NEWSLETTER OF THE ENGLISH HERITAGE RESEARCH DEPARTMENT

RESEARCH NEWS

Tin-glazed ware owl cup - story on page 25

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This issue focuses on the Chester Amphitheatre Project, an initiative funded, owned and supported jointly by Chester City Council and English Heritage.

The results of this project will improve understanding and presentation of the amphitheatre, and will inform discussions of the value and significance of heritage assets for the modern townscape and economy of Chester, contributing to wider social and economic debate. This shows how local authorities, communities and English Heritage can work together to put the historic environment and the Heritage Cycle of Understanding, Valuing, Caring and Enjoying at the heart of broader planning issues. For all these reasons the project is a very high priority for both the City Council and English Heritage.

The core of the project is the understanding, presentation and management of the amphitheatre site itself. From the outset we recognised that study of the amphitheatre could not be divorced from the broader historic environment of which it is a part, and that any research project had to be fully engaged with the interests and concerns of the people and City of Chester. Mindful of the excitement that the project generated in Chester, and among wider national and international audiences, the City Council and English Heritage ensured the widest possible access and consultation. The excavation was planned as a public event. The website with its 24/7 webcam provided virtual access around the globe, and the 170,000 visits to the excavation viewing gallery testify to intense interest among the people of Chester and visitors.

Non-invasive studies, documentary analysis and buildings research have established the contemporary setting and context of the amphitheatre and its influence on the development of the medieval and modern townscape. They have also allowed us to assess the character of the amphitheatre environs and their value for Chester now and in the future. The project has provided an opportunity for exemplary inter-disciplinary work and for the development of new approaches and techniques of investigation. At the heart of it all, the excavation has revolutionised our understanding of the amphitheatre and post-Roman activity on the site. On the back of this the Grosvenor Museum at Chester will host an international conference on the subject of the Roman Amphitheatre in 2007.

We also report on other current work which, through the English Heritage Research Strategy, addresses major issues facing the historic environment. Work at Runwell Hospital in Essex is aimed at informing the NHS Disposals Programme; support for the International Radiocarbon Conference at Oxford helps to build expertise and capacity in the sector; staff contribute to an HLF-funded outreach initiative at the Museum of Fulham Palace; English Heritage launches new project management guidelines for historic environment research projects; and dendrochronology dates the Dauntsey Doom.

Christopher Scull
Research Director
Research and Standards Group

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Comment should be sent to Tony Wilmott at: English Heritage, Fort Cumberland, Fort Cumberland Road, Eastney, Portsmouth, PO4 9LD.
Telephone: 023 9285 6700. Fax: 023 9285 6701.
Email: fort.cumberland@english-heritage.org.uk

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The Chester Amphitheatre Project: past, present and future

The Chester Amphitheatre Project is a jointly funded and implemented initiative of Chester City Council and English Heritage. The amphitheatre is a high priority for the City Council, who are the site owners, and English Heritage, in whose guardianship the site is.

The Roman amphitheatre at Chester lies on high ground on the banks of the River Dee, just outside the south east corner of the legionary fortress of Deva. It was built in a commanding position, visible to anyone approaching from the south and west and from the river. This siting would have been very deliberate, as the amphitheatre, as one of the grandest and most important building types invented by the Romans, expressed Roman identity and power in a way few other structures could.

PAST WORK

Despite its size, the amphitheatre had disappeared from sight and knowledge long before antiquarian interest in the Roman history of Chester began. It was discovered by W J Williams in 1929 during the installation of heating to the Dee House convent school. The discovery did not come a moment too soon, as at the same time it was intended to straighten Little St John Street, the road on the northern side of the amphitheatre which had preserved the lines of the north wall of the building for at least a millennium. The existence and extent of the amphitheatre was confirmed in the following years by excavations carried out on the line of the road by R N Newstead and J P Droop. The road scheme was dropped in 1933, and the idea of excavation was kept alive by the Chester Archaeological Society. From 1959 to 1969 extensive excavations of the northern half of the amphitheatre by F H Thompson were funded by the Ministry of Works/Dept of the Environment, and culminated in the consolidation of the northern half of the site, and it's opening as a public monument in 1972.

The displayed portion was laid out in a style which is very much of its time. The Roman walls were supported by concrete poured against their rear faces, and the seating banks were grassed. The arena was laid to gravel. The southern half of the amphitheatre was retained by a severe concrete retaining wall 4m high, surmounted by a further 2m high brick wall, defining the grounds of Dee House, the Grade 2 listed building which occupies a large part of the site of the southern side of the amphitheatre.

PROJECT ORIGIN AND DEVELOPMENT

The display of the amphitheatre has long looked tired, with Dee House standing empty. The future of the amphitheatre site has frequently been discussed within the last twenty years, and different proposals have been drawn up for the monument, all

The Chester Amphitheatre Project logo and definition

chester amphitheatre project

The Amphitheatre Project is a high priority in the policy of Chester City Council, and is a designated English Heritage Beacon Project. It is conceived as an integrated partnership between the two bodies

Chester City Council

ENGLISH HERITAGE

The northern half of the amphitheatre as displayed from 1972 to 2004

involving some element of excavation and display. In the 1980s plans were put forward to excavate the remainder of the amphitheatre and to reconstruct a portion of it. Consent was given to demolish Dee House, but the scheme failed and planning consent lapsed in October 1995. Also in 1995 planning consent had been granted for a new court building, to be constructed to the south-west of the site. This building was completed in early 2001.

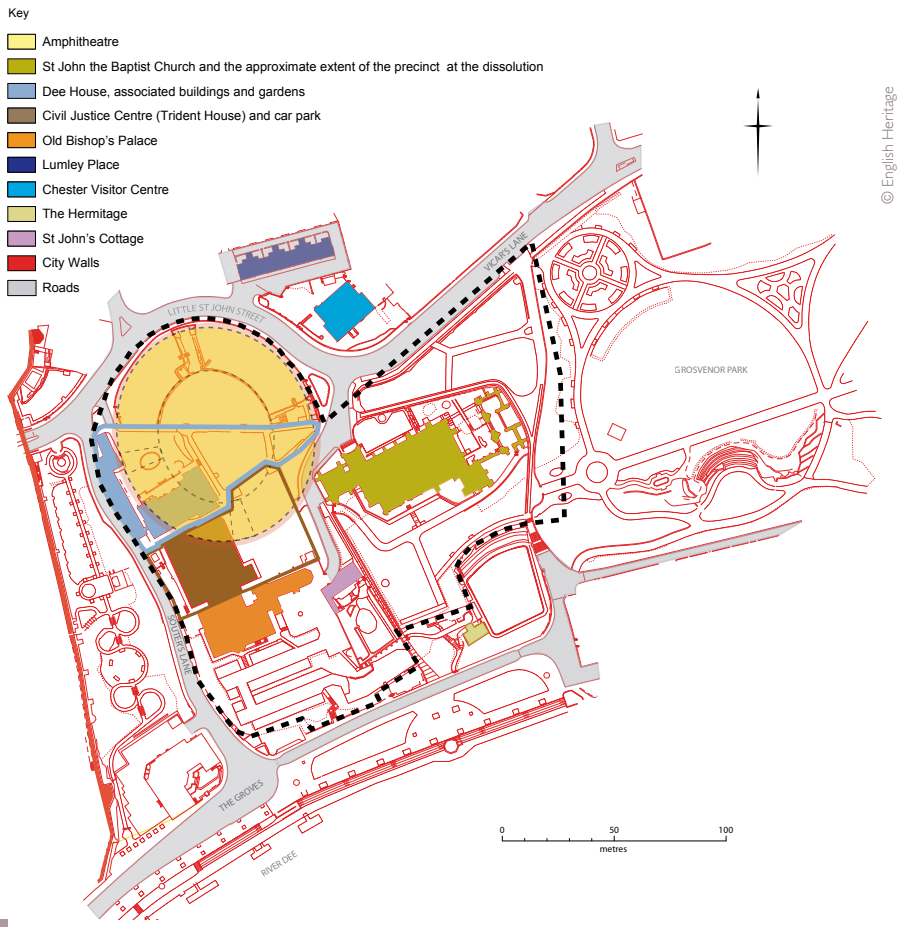
The result of these changes of plan for the site has been the development of an extensive grey literature, which summarises the site, its importance and the opportunities which exist for its display. This also covers the condition of the amphitheatre, as the site has been evaluated on a number of occasions (in 1993, 1994 and 1999) in advance either of development or proposals for development. The constant re-evaluation of the monument in small evaluation trenches was thought to be having a deleterious effect on the legibility of the surviving archaeology. In 2000, Chester Archaeology undertook an evaluation of the conserved area of the amphitheatre, demonstrating that the monument may not have been as totally excavated as had been believed. Also in 2000, Keith Matthews of Chester Archaeology drafted a preliminary research framework for the site in which estimates of the surviving quantity of archaeology were attempted. Two further seasons of small-scale, targeted work by Chester Archaeology, the last in Summer 2003, further examined the conserved area of the site.

In January 2001, English Heritage tendered for the production of a conservation plan for this problematical site, and in Spring of 2002, discussions between EH and Chester City Council considered the future of the amphitheatre. By summer 2003 the concept of a joint English Heritage/Chester City Council project to investigate the amphitheatre was established. Three strands of work were identified:

- *An archaeological research framework*
- *A non-invasive survey of the amphitheatre and its environs*
- *Excavation within the amphitheatre area.*

These strands were detailed in a briefing paper to the Chester Amphitheatre Steering Group in October 2003. At the same time a project design for non-invasive survey was produced by Stewart Ainsworth, a Research Framework document was produced by Oxford Archaeology, and Tony Wilmott was tasked with designing an excavation project in collaboration with Chester Archaeology for the summers of 2004 and 2005. The project design was approved in April 2004, and in May, Dan Garner was appointed by Chester City Council to co-direct the excavation.

The study area for non-invasive work



PROJECT AIMS

The overarching aim of the Project is to provide baseline data to inform the development of proposals for the future of the site, its presentation and interpretation. This data has been acquired through both non-invasive survey and excavation, each of which aspect of the project has its own list of aims.

The programme of non-invasive survey, which was designed and implemented by the EH Archaeological Survey and Investigation team, was intended to contribute to the understanding of the amphitheatre in its immediate context, in particular its relationship with the post Roman and ecclesiastical landscape. It would enhance the quality of the basic recording for the site to better inform subsequent management and display, by providing a high level of survey data for a computerised reconstruction of the amphitheatre and its topographic setting. It was also hoped that it would provide opportunities for community involvement and a variety of outreach activities, inform the selection of potential future targets for excavation, and contribute to conservation and preservation issues related to Dee House and the future conservation and display of the site.

The excavation programme was specifically framed to validate and enhance data recovered in previous excavations, to create a knowledge base sufficient to make judgements on the future treatment of the amphitheatre and of Dee House, to engage and interest the public in Chester and further afield in the processes of archaeology, and to undertake training in archaeological techniques to archaeology students.

IMPLEMENTATION

The non-invasive work began in early 2004, using a suite of techniques to illuminate the total landscape history of a broad study area encapsulating the area from the amphitheatre at the north, to the River Dee to the south, the city walls to the west and to Grosvenor Park at the east (see bottom left). Excavation, which began in June 2004, concentrated on three areas (see bottom right); Area A, designed to establish the extent of Thompson's work on the *cavea* and to re-examine his phasing of the structure and its dating. Area B would examine all aspects of the post-Roman archaeology of the site down to the top of Roman levels in order to establish the post-Roman sequence lost by Thompson, and attempt to demonstrate a connection between the amphitheatre and the siting of the early church of St John's. Area C was excavated in order to examine the history of the infilling of the arena, and the consequent disappearance from sight of the amphitheatre in the townscape.

RESULTS

The results of the Project, in terms of new information on the amphitheatre and its environs over two millennia have been spectacular. The following articles give a flavour of the discoveries from excavation, survey, finds work and environmental study, as well as highlighting the opportunities realised in outreach and education. Though of enormous interest and importance archaeologically, however, the amphitheatre itself does not survive terribly well. Some walls are fairly impressive, but most are robbed, some removing even the foundations and leaving only robber trenches, in one case 2m deep. Most of the surviving archaeology consists of soft deposits. This presents an obvious challenge to aspirations to display the monument in new ways.

THE NEXT STEP

Thanks to the Project, the future of the amphitheatre and Dee House site can be contemplated with a firm basis of knowledge both of the site's history through all periods, and of the state of preservation of the monument. This alone is a very substantial advance on where we were three years ago. Discussions between the project partners have, of course, been constant throughout the duration of the project, and consultations with the various stakeholders in the site are continuing. During the last months two public consultation workshops have taken place, and these have generated a broad consensus, and increasingly clear vision for the long-term prospects of this important and multi-facetted site.

Tony Wilmott

The excavation areas

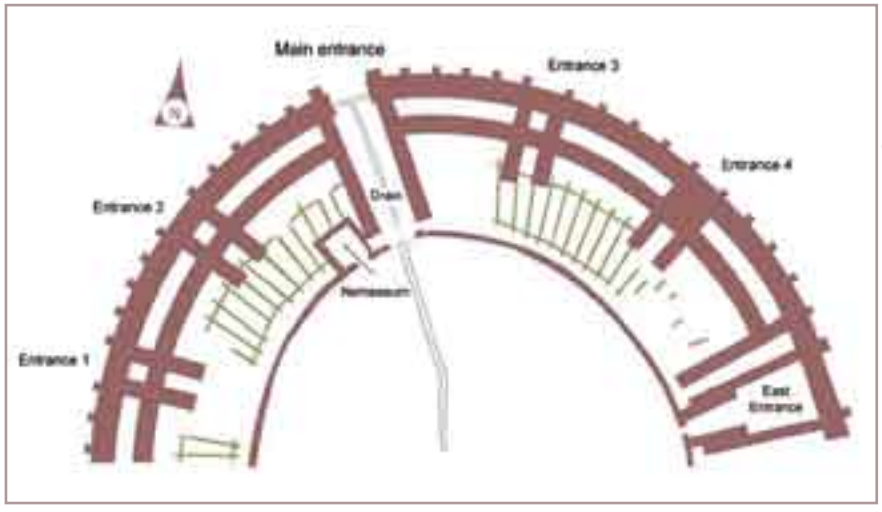
THE CHESTER AMPHITHEATRE PROJECT

The Roman amphitheatres of Chester

Excavation has revolutionised our understanding of the scale and grandeur of these buildings, and of the activities that took place in the arena and around the amphitheatre.

In his 1975 report on the excavations of the 1960s, Hugh Thompson concluded that there were two amphitheatres, the first entirely timber built, and the second built of masonry. Thompson believed that all of the stone elements discovered were contemporary. These were the arena wall, the main outer wall, the stone-built entrances, and a wall 1.8m inside the outer wall which Thompson termed the 'concentric wall'. No archaeological dating evidence for the timber phase was found, so it was dated theoretically to the mid- AD 70s, as it was assumed that the amphitheatre was contemporary with the earliest timber phase of the legionary fortress. The stone phase was dated by archaeological means to *c* AD 100; a date derived from finds from the arena wall. There have always been problems with these interpretations, as it was difficult to reconcile the outer wall and subsidiary entrances on the one hand, and the 'concentric wall' on the other as contemporary architectural features. Now, as a result of the stratigraphic excavation of a wide area of the site, we can reach detailed new conclusions on the structural history of the building, which diverge greatly from Thompson's model.

Thompson's interpretative plan of the 1960's excavations. The timber traces of his first amphitheatre are in green, the stone work of his second amphitheatre in red



At the bottom of the sequence was a buried soil identified as the pre-Roman ground surface. Analysis of the pollen from this deposit by Dr David Robinson at Fort Cumberland showed that the landscape was open and grazed, with some evidence for cultivation. There were also indications of prehistoric occupation.

The first amphitheatre (1a) was stone built, and its outer wall was Thompson's 'concentric wall'. A large dump of redeposited natural clay tipped against the inner face of this wall was derived from the first stage of the creation of the arena, which was a large ellipse, hollowed into the ground. It is probably that a stone wall was built to revet the sides of the hollowed-out arena, and the bank of excavated spoil which formed the first seating bank. Like many British amphitheatres, the first phase at Chester probably featured wooden benches supported by a sloping earthen bank. Entrances were in all likelihood provided by the four major entrances to the arena, which appear to have continued in use for the whole lifetime of the amphitheatre, and it is probable that all access to seating was through these entrances.

