NEWSLETTER OF THE ENGLISH HERITAGE RESEARCH DEPARTMENT

RESEARCH NEWS

East Range roof looking north at Apethorpe Hall, Northamptonshire - story on page 8

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Research News 5 focuses on the programme of investigation and research by English Heritage at Apethorpe Hall in Northamptonshire, undertaken as an integral part of the programme of repairs to this important country house. The results, which have greatly enhanced understanding of Apethorpe Hall, its Jacobean state apartment, and its landscape, have aided the repair programme and will inform decisions on how best to secure a sustainable future for the property. They will also allow us to tell the extraordinary story of Apethorpe Hall, and why it is so important, to everyone with an interest in its history.

The research team has enjoyed unique access to the house and has exploited this opportunity to deliver an ambitious programme that integrates a wide range of disciplines and pioneers new approaches and techniques. Imaging technology, paint research, landscape analysis, dendrochronology and geophysics, as well as documentary research and fabric analysis, have all made fundamental contributions, and externally-commissioned studies of the Jacobean ceilings and the masons' marks have yielded significant results. The final element of investigation will be archaeological excavation, to be undertaken in the late summer of 2007, which we hope will elucidate the plan of the earliest house.

Timely publication, and sharing through outreach and training the knowledge and experience we have gained, are important aspects of the Apethorpe programme. Research work does not deliver full value unless its results are shared as widely and as promptly as possible with the right audiences. English Heritage's *Informed Conservation* Series, which is produced in partnership with our colleagues in local government, aims to do just this, highlighting what is distinctive about key historic areas and reinforcing the importance of informed understanding to good conservation practice. Autumn saw the launch of two new titles in this key series, as well as publication of *The Historic Landscape of the Quantock Hills* and the launch of *English Heritage Historical Review*, which focuses on research discoveries from the English Heritage estate. Details of all four publications may be found on pages 45-47.

Also in this issue we report on new discoveries and interpretations arising from other current work which addresses the priorities of English Heritage's Research Strategy: a newly-discovered map of Hailes Abbey by Ralph Treswell and the light it sheds on the late 16th-century landscape; investigation of the late medieval or Renaissance garden at Ashby de la Zouch; and work in the north Pennines which aims to integrate understanding and management of the historic and natural environments, and to model impacts of climate change. The North Pennines Project is being developed as part of English Heritage's programme of research and investigation in protected landscapes. Work on the historic environment of the Mendip Hills is another strand in this programme.

Christopher Scull
Research Director
Research and Standards Group

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The Research Programme at Apethorpe Hall

Extensive multidisciplinary study, carried out within a major repair programme, has uncovered a wealth of new information on the history of this important country house and its broader landscape context.

Apethorpe Hall in Northamptonshire is a Grade I listed country house of exceptional importance. It dates from the second half of the 15th century and is located on the outskirts of the village of Apethorpe in the historic Rockingham Forest. The house has suffered from twenty years of neglect resulting in its inclusion on the English Heritage Buildings at Risk register. This in turn led to its recent compulsory purchase by the Department of Culture Media and Sport on behalf of English Heritage.

Research Department staff and other specialists have been afforded unfettered access to the house during 2005-6 enabling a fully integrated multi-disciplinary research programme to be undertaken. The research has been carried out in conjunction with an English Heritage managed repair programme to the south and east ranges of the house, ongoing work that has revealed important new information about the architectural history of the house. This repair programme is scheduled for completion in 2008, when the house and grounds will be marketed with the aim of attracting a buyer capable of undertaking further repairs and other works in a sensitive manner and generally securing a sustainable future for the property. Central to the decision making process in this regard will be the enhanced understanding of the significance of the house and its landscape that has emerged out of the research programme.

A potted history of the house and the range of primary and secondary sources utilised by the research team is provided by Kathryn Morrison in her piece on Architectural Investigation and Research. In particular, a great deal of new research material highlighting the significance of the state apartment at Apethorpe Hall was contained in the English Heritage advice to the Secretary of State and presented at the Public Inquiry relating to the compulsory purchase action in 2004. This work established without doubt that Apethorpe Hall was virtually unrivalled in receiving more royal visits than nearly all other surviving great houses of the period outside of the royal palaces. Further investigation of the fabric of the house as part of the 2005-6 research programme combined with, among other things, some highly-targeted opening up as part of the repairs, dendrochronology, geophysical survey, landscape analysis, measured survey and further documentary research has greatly enhanced our understanding of the historical development and significance of the house and its landscape.

Damian Grady © English Heritage. NMR 23765/09

An oblique view of Apethorpe Hall taken from the south east in 2004

This photograph depicts the Duke's Chamber around 1923. The ship on the chimneypiece refers to King James's favourite, the Lord High Admiral, the Duke of Buckingham

The research programme is managed by John Cattell, English Heritage's Chief Buildings Historian, and taken forward by a research team comprising representatives from virtually every section of the Research Department together with regional colleagues, including the Apethorpe Hall Project Director, Nick Hill. The team brings together internal specialists drawn from a wide range of academic and professional disciplines. From the outset it was intended that the research programme should be seen as an exemplar for the multi-disciplinary analysis and investigation of a complex major monument and its landscape. The research team meets at six-weekly intervals, and, in addition to joint fieldwork, these meetings represent the principal forum for the lively exchange of ideas about the interpretation and recording of the site. We have all learnt a great deal from each other and gained a much deeper appreciation of the many benefits arising from working in this way. For those involved it has helped to break down the barriers that have traditionally separated disciplines such as architectural history from, for example, archaeological science. The full range of internal expertise employed at Apethorpe Hall is showcased in the following pages.

In addition to the wide range of internal expertise employed at Apethorpe a number of external specialists have been commissioned to provide advice. These include Dr Claire Gapper who has produced a report on the plasterwork and Dr Jennifer Alexander who has made a highly-illuminating study of the masons' marks appearing on the stonework at Apethorpe. The latter is of considerable interest as it represents the first systematic study of masons' marks on a building of this type and period.

The findings of the research programme were brought together in an English Heritage report published in the Research Department Report Series in February 2007. This will provide much of the raw material for an English Heritage monograph on the site proposed for publication in 2009 following the completion of the English Heritage managed repair programme and the sale of the house. The monograph will be complemented by a range of journal articles on aspects of the research and investigation work at Apethorpe Hall to be published over the next two to three years. The book and many of the articles will benefit from ongoing discoveries emerging out of the repair work and as part of targeted supplementary work, eg phase 2 of the dendrochronology programme.

One important Research Department contribution, archaeological excavation, is missing from this round-up because it is has yet to happen. This is largely a result of the need to wait for the removal of the extensive scaffolding in the main courtyard next year. As Neil Linford points out, geophysical survey in this courtyard suggests that the footings of a previous east range (demolished to make way for the present east range built further to the east in 1622-24) may survive below ground. Targeted archaeological excavations led by

the Archaeological Projects section of the Research Department will take place, probably late next summer, to 'ground truth' this area and others where geophysical survey suggests there are below-ground archaeological remains. We hope to include the key findings in the forthcoming monograph.

Our work at Apethorpe has generated a huge amount of interest in the academic world, and among heritage sector groups and the local community. With the recent transfer of the title of the property to English Heritage it is now possible to publicise the research work at Apethorpe as part of an integrated education, outreach, and training programme. The house and grounds will be visited by a wide range of groups, especially amenity societies and local history groups, as well as specialist societies such as the Society of Architectural Historians of Great Britain. There is also considerable interest among local residents and further visits and publicity in local papers is envisaged. An English Heritage members' day visit is planned for April 2007 and the 2007 Heritage Open Days will provide an excellent opportunity to showcase the results of the excavations and to lead tours around the house and grounds. Also, the Research Department section at the Festival of History held in Northamptonshire each August features an exhibition highlighting the latest research findings at Apethorpe. Consideration is being given to using the house and grounds for training courses in building conservation and investigation techniques.

Finally, the research team has been especially privileged to have had unrestricted access to one of England's great houses, an opportunity unavailable to many architectural historians and archaeologists with an interest in buildings and landscapes of this period. It is hoped that the expertise marshalled in the course of the recent research programme at Apethorpe, as well as the methodologies and innovative approaches adopted, will serve as useful models for others engaged in the multi-disciplinary study of complex buildings. Hopefully this research and analysis, the scope of which is presented here for the first time, will act as a springboard for further work on the house and its landscape and will help spark a renewed interest in the study of England's outstanding country house heritage.

John Cattell

Research Department staff Nigel Fradgley and Andrew Williams measuring the oriel window in the Great Hall

THE APETHORPE HALL RESEARCH PROGRAMME

Architectural Investigation and Research

Documentary research and fabric analysis enable an understanding of the importance and development of Apethorpe, while specialist studies add rich detail.

Over the last three years, architectural historians and investigators in English Heritage have undertaken, and commissioned, a great deal of research and analysis on Apethorpe Hall, hugely advancing our understanding of this vast and important country house.

Apethorpe Hall was built in the late 15th century, probably in two distinct phases, by Sir Guy Wolston. Alterations and additions were made by subsequent owners in the 16th century, notably by the Keble/Mountjoy family around 1530-40 and by Sir Walter Mildmay around 1560. The most significant part of the house, the state apartment, was enlarged and enriched by Sir Francis Fane, the 1st Earl of Westmorland, in 1622-24, following an order issued by King James I, who was a frequent visitor. In the early 1740s, the 7th Earl decided to remodel the house as a Palladian palace. Only part of this scheme was carried out: the east end of the north range was rebuilt as a Library, while the south range was given a new north façade and a ground-floor 'Arkade'. Little more was done until the 1840s and 50s, when a first-floor conservatory was added and the Jacobean loggias were largely swept away. After Leonard Brassey bought the house in 1904, he commissioned the architect Sir Reginald Blomfield to undertake numerous alterations, some in the guise of restoration work which strove to return the house and its setting to their 17th-century appearance. Further changes were made after 1949, when the house became an approved school. For the last 20 years Apethorpe Hall has stood empty, slowly falling into decay.

The last serious study of Apethorpe Hall was carried out by staff of the Royal Commission on the Historical Monuments of England in the late 1970s and early 80s. The results were published in the *Northamptonshire VI* inventory volume (1984), and in John Heward and Robert Taylor's *The Country Houses of Northamptonshire* (1996). This work has provided a sound basis for the current research project.

Three strands can be identified in the architectural investigation of Apethorpe Hall: documentary research, fabric analysis and specialist studies. These strands are tightly

Below left: An unusual view of the service courtyard of Apethorpe Hall, taken from the Orangery roof in 2005 and looking towards the hall. The school dining hall in the courtyard has recently been demolished

Pat Payne, © English Heritage

Right: A sketch drawing showing how Apethorpe Hall might have looked if it had been rebuilt to the plans devised by the architect Roger Morris for the 7th Earl around 1740

Peter Smith, © English Heritage

© Lord Brassey

The King's Chamber, photographed around 1920

interwoven, with each one serving to make the others more meaningful. The final report of the Research Project Team, to be issued this winter, will demonstrate how the integration of these different approaches has resulted in a fuller comprehension of the house and the previously neglected stable buildings.

DOCUMENTARY RESEARCH

The first approach was necessarily historical research, as English Heritage did not gain access to Apethorpe Hall until autumn 2004. Prior to the handover, much analysis of primary and secondary sources was carried out by Emily Cole (now Head of the Blue Plaques Team/Senior Historian), James Edgar (the Apethorpe Project Leader 2000-04, now Team Leader, P&D East Midlands) and Richard Lea (now a Buildings Analyst in the Properties Presentation Team).

To put this task in context, it should be noted that Apethorpe Hall is relatively poorly documented: the earliest surviving building accounts date from the early 18th century, and the first known topographical views are stylised images on 17th-century maps, and a more accurate view by Tillemans, dated 1721. The historians' work included an analysis of the inventories of Apethorpe Hall, which survive from 1629, 1691, 1705, *c* 1736, 1774 and 1842. These formed the basis of a series of plans that showed the development of the house as it was then understood. Another document which greatly assisted with this process was the Reverend H. K. Bonney's two-volume manuscript history of the house, *Collectanea Apethorpeana*, compiled in 1830-38 but including copies of long-lost architectural drawings dating from the 18th century. Aside from Bonney's copies, the earliest surviving floor plans of the house date from 1858.

Another aspect of the historians' work at this stage was to compare Apethorpe Hall with other Elizabethan and Jacobean houses in order to assess its relative significance. This established the historical importance of Apethorpe as one the houses most visited by King James I, who came here 11 times

Pat Payne, © English Heritage

The recently discovered passage linking the King's Chamber with the Duke's Closet, the duke in question being George Villiers, Duke of Buckingham, favourite of James I

Pat Payne, © English Heritage

This partially uncovered window lit the Great Chamber in the 1560s, and was blocked in the 1740s

between 1604 and 1624. It also established the rarity of the surviving state apartment. Although this incorporates some remnants of older state rooms created in the early 1560s, and was subject to some alteration in the 1740s, the principal rooms were respected and retained by later generations, complete with their plaster ceilings and carved chimneypieces.

