).