The second phase (1b) is the one about which we now know most. Much of the seating bank of phase 1a was dug away, leaving a broad terrace only slightly above original ground level upon which a system of timber-framed seating was erected. The survival of timber, sometimes as stain, sometimes in virtually mineralised form, has enabled us to understand the mechanics of construction. Timber slots were cut into the terrace, running radially out from the arena wall, linked by two ring-beam slots on the inner and outer ends of the beams. This was the timber structure found by Thompson and interpreted as a timber amphitheatre. Into these slots were placed pre-fabricated timber frames. These

Overhead view of the excavation in Area A at the end of the 2004 season. Amphitheatre 1, including the timber beams for seating, and the external stair, are shown in blue, the outer wall and *vomitorium* in red. Medieval and post-medieval pits are shown in orange and green

included a base plate and a pair of uprights, and to the rear, nearest the outer wall, diagonal braces. These frames were not jointed, but simply nailed together, and it is the position of the nails, impossible to drive home *in situ*, which shows that the frames were prefabricated. Preliminary identification of grain patterns of timber preserved in the corrosion products of the nails suggests that at least some of the timber used was beech. Once the frames were erected (working in an anti-clockwise direction), the foundation slots were backfilled. Within this backfill was found a coin dating to AD 96, providing an unrivalled *terminus post quem* for phase 1b. It is probable that the arena was now deepened, being excavated down to the level of bedrock, as the timber frames were now buried to at least 1.2m depth in red stony sand, the geological layer which sits naturally between sandstone bedrock and the upper clay, in order to weigh down the frame for the seating. The arena wall would have been rebuilt, achieving its final form.

The four principal entrances were retained and supplemented by new access to the rear seats. One of the most important findings was a robbed stone footing running along a 6m stretch of the exterior face of the outer wall. This was cut through external surfaces of phase 1a, but the fact that these were few suggests that the earlier phase was not long lived. It almost certainly represented the base of an external stone staircase leading to the back of the amphitheatre seating rake, and providing access to the rear of the auditorium. The foundation featured three small buttresses, which may indicate the use of decorative blank relieving arches along the face of the outer wall of the stairway. External stairways to amphitheatres are found at Paestum and at Pompeii, where the famous amphitheatre also has relieving arcades beneath the stairs. The addition of external stairs would now allow the social stratification within the allocation of seats which was normal in amphitheatres, with the less privileged accessing the rear seats via the rear wall first, and then the wealthy and influential processing into their seats via the four main entrances.

The space between the outer walls of amphitheatre 1 and amphitheatre 2 measured 1.8m wide, and preserved deposits outside amphitheatre 1, which were accumulated

Semi-mineralised timber framework for the seating of Amphitheatre 1b seen in section

when it was in use. This is hugely important, as such deposits have not survived elsewhere in the Roman empire. The stratigraphy is complex, incorporating a variety of deposits, surfaces and structures, which are yet to be fully analysed. Postholes may represent external booths and stalls, possibly short lived, and erected from time to time for festivals. A kerbed road ran round the building and the fact that wheeled traffic used the road is shown by the presence of wheel ruts in soft deposits bordering the road. One of the major components of these deposits is a characteristic yellow sand, which is not native to the site. This material, laid in a series of interleaved deposits, may represent sand used in the arena and cleared out on occasion. Suggestive of this is that the material was very thick (up to 1m) near the northern main entrance, spreading and becoming shallower the further from a main entrance it spread. It is clear that accumulated material against the outer wall of the amphitheatre was occasionally removed, after which deposition started again. Close to the north entrance of the amphitheatre was a small, three-sided, stone-built structure with a plastered and painted interior. This was probably a small shrine. Shrines in analogous positions occur at the amphitheatres at Caerleon and at Carnuntum, Austria while a furnished burial was found here at the amphitheatre at Merida, Spain. The shrine was built upon and sealed by successive yellow sand deposits.

These deposits were cut by the foundation of the outer wall of amphitheatre 2. This was far larger and more impressive than its predecessor. The outer wall was a massive construction consisting of a sandstone foundation 2.7m wide founded on sandstone bedrock in a 1.3m deep trench. The upstanding masonry consisted of well-dressed stone blocks bonded with brown lime mortar, and was of superior workmanship to that of the first building. The four principal entrances were probably in the same positions as the first structure, and served the same purpose. The rear seats were

Excavation of yellow sand deposits between the outer walls of the first and second amphitheatre

Amphitheatre survival in Area B. In the foreground is a 2m deep robber trench for the outer wall of Amphitheatre 1. To the left, the stonework cut by a later cellar is the side wall of an Amphitheatre 2 *vomitorium*

Mortar pad on top of 'buttress', demonstrating that these were the bases for decorative columns

reached by way of *vomitoria*, two of which were provided between each pair of main entrances. The *vomitoria*, were each flanked by a pair of walls almost as thick but not as deeply founded as the outer wall. These supported vaulted stairways, which led to the upper seating within the structure of the building. So massive were the walls that they probably supported stone seating. The external face of the outer wall was furnished with features interpreted by Thompson as buttresses. These were placed at regular intervals: one either side of each *vomitorium* and a single example between each pair of entrances. On examination it became clear that the 'buttresses' consisted of large stone blocks placed at ground level around the façade of the building, but without foundations. In two cases, semi-circular pads of white mortar adhered to the upper face. The foundation stone was fissured around the mortar pad, crushed by the weight of what stood on it. This can only have been a half-round engaged column of the sort seen elsewhere, including at the Roman Colosseum.

Beyond the external face of the outer wall was a series of between five and six successive metalled road surfaces, the earliest of which was contemporary with the construction of the amphitheatre. These road surfaces show no sign of the piecemeal activities that took place around the first building, and it is possible that a formal open space existed.

Excavation in the centre of the arena gave a clue to the nature of the spectacles enjoyed there. A large stone block was found close to the centre of the arena. This had in its centre a lead plug, which had secured an iron fitting. It is possible that this, and other stones which were found in the northern part of the arena in the 1960s, had been used to secure the animal or human victims of the arena (see *Research News* 2, 37).

Analysis of these complex structures has just begun, but there is no doubt that this process will reveal more surprises. Particularly important will be the mathematical and architectural study which will, at least virtually, restore these buildings to their original form.

Tony Wilmott and Dan Garner

Overhead shot of the amphitheatre remains in Area A at the end of the 2005 season

The role of a coordinated, multi-disiplinary programme of non-invasive survey on the Chester project has been crucial in developing an understanding of the development of the townscape in the environs of the amphitheatre.

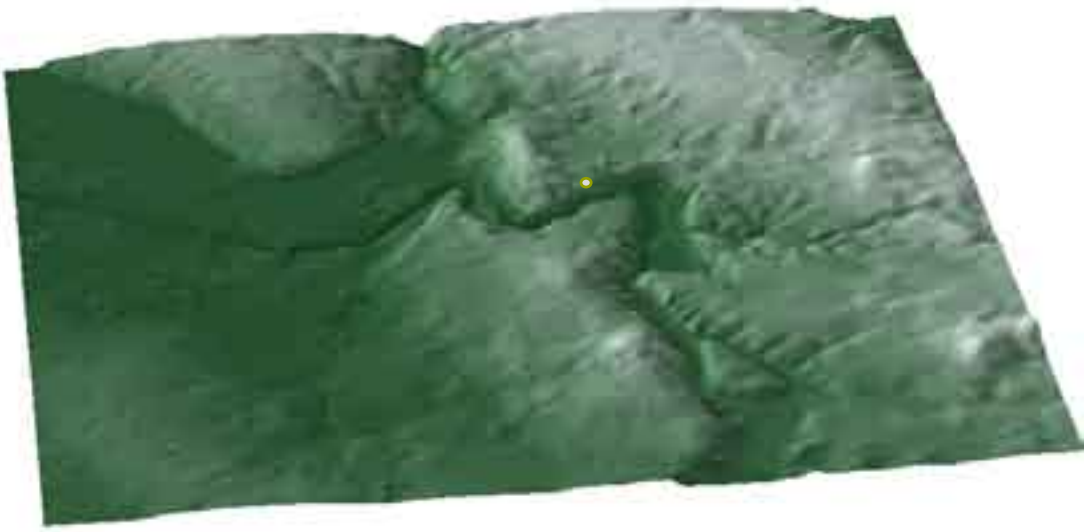
The excavations of the amphitheatre in the 1930s and 1960s (p 3) were dominated by concerns about the Roman structure and history of the site. Little if any, investigation was conducted into the amphitheatre's role in influencing the development of the urban fabric of Chester. The 2001 Conservation Plan stated that an understanding of the area immediately around the amphitheatre was necessary to place it in a wider context. Particularly relevant was the close proximity of the church of St John the Baptist, traditionally founded as early as the 7th century AD, and which by the 10th century was one of Chester's two Minster churches. St John's importance was further enhanced, when between 1075 and 1102 it was elevated to cathedral status. Was there an historical or physical link between the amphitheatre and this religious enclave?

A similar gap in the understanding lay with the subsequent impact of this co-location of church and amphitheatre on the evolution of the medieval, post medieval, and later townscape.

Underpinning the non-invasive methodologies to be used to fill these gaps in the contextual knowledge and record were two fundamental principles. Firstly, and most importantly, was the need to improve the understanding of the historic environment of the study area. Secondly, that any survey data produced, including that from both legacy and new excavation, could be assimilated into a single integrated, geo-referenced system of recording. A number of surveys and recording methodologies were identified and implemented by the English Heritage Archaeological Survey and Investigation team to fulfil these objectives;

Phil Sinton © English Heritage

Landscape survey. Compilation of six of sixteen 1:200 scale survey sheets at the north west of the study area (here at a reduced scale). The survey has been used to record earthworks and elements of the built environment such as building materials, phasing, period, construction methods, surfaces etc. The information is recorded in a series of layers in CAD and the intention is to link this to textual detail and other survey data via a GIS



A 3D relief model of an area 10km^2 around Chester based on OS Land-Form Profile® digital data and ArcGIS™ 3D Analyst™ software. The yellow spot marks the site of the amphitheatre, sited on the north side of the gorge of the River Dee and at the focus of the two main land routes from the south and east. Surprisingly given its iconic status, it seems to have been invisible to approaches from the sea to the west

TOPOGRAPHIC SURVEY

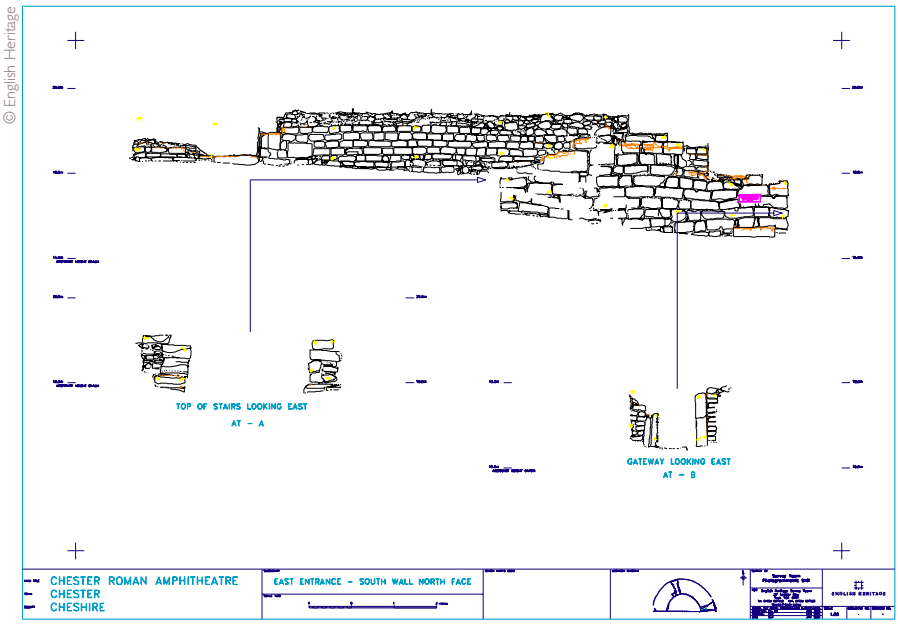
Because of the varying dates, quality and scale of previous surveys, particularly given the amount of changes across the site as a whole, the large-scale digital Ordnance Survey (OS) map - originally surveyed at 1:1250 scale - was considered too small a scale to adequately record and integrate the details of the past interventions and surveys with the new project data. Also, given the importance of comparing levels and services on the excavated part of the site with other areas of the amphitheatre and its penumbra, there was also insufficient height data to adequately represent changes in level. Thus it was decided to commission a new topographic survey from Loy Surveys Ltd, and ensure this was tied into the OS National Grid using a combination of EDM and survey-grade GPS. The survey not only permitted recording of a high level of detail relevant to the project but also provided an accurate base for all the other surveys and any future excavation, engineering or ground works on the site. Features such as walls, kerbs, drains etc were feature-coded for processing in CAD and all points were recorded in plan as well as height, providing a fixed network of 3D points with OS National Grid coordinates. This survey data forms the geo-referencing foundation for computer integration of all other survey datasets, including current and historic excavation recording (plans from Thompson's excavations of the 1960s were scanned and geo-referenced using common features), 3D modelling and GIS analysis.

GEOPHYSICAL SURVEY

The open ground within the study area varies in character from green open space around St John's and Grosvenor Park, to tarmac roads, gardens and car parks. Previous studies had identified the potential for the survival of below-ground archaeology close to the amphitheatre and therefore it was decided to extend geophysical survey into these areas. The results of this survey were particularly revealing in the potential for the survival of further ecclesiastical structures close to St John's (see case study p 20).

PHOTOGRAMMETRIC SURVEY

To what extent the standing fabric within the excavated part of the amphitheatre is original and *in situ* or replaced following the excavations of Thompson in the 1960s, has been subject to some debate. There was also some academic debate as to whether some elements of the excavated and consolidated fabric around the east entrance represent the remains of a post-Roman church on the site, possibly a precursor to St John's. To inform these debates, a stone by stone photogrammetric survey of



Photogrammetric survey. A sample plot of the transcription of fabric of the east entrance of the amphitheatre

Laser-scanned point-cloud data of the east entrance

the excavated half of the amphitheatre at 1:20 scale was undertaken by the English Heritage Metric Survey team. The results of this are still under assessment.

LASER SCANNING

As public presentation and display was an important part of the project it was decided to test the use of high-resolution laser scanning to produce computer-generated models of the site. The survey was undertaken by Z & F (UK) Ltd. The survey has provided a 3D record of the standing fabric and the whole of the excavated half of the amphitheatre. Additional benefit has been gained by using the opportunity to test the technology and assess its applications to other forms of monument recording.

UNMANNED AERIAL VEHICLE (UAV) AND OTHER AERIAL PHOTOGRAPHY

To acquire detailed low-altitude images of the amphitheatre and its environs prior to excavation, a high-resolution digital camera attached to a tethered balloon was used. As well as providing detailed images of the area for exhibitions, the technique also provided a record of the whole site prior to excavation. The photography was commissioned from Skycell Ltd. The activity also provided an initial focus for publicity for the project, as capturing images in this publicly observable way replicated an activity first performed in 1852 when John McGahey drew a prospect

Below: The UAV in action in Grosvenor Park.

Right: The east entrance of the amphitheatre and Area B photographed from the UAV before excavation commenced

of the area from a tethered hot-air balloon. His drawing provides one of the most complete images of this part of Chester prior to significant demolition of a number of mansions soon afterwards. New oblique photography was also undertaken by the Aerial Survey and Investigation team using fixed-wing aircraft.