FABRIC ANALYSIS

Once Apethorpe Hall was in the hands of English Heritage, it was important to determine the extent of dry rot, damp and structural problems, prior to planning the repair programme. This involved the removal of modern plaster finishes and modern panelling in various parts of the house. A number of architectural features were uncovered in the course of these explorations, adding greatly to our understanding of communications throughout the house, and clarifying the function and status of rooms at different periods. One of the most interesting discoveries was a short passageway leading from the King's Chamber in the south range to the Duke's Closet in the east range. This passageway was blocked at one end in the 1740s, and at the other end in the early 19th century. The jambs at its east end retain some of the earliest paint finishes in the house, being painted white with coloured stripes on the face, and red on the reveals. It was also realised that the modern corridor that runs along the north side of the King's Chamber is an original feature, which was removed in the 18th century, but reinstated by the school in the mid 20th-century. This allowed direct passage from the Withdrawing Chamber to the Back Stair and Long Gallery, without disturbing the occupants of the most private rooms in the state suite.

Amongst other discoveries were three windows belonging to Sir Walter Mildmay's state apartment of 1560-62. These enhance our knowledge of this early apartment, showing that the rooms looked out over a south garden. The windows themselves are possibly the earliest dated examples of ovolo moulded mullions and transoms in Northamptonshire. When they were blocked in the 18th century, they were painted with illusionistic glazing.

In addition to uncovering and interpreting a number of lost features, the architectural investigation has advanced the understanding of the historical development of the house through plain and simple observation. For example, by examining the relationship between the individual components of the complex hall range, from both structural and functional viewpoints, a new theory concerning its chronological development can be put forward. It is likely that the hall itself, which could not be dendro-dated, was built in the 1460s, and is therefore 20 years earlier than previously thought.

SPECIALIST STUDIES

Several specialist studies have been commissioned to enhance and complement the investigation and research. Several are reported in this issue, others have included an assessment of the stone sculpture by Dr Adam White, a geological analysis of the building stones by Dr Diana Sutherland, thermal imaging by Robert Demaus and a study of the usage of the state apartment in the 16th and 17th centuries by Emily Cole. Richard Sheppard is currently examining the timbers of the east range roof (see cover), which have been fully exposed throughout the summer for the repair programme. Future work might involve a study of the Long Gallery panelling, which was constructed in the 1620s with large openings for full-length portraits, and it is possible that excavations undertaken next summer may uncover more exciting evidence of the early form of the house. There is still more to be achieved.

Kathryn A Morrison

Pat Payne, © English Heritage

The late medieval hall, which was probably built in the 1460s by Sir Guy Wolston

THE APETHORPE HALL RESEARCH PROGRAMME

Imaging, Graphics and Survey team's involvement at Apethorpe Hall

Survey, graphics and photography provide essential baseline data for the conservation and research projects.

Imaging, Graphics and Survey team (IGS) is responsible for carrying out exemplary work in the specialisms of surveying, photography and graphics in order to inform and underpin English Heritage's historic environment research and standard setting activities. IGS comprises four specialist teams; Archaeological and Architectural Graphics and Survey, Photography and Metric Survey. The involvement of IGS was crucial to both the programme of essential repairs to the house and in contributing to the integrated programme of research, survey and investigation. The IGS Photographic team continues to be involved in documenting the course of the project.

The project design set as one of the aims that the work at Apethorpe should "serve as a test-bed for inter-disciplinary co-ordination and help mesh together the archaeological and buildings teams making up the new Research Department of English Heritage". In the case of the IGS teams this involved integrating the production of surveyed plans and sections to document the programme of

Section of Hall looking north towards services, surveyed by Architectural Graphics

conservation and repair by contractors, with the production of drawings as part of the process of investigation of the structure leading to an understanding of the history of its development. In the event, plans and sections of two wings were externally contracted and the architectural graphics team produced plans and sections of the rest of the house. The ground-floor plan (next page) is the result of the integration of these two branches of architectural survey, normally carried out specifically for these different purposes and at different times. Architectural Investigators, Photographers and Architectural Graphics and Survey team members collaborated to record and illustrate the frieze in the Withdrawing Chamber, discovered preserved behind an inserted coving. Steve Cole describes his contribution to this piece of work below. The work of the IGS teams will contribute greatly in illustrating the proposed report and book.

Bernard Thomason

METRIC SURVEY

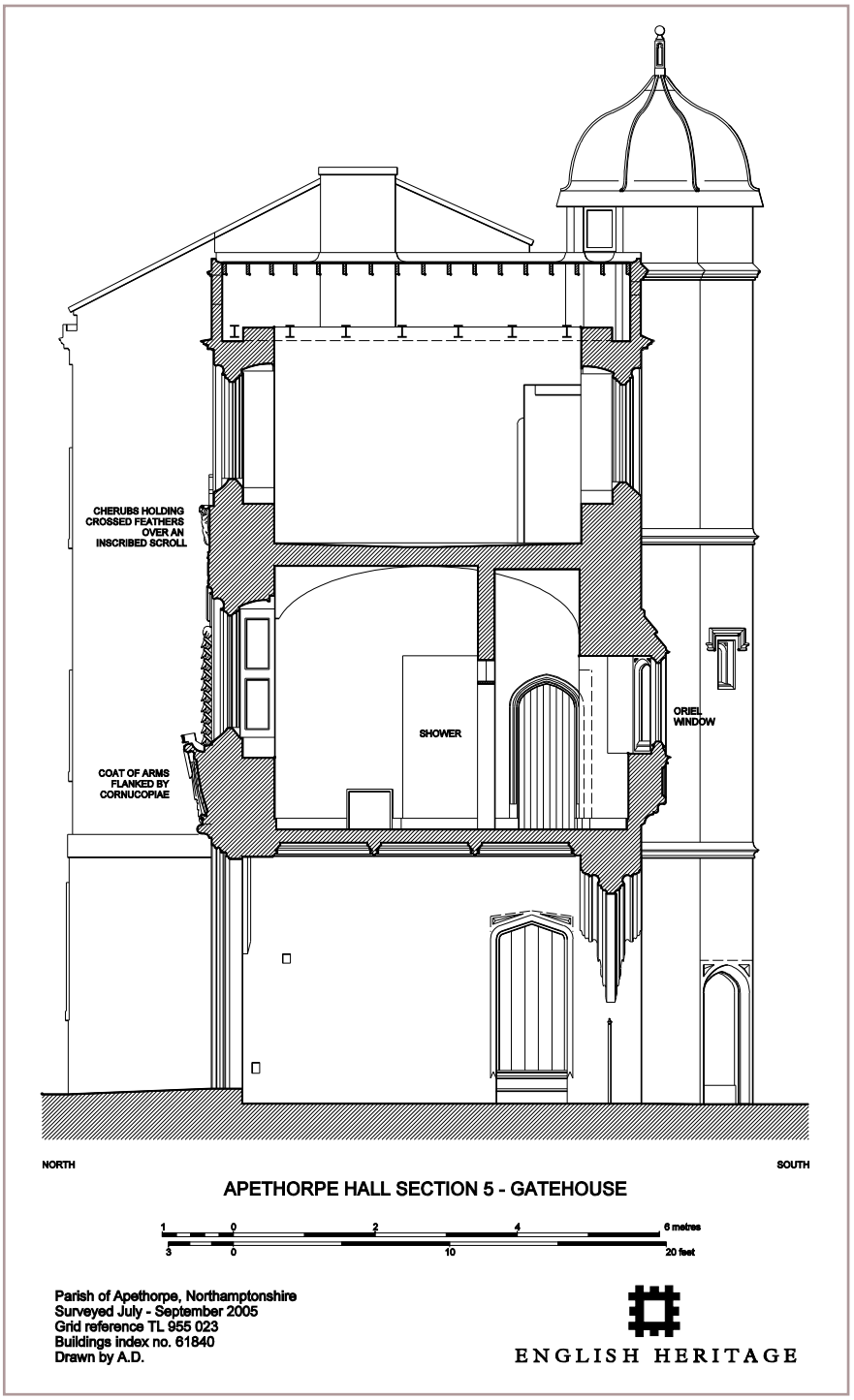
When project director Nick Hill wanted plans and elevations of Apethorpe Hall, for the conservation of the south and east ranges, he first approached the Metric Survey Team which is able to deliver a suite of standard survey products at fixed prices in a matter of a few weeks. At the planning stage of the conservation project, survey comes first as it is the base-map on which all decisions are made. The survey undertaken in respect of the south and east ranges of Apethorpe Hall was the minimum required to plan and cost the repair works:

- *A roof plan showing the falls, up-stands and levels of rain water goods at 1:50 scale*
- *A set of floor plans showing heights, material and layout as found at 1:50 scale*
- *A set of sectional elevations showing heights, material and layout as found at 1:50 scale*
- *Site plan showing services, landscape and heights of hard detail, contours at 1:500 scale*
- *Stone by stone exterior elevations at 1:50 scale*

All of these products are available from a number of suppliers who are retained by English Heritage under the framework contract at pre-tendered standards and prices. The advantage of the framework agreement for the supply of metric survey is the ability to estimate prices by product and area from suppliers who can deliver them in an agreed time. At Apethorpe the project director asked for a price breakdown for all available options and then chose the most cost effective for the project.

The selected survey products were costed, programmed and checked by the Metric Survey Team, and perhaps more importantly made available in advance of completion (as preliminary issue) to the project planning team.

The most urgent stages of the project required immediate attention to weatherproofing the structure. To do this roof plans were needed



Section of Gatehouse looking East with 18th Century Library addition behind, surveyed by Architectural Graphics

to schedule the work. Preliminaries of the roof plans were released to the project architect in 8 weeks of survey being commissioned. The roof plans enabled the design of renewed lead work and the recording of the interventions in removing and replacing the roof material.

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Bill Blake

ARCHITECTURAL GRAPHICS AND SURVEY

The Architectural Graphics and Survey Team produced interpretative measured surveys at ground and first-floor level of the hall and

north ranges of the main courtyard, together with similar surveys of the buildings enclosing the kitchen court and the service court and added analytical data to the base surveys procured by the Metric Survey team through the framework agreement. The team also produced a range of sections and illustrative material, in a major contribution to the project.

An agreed drawing list was produced in consultation with the project director and the Architectural Investigation Team. The strategy was to produce drawings of two types. The first consisting of record drawings (plans sections and details) available to all other disciplines for further annotation and use as the project progresses. These continue to be updated and enhanced by Architectural Graphics as more historic details are revealed in the course of the protracted repairs programme. The number of sections produced is influenced by the number of major structures and building periods represented, and the positions of the section lines are chosen not necessarily at the mid point of a building range but optimally to convey the most information about the historic structure and development.

Plan of the Ground Floor; colour tints indicating the successful combination of the contracted part of the survey with that of the Architectural Graphics team

East elevation of east range in snow

Pat Payne, © English Heritage

The second type of drawings are synthetic, defined at a later stage when investigation is substantially complete and the focus turns to interpretation and presentation of the findings. At this stage, Architectural Graphics can advise on what type of illustrations will best illustrate and elucidate for the reader key aspects of the building development; scenarios which are often complex and difficult to present textually. Reconstruction drawings, in all the various forms they can take, are obvious examples of this category. The record drawings made during the first stage are also used as the basis for illustrations to explain the development phases of the building.

Nigel Fradgley

PHOTOGRAPHY

The photographic recording work at Apethorpe Hall follows closely the phased acquisition, investigation and repair works to the Hall itself. An initial record to show the condition of the Hall and its associated buildings took place in November 2004. This consisted of exterior and interior views of all the main elevations and principal rooms, notably the State Apartment.

The survey work itself is interesting not only because of the challenges presented by a large, ancient and complicated country house but also because the survey period spanned the photographic team's changeover from conventional recording on film to digital image capture.

The challenge presented by much of the work was access to provide a suitable viewpoint and then to allow lighting. The discovery of a frieze which had been hidden by a later insertion of coving into a chamber brought these two factors to the forefront. The frieze is located between the inserted coving of the Withdrawing Chamber on the first floor and the floor of the attic room above. The surviving remains consist of the frieze itself and a small flat area of ceiling plasterwork cut off from the ceiling when the coving was inserted.

Combined image of remains of earlier frieze or tympanum over King's Chamber

Steve Cole, © English Heritage

Martin Stapleton repairs the wooden panelling from the Long Gallery

Without the removal of the coving below, the frieze could only be photographed in sections. An image of the complete scheme was required so that it could be drawn and used in a reconstruction drawing of the former chamber. A 35mm size Nikon digital camera was used to allow for a viewpoint between the ceiling joists that was low enough to be beneath the overhang of the coving and sufficiently far away from the frieze to allow capture of each complete section.

Each section was photographed by wedging myself between the joists and hand holding the camera (resting it gently on the lathes of the ceiling) at approximately the same distance from the frieze. Wherever possible light was introduced from the right of the camera in each shot to provide consistent relief of highlight and shadow across the plasterwork. The frieze is terminated at either end by a cherub. It was not possible to photograph the cherub at the right hand side due to obstructions. This was overcome later in the computer by reversing the image of the leftmost cherub and aligning it with the other plasterwork sections. Some other views of the flat area of the ceiling were also taken to show the bosses and strapwork decoration.

Whilst the image is far from perfect in itself, it does provide enough information to allow my colleague in Architectural Graphics to draw up a reconstructed scheme and to visualise this in a reconstruction of the earlier chamber.

The work of the photography department continues at Apethorpe; during the conservation phase of the project we are there capturing the work of the craftsmen and women working to conserve and safeguard this important building.

Steve Cole

An elevation of the tympanum was produced after some enhancements on computer

Steve Cole, © English Heritage

THE APETHORPE HALL RESEARCH PROGRAMME

Understanding the Jacobean ceilings

The series of elaborate early 17th-century ceilings in the state apartment, created for King James 1, is a rare and precious survival.

Amongst the most significant features of Apethorpe Hall are the elaborate plaster ceilings of the first-floor rooms that once constituted the state apartment. These ceilings impart an indisputable magnificence to the state rooms, even in their present forlorn state. They were made in 1622-24, and would have been admired by King James I when he last visited Apethorpe in 1624.

When English Heritage took on responsibility for Apethorpe Hall in Autumn 2004, it was evident that the ceilings required painstaking conservation work. At that time they were largely hidden by protective scaffolding. Already, parts of cornices had been lost, and cracks and damp patches were apparent. Nevertheless, from an historical point of view the ceilings seemed to pose few problems.

Pat Payne, © English Heritage

The ceiling in the King's Chamber adopted a novel form with a flat centre (decorated with the royal arms), surrounded on all sides by deep coving. This photograph was taken after the ceiling had been cleaned, and 1970s paint removed

It was generally accepted that the most intricate, those in the Great Chamber, the Withdrawing Chamber, the King's Chamber and the Duke's Chamber dated in their entirety to the 1620s, while some doubts lingered over the authenticity of the plainer ceilings in the Long Gallery and the corridor that bypasses the King's Chamber. To pronounce on this issue, and to provide a general assessment of the ceilings from an art historical point of view, the Research Team called on the expertise of Dr Claire Gapper.

Since completing her doctoral thesis entitled 'Plasterers and Plasterwork in City, Court and Country, *c* 1530-1640' Claire has become established as the foremost expert on early modern plasterwork in England. She has examined the ceilings of many country houses, and provided advice for a wide range of heritage bodies and private house owners, for example at Sizergh Castle and Hatfield House. At Apethorpe, Claire's specialist knowledge, combined with the fabric analysis undertaken by the English Heritage Research Team, has considerably advanced our understanding of the ceilings. With her help it was possible to establish that the relatively simple Long Gallery and King's Chamber Corridor ceilings are, indeed, original work of the 1620s. They copy a design published by Serlio which became extremely popular in late 16th and early 17th century England recurring, for example, at Canons Ashby in Northamptonshire (*c* 1600), and in Inigo Jones's House of Lords (1624-25). According to Claire, 'one could view Apethorpe's gallery, which provides a striking contrast to the other state rooms, as moving towards the more chaste, classical mode espoused by Jones'. Ceiling design was entering a time of transition.

A much more complex puzzle was offered by the discovery, beneath the attic floors, of

Pat Payne, © English Heritage

Dr Claire Gapper in the Great Chamber. The coving and cornice, inserted in the 1740s, were closely examined in the course of the restoration work

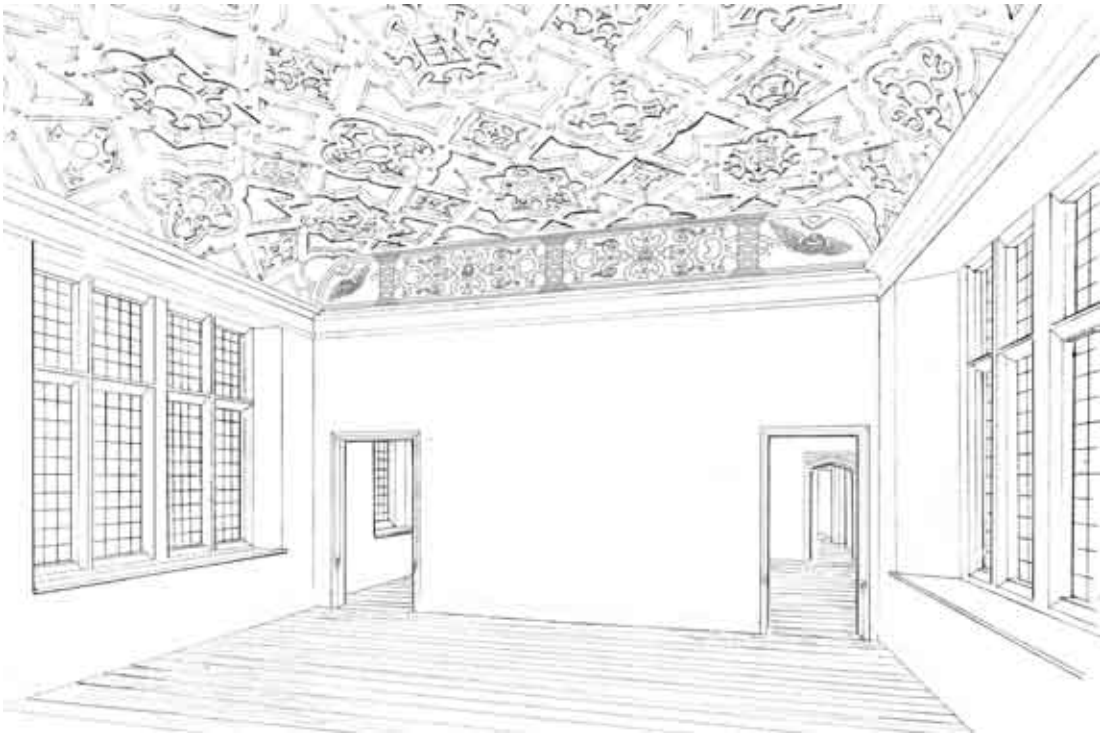
two plaster friezes or tympana which had once adorned the short end walls of the Great Chamber and Withdrawing Chamber, but were now concealed behind apparently contemporary coving. Were they remnants of earlier ceilings? Did they represent a preliminary scheme, perhaps a mistake on the part of the plasterers that was quickly rectified in 1622-24? Or did they indicate some serious intervention by a later generation?

Fabric analysis eventually demonstrated that the newly-discovered friezes are, indeed, part of the original 1620s ceilings, and that they were concealed behind new coves in the 1740s. At that time, John Fane, 7th Earl of Westmorland, was remodelling the ground floor of the south range, and rebuilding the north elevation, as part of an abortive scheme to transform Apethorpe Hall into a Palladian villa. Various structural alterations, including the removal of a transverse wall, caused the loss of part of the original ceilings, something rectified by the creation of new coves. These were installed with the utmost care, with almost imperceptible joints, and stylistically in keeping with the work of the 1620s. This fascinating discovery emphasises the significance assigned by the 18th-century owners to their historic state apartment; it highlights the value they placed on preserving the character of rooms which had once received royal guests, and which were already, undoubtedly, a showpiece for visitors. The almost antiquarian approach evinced in the treatment of the ceilings is something that can be detected in the alterations and additions of other generations at Apethorpe, from the 17th to the 20th centuries.

Claire Gapper readily acknowledges the national importance of the Apethorpe ceilings. She says: 'It is incredibly rare for a complete suite of decorative ceilings to survive from this period. The closest parallels are the ceilings of Blickling Hall in Norfolk and Aston Hall in Birmingham, both of which survive, and those of Albyns in Essex, which has been demolished'. Although the identity of the Apethorpe plasterer is not known, 'like

The ceiling of the Long Gallery is based on a pattern published by Serlio. When this photograph was taken the restoration of the 17th-century panelling had already begun

Pat Payne, © English Heritage



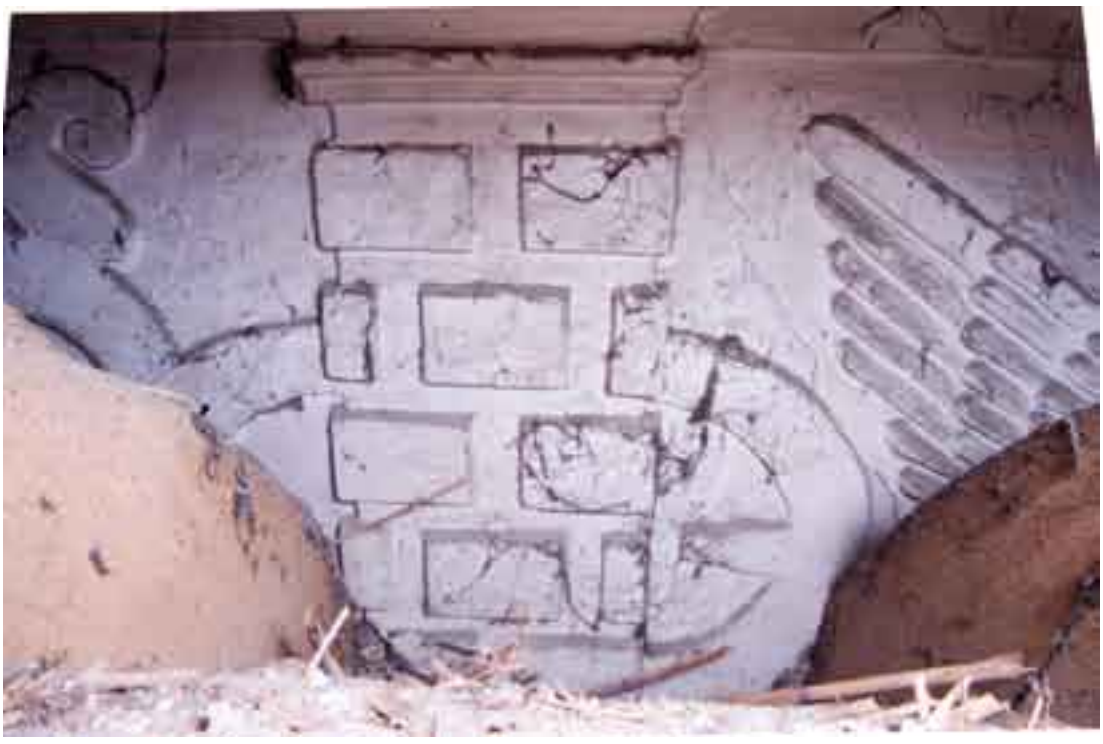
Tony Berry © English Heritage

This drawing reconstructs the original form of the Withdrawing Chamber ceiling (east end). It also shows a recently uncovered doorway (that on the right) which gave direct access to the King's Chamber. The drawing is the result of a combination of photographic research and architectural graphics expertise provided by the IGS team (see previous article)

Blickling and Aston Hall, the ceilings can be placed in the framework of the "London" style that emerged in the 1620s and may be by Edward Stanyon'. As Edward Stanyon came from the nearby village of Nassington, and had previously worked with the Apethorpe master mason on at least three other houses, this is a convincing attribution. As to the original finish of the plasterwork, Claire suggests that whitewash would have been the preferred final coat, 'this seems to be confirmed by the recently discovered tympana, which have no trace of colour on their surfaces'. This has been corroborated by paint analysis by Helen Hughes of English Heritage, who confirms that no early colour can be found, even on the royal arms in the King's Chamber.

Eventually, Claire will publish a full account of the Apethorpe plasterwork, including the discovery of the friezes and an explanation of the work undertaken in the 1740s.

Kathryn A Morrison



Steve Cole. © English Heritage

A detail of the recently discovered Withdrawing Chamber frieze. To the right of the rusticated pilaster is a cherub's wing

The recording of the masons' marks

Masons' marks show a hierarchy of specialist workers and allow comparison with other buildings.

One of several stand-alone studies that have combined to enhance our understanding of Apethorpe Hall, is the recording and analysis of the masons' marks, commissioned in winter 2005-06 from Dr Jennifer S. Alexander. Jenny Alexander is an architectural historian who has taught for many years at the University of Nottingham, and is well known as a specialist in the study of masons' marks, primarily on medieval ecclesiastical buildings. Over the last 20 years she has developed a rigorous methodology for recording masons' marks, and has used the evidence they present to illuminate the phasing of significant medieval buildings, such as Southwell Minster. The work at Apethorpe is the first attempt to adapt this methodology to a post-medieval structure, and has produced ground-breaking results.