LANDSCAPE SURVEY

The topographic survey base-map has been used to record details of the fabric of the landscape in the study area. The area was divided into 16 sheets, and the ground was perambulated to record features at a scale of 1:200, including earthworks and elements of the built environment such as building materials, construction methods, surfaces etc. This has underpinned analysis in terms of dating, phasing and potential survival of early features, permitting the sequence of development of the present day landscape to be interpreted. This survey also incorporates the results of the cartographic, documentary, architectural and geophysical surveys and as well as providing the building blocks for interpretation it will also allow the information

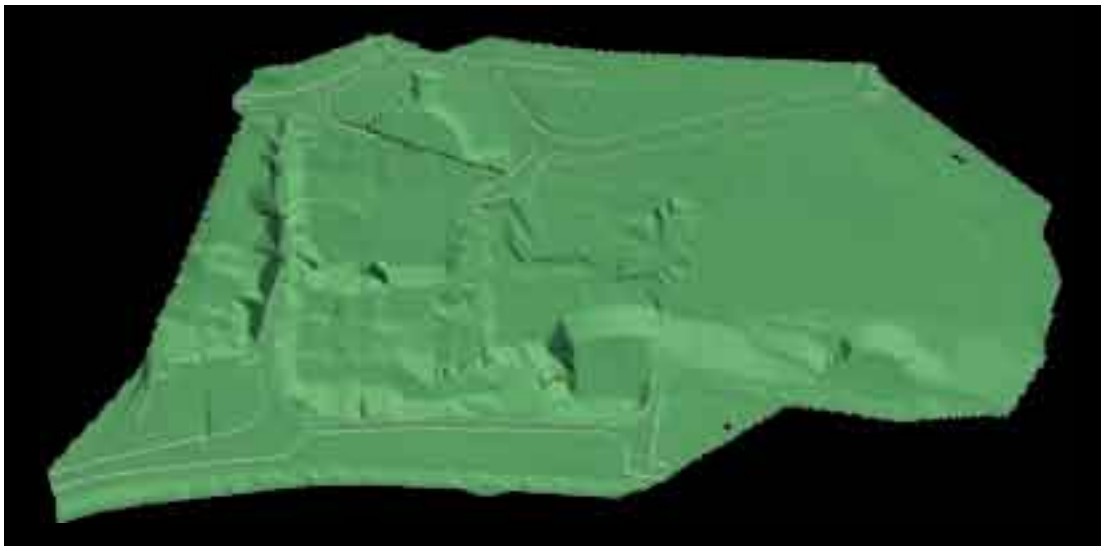
An extract from a drawing of Chester made by John McGahey from a tethered balloon in 1852. The amphitheatre is between the tower of St John's at the centre (this collapsed in 1881) and the City walls to the top right

to be collated within a GIS environment. GIS is also being used to analyse factors relating to the siting of the amphitheatre and its visual impact on the landscape.

DOCUMENTARY AND ILLUSTRATIVE SOURCES

To complement the landscape survey, a limited survey of primary sources held at the

The study area as photographed from the air from a fixed-wing aircraft by Jane Stone on 23rd July 2004 with excavations underway in Area A



© English Heritage

A 3D model of the survey area produced using the data from the topographic survey and ArcGIS software. This modelling helps interpretation and visualisation of the impact of Roman and medieval quarrying on the natural riverside topography

Cheshire and Chester Archives and Local Studies Office was undertaken by Dr Jane Laughton on behalf of the project. In addition, numerous reports and published secondary sources were consulted. During the course of the project, and with fortunate timing, the historical background to the project area was significantly enhanced by the publication of two volumes of the *Victoria County History* related to the City of Chester. The collections at the Grosvenor Museum, the Cheshire and Chester Archives and Local Studies Office, and Chester History and Heritage were also trawled for prints, illustrations and photographs of the study area. The collection revealed many otherwise unrecorded details of demolished buildings, as well as revealing the visual character of the area, particularly during the 18th century, when this area hosted a number of elegant villas and mansions, and the City walls and the Groves by the river were popular promenading venues for smart Georgian society.

Published excavations and archive deposits were also consulted as part of the study. Although dominated by the amphitheatre, other work has been conducted in the immediate vicinity over the years. These have provided useful data and interpretations which have fed into the analysis of the wider environs.

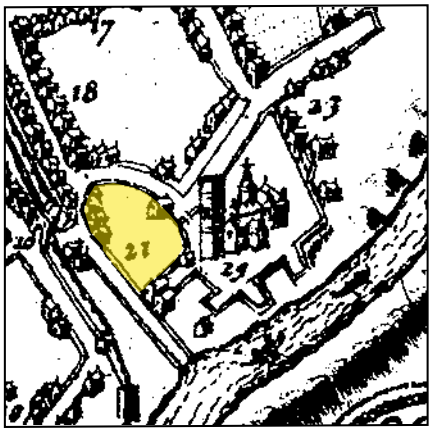
CARTOGRAPHIC SURVEY

Some 30 historic maps of Chester have been identified so far, the earliest dating from around 1580, and these have been carefully analysed to see if they contain clues to help understand how the amphitheatre may have influenced the development of the landscape of Chester. All these maps have been scanned and have been collated with the topographic survey within a CAD/GIS environment.

John Speed's map of 1610 is particularly interesting as it shows that the northern curve of the amphitheatre survived as a visible feature in Chester at that date. This curve suggests that the outer wall of the amphitheatre (or at least another wall built on the same line around it to define St John's precinct) and the road on the outside of it had continued to mark a boundary since the Roman period. The fact that the curved route of Little St John Street – which can still be seen today – can be traced on all maps from that date, is a good example of how cartography can reveal early features which were important enough to be retained as boundaries or routes around which the later urban landscape developed. Other maps, such as that made by Murray and Stuart in 1791 also indicate not only the sites of buildings since demolished, but also give a

© Grosvenor Museum, Chester City Council

A late 18th- century watercolour with pen and ink by Moses Griffith from south of the river. The image captures well the character of the area with the elegant houses, the imposing presence of St John's, and the tree-lined walk along the Groves



John Speed's map of 1610 (with the site of the amphitheatre highlighted). The extract shows the area of the amphitheatre and St John's at an enlarged scale. The curve of the road around the northern arc is clearly visible in what is otherwise a fairly rectilinear street pattern

flavour of the character of the area, with significant amounts of open space and formal gardens, in contrast to the more densely packed townscape within the City walls.

ARCHITECTURAL SURVEY

A number of buildings within the study area were rapidly examined to provide a preliminary assessment of their origins and development. Key buildings included Dee House (on the site of the southern half of the amphitheatre), and St John the Baptist's church (see case study p 27).

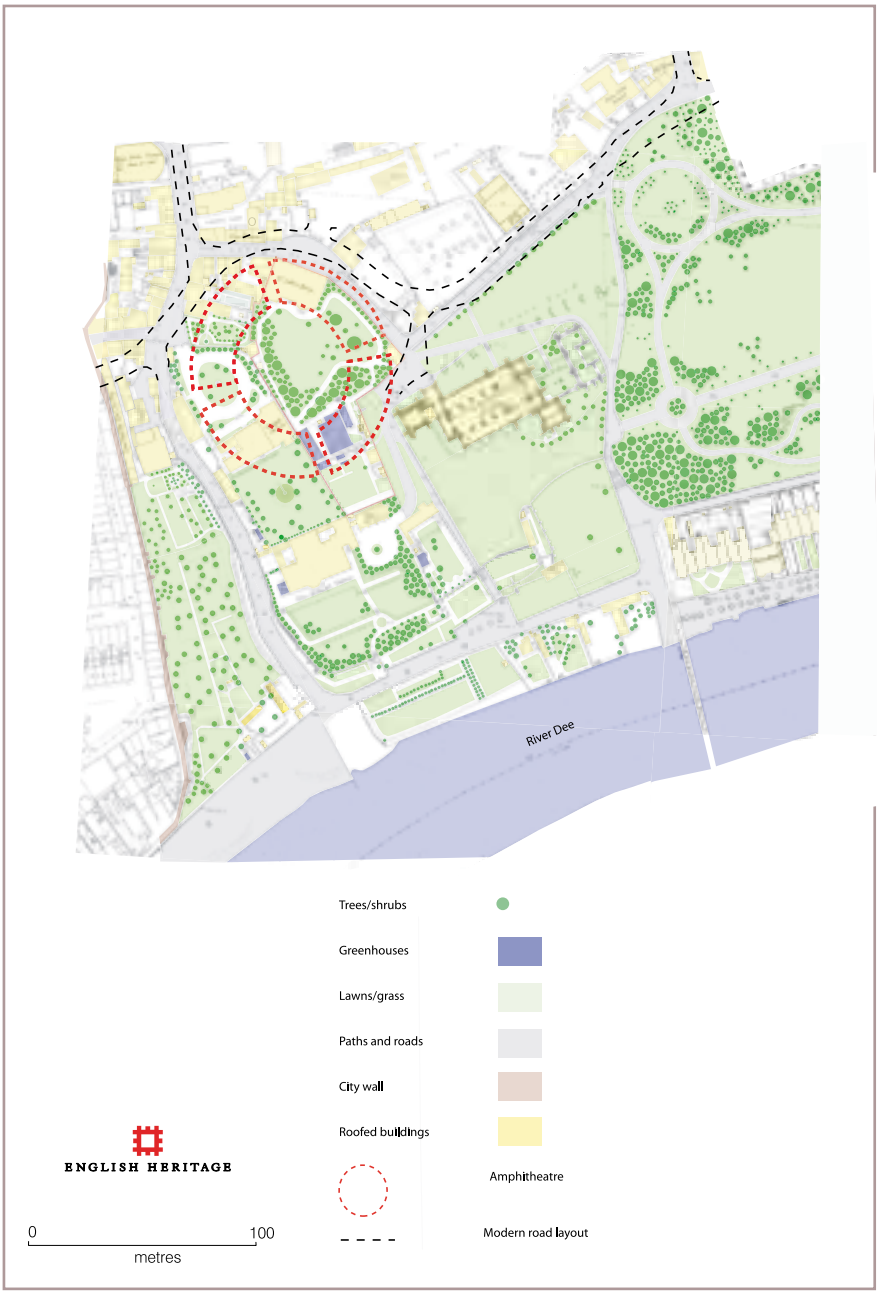
ANALYSIS AND UNDERSTANDING

Although the Roman amphitheatre might be considered to be the dominant historic monument, the origins of the modern urban landscape character have principally been fashioned by the presence of the church and college of St John the Baptist. Despite the Roman origins, it is the presence of the church, with its attendant layout of college buildings, precincts and land that has been the single most influential factor in the development of the landscape of this part of Chester we see today. It must be remembered that whilst the amphitheatre was in use for only *c* 300 years, St John's has been at the centre of an evolving religious enclave here for *c* 1300 years.

The two monuments seem to have a linked past. The siting of St John's appears to have been determined by the historical presence of the abandoned amphitheatre, which may have become a focus of settlement or centre of local power immediately after the Roman period. There is also circumstantial evidence that there might have been strong traditions of Christian martyrdom associated with the amphitheatre. The royal church of St John's seems to have been established on or close to the site during the 7th century. It continued to expand through the medieval period as an important religious centre, including elevation to cathedral status for a short time in the 11th century, as well as the establishment of a college of canons. Some of the perimeter of the amphitheatre site seems to have been perpetuated in the college precinct boundaries. Later in the medieval period, a small area at the north-west fringe of the precinct (over the amphitheatre) appears to have been released for roadside domestic or commercial properties. This would have reduced the overall area of the precinct.

Although St John's was dissolved in 1547, it remained as the parish church, and the bishop's and archdeacon's residences were

An extract from Murray and Stuart's map of 1791 showing the area of St John's, the Groves and the amphitheatre



Interpretation of features as mapped by the Ordnance Survey in 1874 showing the position of the amphitheatre and the modern road system

retained within its former precincts, while other college buildings around the precinct became private residences for the local gentry. Until the mid 17th century, the character of the landscape was essentially similar to that of the original medieval college precinct, although with more secular usage. The Civil War (1642-6) appears to have led to destruction of some buildings of the former college, although others seem to have survived, albeit damaged. However, regeneration and re-modelling had started to take place by 1690, when a new, Dutch-style mansion was built by the river. Regeneration of this area continued throughout the early 18th century. This was a prosperous time for Chester, and the wealthy gentry moved to live outside the walls where the air was cleaner and there was space to build new fashionable houses and elaborate gardens. The former precincts of St John's offered all these attractions as well as a long tradition of gentry ownership. The fashionable status of this area was enhanced by the creation of the riverside Groves and the refurbishment of the City walls as a promenade in the early part of that century. It is clear that the area had retained a broadly coherent character since at least the medieval period and that this character survived despite the replacement of medieval buildings and closes by Georgian town and gardens. Thus, throughout the 18th and 19th centuries this area was a hybrid between a villa suburb and a cathedral close. Towards the end of the 19th century some of the Georgian town houses were demolished, though the historical identity of the area was retained and enhanced when open ground to the east became Grosvenor Park in 1867.

This later period also saw regeneration of the ecclesiastical character, with restorations of St John's Church, and extensions to the Old Bishop's Palace. The Archdeacon's house remained, and Dee House had a number of clerical tenants throughout its life. The 19th century also witnessed the architectural reassertion of Catholicism. Dee House became part of this resurgence when, in 1854, it was acquired by the Faithful Companions of Jesus as a convent and girls' boarding school. Shortly after, a three-storey chapel block was added. The school and convent grew with the addition of new blocks and grounds, and by the mid-20th century it played an important part in Roman Catholic life and education in Chester.

In many ways, the major changes to the character of the area have occurred in the 20th century. The discovery of the amphitheatre in 1929 and proposals for the new inner ring road eventually led to the major excavation by Thompson in the 1960s. This led to the exposure of the northern half of the amphitheatre and the demolition of the roadside properties along Little St John Street and the loss of an 18th-century town house and former garden areas of Dee House Convent. Also during the 20th century, the Old Bishop's Palace and Dee House have changed from religious and education-based occupancy to commercial and public ownership, and significant areas of former gardens associated with these buildings have been lost to car parking and the construction of the Civil Justice Centre.

Stewart Ainsworth

The amphitheatre site after the Romans

Excavated data from the site shows its uses across the fourteen post-Roman centuries, adding to and amplifying the data from the broad non-invasive survey.

When the northern half of the amphitheatre was excavated in the 1960s, the post-Roman deposits were removed by machine. Most importantly, the fill of the arena was machined away to the level of the arena floor. This meant that cut features within the arena could not be properly phased, and that they could only be dated by the finds which they contained. A cluster of post-holes in the centre of the arena, which contained no finds, were dated to the Roman period, and interpreted as a saluting platform for military parades. In reality there was no indication of the stratigraphic level from which these were cut. All of these factors led to the excavation of Area C in the centre of the arena, intended to examine the deposits machined away on the north side, and to evaluate what was lost and what remains.

The stone block found in the centre of the arena has already been mentioned (p 9). The area around this was the focus of intensive activity after the arena had ceased to be used. A long and complex stratigraphic sequence of deposits, pits, and post-holes, culminating in the construction of a small post-hole building spanned the period (broadly) from the end of the Roman use of the arena to the 11th century. It is extremely likely that the post-holes found in the arena by Thompson actually belong to this phase. The dating of this sequence is as yet unknown, but it may represent occupation, possibly of high status, within the sheltering walls of the amphitheatre. Thompson discovered that the main east entrance was walled up at some point, and in Area A one of the *vomitoria*

Post-Roman and pre-11th century pits and post-holes in the centre of the arena, Area C

Area B showing medieval walls of various phases. The garden bedding trenches which cut these walls can be seen in the top right corner

entrances was similarly treated. The essence of an amphitheatre was to allow a large number of people to enter. Walling up entrances suggests that this function had altered, and it is possible that this might indicate that the amphitheatre was made defensible, as a free-standing fort for occupation or refuge. It is possible that this occupation was the context for the siting of St John's church immediately outside the amphitheatre in the 7th century.

It is important that the end of the apparent occupation in the arena dated to the 11th century, as this was consistent with the date of the robbing of the outer walls of the building. The context for the robbing relates to the Norman expansion of the city of Chester,

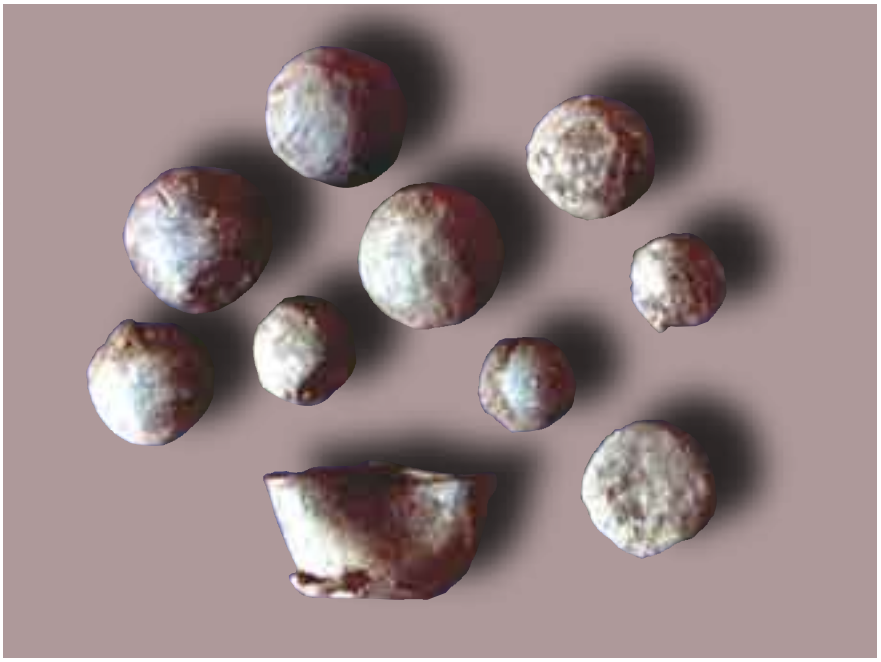
Sherds of enamelled glass from 16th-century pit in Area C. Together with other finds, such as the owl cup (p 25), this suggests post-Dissolution dwellings of high status on the site

and specifically the conversion of St John's church to become Chester's first cathedral in 1075. Though the story of the robbing of the amphitheatre is complex and not fully understood, a major phase was undoubtedly robbing for the construction of the new cathedral church.