So what are masons' marks? Essentially, they are marks incised using a chisel or a punch by banker masons who shaped blocks of building stone. This practice is ancient, and has been part of the construction process since at least the Bronze Age. Marks were made for various reasons which are rarely, if ever, documented. Their purpose must always be deduced from a study of the marks themselves, and the buildings on which they appear. Setting aside quarry marks and assembly marks, which have very specific practical functions, banker marks often seem to record the output of individual masons who were paid by the block (ie: task work), rather than by wages. It is also likely that a master mason controlling a large workshop would have needed to identify the authorship of individual blocks as a means of quality control.

By the early 17th century, in contrast with preceding centuries, marks could be conspicuously displayed as a form of trademark. There was still no registration system for masons' marks in England, but a number of contracts and other documents bearing masons' marks survive from this period.

In at least one recent case, an English monument has been attributed to a named mason because it displays a mark which has been found in a document. However, the potency of masons' marks as a tool for the architectural historian becomes most apparent when we move away from the desire to attribute works to individual named masons, and learn to use them to identify groups of masons (workshops), to elucidate working practices, and to phase and date buildings.

Some of the early 16th-century elements of Apethorpe Hall bear masons' marks, but too few to be significant. It is the work of 1622-24 – namely, Sir Francis Fane's new east range and his remodelled south range – that displays a particularly large number of marks, making it especially fruitful to study, with results that have implications for the understanding of other early modern buildings. The recording of these masons' marks was undertaken methodically, taking advantage of the

Pat Payne, © English Heritage

Dr Jennifer Alexander examining the overmantel in the King's Chamber for masons' marks

Table of masons' marks at Apethorpe Hall

scaffolding currently covering the east and south ranges. Over 850 instances of approximately 60 different marks were drawn and photographed; their precise location and orientation was recorded; the data was encoded, using a format derived from the number of strokes used to cut the mark, and entered onto a database. Analysis of this data has produced evidence of phasing, and of changes in the organisation and composition of the workshop. For example, by plotting the distribution of marked stones throughout the building, and examining variations in the form and position of individual marks, we can suggest that work began with the south and east walls of the projecting south end of the east range, possibly including the cellar in that position. This would have proved less disruptive to the existing building than commencing with any other part of the new work. Stone for the south range displays greater variation in marks than that of the east range, and was cut over a longer period: work may have been less continuous here, where an existing structure complicated the building process.

The marks reveal specialisation amongst the masons, possibly reflecting the hierarchical structure of the Apethorpe workshop. While some masons worked exclusively on simple squared blocks, others worked mainly on window jambs, and a small group of three masons produced moulded doorways and stone for fireplaces. In the latter instance, it is not possible to be sure if the same men were responsible for the figural sculpture decorating the fireplaces, as the marks never

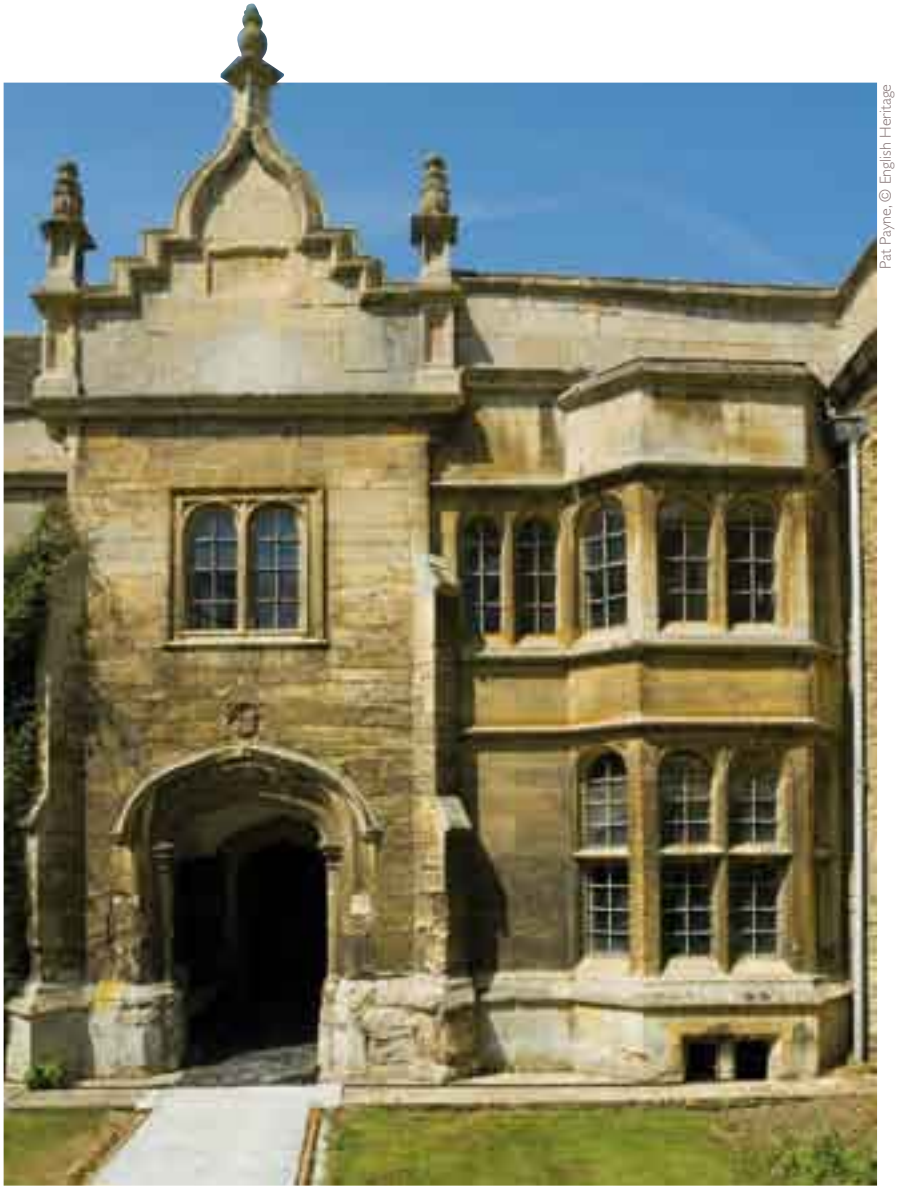
Two carefully positioned masons' marks (2t7) on the underside of impost blocks on the east range of Apethorpe Hall

occur on the same blocks as the carving. It was this elite group of masons that, with other members of the team, cut the stone for the Mildmay Chapel, built in 1621 on the south side of Apethorpe church, to house a monument which has been attributed to the court sculptor Maximilian Colt. There can be no doubt that, on occasion, masons from this group displayed their marks with deliberate prominence, as a form of 'signature'. In the case of the fireplaces, one wonders how they would get away with 'signing' the work, if they were not also the sculptors. This clearly merits further consideration.

At the simplest level, the profusion of masons' marks on stonework known to date from 1622-24 has made it possible to identify other work done on the house at that time. For example, three marks belonging to the 1622-24 workshop appear on

The chimneypiece in the Long Gallery, photographed by RCHME in 1978. The statue of King David playing the harp was damaged by vandals before English Heritage acquired the site

A mason's mark (13h1) on the Withdrawing Chamber overmantle



Pat Payne, © English Heritage

Pat Payne, © English Heritage

The bay window to the right of the hall porch. Once dated to the middle of the 16th century, masons' marks have shown that this was built in the 1620s.

A complex mason's mark (14fa2) on the jamb of the doorway of the Spencer Room, at the south end of the east range of Apethorpe Hall

the windows of a two-storey bay positioned to the north of the hall, within the main courtyard. Previous accounts of the house have always dated this feature to the middle of the 16th century. Now, we can be certain that it was erected in or around 1622-24. Stylistically, it is very different from the new east range: it appears to have been built to balance an older window, at the opposite end of the same façade, and as such was deliberately old-fashioned in style.

Finally, an analysis of the masons' marks at Apethorpe has allowed the research team to establish relationships with other buildings, including Apethorpe church (Mildmay Chapel, 1621; tower arch, 1633), Kirby Hall (staircases and doorways, 1575-91), Stibbington Hall (porch, 1625), Hunstanton Hall (porch 1616-18; gateway to forecourt, 1623), Blickling Hall (1619-23) and elsewhere. From this, there seems little doubt that the workshop in question was that of Thomas Thorpe of King's Cliffe (d. 1626/27), whose involvement is documented at both Blickling and Hunstanton, and whose father's involvement is documented at Kirby. The intriguing possibility remains that Thorpe's personal mark will one day be identified.

Forthcoming publications by Jennifer Alexander, and Kathryn Morrison will explore the significance of the connections between these structures, and the involvement of the Thorpe team, in much greater depth, and will present a fuller account of the methodology involved in recording and analysing masons' marks on this class of buildings.

Jennifer S Alexander and Kathryn A Morrison

Historic interiors investigation and architectural paint research

The search for long lost hangings, missing paint and Jacobean splendour……

The historic interiors research builds on and contributes to the structural and historical analysis of Apethorpe Hall. The main aim of the preliminary phase of the historic interiors research was to clarify the decoration of the state apartment rooms carried out in the 1620s at the command of James I. Further research campaigns will be designed to investigate other areas of the house to clarify earlier phases and the development and use of the house until the late 20th century. This information is required not only to provide an understanding of the original use, fitting out and decoration of the apartment but to inform decisions on the future conservation management and representation of these principal rooms.

At the outset of the investigation an outline A4 room chart was prepared for each of the main areas which integrated the examination of the surviving fabric with secondary sources such as inventories, plans and photographs. Each chart was updated as the research programme progressed and continues to be a valuable working tool for recording alterations and applied finishes. During the late 16th and early 17th centuries fabric hangings were the primary wall decoration in high status rooms, and this was certainly the case at Apethorpe.

Stone architrave
King's Chamber

Cross-section of a sample from stone architrave x100. First decoration: lead white oil paint tinted with smalt applied over white undercoats and a red iron oxide primer

An inventory drawn up in 1629 lists the numerous tapestries and hangings which were the main decorative element of the wall faces of the principal rooms, complemented by curtains, upholstered furniture, cushions and carpets and indicates the increasing opulence and luxury of the state rooms as they near the King's Chamber. The provision of a Turkish carpet and refinements such as matching upholstery *'sutable to'* and pairs of curtains (possibly the earliest recorded indication of the use of such curtains), reveal Fane's wealth and his awareness of contemporary fashions. In contrast to the profusion of colour characteristic of Tudor and Elizabethan interiors, Jacobean tastes were developing an appreciation of more restrained and co-ordinated colour schemes. The Apethorpe research project therefore provides a rare opportunity to correlate the results of a structural investigation with an analysis of detailed 17th century inventory to provide 'a virtual' refurnishing of the state apartment.

Wooden architrave of Duke's Chamber

Although the state apartment retains its 1620s ceilings, chimneypieces and much of its floor-plan, the wall faces have been subject to extensive and repeated alteration. Apart from the panelling in the Long Gallery nothing of the original Jacobean panelling and wall plaster was thought to have survived. The ornate chimneypieces which dominate each room may have been painted and gilded, but have been subjected to a rigorous paint removal campaign, and to date no trace of any 17th-century surface decoration has been discovered. Ornate decorative plaster ceilings such as those found at Apethorpe were commonly painted white except in certain high status rooms where they were, at great cost, sometimes painted blue and even gilded. But investigation of the ceilings at Apethorpe concluded that these, like the chimneypieces, had been thoroughly cleaned. The existing decorations have been applied over 20th-century repairs. The only traces of early 17th-century decorative finishes to survive were found on elements protected by later 18th-century additions which were revealed during the architectural investigation.

For example, traces of a white distemper, possibly the original scheme applied in 1622-24, survive on fragments of the original Great Chamber and Withdrawing Room ceilings which lie behind the existing coving, applied *c*1740, and the original plaster of a window reveal in the Duke's Closet and an entrance to the roof walk.

Until the discovery of the passage from the King's Chamber to the Duke's Closet, it seemed that, due to the extensive paint removal carried out in the previous century, there was little scope for architectural paint research. However this small area, completely blocked and forgotten prior to this phase of works, retains early painted decoration and provides a rare insight into the decorative conventions of the period. Samples removed from the stone architrave in the King's Chamber and the carved wooden architraves

of the doorways into the Duke's Chamber are undergoing detailed analysis. These indicate that both elements were painted white tinted with smalt (a coarse blue pigment used in the seventeen century) over a red primer. Further work will also attempt to decipher the traces of a banded decorative scheme which frames the eastern entrance to the passage from the Duke's Closet. The presence of wooden pegs may suggest that an applied architrave (now lost) may have been fixed as an additional embellishment.