The survival of the northern boundary of the amphitheatre in the landscape to the present suggests the survival of parts of the outer wall. This line seems to have survived as the boundary of the St John's precinct. Cess and rubbish pits dating from 1200 onwards occupy the back land of medieval tenements in Area A, and at least three such properties, probably those shown on John Speed's 1610 map of the city, which also depicts the curve of the northern side of the amphitheatre (p 15) were identified. Although coherent structural evidence was lacking, medieval pits in all three excavation areas produced finds and environmental material with huge potential to enhance knowledge of domestic life in medieval Chester. In the southern half of the amphitheatre, in Areas C and B it was clear that the early medieval occupation in the arena was followed by the gradual accumulation of cultivation soils. The arena wall, still standing to some 2m high at one point, finally disappeared from view beneath these soils in the 14th century. In Area B the walls of a number of successive medieval buildings were found overlying both the cavea and the arena of the amphitheatre, with the corner of one building founded on the arena wall itself.

Many of these buildings were probably collegiate in function. The walls of the latest were cut by bedding trenches for a formal garden. This appears to have been associated with a high-status, probably post-Dissolution building, which can be correlated with a collegiate building shown on early mapping. Discoveries of fine moulded ceiling plaster and ceramic tiles in the demolition debris of the building, shows its quality. In Area C a pit yielded finds and environmental evidence indicative of feasting in the 16th century, and a gold ring from this area also dates to the Tudor period (p 26). This confirms that this was the site of a wealthy holding.

During the siege of Chester in 1645 many properties close to the walls were demolished to deny cover to the attackers, and it is probable that the building in Area B was one such. Following the fall of the suburbs on 19th



Lead shot and a bandolier cap from the Civil war siege deposits

September 1645, however, two or more cannon were brought up and installed in St John's churchyard under cover of buildings which had not been demolished. After 32 shots had been fired, a breach was made in the city wall. The delayed assault which followed was beaten back by fierce resistance. The re-built breach can still be seen today from the 'Roman Gardens'. In Area B this fighting is reflected by finds of over 100 pieces of spent lead shot which varied in calibre, including both pistol and musket balls. The cap of a bandolier cartridge and a lead powder-flask spout were also found, and were identical to similar finds from Beeston Castle from where some of the troops in the besieging army came.

For the remainder of the 17th and 18th centuries the archaeological evidence in Area A consisted of cess pits. In Areas B and C garden soils accumulated. In both these areas bedding trenches to the formal gardens shown on early maps were excavated. These were parts of the garden associated with Dee House, which was built around 1730. The development of the house, the property boundaries and gardens can be traced in historic mapping. To the east of Dee House gardens, a map of 1789 shows a boundary to the north of Dee House, separating its formal gardens from those of St John's House. The eastern side of the boundary, together with a small cellared building, which appears only on this map, were excavated. The well-preserved cellar had destroyed archaeological deposits of earlier periods almost down to the base of the amphitheatre seating bank. During the 19th and 20th centuries the excavation Areas B and C lay within the gardens of Dee House and St John's House, and the archaeology reflected this.

In Area A the excavation showed that the earlier excavators had left a great deal of the Roman archaeology of the northern cavea undisturbed. The re-excavation of the trenches excavated by Prof Newstead in the 1930s and by F H Thompson in the 1960s within the context of a large open area excavation showed the reasons for past deductions and conclusions on the Roman amphitheatres, and allowed these to be corrected and expanded upon.

Dan Garner and Tony Wilmott

Late eighteenth century cellared building and boundary, Area B

THE CHESTER AMPHITHEATRE PROJECT

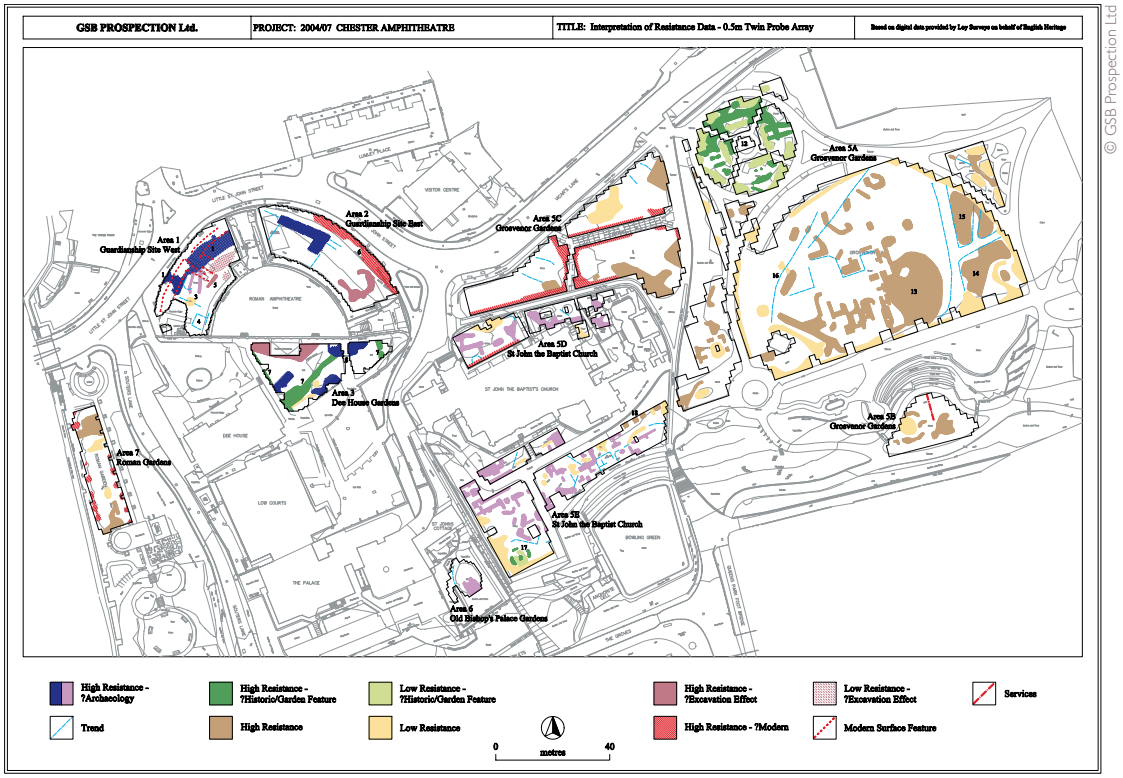
Chester Amphitheatre: geophysical survey

Magnometer, earth resistance and Ground Penetrating Radar were all used within the amphitheatre and immediate environs.

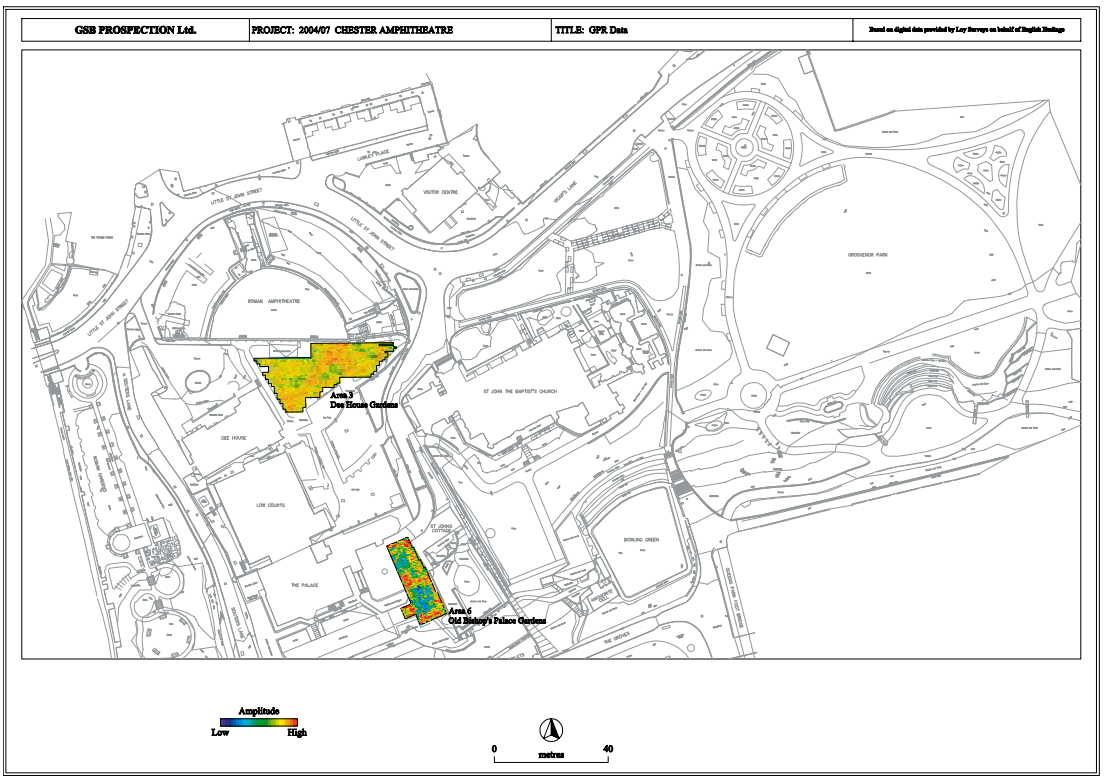
Geophysical survey was conducted in advance of the 2004 excavation with the aim of furthering our knowledge of the Guardianship area and to attempt to determine traces of the amphitheatre beyond the south wall in the grounds of Dee House and the Civil Justice Centre car park. A further aim was to examine the immediate environs of the monument and explore the potential later reuse of the amphitheatre during the medieval development of the city. An initial geophysical investigation of the amphitheatre had previously been undertaken by Chester City Council through GSB Prospection Ltd using Ground Penetrating Radar (GPR) and, given their experience with the site, it was decided to commission further, complementary coverage from the same specialist contractor.

Whilst geophysical survey can be conducted within an urban setting the range of techniques that can be employed is often limited and data collection will be restricted to accessible areas of open space. Fortunately, both the Guardianship area and public gardens to the east and west of the monument provided relatively large areas laid mainly to grass where the earth resistance technique, that requires a good electrical contact between the electrodes and the ground surface, could be deployed. Areas of hard-standing could only be usefully surveyed using GPR, as this technique is able to penetrate through near surface layers of tarmac or concrete, although limited magnetic survey was also used in specific areas to identify both thermoremanent features (eg kilns) and modern ferrous services.

The majority of the earth resistance data was collected with a 0.5m mobile probe spacing using the Twin Probe array, although a more deeply penetrating 1.0m spacing was also used over the Guardianship site and the garden of Dee House. In addition, GPR survey had been previously conducted over the Guardianship site, Dee House car park and garden, the Civil Justice Centre car park, an area of Little St John Street and the Old Bishop's Palace Gardens.



Graphical summary of significant anomalies recorded by the 0.5m mobile probe spacing earth resistance survey conducted in 2004



Ground Penetrating Radar data collected from the gardens of Dee House and the Old Bishop's Palace during the 2004 survey. The summary amplitude time slices show mainly extant or recent garden features (paths) at Dee House, but suggest more significant remains survive at the Old Bishop's Palace site

A combination of geophysical techniques, particularly those able to distinguish shallow anomalies from a more deeply buried response, can enhance the interpretation of archaeological activity within an urban context where later reuse and modern intervention (eg services) can obscure the identification of underlying Roman remains. This is illustrated by the geophysical response over the Guardianship area where a palimpsest of anomalies due to modern surface features, recent excavation trenches and the rerouting of Little St. John Street are all evident within the data. Despite this, both the GPR and earth resistance data have indicated anomalies of potential archaeological significance that do not appear to be related to any previous building activity on the site recorded by historic mapping. These anomalies include possible structural remains and the partial course of a concentric wall identified by the GPR survey that, apparently, continues beyond the south wall into the grounds of Dee House, the Civil Justice Centre car park and Little St. John Street.

Rectilinear, high resistance anomalies recorded in the grounds of St. John the Baptist's church provide further tentative evidence for building remains, possibly associated with the remains of an earlier chapel on the site; however they could also represent a former churchyard layout. The relationship between the anomalies in the churchyard and the adjacent Old Bishop's Palace gardens is unclear, although this latter site appears to indicate significant buried structures in both the earth resistance and GPR data sets collected here.

Results from the earth resistance survey conducted over the large open area of lawn within Grosvenor Park have also proved difficult to interpret, and this may well be due to a combination of the influence of the underlying geology or to a previous garden layout. A similarly inconclusive earth resistance response was recorded in the Roman Gardens, to the south west of the amphitheatre, where an 18th century pipe kiln had been previously excavated. Additional magnetic survey in the Roman Gardens indicated both modern ferrous disturbance and a row of four very strong anomalies (>100nT) of archaeological potential, possibly the remains of further pipe kilns.

The interpretation of geophysical data collected from an urban setting is often hampered by the key-hole nature of the survey areas and a combination of modern and historic intervention. At Chester, the use of complementary geophysical techniques assisted the identification of more significant responses and it is possible that extending the survey, particularly with the use of GPR, may improve the archaeological interpretation of the immediate area surrounding the amphitheatre further. However, in the first instance a thorough appraisal of the geophysical survey in light of the excavation results and historic mapping is required to gauge the effectiveness of the techniques applied and the fidelity of the interpretations drawn from the data.

Neil Linford

THE CHESTER AMPHITHEATRE PROJECT

News from the finds room and laboratory

As the assessment of the finds and environmental material gets under way, some things already stand out...

The excavation yielded a large number of artefacts and ecofacts of all dates from the prehistoric to the modern. The specialist assessments will be commenced shortly, but there are already individual objects, groups of objects and environmental assemblages that are either intrinsically interesting, or which demonstrate the potential of the material to enhance understanding of the site across the centuries. We start, though, with a spectacular earlier find which has just been reinterpreted.

The Chester *retiarius* relief (Saffron Walden Museum)

THE CHESTER GLADIATOR

A relief sculpture of a gladiator was found in Fleshmongers Lane, within the walls of the legionary fortress but near to the amphitheatre, in 1754. Following a series of changes of ownership it appeared in Saffron Walden Museum, where it now is. It is made of Welsh slate, and depicts a gladiator of the type known as a *retiarius* or net fighter. He wears a loincloth (*subligaculum*), and on his right arm is a padded arm guard (*manica*). Standing up from the right shoulder is a bronze face guard (*galerus*). In his right hand he carries a trident, and in the left hand is his net. He was probably originally facing an opponent. Though this part of the panel is lost, a dropped sword, and a raised shield can be seen, and the opponent was therefore probably a *secutor*, and may have been shown in a posture of surrender. The Chester *retiarius* differs from all other depictions of this kind of gladiator in that he is clearly a left hander (*scaeva*); all other images show the left arm protected, net in the right hand and trident in the left. This is so unusual that the relief must show an actual individual. His name may have even appeared on one of the broken edges of the relief. If so, it is likely that this left-handed *retiarius* was a popular fighter who fought in the Chester arena.

Tony Wilmott

A SOUVENIR BOWL?

Part of a small samian bowl from southern Gaul was found in a robber trench of amphitheatre 2. It represents the moulded bowl form 37, but it is extremely small for such a bowl, at only *c* 140mm in diameter. It may well have served some ornamental use rather than as functional tableware. It was made in La Graufesenque, near Millau, in the period *c* AD 85-110. Below a standard

Miniature samian ware bowl depicting gladiators (photo: David Heke)

ovolo, two gladiators, two small cupids and a dolphin are depicted. To find such a small bowl and one that displays gladiators so prominently in this context, is undoubtedly significant: it may have been intended for a ritual or votive function or possibly as a small souvenir for sale at the amphitheatre. One of the gladiators is of the lightly armed *murmillo* type with rectangular shield, arm guard, dagger, helmet, greaves and loincloth.

Margaret Ward

GLADIUS HILT

A fragment of a fluted bone handgrip from a sword was found in a pit outside, and contemporary with, amphitheatre 1. Various items of Roman arms and armour have been found in Chester, including daggers, scabbards and a cheekpiece, but the bone fittings are rare. The handguard and pommel of a sword were often made of wood and hence require particular conditions in which to survive.

Gillian Dunn

FAUNAL REMAINS FROM AMPHITHEATRE 1

Some well stratified late 1st or early 2nd century Roman pit deposits just outside the walls of amphitheatre 1 contain quite a variety of faunal remains in association with relatively large amounts of wood charcoal. These deposits clearly relate to the disposal of food and butchery waste which was possibly cooked just outside the amphitheatre and may have been consumed by spectacle-goers. Cattle, calf, pig and sheep and goat (kid) remains are most frequent. There are also meat-bearing bones of red deer. Amongst the bird remains there is chicken and woodcock (*Scolopax rusticola*) and there are some small passerine species. A member of the salmon family (tentatively *Salmo salar*) and various smaller fish (including probable *Pleuronectidae* flatfish) are also present. Mussel (*Mytilus edulis*) and some oyster fragments are common from many wet sieved samples from between the walls or just outside the outer concentric wall. Assemblages from within the fortress usually contain much the same range of species and many have been butchered in similar ways. We cannot yet claim to have found butchery or meats distinctive to the amphitheatre but it appears quite likely that we have recovered remains of some of the foods consumed within it.

Gladius hilt fragment compared to a modern replica

Ian Smith

ROMAN PORTABLE OVEN *(CLIBANUS)* FRAGMENTS

A small but significant group of portable oven (*clibanus*) fragments was found during the 2004-5 excavations and identified during the assessment of material collected as ceramic building material. A rim was also recovered from the site in the 1960s, although it went unrecognised at the time. The *clibanus* was one of a number of different types of small, portable oven that were used throughout the Roman period. They were often made of

Clibanus fragments. Left to right, base, wall and rim. (photo: David Heke)

clay and were mainly used to bake bread and cakes, to roast meat, and to keep food hot. We know that *clibani* were made at the legionary tile and pottery works at Holt, which supplied the fortress at Chester. They are barrel-shaped and have a large opening at the top, with a thick, thumb-impressed rim. Very few *clibani* are known from Britain and only two have been found near-complete, one from Holt, the other from Prestatyn, a Romano-British industrial settlement not far from Chester which was also supplied by the Holt kilns.

Alison Jones

HIBERNO-NORSE PIN

A copper alloy pin found in the backfill of the robber trench of the outer wall of amphitheatre 1 in Area B is one of the few artefacts datable to the early medieval period from the site, and is important in providing dating evidence for the robbing, which, it has been suggested, may have been for the construction of the 11th century cathedral church of St John's. The pin is *c* 85mm long with a rounded head 6 mm in diameter. The remains of a tin or silver coating covers the head and upper shank which are decorated with a minute but complex design of ring and dot motifs interspersed with plain lines and lines of dots. The design is so small a magnifying glass is required to appreciate its complexity.

Hiberno-Norse pin from robber trench in Area B

Pins such as this are considered to be an Irish type of possibly the 11th century; only two have been previously recorded from Chester, both with different decoration to this example. The pin is one of several objects from the city that demonstrate the cultural and trading links that Chester had with Ireland at this time.

Julie Edwards

FAUNAL REMAINS FROM A TUDOR PIT

A pit dug in Tudor times in Area C was used to dispose of a huge amount of food waste. There has been speculation that the fills of this pit may be the result of a high status feast, and certainly the numbers of bones and shells representing beef, veal, mutton, lamb, pork and suckling pig, venison, rabbit, hare, wild and domestic birds, eggshell, oysters and mussels would fit the large consumption of meat that is recorded to have taken place at big Tudor feasts. We wet-sieved many hundreds of litres of soil samples from the pit deposits (to 2mm in 20 litre increments). This produced large numbers of well preserved remains that we think (based on the stratigraphy and density of bones) were dumped over a short period.

Chicken bones are most numerous amongst the bird remains and both cocks and hens are represented. Further consultations of comparative material will be needed to produce a comprehensive list of the species present, but the other birds include geese, ducks, woodcock, lapwing, golden plover, curlew, snipe and some passerines including probable members of the thrush family. Work on the fish bones will be undertaken by Dr James Barrett. A preliminary scan, undertaken on site, suggested the presence of a variety of species including some probable flatfish types in addition to rays, salmon and possibly herring. Animals that were probably not eaten include a mole that almost certainly burrowed into the pit after it was backfilled. It is also possible that a dead cat was thrown into the pit with the food waste, or it might

The owl cup, showing the body and lid as separate pieces

have died whilst scavenging in the pit. This issue needs further investigation since the cat bones include some from kittens. Also of interest is a broken and healed (but poorly aligned) adult cat tibia. Without doubt, the smell of this huge dump of bones would have attracted scavengers to the pit and it may be the case that some, such as this unfortunate adult cat, entered the pit but were unable to scale the steep (approximately 2.5m deep) sides to get out again. Clearly this is a valuable zooarchaeological assemblage for the Tudor period of Chester and the north-west.

Ian Smith

TIN-GLAZED WARE OWL CUP

This startling find, which is shown on the cover, comes from the Tudor bone rich pit in Area C described above. The pit produced relatively little pottery and the pieces that are present appear to have had a drinking function. The smashed but virtually complete tin-glazed ware owl jug or cup is probably the most complete example to have been found in an archaeological context in Britain. This intriguing and rare vessel consists of two parts forming the body and head of an owl that stands *c* 160mm high. The head acts as a lid or cover to the body which may have served as a container for liquid. The wings and feet are moulded in relief with the feathers and features painted in blue. The head has moulded eyes, ears and a beak; it too has painted blue feathers but traces of gold leaf suggest that the eyes and beak were gilded.

Owl jugs are better known in the late 17th and 18th century in Britain but there appears to have been a fashion for ceramic and silver owl cups in the Low Countries and Germanic states during the 16th and early 17th centuries. A number of tin-glazed ware owls suggested to have been made in the Tyrol are painted with dates ranging from 1540-1561 and Cologne stoneware examples are known from the first half of the sixteenth century. Their precise function is unclear, some were given as trophies or commemorative gifts and some are associated with guild organisations: a

The gold sergeant-at-law's ring

Cologne stoneware owl with silver mounts is owned by the Worshipful Company of Armourers and Brasiers in London, their records detail it as a gift made to them in 1537. The amphitheatre owl may have been a novelty ornament or been used for drinking a ceremonial toast at a banquet. The associated finds from the pit which include a variety of high quality glass vessels suggest a deposition sometime in the 16th century and with the bone assemblage are suggestive of a high status celebration. Further work will attempt to more closely identify a date and provenance for the artefacts from this remarkable assemblage of material.

Julie Edwards

A SIXTEENTH CENTURY SERGEANTS AT LAW RING

A sergeant-at-law was a high ranking barrister from whose ranks judges were chosen. In general only a small number of sergeants were appointed at any one time. Their appointment was accompanied by ceremony and celebration including a great feast and the giving of gold rings by the appointee to colleagues, friends, important officials and at certain periods the monarch. The ring found in Area C is one such. It is a gold band with an inscribed motto and two flowers, enamelled red and white, engraved on the outside between punched borders. The lettering, which is inlaid with black enamel, runs around the ring, and is divided by the flowers, reads: REGIS. PREP * LEG + EX *. In the light of other rings with similar, uncontracted inscriptions the full text for the ring from Chester would be 'EXECVO REGIS PRESERVACIO LEGIS' (The execution of the law and the preservation of the crown). The mottos appear to be different for each call of sergeants and potentially it should be possible to closely date the ring from the motto. Two similar rings in the British Museum are suggested to date to the first half of the sixteenth century. The Chester ring may be of this period as well. I would like to thank staff at the British Museum for their help in this identification.

Julie Edwards

DEE HOUSE SCHOOL BADGES

Dee House became a Catholic girls school in 1854, and in 1925 was acquired by the Ursuline order, who continued Dee House School until its closure in 1976. It is not surprising that some of the latest finds from the site belonged to this phase, and two enamelled badges were found, one with the school's initials, DSH, and one a Vice-Prefect's badge of a mass-produced style familiar to anyone who was at school in the 1970s!

Tony Wilmott

Two badges from Dee House School

Dee House and the architectural heritage

Lost to view in the post-Roman era, the Amphitheatre still shaped the area. Dee House helps us to understand how.

In 2004 staff from English Heritage's Architectural Investigation Division undertook a rapid assessment of the principal buildings enclosed by the River Dee, the City Walls, Little St John Street and Grosvenor Park. This highlighted a distinctive quality of seclusion and spaciousness, a cross between a cathedral close and a villa suburb, embracing a handful of substantial 18th-century houses and their gardens and the medieval ecclesiastical landscape they adjoin. The siting of the larger houses – one of them built as the private residence of the 18th-century Bishop Peploe – was clearly significant. They either faced, or had gardens overlooking, delightful prospects over the River Dee, along the nearer bank of which an elegant promenade was established. They also enjoyed the proximity of the partially ruined St John's Church (a pre-Conquest foundation and Chester's first cathedral, with fabric from the late 11th century onwards) and of the former Hermitage (also known as the Anchorite's Cell), which would have appealed to the increasingly popular antiquarian taste.

One of these houses, the Grade II listed Dee House, has been a particular cause of concern for some years owing to its poor condition. Consequently Dee House, which was built in the early 18th century for the locally influential Comberbach family, is currently the subject of a more detailed investigation. It was originally a compact three-storey brick house, with a five-bay main block and a narrower service wing. The original plan-form survives substantially intact, together with some decorative details and an impressive twisted-baluster staircase occupying a generous stair hall. The house was partially remodelled in the early 19th century when the principal ground-floor rooms were fitted out with doorcases and other features incorporating reeded decoration and paterae.

In 1854 Dee House was acquired by an order of Roman Catholic nuns, the Faithful Companions of Jesus, and between 1866 and 1869 a new wing was built on the east side of the house to provide a purpose-built chapel and schoolrooms. The three-storey chapel wing is an early design by the Liverpool architect, Edmund Kirby (1838-1920). Built in a muscular Gothic interpretation of the Early English style, it has groups of lancets on each gable and a robust interior scheme characterised by the use of prominent chamfers and stops. Kirby was a pupil of Edward Welby Pugin (A W N Pugin's son) and worked with John Douglas, arguably Chester's most celebrated architect, before establishing his own practice. He worked extensively in Cheshire and Liverpool and the Catholic Church was one of his most important clients.

Dee House has its own particular story to tell but it also reflects the twin characteristics – ecclesiastical enclave and villa suburb – which emerged from the wider study of the area. It began as something between a town house and a villa, enjoying the ample space which an extra-mural position afforded but turning its back on the river views. In the early 19th century its occupants were mostly Anglican clerics and from 1854 until 1976 it was a centre of Catholic education and devotion. Today its history and significance are better appreciated and we can see how both Dee House and the particular characteristics of its setting have their roots in the disposition of the Roman town, of the amphitheatre outside the walls and of the resulting street pattern.

Adam Menuge and Matthew Withey

Dee House

Bob Skingle © English Heritage

THE CHESTER AMPHITHEATRE PROJECT

"What you see is what you get": An experiment to improve our understanding of environmental archaeology sampling strategies

The Chester Amphitheatre Project allowed research into the efficacy of sampling strategies which will inform their development in the future.

Absence of evidence is not always evidence of absence. This is no more obvious than when dealing with the recovery of environmental remains from archaeological sites. Most of these are very small if not microscopic. Even animal bones, which may seem large or easily visible, are surprisingly difficult to see when covered with soil. Consequently, "what you see" is literally "what you get" when excavating by hand alone. Guidelines have been established for sampling various environmental remains (pollen, macrobotanical remains, animal bones, etc.), in order to recover representative assemblages (see English Heritage Environmental Archaeology Guidelines 2002/1). However, there is some variability in the manner and consistency with which such approaches are applied. This may be due to different opinions and understanding of the value of sampling, but it is undoubtedly also due to constraints of time or money. The process of sampling and sample processing are very time-consuming so strategies must be well-thought out, appropriate to the questions asked and re-evaluated throughout the duration of an excavation.

The Chester samples were processed by flotation and coarse wet-sieving to ensure the recovery of a representative range and quantity of plant and animal remains

Problems of sampling for and recovery of animal bones have long been recognised by zooarchaeologists, resulting in the publication of seminal papers in the 1970s, for example by Sebastian Payne and by many others since then. Various experiments outlined in these publications amongst others have shown how recovery by hand alone results in severely biased assemblages, missing the majority of small animal bones (eg. small mammals, birds, fish) and small bones of larger animals. So for example, in hand-collected assemblages, sheep and pig will be underrepresented compared to cattle, and the representation of different body parts will be skewed towards larger fragments, eg small foot bones and teeth will be missed. Even age distributions may be affected by the loss of bones of very young, including foetal/neonatal animals. Such biases will severely hamper our ability to interpret the nature and role of a site and of the activities that took place there, and of wider economic and social developments through time. For example, representative results are required if

we want to consider questions such as:

- *the role of wild fauna, birds and fish at different time periods, within and between sites, in relation to social status or for example transition period economies*
- *the development of animal-based industries, eg. cod/herring fisheries*
- *the economic role of animals, for example meat versus dairy versus wool*
- *the symbolic role of animals (rigorous recovery and recording of associated bones is essential to enable discussion of "special deposits")*
- *the nature of urban occupation and use of space, for example in the post-Roman period*

An opportunity arose during the excavations at Chester amphitheatre to undertake an experiment on the effect of cumulative sample collection/size. This is being undertaken with the collaboration of Chester City Council and Fort Cumberland archaeologists and specialists, under the direction of Chester CC Environmental Archaeologist Ian Smith. Guidance is provided by the Environmental Studies zooarchaeologists for the experiment.

The aim of the experiment is simply to provide some real-life examples of sampling strategy and sample sizes. We aim to generate a dataset which will allow us to examine the cumulative effect of increasing sample size on information potential of the Chester animal bone assemblages. This will provide material evidence (to accompany theoretical models, for example those proposed by Sebastian Payne) in support of sampling, and allow us to develop our guidance for best practice, in particular regarding decision-making processes.

In reality it is impossible to suggest a minimum or maximum sample size for a feature, area or site, as the bone yield will only become clear upon excavation; fragment distributions and frequencies fluctuate depending on the nature of individual deposits and this factor is difficult to predict. Consequently, as advised by Sebastian Payne in his 1992 guidance note (and see the English Heritage Environmental Guidelines 2002), sample sizes should be decided upon and revised with the advice of a zooarchaeologist. In the absence of such an approach, as recommended at present a minimum sample size of 100L for wet-sieving allows a check on the hand-recovered bone.

Recovery of small bones (eg toe bones) and teeth by coarse sieving and from the heavy residues of flotation is essential for exploring such questions as food provisioning. For example the presence of whole or partial carcasses may help to elucidate the nature of provisioning and distribution in a settlement, and from this the network of contacts and exchange and level of organisation

In addition to the standard 40-60L samples taken for the recovery of plant and animal remains (by flotation and from the heavy residues), we advise that where warranted (ie. where contexts are bone rich, or specific questions or remains are of interest), large samples of up to or more than 100L are taken for wet-sieving. These are generally processed over a minimum mesh size of 2mm, although smaller mesh sizes may be advised, for example when deposits are rich in fish bone. At Chester, large samples of 100-600L were taken in 20L subsamples from contexts that were deemed stratigraphically secure. A large deposit, possibly midden material dumped to build up the seating bank in Area B, is tightly dated

Samples taken during excavations of Chester amphitheatre were recovered from a range of deposits including build-up of Roman waste and fills of other contexts, for example Tudor pit fills. In some sites, the recovery of small animal remains by sieving, including bones of small songbirds (see below left), helps us to better interpret and understand variation in diet and related aspects such as social status

Judith Dobie. © English Heritage

Illustration of a Roman butchers shop

to the late 1st century AD and the physical characteristics of the finds within would suggest rapid incorporation into the burial environment. A second context consisted of "a silty deposit possibly from a cut feature, outside the first amphitheatre with good survival of mollusc shell and occasional fish bone but also with mutton, pork, beef, and venison represented". The date range is thought to be relatively restricted. A Tudor pit that appeared bone rich was sampled in this manner also.