Research continues in the Long Gallery. Close examination of the original panelling suggests that it, too, was subject to the rigorous paint stripping campaign possibly carried out during the early twentieth century when damaged sections of panelling were replaced with fibrous plaster moulds. During the 17th century, oak panelling was routinely grained in imitation of more expensive hardwoods such as walnut. Until recently only one small fragment of a painted decoration had been found on the panelling, but the discovery of two small armorial badges painted on the plaster behind the panelling may provide more clues about its embellishment. These may have been trials for a decorative stencil motif which was applied in the centre of the panel beds.

The lost hangings and the stripped paint and gold are gone forever - but the current investigation helps us conjure up images of the splendour of the sumptuous interiors James I would have enjoyed when he returned to Apethorpe in 1624.

Helen Hughes

Cross-section of a sample from the wooden architrave x100. First decoration: lead white oil paint tinted with smalt applied over white undercoats and a red iron oxide primer

General view of original decoration of doorway from the King's Chamber. This has been decorated with painted banding. The wooden peg suggests that an applied architrave had been added to the doorway

THE APETHORPE HALL RESEARCH PROGRAMME

Landscape analysis around Apethorpe Hall

Analysis shows the impact of Apethorpe Hall on the wider local landscape.

The Hall and village are located on the north-eastern fringe of the Rockingham Forest, an area of Saxon woodland that was formalised as a hunting landscape soon after the Conquest and which grew in size during the 11th and 12th centuries. The placename may well be a corruption of *Api's thorp* – the village or hamlet belonging to Appi. The Scandinavian origin of the placename suggests that the village was already long established at the time of Domesday.

The morphology of the village at this time is unknown but it may well have included settlement and a church. The earliest surviving fabric of the church of St Leonard dates to the late 15th and early 16th centuries but a 12th-century fragment survives and it may well be that a pre-Conquest timber antecedent existed on the same site. A map of *c* 1641 depicts, in a highly schematised fashion, a nucleated village articulated along a number of thoroughfares, with the church sitting at a crossroads. On this map, Apethorpe Hall is shown clearly in its present location with an intimate 'Litle Parke' to the south. A double row of settlement (Town Street) extended towards it from the north, partly mirrored by a parallel row to the west, known today as Laundry Lane.

One of the most basic questions we have asked is 'how old is the village'? Linked to this are questions about the earliest date for the current Hall – is there a precursor underneath/within it, or does it lie buried in the village? Further work is needed but it is worthwhile speculating that the earliest manor at Apethorpe lay at some distance from the present site, perhaps close to the church.

Extract of a map of *c* 1641. This plan shows the village and Hall set within its wider landscape context. Two parks are named. 'Litle Park' on the southern periphery of the Hall was established well before 1551, and 'Newe Park', detached and some distance to the south-west first mentioned in 1543. Within this there are at least two lodges, one of which, on Morehay Lawn, may well be the site of the 'King's Standing' used as a vantage point during the early 17th century to observe the hunt

Extract of Enclosure map of 1778.
This map shows in some detail the layout of the village, Hall and gardens. A fairly well-ordered morphology is visible and this may well be conditioned by the underlying field system. Traces of landscape gardens can be seen to the east of the Hall, and the church is flanked to the south by a large oval enclosure, possibly an early feature in the Apethorpe landscape and of Early-Middle Saxon date

On the 1778 enclosure map the church figures prominently, but the route from the church to the Hall has been altered substantially; buildings and closes have been removed to create an enclosure that houses the 'Manor House', built in 1711 for the Earl of Westmorland's agent Maurice Berkeley. Intriguingly, on this plan, there is a wide area in front of the Manor House in some ways reminiscent of a village green. The main route through the village extends from this open area to the west across the river. To the north and flanking the green on the west, is a large oval enclosure sub-divided by a series of roughly parallel strips. The juxtaposition of crossroads, church, and mill suggest that this is the heart of the ancient village of Apethorpe and that the enclosure may well be an early, Saxon, element in this. Nothing now survives of this enclosure.

The establishment of the village and its manorial focus in the Early Saxon period, itself represented a substantial shift in the immediate post-Roman landscape. A Roman villa, *c* 500m to the south of the Hall of 1st to the 4th century AD date, is the likely precursor to the manorial settlement at Apethorpe.

The establishment of the Hall and its associated gardens in the 15th century fossilised the physical separation of the manor and its village. The Hall and gardens adhere to a fairly geometrical layout and consist of a range of buildings with square and rectangular compartments to the south. This layout is evidently influenced by pre-existing elements of the open field system. On the ground all trace of the fields have been removed but aerial photography has been instrumental in recovering this lost landscape. The 1947 vertical aerial photograph is an excellent example of this. Ridge-and-furrow cultivation is visible on either side of a prominent trackway, evidently a very early and influential route through the landscape. The modern approach from King's Cliffe to Apethorpe follows it, and it clearly continued through the village to the south for a further 1.5km. Ploughing continued in this area until the late 17th century but has a very much earlier origin, probably superimposed on Romano-British fields located close to the villa.

Links between the Hall and the wider landscape are also clear. The *c* 1641 map provides excellent detail on the rural pursuits of hunting, shooting, and fishing especially in the area of the 'Newe Parke', established on higher ground to the south-west of the Hall in existence by 1543. Repeated episodes of expansion took place throughout the 16th and 17th centuries and within its bounds there is a substantial lodge and associated pond. The incorporation of 'greene' areas,

Extract of aerial photograph. Aerial photography has been instrumental in allowing us to assess the importance of relict landscape features in the landscape around Apethorpe. On this photograph, Blomfield's early 20th-century lake is prominent on the east side of the Hall. To the south and west, the remains of ridge-and-furrow cultivation can be seen spreading out on either side of a trackway that extends in a loop from the north (top left of photograph). The trackway extends to the south of the Hall for some distance and is likely to have been an important element in the pre-Hall landscape and appears to provide an axial cue for the development of the Hall and its garden compartments

such as 'Apthorp Greene' and 'Goose Greene', provided suitable arenas during the hunt, and here it is plausible that the remains of the (by then deserted) village of Hale, were included, perhaps as a nostalgic and noteworthy feature. It is worth speculating that 'Morehaie Launde' (Morehay Lawn) may well have been established for horse racing. The 'King's Standing' was identified as the spot where, during the reigns of James I and Charles I, people would gather to view the racing in adjacent fields. No trace of this vantage point survives but the *c* 1641 map depicts an open courtyard building, probably the 'King's Standing', on the northern periphery of the 'Launde'.

More formal gardens were created around the house in the 17th and 18th centuries. To the east of the Hall the Great Pond, was used for boating as early as 1659. The Enclosure map of 1778 shows a formal layout of ponds aligned with the house here, in a field called 'Farrying Ground'. In this general area there are at least two small tree ring enclosures, another lies 500m to the south, and they were intended to act as eye-catchers when viewed from the Hall. It may well be that the large tree ring hosting a Lebanon cedar on the lawn adjacent to the former 'Bowling Green', identified as such *c* 1720-40, on the south side of the Hall, is contemporary with this phase of garden activity. One of

the most significant features of the 18th century designed landscape is the Dovecote, built on rising ground 200m to the north-west of the Hall, and part of the 7th Earl's embellishment of the estate.

In the late 18th century additional work was carried out including a refashioning of the park to the west of the private gardens. Here, on the edge of the former orchard, is a small detached garden that consisted of a rectangular pond, with the domed remains of a red brick ice-house at its north-eastern corner. The pond was fed by a spring 120m to the west, water flowing along a sharply defined channel furnished with a brick-built culvert. To the south of the pond there is a serpentine pathway, still traceable on the ground, leading in a loop through a small copse.

Following the purchase of the estate in 1904 by Leonard Brassey, the gardens and parts of the Hall were remodelled by Reginald Blomfield over a period of several years. A lake was created in 1908 to the east of the Hall and alterations as part of this removed elements of the earlier designed landscape including much of the 'Farrying Ground'.

Apethorpe today is a village much like any other, containing a mix of building types with a veneer of recent development. Its appearance, however, evidently masks a long and complex history. Archaeological investigation in the village as well as the landscape surrounding Apethorpe, incorporated analysis of documentary material and early cartographic sources as well as aerial photographic interpretation and ground-based reconnaissance. What we arrive at, now, is an understanding of the Hall and its setting that is both unexpected and exciting in its detail, and illustrates the 'connectedness' of the landscape at Apethorpe in a way that was previously underestimated.

Dave McOmish

The Dovecote.
One of the most significant features of the designed landscape is the Dovecote, built in 1739/40 on rising ground 200m to the north-west of the Hall, and part of the 7th Earl's embellishment of the estate. The Dovecote, with its distinctive ogee roof profile, was designed as an eye-catcher or feature in the park and is visible across much of the southern and eastern areas of the garden

THE APETHORPE HALL RESEARCH PROGRAMME

Dendrochronology

The dating of timbers within the buildings confirms established phasing and opens up new questions.

An extensive dendrochronology programme, commissioned by the Scientific Dating Team, is being undertaken by the Nottingham Tree-Ring Dating Laboratory, with technical support and quality assurance from Cathy Tyers at Sheffield University.

Sampling has proceeded in conjunction with architectural research, as areas have become available for investigation. Over 220 samples have been obtained from oak timbers in the main house complex, with a further series of over 40 samples from the stables and granary complex to the north-east. So far 175 timbers have been successfully dated, representing seven periods of tree-felling from the late-15th to mid-18th centuries, all of which can be linked to documented periods of construction or remodelling. It has provided independent confirmation and clarification of the extent of previously identified building phases, and has led to some alternative interpretations.

The precision of dating varies according to the number of datable timbers from an area and how many, if any, retain the final growth ring (bark edge), which gives the precise year of felling. If at least some of the outer band of rings (sapwood) exists, a felling date range can be established. Usually construction (using green timber) followed very shortly after felling, but with large scale construction short-term stockpiling and reuse of timber is to be expected, potentially complicating the interpretation of dendrochronological results. Clear evidence has been found of multiple felling dates in several of the areas investigated at Apethorpe.

Analysis has shown that timbers from the roofs of the cross wing and parlour wing in the hall range, and the roof of the west range, are broadly coeval, and date to the late-15th century. This was expected for the cross wing and the west range, but it had been thought that the parlour wing roof was rebuilt in the 17th century. As only one timber from this group has bark edge (dated to 1476), we cannot say whether the roofs are precisely coeval or built in a particular order. It is impossible to relate the construction of these roofs to that of the hall, which was built using timbers from young, fast-grown trees (sequences of fewer than about 50 rings can rarely be dated reliably).

There is widespread evidence of felling in the mid-16th century, associated with the extensive works undertaken by Sir Walter Mildmay. Timbers of this date were found in the north and hall ranges of the main house, the granary and the stables, but in the south range, where the state apartment

Left: The roof of the Granary, dendro-dated to the 1560s.

Right: Robert Howard of the Nottingham Tree-Ring Dating Laboratory at work on the roof of the East Range

were created at this time, there were only three dated timbers of this period, in the roof of the extreme west end. This roof also incorporates at least two timbers associated with the major remodelling by Sir Francis Fane, thought to have started in 1622. Similar results from the roof of the 'vice' adjoining the gatehouse in the north range, suggest either that earlier timbers were reused in a new 17th century roof, or that remodelling included the insertion of later timbers into an existing roof.

The east and south ranges show widespread evidence of felling activity associated with Sir Francis Fane's works. Some of this pre-dates the 1622 order by the King granting trees from the Royal Forest to enlarge the house, suggesting that the formal document confirmed an existing informal agreement. A trimmer beam in the east range, now hidden under floorboards, was felled in 1620, and may therefore mark the position of the original staircase. A precise felling date of 1621 from a timber in the roof of the south range, and a date-range of 1613–30 from another, confirm that this roof was rebuilt at about the same time as the east range was built. The dated timber work associated with the state apartment is clearly all from this period of reconstruction.

An unexpected phase of felling dates to the latter part of the 17th century. Several precise felling dates between 1682 and 1692 have been produced for timbers from the matted passage in the hall range. This passage connects rooms in the north range with the principal lodgings on the garden front, and was expected to date to the first half of the 16th century, but none of the dated timbers can be of this date. The implication is that the matted passage may have been partially rebuilt in the last decade of the 17th century.

The final major felling period dates to the first quarter of the 18th century. The documented 1704/5 rebuilding of the kitchen in the north range is reflected in early 18th-century felling date ranges for many of the kitchen roof timbers. A series of precise felling dates between 1706 and 1716 have been produced for timbers from the Orangery, which accords well with the documented construction date of 1718-19. Away from the main house complex, felling dates obtained from the granary complex indicate a period of broadly coeval activity.