Processing, sorting and recording samples in incremental divisions will demonstrate information loss and gain proportionally to the numbers of litres taken. Such data are invaluable in our role as advisors within the archaeological profession, as it will be for the Regional Archaeological Science advisors. The results will provide useful data for training also.

Roman (late 1st or early 2nd century AD) fish bones from a pit just outside the amphitheatre walls excavated in 2006. Many fish bones were recovered from 4 and 2mm wet sieved fractions and some from <2mm (from flotation). There are very few fish bone assemblages from Chester (relative to the number of sites and number of mammal bone and bird bone assemblages) so this material will be invaluable for understanding fish exploitation and procurement

The samples have been processed and are awaiting assessment (evaluation of their information potential). This will allow us to critically assess the data, examining the representation of different animal groups, skeletal elements, age groups, and measurable bones, considering information value and critical cut-off points, and most importantly how we work through decisions on site and at the post-excavation stage.

Polydora Baker

A public event: access and outreach on the amphitheatre site

With its purpose-designed viewing gallery and website, and by means of guided tours, exhibitions, artists in residence, National Archaeology Day events and television programmes, the amphitheatre project has emphasised public engagement at all levels.

A photograph of the amphitheatre excavations of the 1960s compared with pictures of the 2004-6 work in this issue shows just how far archaeology has progressed in its current emphasis on public engagement, education and outreach. The picture shows the excavation surrounded by a high, close set wooden fence, hiding the work from prying eyes, and only visible from the top of the adjacent Newgate arch.

By contrast, during the recent work every effort has been made to encourage public involvement. The demolition of the high wall which separated the excavated northern half of the amphitheatre from the grounds of Dee House opened up the whole site to a remarkable extent, but the best place to view the totality of the site was from the concrete retaining wall on which the brick wall had stood. This provided the opportunity to create the walk-through viewing gallery along the top of the retaining wall, which was designed and constructed by Chester City Council engineers in conjunctions with Messrs Parsons. The gallery has been a hugely successful feature of the project, attracting more than 170,000 people during the two excavation seasons. Notice boards along the gallery were updated on a regular basis by Cheryl Quinn of Chester Archaeology, with new text and annotated digital photographs emphasising visible features. It was decided at the inception of the project that aspects of the work which are not usually on display would be located so that visitors could view them. The environmental sieving facility was placed next to the viewing gallery and was a great draw. The finds processing room was located in the upper floor of the nearby Chester Visitor Centre, which was specially fitted out with sinks for finds washing, and racking. A small display of typical finds was maintained. In the same space was a small exhibition which included children's interactive activities, and the large window of the room afforded a raised view of the site and excavation.

During the 2004 excavation season site staff, particularly the Project Directors and the supervisors were committed to undertaking several guided tours of the excavation per day. This was very time consuming, and took key staff away from site work, so in 2006 an outreach assistant, Marie Rowland, was appointed. This enabled the virtually

The 1960s excavation viewed from the Newgate arch. Note the high fence

The viewing gallery in 2004-5 ran along the top of the concrete retaining wall which bisects the site, and allowed all parts of the site to be seen

constant presence on the viewing gallery of someone who could engage with visitors and answer their questions, taking the pressure from site staff, who were at the same time encouraged to talk to members of the public who asked questions across the fence. She also co-ordinated and hosted the many school groups and special interest groups who booked more formal visits.

The viewing gallery and finds processing room were the distribution points for the project Newsletters. Written by the project staff, these were produced at irregular intervals as new developments in the archaeology of the site demanded, and were designed and produced by Cheryl Quinn. The dispensing boxes often had to be re-stocked several times a day.

The project was made available to the wider world through an award-winning dedicated web site (www.chesteramphitheatre.co.uk). This was updated constantly with the latest finds, discoveries, and information, and featured a blog for one-to-one communication with interested people. Perhaps the most popular element of the site was the 24/7 webcam, which enabled viewers to watch work in progress in Area A *via* a camera housed in the Chester Visitor Centre.

One of the more unusual departures for the project was the presence on site of artists in residence. Julia Midgley is a specialist in Documentary Drawing, and was commissioned to make a record of the 2004 excavation season. Julia's drawings were a unique reflection of the experience and spirit of the excavation. Her drawings and written diary were published as a booklet, *Amphitheatre*, and an exhibition of her work was held in the Grosvenor Museum. The second artist was Chester photographer David Heke, who also

Gladiatorial combat on National Archaeology Day

had an exhibition, at the Chester Visitor Centre. Both artists brought their own vision to the project, and their records are a very different way of looking at the excavation process.

Two further exhibitions were held in association with the project. The first of these at the Gosvenor Museum, entitled 'To be killed with Iron', concerned the world of the Roman gladiator. The second was given in association with the non-invasive survey work. It was held in collaboration with Chester History and Heritage as an exhibition and fact-finding event whose aim was to record memories of the study area from a 20th-century perspective. Information from this event helped positively identify the function of a mystery building which was visible on the site of the amphitheatre on a 1947 aerial photograph, but was subsequently demolished, and which had never appeared on any maps or photographs before or after that date: it turned out to have been a NAAFI canteen!

An important part of the work was the link between the project and both Liverpool University and Chester College. Students from both these institutions came to the amphitheatre to receive the practical training which is an essential part of their degree courses in archaeology. The staff of Chester Archaeology have long engaged in the teaching of Chester College students, and this was continued on site. Liverpool University contributed the services of an additional site supervisor, Jason Hall, who acted as student liaison, and, together with the Project Directors, compiled training reports. A proper training programme was devised, involving practical tuition and classes in finds work and environmental archaeology among other areas. Local volunteers from the Chester Archaeological Society and the wider community also benefited from this programme and from the experience of working on site and in finds processing, whether experienced or new to site work.

The project enjoyed considerable media exposure. On television the main event was the documentary made in the first season for BBC Timewatch, entitled *Britain's Lost Colosseum*. The producer, Deborah Perkins, and her team became familiar figures on site, allowing an engaging 'fly-on-the-wall' presentation which has been very well received. The project also featured in the

Documentary drawing by Julia Midgley. The drawing captures the first filming visit of BBC Timewatch to the site, and the repeated figures reflect the frenetic activity of archaeology, survey and filming

North-West ITV series, *Lost Treasures* and on Channel 4 Time Team *Big Roman Dig*. In both seasons the Project Directors wrote a weekly diary column in the *Chester Chronicle*.

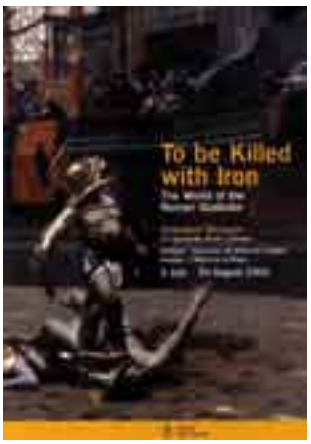
In both seasons, National Archaeology Days were celebrated in the amphitheatre, with show and tell areas and children's activities. Beyond a doubt the most popular element of this was the re-enactment of gladiatorial combat portrayed by the Britannia re-enactment group, and the Roman interpretation specialists of Roman Tours.

Other products of the project are appearing. A great many lectures on the project have already been given to diverse audiences, and Autumn will see the site presented at the 20th International Congress of Roman Frontier Studies and at the Society of Antiquaries of London. A booklet entitled *Chester Amphitheatre; from gladiators to gardens*, which highlights the landscape history of the site was published in 2005, and an interim report is to appear shortly in English Heritage Historical Review.

The latest departure for the project will be an international conference on the subject of the Roman Amphitheatre to be held at the Grosvenor Museum, Chester on the weekend 16th-18th February 2007.

Tony Wilmott

Poster for Grosvenor Museum exhibition



NEW DISCOVERIES AND INTERPRETATIONS

Dunstanburgh Castle – Northumberland's own Camelot?

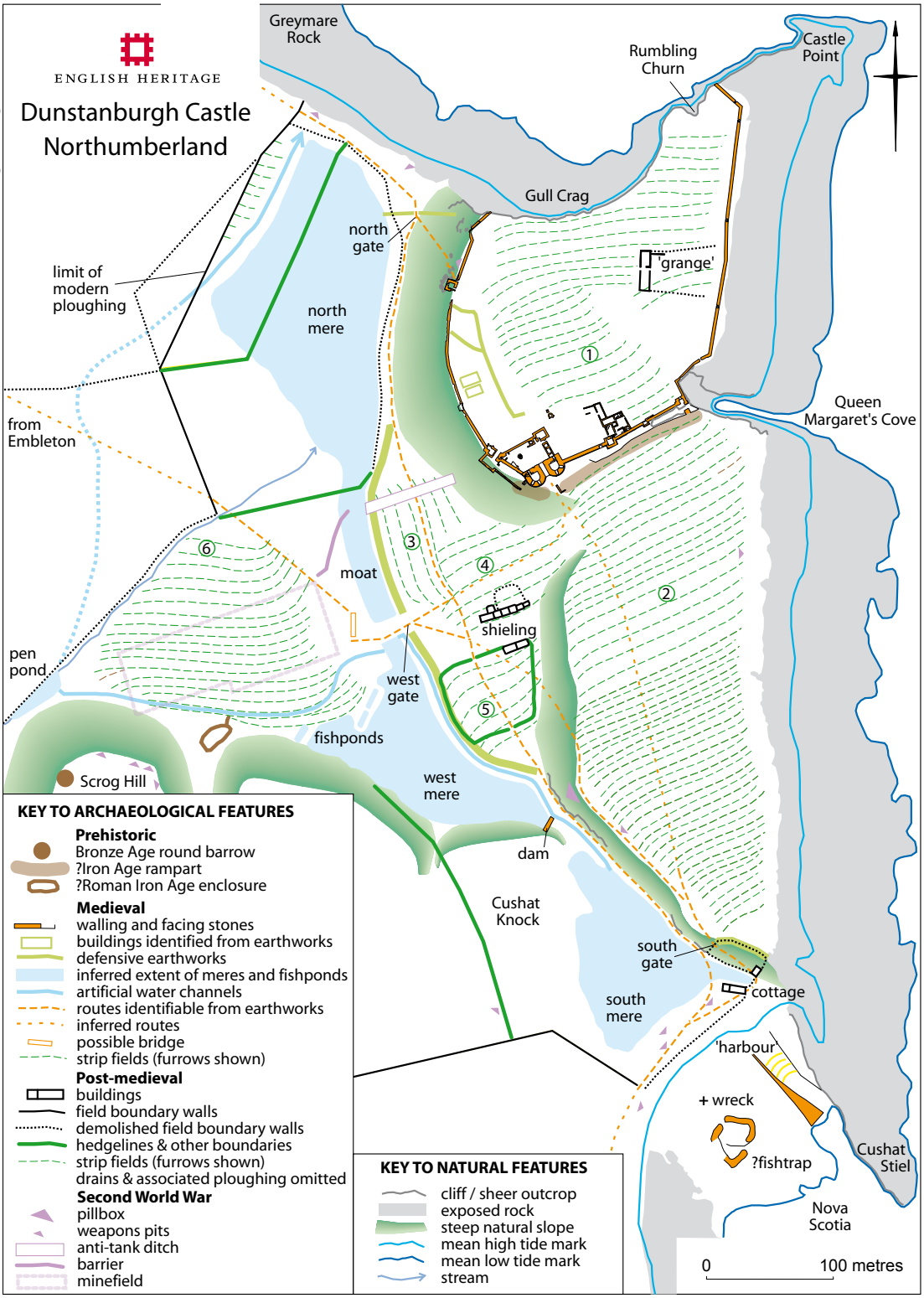
New investigations of this romantic Northumberland castle reveal its propaganda messages in a bitter fourteenth-century power struggle.

Silhouetted against the moody backdrop of the North Sea, the forbidding ruins of Dunstanburgh are among the most dramatic of any castle in Britain. Construction was begun in 1313 by Thomas Earl of Lancaster (c1278-1322) and probably more or less completed by the time of his execution for treason on 22nd March 1322. Many historians have concluded that the origins of the castle lie in the prolonged conflict between England and Scotland, which culminated in the battle of Bannockburn on 24th June 1314, fought between Edward II of England (1307-27) and Robert I (the Bruce) of Scotland (1274 -1329).

More recent research by English Heritage, working in partnership with the National Trust, shows that the real motivation behind the construction of the castle, on such a lavish scale yet in a location that was almost pointless in strategic terms, lies primarily in the character and political ambitions of its builder. By far the wealthiest and most powerful of all Edward II's barons, Lancaster had become a fierce opponent of his king.

The Barony of Embleton, within which Dunstanburgh lies, was a northern outpost of the vast estates that Lancaster inherited. The castle was built too far from Embleton to

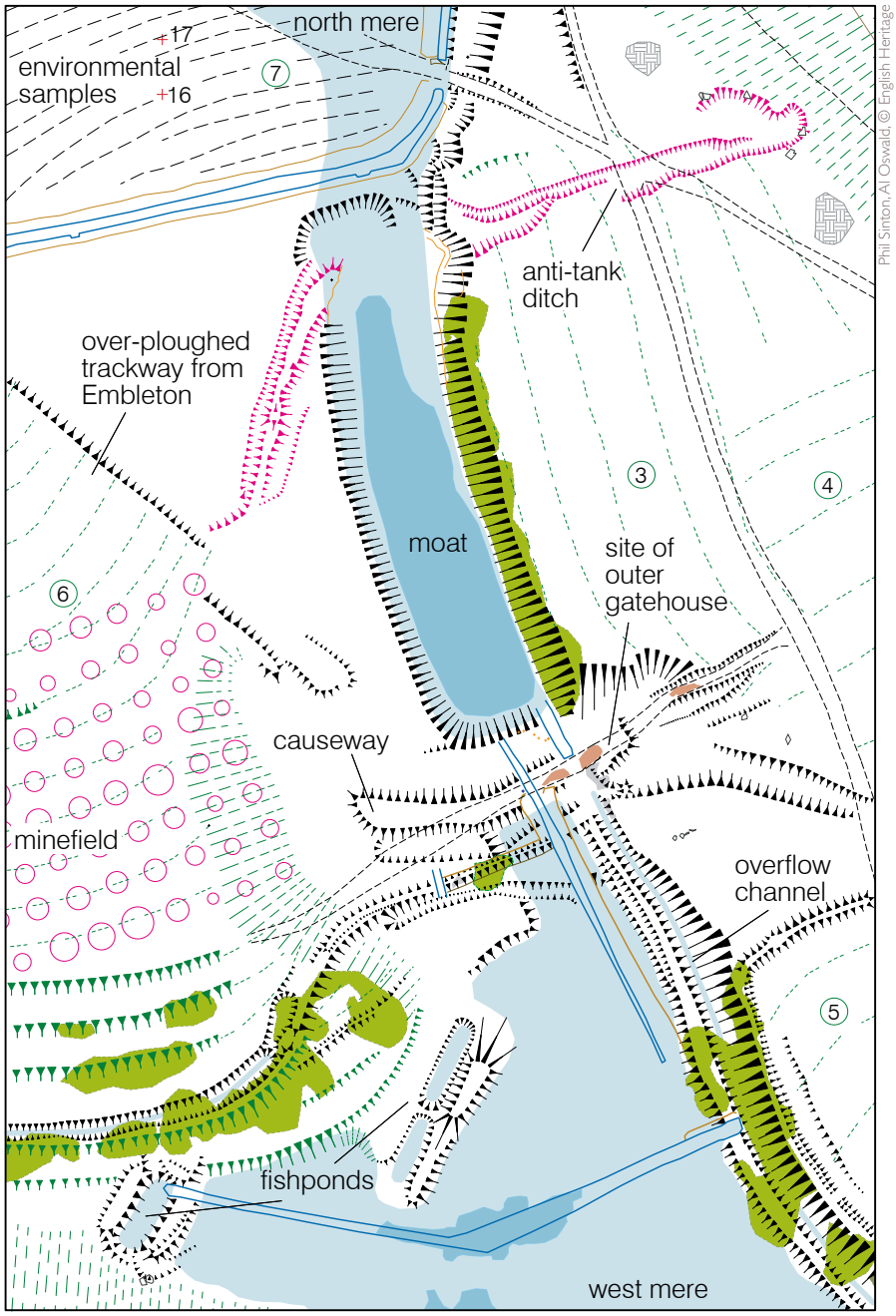
Dunstanburgh's unique gatehouse, seen from beyond the newly recognised southern mere, flooded after exceptionally heavy rain. This mere was long believed to be the site of the castle's documented harbour



Schematic plan of the historic landscape

offer the villagers any real protection, and too far from major routes to impede the Scots. Its remote location may have been chosen not just because of the natural impregnability of the lofty promontory, but also because on a clear day there is an uninterrupted view of Dunstanburgh's 'rival': Bamburgh Castle, the king's key stronghold in Northumberland. Several of Dunstanburgh's architectural features are carefully contrived to outdo the grand designs of Edward I's Welsh castles of the 1280s and 1290s, such as Aberystwyth, Harlech and Beaumaris. In particular, the daringly modern design of the castle's masterpiece, the five-storey gatehouse erected by Master Elias the mason, would have been one of the architectural wonders of its day.

In November 2003, English Heritage began a programme of archaeological, architectural and historical investigations into the castle which have now resulted in the replacement of on-site interpretation panels and will



Phil Sinton, Al Oswald, © English Heritage

Extract from the detailed survey, showing the previously enigmatic 'moat' and the causeway that carried the main approach to the castle from Embleton. The pale blue tone depicts the inferred extent of the 14th-century water features; the darker tones represent current areas of standing water and drains

underpin the publication of a new guidebook in 2007. Initial analytical field survey by English Heritage's Archaeological Survey and Investigation Team identified a spectrum of historic remains: a Bronze Age barrow, a possible Iron Age rampart, a stone quay probably contemporary with the castle, post-medieval settlements, Second World War anti-invasion defences, the wreck of a Cold War 'spy trawler'.

As far as the castle is concerned, the most important findings of the field survey concerned an outlying pond, whose dimensions corresponded precisely to those of 'the ditch between the site of the castle and the field of Embleton on the west side,' described in building accounts of 1313 as being 20 perches long by 80 feet wide (100.6m by 24.4m). Until the survey, the purpose of this isolated stretch of 'moat' was something of a mystery, for it seemed to be oddly disconnected from the castle, apparently contributing virtually nothing to its defence. The archaeological survey showed that its northern end had originally opened into a shallow mere, covering 2.25ha (5.56 acres) of what is, even today, boggy ground, despite determined post-medieval attempts at drainage.

This was the northernmost of three freshwater meres, which together formed a discontinuous lake around the whole landward side of the castle outcrop. Following the crest along the inner edges of the meres and reinforcing this outermost perimeter was an earthen rampart, probably topped by a timber palisade. At its southern end, the moat ended at a causeway, which divided it from the westernmost of the three meres. To keep the meres full, water from a spring further inland was channelled to this point, where it was controlled using a simple but cleverly devised system of sluices and overflow channels. The same water supply seems to have fed a series of small outlying fishponds. The principal medieval route from Embleton, parts of which still survive as an earthwork, crossed the causeway and it is likely that an outermost gatehouse stood here, perhaps built in stone, although very little trace of it now survives. Still further south was the third mere, also an area of marshy ground today, and long mistakenly believed to be the silted-up medieval harbour. The discovery in the inter-tidal zone of the real harbour – or at least the massive remains of a 75m-long stone quay - firmly put paid to this belief.

Today, it is difficult to imagine how spectacular the approach from Embleton must have been. At the foot of the Lilburn Tower, which overlooked the northern mere and dominated the approach, natural rock pillars were deliberately preserved intact by the builders, making the tall, elegant tower and its reflection in the shallow water of the northernmost mere an awe-inspiring and beautiful sight. The meres contributed to the defences and must have served as a larder for fish and wild birds, but they were also partly ornamental in function, a piece of

After painstaking ground-modelling with GPS to establish the extent of the northern mere, nature intervened: heavy rain and snow-melt flooded the north mere almost to its medieval levels

medieval 'landscape design' on a grand scale. The same is true of other large medieval meres, such as those at Kenilworth Castle in Warwickshire and Framlingham Castle in Suffolk. The prolonged and indirect approach would have meant that visitors were unprepared, when they eventually turned to face the great gatehouse, for the immense size and extraordinary design of this unique architectural showpiece.

If Lancaster intended the architecture of the castle to be 'read' by the elite as a symbol of his opposition to the king, it may also be that he conveyed the same message through the castle's landscape setting, but in a more subtle and complex way that inevitably leads us into the realms of speculation. Current trends in castle studies support the possibility that by setting their strongholds in 'watery landscapes', medieval lords may have been deliberately incarnating the medieval concept of Avalon. It may also have been important that Dunstanburgh occupied the site of a more ancient fortification (believed on the evidence of the recent field survey, and fresh analysis of finds made in 1930, to be an Iron Age promontory fort). During the height of its popularity among the English aristocracy in the 14th and 15th centuries, Arthurian mythology was extremely politically potent. At its most powerful, it could suggest an older and more legitimate claim to the English throne. Throughout the collusion with the Scots that led to his execution, Lancaster reportedly used the pseudonym 'King Arthur' and it has been said that he sometimes attended and hosted court entertainments dressed in the costume of Arthur. Without a word of treason being spoken, the whole splendid composition of Dunstanburgh perhaps silently invited the knights of the realm to regard the castle as Camelot, and thus Thomas, grandson of Henry III, as Arthur, the rightful king of the Britons who would one day rule again.

Copies of the full report on the investigation of Dunstanburgh are available through the National Monuments Record as part of the Research Department Report Series, no. 26/2006

Alastair Oswald and Jeremy Ashbee

The new survey provides a better understanding of the castle's role in Second World War coastal defence. Beyond the pillbox lies the western mere, now managed by the National Trust as a wildlife habitat

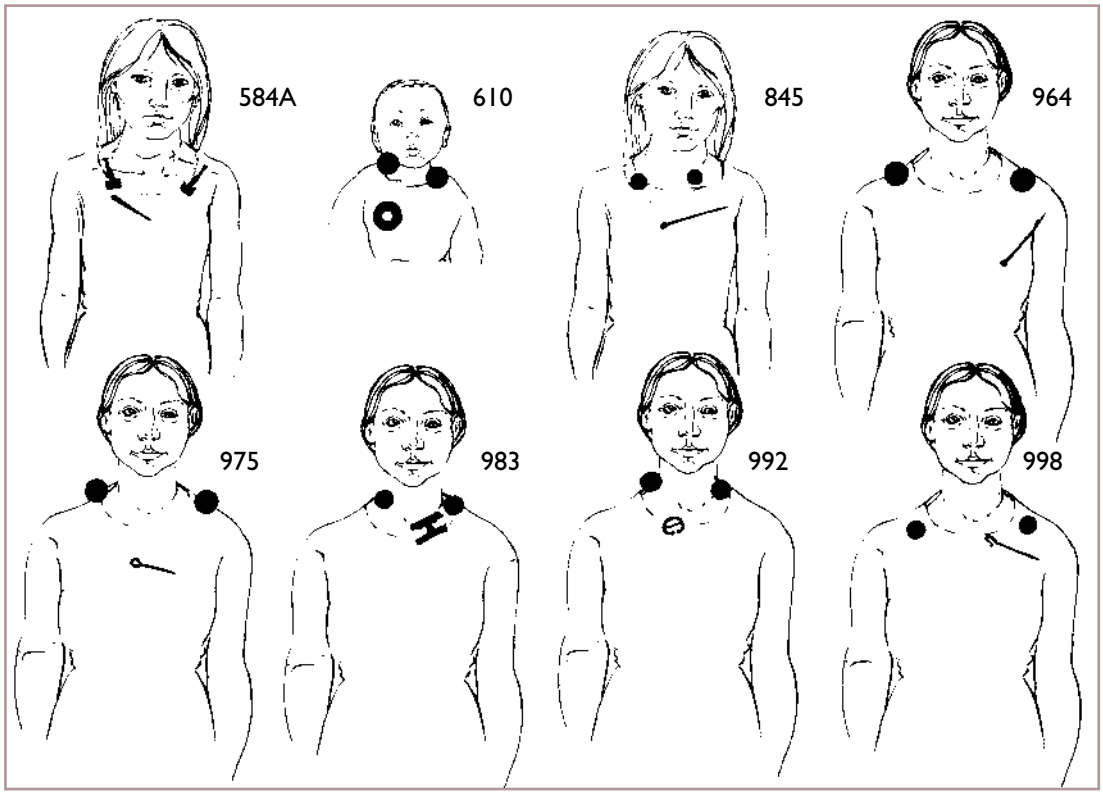
NEW DISCOVERIES AND INTERPRETATIONS

Reconstructing Anglo-Saxon dress from graves at Mucking, Essex

Work on finds from graves has allowed the reconstruction of the dress of Anglo-Saxon people from the 5th to the 7th centuries.

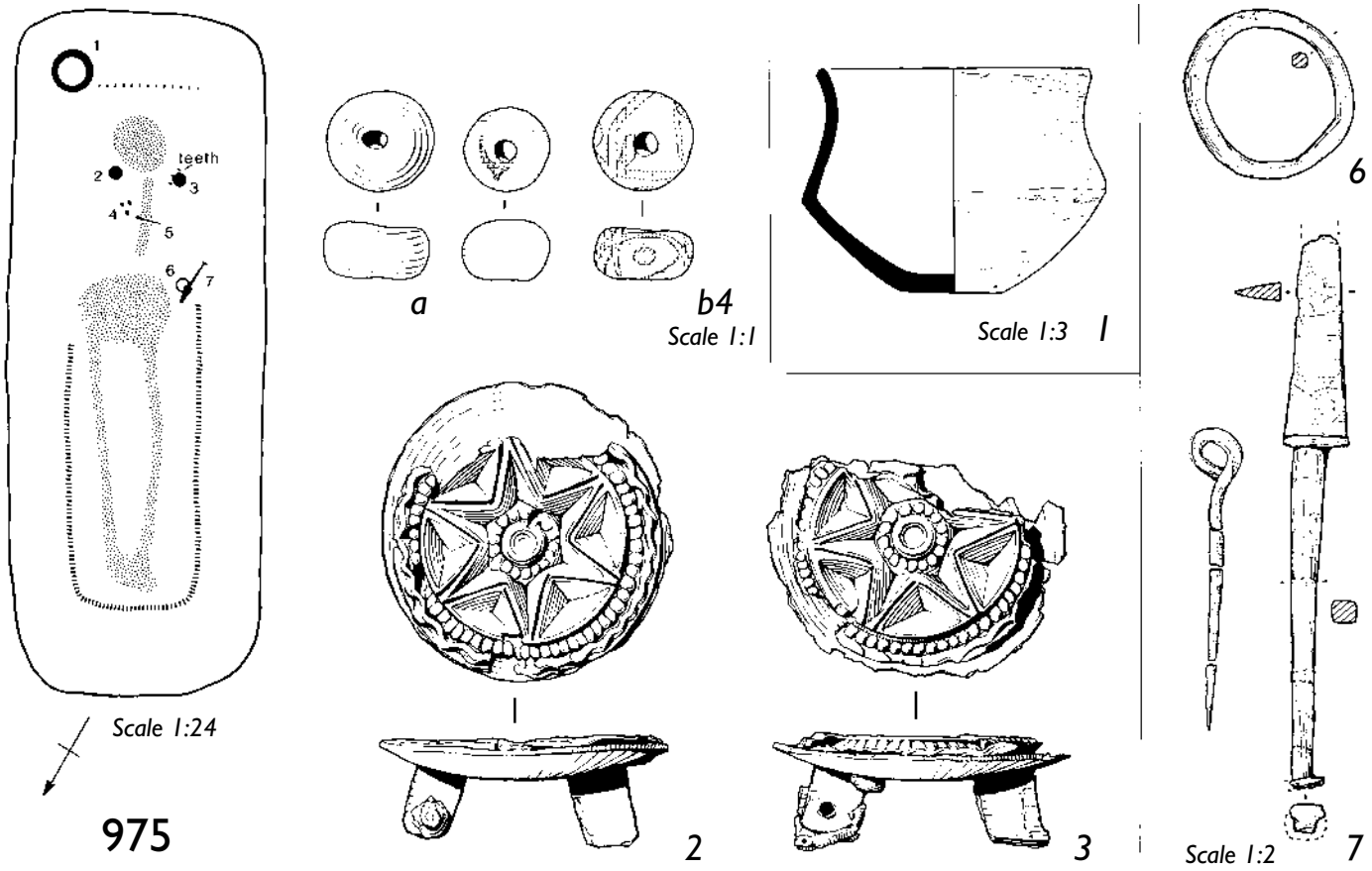
Collaborative research to bring the finds from the Anglo-Saxon site at Mucking to publication has enabled the graphics studio to complete the first reconstruction drawings showing the differing styles of dress of individuals buried in one of the site's two cemeteries. Mucking was excavated in the late 1960s and early 1970s and is among the most important multi-period excavations to have taken place in this country with evidence of settlement stretching back to the Neolithic period. The site occupies a gravel terrace near to East Tilbury and enjoys commanding views across the Thames estuary. The Anglo-Saxon settlement is thought to have begun in the fifth century as a settlement of Germanic mercenaries stationed to guard the estuary against sea-borne invasion from across the North Sea.

One of the Anglo-Saxon cemeteries had been partly destroyed by gravel extraction before the start of excavation and only contained around 63 inhumations. The second cemetery, nearest to the settlement, was complete and preserved the remains of 282 inhumation and 463 cremation burials. The positions of the 125 brooches from the inhumations provided the key to reconstructing how the deceased had been dressed. The bodies did



Judith Dobie, © English Heritage

Graves with bodies wearing a pelos pinned with pairs of brooches on the shoulders and with a wrap or head covering (610 was a baby's grave, 584A and 845, adolescents)



Judith Dobie, © English Heritage

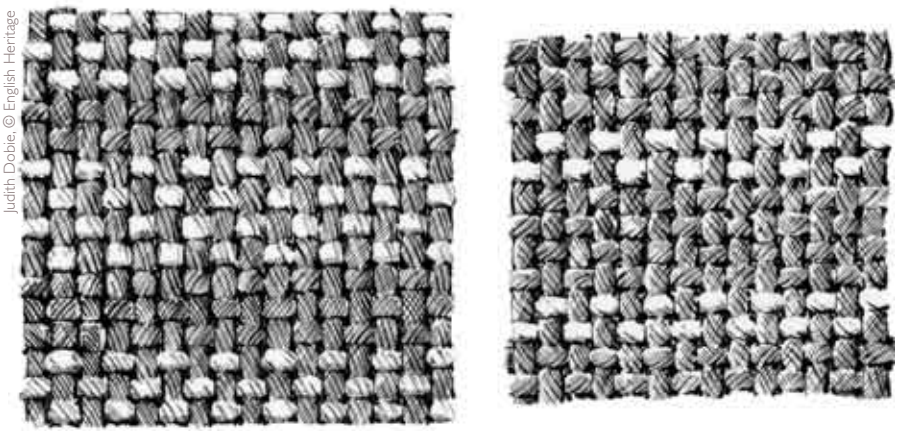
Plan of grave 975, and the grave goods

not survive well in the acidic soil and commonly all that remained was the soil silhouette. This meant that the age and sex of the person had to be estimated from the size of the body stain and the types of grave goods. The burials date from the 2nd quarter of the 5th century to the late 6th or early 7th century.

There is little pictorial evidence of clothing from this period but the position of the brooches and fastenings on the bodies and the types represented enabled the research team to draw conclusions about the different styles of dress and enabled the graphics studio to reconstruct several examples for publication.

The basic dress of a moderately well-off Saxon woman was the peplos, a tube of cloth fastened on top of the shoulders by pairs of brooches. Often a string of beads hung between the brooches. Sometimes a shawl was worn and fastened with a central brooch or pin. Grave 975, that of a female dating from mid to late 5th century, is of this type. From the grave plan, the pair of starred, applied brooches 2 and 3 sit high on the shoulders. Mineralised, preserved textile survives well on the metal pins of brooches and other objects and analysis of the cloth from the backs of the applied brooches show that her peplos was of twill woven wool. Also preserved on the backs of the brooches was the tablet woven braid which would have edged the dress.