The most recent timbers so far dated are two joists in the South Range Drawing Room, both of which appear likely to date to the mid-eighteenth century, and one of which was felled in 1740, coinciding with the Palladian reconstruction of the north elevation of this range.

Further sampling will be undertaken to address additional questions that have arisen during the dendrochronological and architectural research. Once completed, in addition to the independent dating evidence for the architectural history of Apethorpe Hall, it may be possible to examine the data more closely to reveal any changes in timber resources through time.

John Meadows and Cathy Tyers

Centre: Robert Howard inspects the hall roof fence.

Below: The West Range roof, dendro-dated to the late 15th century

RESEARCH THEMES AND PROGRAMMES

A 2 D 4 E 1

Apethorpe Hall: geophysical survey

Despite the worst efforts of Skullion, geophysical survey has proved useful both inside and out at Apethorpe Hall.

A series of geophysical surveys have been conducted at Apethorpe Hall, including work conducted directly by English Heritage and extensive magnetic and earth resistance coverage over the surrounding land commissioned from external contractors. Much of the work conducted by the Geophysics Team has been closely associated with the evolution of structure of the building in an attempt to answer questions posed by colleagues in the Architectural Investigation Teams.

The most promising area for geophysical survey was probably the East Main Courtyard, which is currently laid mainly to grass, making an earth resistance survey both practical and a useful complement to the existing magnetic data when searching for structural remains. However, the complex nature of the expected remains suggested the added vertical resolution of Ground Penetrating Radar (GPR) would be useful both here and essential within the fabric of the building itself. The amplitude time slice from the GPR survey in the East Main Courtyard superimposed over the metric building plan effectively shows the varying strength of GPR reflectors through a thin slice of the ground between 0.675 and 0.75m below the current ground surface. Both the GPR and the earth resistance surveys revealed anomalies associated with the former structure of the Hall, including the putative remains of the original East Range.

Fig 1: Greytone image of the 18 to 20ns GPR amplitude time slice (approximately 0.675 to 0.75m beneath the surface) superimposed over the metric plan of the East Courtyard, revealing wall footings that may be related to an earlier phase of the Hall. The inset figure shows a deeper time slice (0.825 – 0.9m) containing a curious circular anomaly, possibly from a stage prop fountain when the site was used for a film set

A subsequent, slightly deeper time slice from the GPR data (Fig 1) located a curious circular anomaly virtually in the centre of the current courtyard design. Such unexpected anomalies tend to cause great excitement in the field when huddled around the laptop in a welcoming hostelry after a hard day's survey. Could this be an original garden design lost beneath the modern utilitarian concrete paving slabs crossing the courtyard? Whilst this interpretation remains possible, background research revealed alternative explanations from the more recent history of the building when it was used as a film set for film productions, including both *Another Country* and the television adaptation of *Porterhouse Blue* featuring David Jason as the irascible head porter Skullion. Careful scrutiny of the Porterhouse Blue DVD suggests Skullion may be off the hook this time, but further research into the other films that used the Hall for their location is still ongoing. Perhaps excavation next year will be the only means of discovering the true origin of the circular anomaly?

The scaffold erected around the South and East ranges of the building also caused some

geophysical problems, both limiting the physical area available for survey and also acting as a very strong surface radar reflector. Unfortunately, some radar energy always leaks out from the antenna and is usually dispersed through the air with little impact on the significant, sub-surface reflections. However, the proximity to the survey area allowed these air-wave reflections to travel from the transmitter to the scaffold and back again to the receiver, where they appear as spurious high amplitude, dipping reflectors in the resulting GPR profiles that can easily be misinterpreted in the final data set. The air-wave anomalies always "rise" in the GPR profile at the end of the lines, due to the shorter travel time between the antenna and the surface reflector, and the angle of dip gives the velocity of the wave front. In air, the velocity of an electromagnetic wave front will approach 0.3m/ns, over four times the average speed of the same energy measured in the ground at Apethorpe (~0.075m/ns).

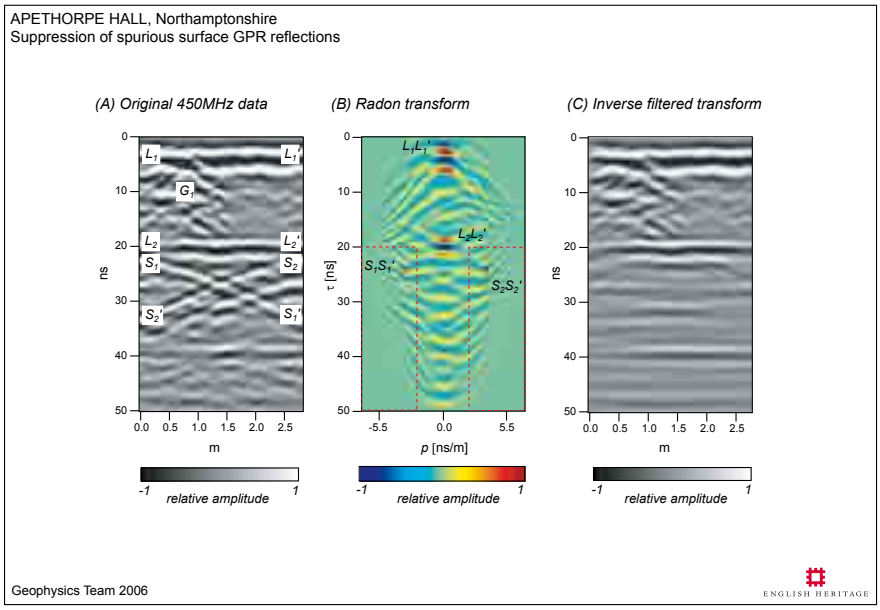


Fig 2: Spurious surface air-wave reflections present in (A) the original GPR profile are suppressed through the use of a linear Radon transfer. The dipping linear reflections (S_1S_1' and S_2S_2') are clearly distinguished in (B) the Radon transfer and are removed by muting data within the red dashed boxes. Applying an inverse transform (C) retains both significant horizontal reflections (L_1L_1' and L_2L_2') and the response to a possible buried wall (G_1) whilst removing the spurious air-wave energy.

Similar problems with air-waves were encountered in the confined spaces investigated within the building, particularly where wall mounted panel radiators or other metal objects were present. Fig 2 shows a typical GPR profile containing both horizontal linear anomalies

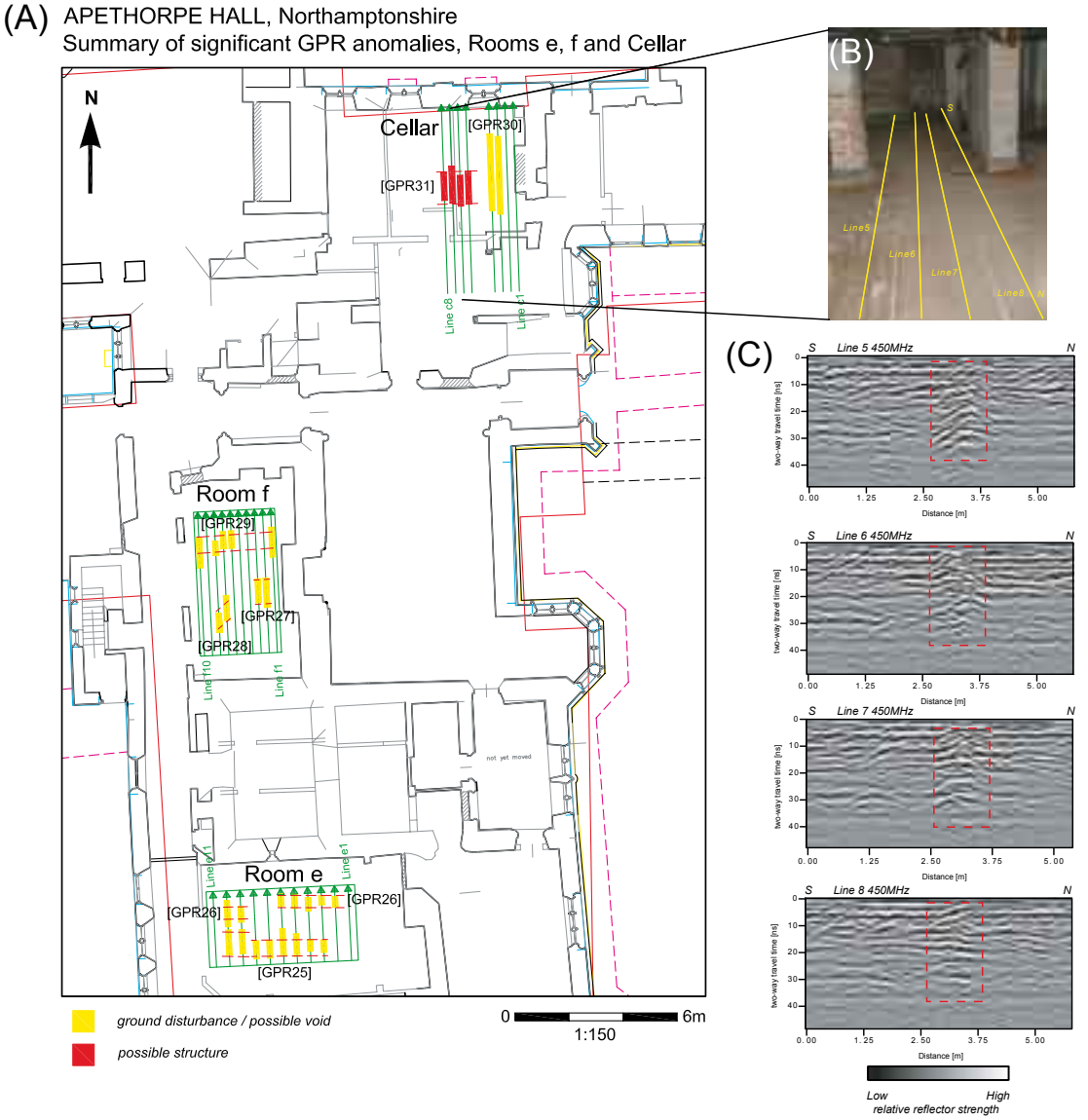


Fig 3: (A) graphical summary of significant GPR anomalies recorded inside rooms e, f and the cellar (B) beneath the North Range. GPR profiles collected from the cellar (C) show a possible wall footing (dashed red box) beneath the concrete floor

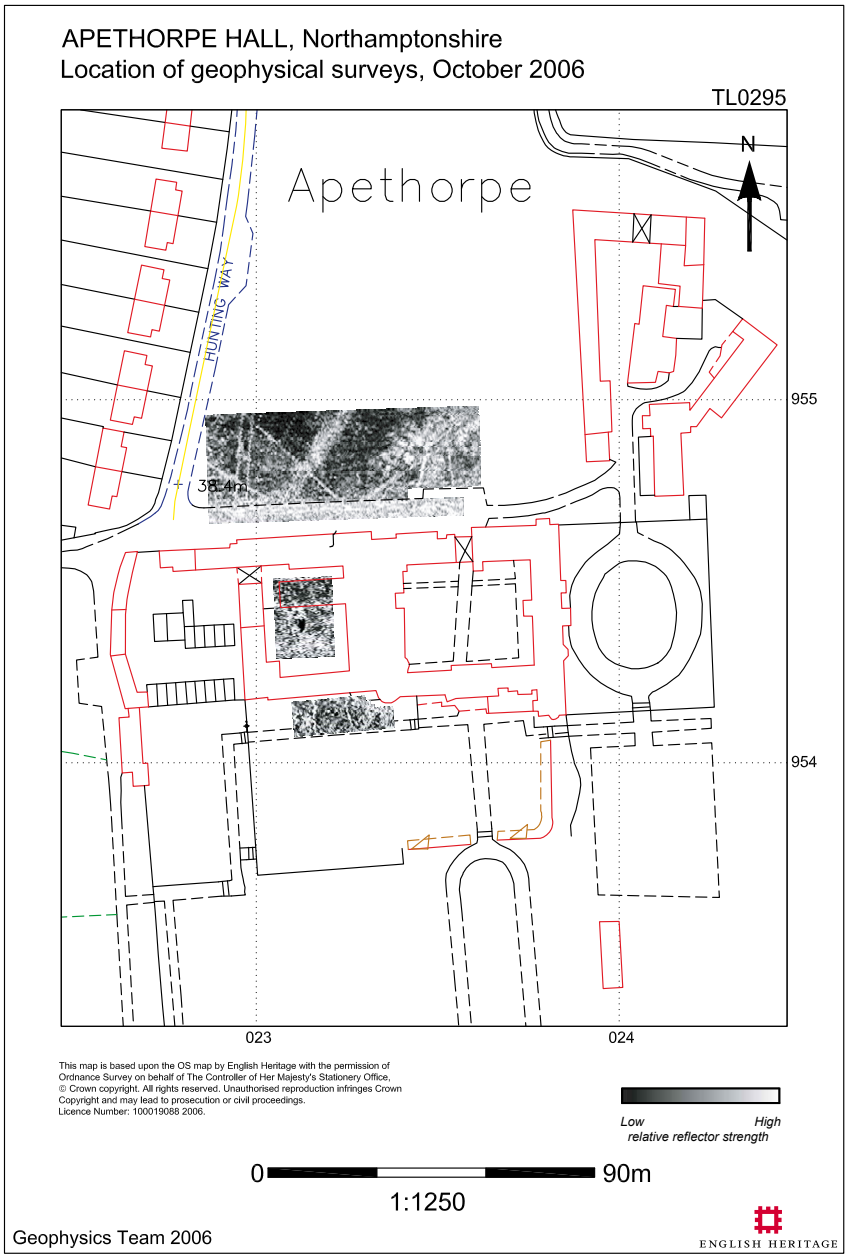


Fig 4: Preliminary results from the GPR survey conducted in October 2006 showing amplitude time slices between 20 and 24ns (approximately 0.75 to 0.9m) collected over the North Lawn, West Courtyard and to the south of the Orangery

together with two spurious air-wave reflections from the walls of the room at either end of the traverse. These spurious reflections were suppressed by the application of a linear Radon transform allowing weaker, more significant anomalies to be identified at the expense of some slight smoothing of the data.