Some fragments of tablet woven wool from Mucking are dyed bright yellow and red and some plain weaves are undyed, in which case there might have existed a neutral coloured pelos with a brilliant edging. Textile surviving on top of the brooches, around the iron pin on the chest (no. 5) and over the knife and bag (nos 7 and 6) hanging from the waist would have come from a shawl or cloak. Enough of this fine, woollen, tabby woven textile survived to recover its pattern of stripes of two tones of brown. The problem was to how to show this evidence in the form of a reconstruction drawing. The first step was to draw out the weave diagram, and then to transfer the resulting pattern to a piece of white cloth using a black pen. The cloth was photographed being worn by a colleague,



Judith Dobie, © English Heritage

Diagrams of the weave of the striped wool tabby cloth which overlaid the applied disc brooches

Tracey Croft, and the resulting images provided the basis for the final reconstruction drawing.

The position of the three beads from the grave suggests they were threaded and tied to the loop of the iron pin holding the shawl. The hairstyle is based on styles reconstructed from Continental sites where bone hairpins and sometimes hair survives. The plaits wound round her head would have been pinned above the ear. This drawing and other costume reconstructions will be included in the publications of the Mucking Anglo-Saxon cemeteries. The background information for the drawings came from the author of the monographs Sue Hirst and from the conservator Glynis Edwards; the textile remains were studied and reported on by Elizabeth Crowfoot.

Judith Dobie

Tracey wearing the pinned, striped Anglo Saxon shawl and shoulder brooches

Completed reconstruction drawing of woman in Grave 975

The Dauntsey Doom Panel: Tree-ring dating

This rare painting presented a challenge to the dendrochronologist, who had to set up his lab *in situ* in the church vestry.

The Dauntsey Doom is a rare vernacular panel painting of the Last Judgement, from the parish church of St James the Great, at Dauntsey in Wiltshire. It shows the saved being admitted into Heaven by St Peter, and the damned being cast into Hell. The painting, on two rows of boards, originally filled the gap (about 4m wide and 3m high) between the rood screen and the church ceiling. It has been extensively restored in recent years, and was recorded in detail by English Heritage's Metric Survey Team. In 2005, the Scientific Dating Team commissioned Ian Tyers of Sheffield University to date the oak boards by dendrochronology, prior to the reinstatement of the painting.

Dendrochronology works by matching the growth patterns revealed by the sequence of tree-ring widths in a timber to patterns in dated reference chronologies. Usually a sample of the timber is removed by coring, and the core is polished and measured in laboratory conditions. In this case, as the boards could not be cored, it was necessary to measure the annual growth rings by cleaning the ends of the boards and positioning the microscope over the cleaned edges. To avoid risking any damage to the painting during transport, the dendrochronology laboratory was set up in the church vestry, where the boards were stored.

The Doom now consists of 21 boards, of which four have split lengthways over time. The split boards, and several others, were found to be unsuitable for tree-ring dating. In some boards, the growth rings were not measurable, either because the ends of the boards were too worn, or because there were bands of extremely narrow rings. Other boards did not have enough growth rings to justify measurement (sequences of fewer than 50 rings can rarely be dated reliably). Many of the unmeasured boards were clearly cut from the same parent tree, however, judging by the positions of knots and saw marks.

Nine of the 11 boards whose growth-ring widths were measured were successfully dated. Four of these boards produced such consistent ring-width sequences that they must have come from a single tree. The other five apparently came from different trees, but all six trees had experienced similar growth patterns and probably grew in the same area. This timber was probably sourced locally, as the growth patterns match well with those in reference material from sites across south and south-west England. The use of local timber is unsurprising, considering the relatively crude carpentry.

All six trees could have been cut down in the same year in the final third of the fourteenth century. It is not possible to be more precise than this, because the actual felling date can only be determined if the final year's growth ring (the 'bark edge') is present, and none of the measured samples included the bark edge. One sample did include the heartwood/sapwood boundary, however, which was dated to AD 1359. As local oak trees have between 10 and 46 sapwood rings 95% of the time, this particular tree was probably cut down between AD 1369 and 1405. Another board had a slightly earlier probable heartwood/sapwood boundary, and an estimated felling date between AD 1363 and 1399. The best estimate for the date of the Doom panel is therefore AD 1369-99.

John Meadows

Detail from The Doom Panel: the jaws of hell

NEW DISCOVERIES AND INTERPRETATIONS

The Duchess, the Museum, the Romans and their plants

An example of making our knowledge more accessible and increasing public awareness of the historic environment.

Greater Celandine (Chelidonium majus): This photo by John Vallender was used as the background image for the poster advertising the exhibition. Once used to cure warts and corns seeds of this plant have been recovered from the Roman fortress at Caerwent, Gwent, and from Roman settlements at Nantwich, Cheshire and Farmoor, Oxfordshire

In the autumn of 2005 the Environmental Studies team at English Heritage were approached by Jill, Duchess of Hamilton concerning a Heritage Lottery Funded exhibition she was putting together as part of the Flora of Fulham project, in conjunction with Miranda Poliakoff and her colleagues at the Museum of Fulham Palace. They were seeking up to date information concerning the introduction of new species of plants into Britain during the Roman period based on recent archaeobotanical evidence. The project was interested in deliberate introductions, commodities such as dates, and plants that were likely to have been cultivated such as grapevines, as well as accidental introductions such as arable weeds.

© John Vallender

We were able to collate this information for the project by combining the information contained within the Archaeobotanical Database (ABCD) currently being updated by Allan Hall, a Senior Research Fellow at the University of York, partly funded by English Heritage, with insider knowledge of the discipline and information kindly provided by archaeobotanical colleagues both past and present.

We also wrote and commented on the text for the exhibition panels, while the members of Imaging, Graphics and Survey provided, or suggested, many of the images. In addition, Sarah Jennings of Archaeological Projects produced finds for handling, and for the displays.

© John Somerville

Ground Elder (Aegopodium podagraria): Everyone who worked on the exhibition and lots of the visitors were astonished to find that Ground Elder was a deliberate Roman introduction. It can be used as a pot herb, rather like spinach. Archaeological remains of this plant have been recovered from Roman deposits at Claydon Pike, Gloucestershire, York, and Little Waltham in Essex

The exhibition, entitled *The Roman's Green Invasion: the plants the Romans brought to Britain*, was opened on the 12th of January by Adam Hart Davis in the presence of the Mayor of Hammersmith and Fulham and was featured in *Country Life*. It was due to close on the 9th of July, but was extended until the end of July prior to the closing of the museum as part of a major restoration project taking place at the site.

Over 2000 people visited the exhibition between January and the end of June. It also formed the focus for an "Archaeology Fun Day" on Sunday 16th July as part of National Archaeology Week which attracted 150 visitors. The Education Officer at the Museum also used the exhibition as a spring board for teaching Roman archaeology to local school children.

Gill Campbell

Below left: Spruce (Picea abies): Remains of Spruce cones from pond fills at Godmanchester, Cambridgeshire, where leaves, shoots, wood and cones were recorded along with along with remains of yew (Taxus baccata), suggesting the presence of a formal garden. Spruce is not recorded in this country after the Roman period until the 17th century when it appears to have been reintroduced from Germany.

Below: Children at the Archaeology Fun Day

NEW DISCOVERIES AND INTERPRETATIONS

Runwell Hospital in Essex and the NHS Disposals Programme

The future hangs in the balance for a large number of redundant NHS hospitals. Assessment of their significance contributes to decision making.

English Heritage is currently being consulted on 96 former NHS hospitals sites that have been transferred to English Partnerships (EP), following a deal between the Department of Health and the former Office of the Deputy Prime Minister (ODPM). EP has been briefed to determine the best future use for this large portfolio of sites, and hopes to work with other organizations to provide up to 14,000 new homes, as well as new employment opportunities, on former hospital land. One of the first steps has been to seek advice from EH on heritage protection issues likely to affect masterplans for the redevelopment of sites identified by EP as priorities. One of these is Runwell Hospital in Essex.

The Administration Block lies at the heart of Runwell Hospital, Essex

(AA052376)

In assessing the significance of hospitals such as Runwell, we can draw on the extensive experience of EH staff. Both EH and the former Royal Commission on the Historical Monuments of England (RCHME) were closely involved with earlier phases of NHS hospital closure. Indeed, it was the mass closure of hospitals in the 1980s that precipitated the RCHME Hospitals Project, which led to the recording of over 1,000 hospital sites in England, and the publication of a book tracing the historical development of different hospital types. In tandem with this, EH carried out an extensive listing review on this class of building.

Since then, large numbers of redundant hospital buildings, most of them unlisted, have been swept away. Our current concern is to make sure that no potentially significant complexes, buildings or gardens have slipped through the net, and so, following a desktop exercise, coordinated visits are currently being made to key sites by staff from three different EH departments: the Government Historic Estates Unit, Heritage Protection and the Research Department.

Our desktop exercise and subsequent visit have established that Runwell Hospital, regardless of heritage protection issues, has a particular claim on our attention: it was the very last of the huge mental hospitals – once known as lunatic asylums – to be built in England. A closer look reveals that its planning was, in fact, highly innovative, and its architects hoped to produce a model for future mental hospitals. As it transpired, however, the outbreak of war in 1939 called a halt to any immediate building plans. Subsequently, a combination of a policy of care in the community, first mooted in the 1960s, and the introduction of new drugs to control many mental illnesses, meant that no further hospitals of this type were ever built. In fact, by the 1980s, the old asylums were winding down, and few survive intact today.

Runwell was designed by Elcock & Sutcliffe for the county boroughs of East Ham and Southend-on-Sea, and was built near Wickford between 1934 and 1937. Its 1,032 patients were accommodated in detached villas, which were designed to be as homely as possible and were spaced some distance from one another in landscaped grounds. This system was inspired by 'colonies' built

(AA052380)

(AA052382)

in the first decades of the 20th century for the mentally handicapped and epileptics, and its adoption for a mental hospital was undoubtedly encouraged by the Mental Treatment Act of 1930, which prioritised remedial treatment above custodial care. Architecturally, the result was very different from the enormous many-towered lunatic asylums of the Victorian and Edwardian periods. Most of the buildings were solid and simple, effectively combining traditional and modern features. The designs of the chapel, administration block and boiler house are particularly impressive, and all three retain a wealth of original features. It is of paramount importance that such buildings are recorded and researched prior to redevelopment.

Runwell is just one of the many hospitals affected by the NHS Disposals Programme. Of the 96 currently involved, 40 lie in London and the south-east, 23 are mental hospitals, 6 are mental deficiency colonies, and one a colony for epileptics. Experience over the last 15 years has shown many different ways in which mental hospitals can be redeveloped, some more successful than others. At Powick (Worcs), everything was swept away except for the central administration block, while at Fairfield Hospital, Stotfold (Beds), demolition was kept to a minimum: the main building was retained and redeveloped as apartments, while an extensive new housing estate was erected on surrounding land.

So what is planned for Runwell? By the end of 2007 adults and older patients will move to a new building currently under construction at nearby Rochford Hospital, and by the end of 2008 secure services will be relocated to a new purpose-built 96-bed facility at the south end of the Runwell site, where staff housing once stood. What was once a mental hospital at the cutting edge of scientific research with an international reputation will fade into history, the old buildings empty, and the site awaiting a new lease of life. In the future, many of the hospital buildings, such as those illustrated here, could make a positive contribution to the redevelopment of the site, either by being converted into attractive housing, or by finding complementary functions within the new community.

Left: The exterior of the Italian-style Chapel at Runwell. The original designs by Elcock & Sutcliffe are dated 1934

Right: The vaulted interior of the Chapel survives with high quality fixtures and fittings, including the pulpit, lectern and Roman-style lamps. This view looks from the nave towards the chancel, which is flanked by a chapel to the south, and an organ bay to the north

Kathryn A Morrison and Harriet Richardson

(AA052377)

The Boiler House of Runwell Hospital has a vigorous modern design, with contrasting brown and yellow brickwork

NOTES & NEWS

A round-up of activities and developments showing some of the scope and variety of projects that are ongoing in the Research Department.

INTERNATIONAL RADIOCARBON CONFERENCE

The 19th International Radiocarbon Conference was held at Oxford University on 3–7 April 2006, the first time in living memory that this important conference has been held in England. The keynote address was given by Lord Renfrew, and 263 other presentations (talks and posters) provided a comprehensive review of recent developments in radiocarbon science and its dating applications, particularly in archaeology. English Heritage was one of the conference sponsors, and provided bursaries for 14 professional archaeologists to attend, learn, and contribute to the conference through oral and poster presentations of their work in collaboration with English Heritage. Nine EH staff also attended, including three Regional Science Advisers.

EH-supported presentations dealt with HEEP/ALSF-funded archaeology in all periods and regions, from the Mesolithic house at Howick, Northumberland, and submerged early Holocene landscapes in the English Channel, to the Neolithic causewayed enclosure St Osyth, Essex, the prehistoric settlements at Yarnton, Oxfordshire, the Bronze Age village and field system and the post-Roman ironworking landscape at Bestwall Quarry, Dorset, the late Bronze Age ironworking site at Hartshill Quarry, Berkshire, the late prehistoric fogou at Boden Vean, Cornwall, the Iron Age settlement at Stockley Park, Greater London, and the Anglo-Saxon settlement at Bloodmoor Hill, Suffolk. Other presentations reported on EH-supported research on Neolithic long barrows, Neolithic causewayed enclosures, and seventh-century Anglo-Saxon burials, and on commercially-funded research on the medieval cemetery at Spitalfields, London.

A novel application of radiocarbon dating – using mathematical modelling of radiocarbon results to date timber-framed standing buildings that cannot be dated dendrochronologically – was also put forward, with a case study on Baguley Hall, an EH property in Greater Manchester. Given the size of EH's ongoing investment in protecting the historic built environment, this application has enormous potential benefits.

As well as giving the EH-sponsored archaeologists and EH staff a concentrated dose of training in radiocarbon dating, the conference brought the radiocarbon scientists face-to-face with their customers, providing the laboratories with useful insights into the technical and logistical challenges facing the historic environment sector, and how precise laboratory measurements continue to transform our understanding of the past.

John Meadows

John Meadows (EH) and Frances Healy (Cardiff University) discussing a conference poster on the London regional review of scientific dating evidence

NEWS FROM TRAINING AND STANDARDS TEAM: NEW PROJECT MANAGEMENT GUIDELINES

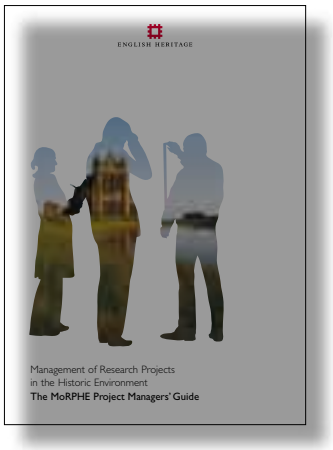
The first two projects to trial the use of new guidelines from English Heritage on research project management have been agreed. The new guidelines 'The Management of Research Projects in the Historic Environment' (MoRPHE) will be piloted by Wessex Archaeology to undertake post-excavation analysis of the Groundwell Ridge site in Swindon and by Archaeology South East (University College London) to manage the Rape of Hastings Architectural Survey. These trials will be evaluated prior to a planned full adoption of MoRPHE for English Heritage funded research in April 2007.

MoRPHE has been produced following a review of an earlier guidance document, 'Management of Archaeological Projects', widely known as 'MAP2'. Since its publication

in 1991, MAP2 has been the model for archaeological projects undertaken or funded by English Heritage, and has been influential in establishing benchmarks and standards for the archaeological profession as a whole. During 2004–5 English Heritage reviewed the applicability of MAP2 in the light of widening definitions of the historic environment and of developments in project management and data handling across this sector, with the intention of issuing new project management guidance. MoRPHE is the outcome of that review.

MoRPHE guidelines will assist in the management of English Heritage's own research, applied research and development projects, and those we commission. Work is in hand to train English Heritage staff in its application, and to develop the capacity to provide training for external partners. The core document 'MoRPHE the project managers guide' and accompanying documents are available now online from the English Heritage 'Free Publications' list (http://www.english-heritage.org.uk/publications).

Training and Standards Team are running MoRPHE training for EH staff on the 19, 25 and 26 October 2006, contact Edmund.lee@english-heritage.org.uk for further information.



MoRPHE Project Manager's guide

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