After appropriate data processing, including application of a Radon Transform, useful information could be gained from unpromising parts of the building. For example, Fig 3 shows a series of GPR profiles collected down in the cellar beneath the kitchens in the North Range, where the possible continuation of a truncated section of original walling entering the cellar from the East was revealed.

A second campaign of GPR survey was conducted in October 2006, (Fig 4) and only preliminary results were available before the production of this article. Unfortunately, results from the West Courtyard have been dominated by the response from the class room block recently removed from this area and other modern services. However, results from a much larger area over the North Lawn proved more fruitful and despite replicating the known location of services identified from previous earth resistance and magnetic surveys some additional structures may be tentatively interpreted from the data at this stage.

Neil Linford

Ralph Treswell's map of Hailes Abbey

A newly discovered map from shortly after the Dissolution provides a pictorial representation of a monastic landscape.

An analytical earthwork survey was recently undertaken at Hailes Abbey in Gloucestershire, by the Archaeological Survey and Investigation team based at Swindon. Having completed the fieldwork, which included an investigation of the wider Hailes landscape, a trawl of the relevant documentary and map evidence was made in order to put the site in its wider landscape and historic context.

It was during this process that a map by the Elizabethan surveyor and cartographer, Ralph Treswell, was found at the National Archives at Kew (TNA: PRO MF1/57). The map was produced as part of a commission of inquiry in 1587 into the ownership of Hailes Park (TNA: PRO E/178/910). It is an immensely important map since it was produced less than fifty years after the abbey's suppression and shows the surviving monastic buildings, the communication and land-use pattern, and elements of the water management to the abbey. On other monastic sites we generally only have the written surveys of the suppression commissioners, the Court of Augmentations accounts, or a survey of the new secular landowner, to get an impression of the monastic layout, but here at Hailes we have a vivid pictorial representation.

The map appears to have escaped the notice of previous researchers and is not included in a list of Treswell surveys drawn up for the London Topographical Society in 1987 by John Schofield, possibly because it was

The remains of the conventual buildings at Hailes. The west range is in the foreground

An extract of Ralph Treswell's map of Hailes dating to about 1587 showing the detail within the former precinct (TNA: PRO MF1/57; north is to the left)

previously attached to the deposition document and therefore part of a bundle. Unfortunately, parts of the map are damaged, particularly the top and bottom; however, in the context of the depiction of the late 16th century landscape, this is probably of little consequence.

Ralph Treswell was among the first cartographers in England to produce scaled plans of estates as opposed to the earlier practice of producing sketch plans or perspective views. Much of his early work was concerned with mapping rural estates in the south of England, and it was not until the first decade of the 17th century that he undertook the urban surveys in London for which he is perhaps better known.

The map is largely coterminous with the ecclesiastical parish. The site of the abbey, set within its former precinct, lies almost at the centre of the map. Beyond the precinct, to the north-west, lie the open fields that extend across the lower plain as far as the River Isbourne and parish boundary. The lower Cotswold slope, which rises above the south-eastern side of the precinct, is dominated by smaller enclosed fields, parkland, and Hailes Wood.

The precinct encloses the monastic church and conventual buildings, the inner court, outer court and the home grange, and covers an area of about 30 hectares. The boundary is shown by what appears to be a paling or a hedge symbol (this is similar to Tilty Abbey in Essex where the precinct boundary was a combination of a hedge and stone wall). At Hailes, the boundary can be traced south-east from the outer gate along a track called Salter's Lane, and then north-east along Hailes Wood before turning north-west to another field gate. The northern boundary is marked by a couple of buildings and what appears to be walling (a continuous double line). It then extends further north-west before turning south along a track.

Access to the abbey was marked by the wayside cross and the gatehouse complex, which comprised an outer gate (a simple field gate positioned on the precinct boundary)

and the inner gate (or great gate). The gates were separated by a short, broad lane with a couple of buildings on the southern side; the larger building may have been guest, or pilgrims', accommodation, since the close beside it is known as 'the inn and close'. The inner gate opens up to the inner court from where a visitor is afforded a view down to the west end of the conventual church and the 12th century church. A building abuts the gateway within the inner court, with a longer detached building beyond.

The principal building that survived the suppression was the west range (the former abbot's lodging), which was converted into a manor house. The abbey ruins are depicted by stone symbols. Although Treswell's illustrations of houses have been described as sketches and not necessarily particularly accurate, here the manor house is remarkably similar to the house shown on a much later engraving by Kip, which suggests that the buildings were relatively accurately depicted. A building extension can be seen on the west side of the manor house. This extension is also shown by Kip where it can be more readily interpreted as a chapel; it was also described by Celia Fiennes in the late 17th century as '… a pretty Chappel with a gallery for people of quality to sitt in which goes out of the hall …'. Since it is shown on Treswell's map, it is likely that it was the abbot's private chapel.

Another building of note within the inner court is the 12th century church, which is probably the building set within an enclosure near the manor house. It has previously been interpreted as a parish church or gatehouse chapel, but was probably used by the hired labour and pilgrims. Beyond the abbey ruins is a slightly curving walled enclosure, which still survives as an earthwork, and has been interpreted as a garden or orchard.

On the north-western side of the precinct was the home grange, which was dominated by a nine-bay barn with a dove-cot positioned centrally in its yard and other buildings on the perimeter. Set apart from the home grange, but nevertheless an integral part of it, was the sheep house. At many Cistercian houses the movement of sheep between granges, from summer to winter pastures, and the collection of the wool clip and skins, was organised centrally, and it is probable that the sheep house here was the administrative centre of their sheep economy.

Until the identification of the map, it was assumed that the main source of water to the abbey was from the rectilinear lake in the outer court; however, it is clear that there were at least two other sources. The lake (which still survives and has a massive dam on its north-western side) provided water to the reredorter, and along a mill-race to a mill in the west. Another source was from a spring on the lower Cotswold hill-slope, which supplemented the water in the lake. The third source was from a conduit house (the 'condit heade'), which collected water from springs on the higher ground. From the conduit house the water flowed along a 'pipe of lead' to what appears to be a settling tank within the outer court, and then to the abbey's south range.

Graham Brown

The conduit, was 'a pipe of lead', which extended from a conduit house on the hills above the abbey to a settling tank within the precinct (TNA: PRO MF1/57; north is to the left)

RESEARCH THEMES AND PROGRAMMES

A 2 D 2

A fluid landscape: lead mining and river systems in the North Pennines

This multidisciplinary project aims to integrate archaeological analysis of the impact of historic lead mining with scientific research into hydrological modelling and climate change.

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Scordale Beck emerging from the high fells of the North Pennines. The scale of the catchment is well illustrated by this photograph. The main mining complex under threat is hidden from view round a bend in the valley toward the top centre, with more lead-mining remains extending for a further 2km along the valley floor. The village of Hilton is in the foreground. Erosion and sediment distribution have led to damage to tracks and walls between the mines and Hilton, and even in the lower reaches of the river system below Hilton, there is a potential threat to the infrastructure of the modern landscape

Rugged, remote Scordale, with its steep slopes, dramatic streams and stark limestone buttresses, lies within the boundaries of the North Pennines Area of Outstanding Natural Beauty (AONB). It is also a Site of Special Scientific Interest (SSSI), a Special Area of Conservation (SAC) and a Special Protection Area (SPA). The valley forms part of the Ministry of Defence (MOD) Warcop Training Area in Cumbria and public access is therefore tightly restricted. Flowing through the valley is the Scordale Beck, a tributary of the larger Hilton Beck, and part of the larger catchment area of the River Eden. Scordale's natural beauty is overlain by an artificially created landscape resulting from at least 200 years of lead and minerals mining, which finally ceased in the early 20th century. These industrial remains, which extend for nearly 2km along the valley, include former mills, tramways, levels, processing areas and waste heaps. Water was used to power machinery, to refine the ore and to expose the mineral-bearing outcrops by the process of 'hushing', which involved the sudden release of deluges from reservoirs high on the valley sides. Consequently, the system of water management was complex and frequently modified, leaving reservoirs, channels and drains scattered across the valley sides. The national importance of these remains is acknowledged in their designation as a Scheduled Ancient Monument.

However, water from the Scordale Beck, which at one time provided the lifeblood for the industry, is now threatening both the survival of the scheduled monument itself and is having a detrimental impact on the wider fluvial landscape. The location of the river catchment area makes Hilton Beck prone to flooding from convective rainstorms and prolonged winter precipitation, and this, coupled with significant sediment delivery problems, has led to severe erosion of the scheduled lead-mining remains. Within the last few years, catastrophic flash floods have reduced former processing buildings to piles of rubble and have undermined waste-heaps. Also, this process has both revealed and partially destroyed buried structures and surfaces which may represent the earliest phases of mining on the site. Further downstream, the flooding and sediment distribution has impacted on the infrastructure of the modern landscape, resulting in the undermining of field walls, roads and tracks. To understand why these problems are occurring and help formulate a strategy for future conservation and management of the valley and its lower reaches, along which is located the village of Hilton, the Eden Rivers Trust in collaboration with the MOD, commissioned a study of the fluvial mechanics by the Geography Department of Durham University. This study, conducted by Professor Stuart Lane, identified the fact that

as well as issues related to localised relief and climate change, the historic human land-use, particularly that associated with lead-mining, was a factor in the dynamics of the river system. However, the importance and long-term impact of this problem was unclear in the absence of any firm understanding of the nature and scale of the industrial activity as there has been no systematic study of the archaeological remains in their landscape context. It was apparent that improved understanding of the historic environment was necessary to understand the interaction between the natural and artificial factors, and then to address the conservation issues.

To inform these research and management issues, the English Heritage Archaeological Survey and Investigation team at York is carrying out a detailed analytical survey of the industrial landscape, working with the MOD (who are part-funding the study), Durham University, the North Pennines AONB Partnership, the Eden Rivers Trust, the Environment Agency and English Nature (now Natural England). The results of the project will not only help prepare recommendations for conservation and management of the historic landscape of Scordale, particularly the scheduled lead-mining remains, but will also feed into the development of predictive models and methodology for use elsewhere within the AONB. With this agenda, the project also contributes to the joint accord on the historic environment signed by English Heritage, Cadw and the National Association for Areas of Outstanding Natural Beauty in 2004. This accord represents a commitment by the three organisations to work in partnership in order to promote the conservation, understanding and public enjoyment of heritage within the AONBs.

The survey methodology for this project has had to be tailored to the restrictions of a military firing range to which access is only available for a few days each year. Where complex industrial landscapes are concerned, evidence for the processing method, for where specific activities were carried out, and for change over time can only be gleaned by detailed examination of the surface remains. Ephemeral earthworks, timber posts, differences in the colour and texture of waste material, discarded artefacts and stratigraphic relationships can all offer vital clues. Experience has demonstrated that this level of detail and analysis cannot be gained and recorded by remote methods such as aerial photography and can only be efficiently undertaken using ground-based analysis and survey, in particular using survey-grade GPS. However, to maximise the value of the limited recording time on the ground, detailed survey is being restricted to the most complicated and threatened remains at the heart of the complex. Digital aerial photography (commissioned by the MOD) is being used to provide an overall transcription of the valley margins, principally to record topography and the more obvious archaeological features, such as quarries and waste-heaps. A rapid ground survey will be conducted to enhance the area covered by the transcription and integrate the results into the analysis. Ground-based photogrammetry is also being used to record the areas where erosion is most severe as part of a 'preservation by record' strategy. Survey commenced in the summer of 2006, and will be completed in 2008. The results will be published in the *English Heritage Research Report Series* and data will be made available for integration into the GIS systems and research strategies of the various bodies involved in the project.

Stewart Ainsworth and Abby Hunt

(AA052380)

Above: This view of the core processing area illustrates the erosional problems at the head of the valley. When this photograph was taken, the Scordale Beck (flows from top left to bottom right) was relatively low. At times of high rainfall the Beck rises to torrent levels which both decend the valley and issue from the high valley slopes (the course of one can be seen on the right). In this area of maximum impact lie the remains of the main crushing mills, buddles and other processing areas.

Remains of one of the buildings collapsing into the stream bed

(AA052377)

NEW DISCOVERIES AND INTERPRETATIONS

A late medieval/ Renaissance garden at Ashby de la Zouch

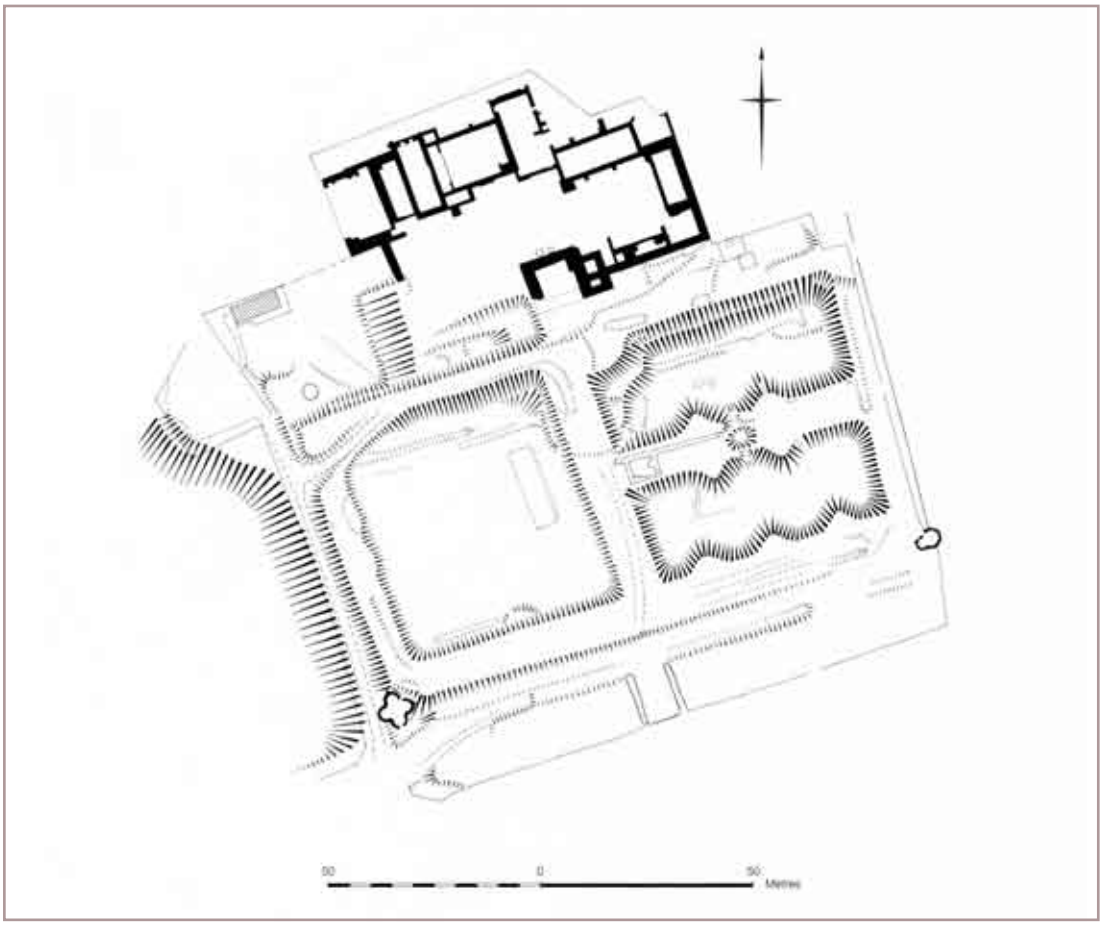
A suite of techniques were employed to elucidate the form, context and date of a remarkable 16th-century garden.

Ashby Castle was a manorial centre developed by the Zouch family from the 12th century. Important additions were made in the late 15th century by William, Lord Hastings, a trusted and powerful supporter of Edward IV. The new works included a massive residential tower and rebuilding of other parts of the complex in a castellated style that reflected Hastings' status and ambition. Though ruinous, much of Hastings' buildings survive. To the east of the castle buildings are the equally remarkable remains of a garden known as The Wilderness. Despite its apparent association with the high-status late medieval residence, the garden has eluded scientific scrutiny in modern times. Is this a late medieval or Renaissance design, created to complement the buildings during or some time following their construction?

To address this question, in the spring of 2006 with support from the Wolfson Gardens Challenge Fund (funded by the Wolfson Foundation), English Heritage commenced a programme of research to identify the original form and context of the garden and to chart subsequent modifications. This research will help English Heritage to provide new interpretation on site.

The field programme took place between March and August, beginning with analytical earthwork survey. This showed that the garden is located on an artificial 'terrace' that slopes very gradually southward, with

Ashby Castle from the south, across the garden, showing Lord Hastings' great tower



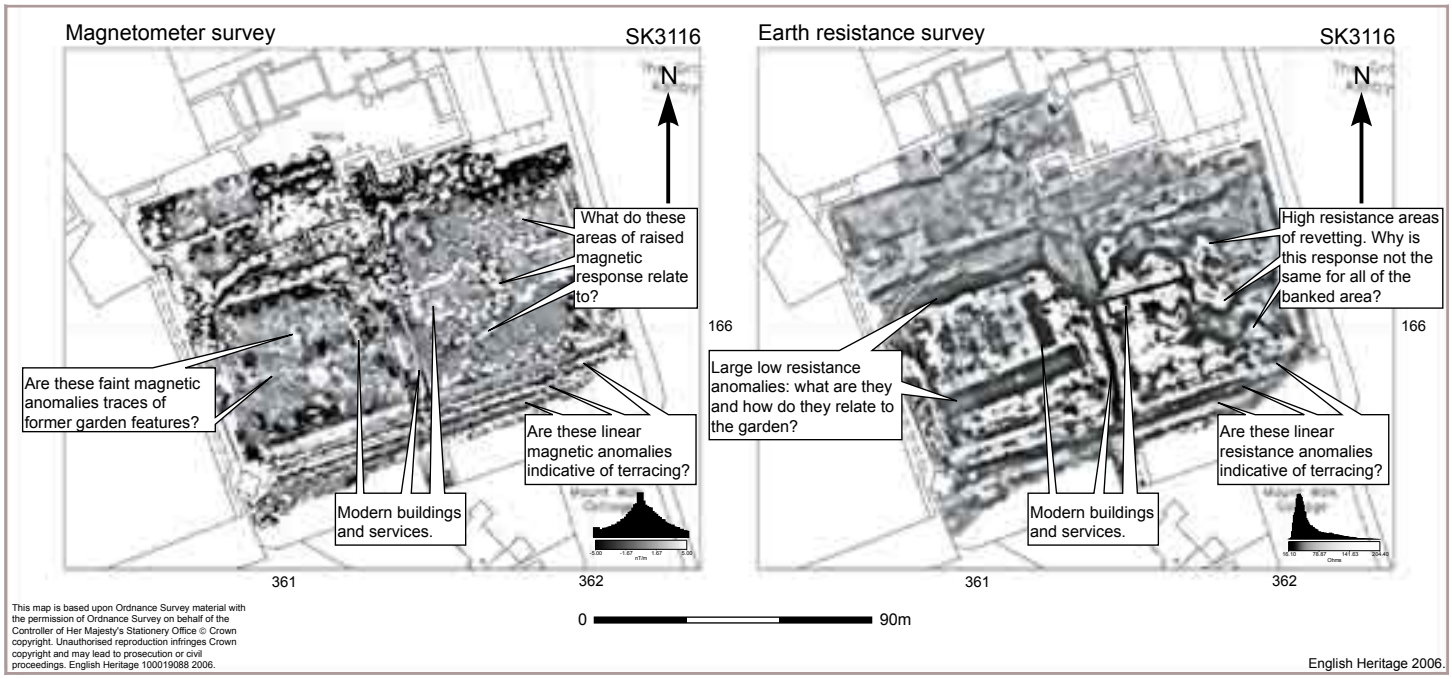
The earthwork survey of March 2006, showing the relationship of the garden to the castle buildings

an overall fall exceeding 2m. The garden comprises two deeply sunken compartments, each *c* 50m square, aligned with the castle buildings. The western compartment is a simple rectangle whilst the eastern one is bisected by a broad walkway and has elaborate scalloped sides. Another wide walkway runs between the compartments and both of them connect with a broad perimeter path. The walkways facilitated access while also providing an elevated view over whatever garden features were contained in the sunken compartments. The garden was defined by brick walls on at least three sides, with substantial remains of two brick garden buildings at the south and east corners. The walls were high enough to create a private garden space. A large crater at the centre of the walkway across the eastern compartment was considered to be the site of another garden building or perhaps a fountain. Previous opinion suggested that the subdivided eastern compartment was a water garden of two ornamental ponds, and the plainer western neighbour a bowling green. The earthwork survey questioned both interpretations, given the slope across the site and the absence of a water supply.

The survival of earthworks beyond The Wilderness, and limited documentary research, suggests that the surviving garden is part of a much wider landscape of gardens and parks.

Geophysical survey was conducted over the whole Wilderness immediately following the earthwork survey. The aim was to gain a better understanding of the original form and any surviving detail from the internal features of the garden, and thereby inform the positioning of proposed excavation trenches. In addition, several parchmarks on the site needed clarification.

The quatrefoil banqueting house at the south-west corner of the garden, seen from across the garden earthworks



Geophysical survey diagram showing the complex anomalies identified by both techniques, and preliminary interpretations

Both magnetometry and earth resistance were applied and revealed many interesting anomalies, such as possible walling or terracing to the south and north of the sunken compartments, evidence for reinforcement of the walkways and traces of more modern buildings and services. The pond theory was further discredited by the absence of evidence for a water supply to the eastern compartment, and the general background response not being symtomatic of a water-laid deposit. The response from the western compartment was very confusing, with large rectilinear areas of low resistance on a different alignment to the sides of the compartment. These are not indicative of flower beds or other garden features but no other explanation could be offered. Very faint magnetic responses were recorded criss-crossing the base of this compartment, which may relate to a deliberate sub-division but generally the patterning was obscured by intense modern responses.

Shortly after the geophysical survey, core samples were taken across the eastern and southern sides of the garden to try and determine the basic stratigraphy of the sunken compartments and walkways. The soils in the sunken areas proved to be shallow and close to bedrock, implying that they were dug into the pre-garden land surface. Logically, the amount of material removed to make the sunken areas would be roughly the same as the amount used to build the walkways. This proved not to be so and the walkways are completely artificial and do not have buried soils underneath. This pointed to several phases of earthwork construction which probably removed all traces of the pre-garden surface. Such a view was further supported by the large drop from the garden edge on the south side and suggests that the creation of the garden was a major earth-moving exercise, completely remodelling the local landscape.

Analysis of all the survey work guided the positioning of three trenches, which were excavated by a team of ten along with local metal detectorists and a trainee archaeologist. On the east side, one trench examined a section of the very substantial brick perimeter wall and showed that the walkway against and inside it was raised soon after its construction; the two are effectively contemporary. This was a major conclusion as it implies the garden, notwithstanding later modifications, is a singular creation. A trench in the western compartment recorded sharp, linear arrangements of differently coloured sandstones (purple, yellow and orange). Could this represent the remains of an 'emblematic' garden – a garden made not with planting but with different colours and materials? Or is this simply natural ground? The only way to be certain is to undertake a larger excavation.

In the eastern compartment the third trench explored the deep crater in the central walkway. True to prediction, this revealed

Far right, top: The east side of the entrance passage to a circular brick building, revealed by excavation in the centre of the causeway that divides the west garden compartment

Far right, bottom: Open day at Ashby Castle, during an early stage in the excavation of the east compartment

the remains of a round building in brick, probably a tower similar to the two surviving at the garden corners. This one may have contained a stair to provide a way down onto the floor of the garden compartments. Two spurs project from the walkway on each side of the building, possibly to enhance the appearance of the entranceway, while excavations of the tip of one of the spurs showed them to be very angular and demarcated by a drain.

Preliminary analysis of finds places the garden construction in the early 16th century.

Later, Ashby Castle was used as a Royalist stronghold during the Civil War. It is likely that the garden wall may have been re-used to defend the castle against the attacking parliamentarians during a prolonged siege. Accordingly, a substantial ditch was dug outside the wall as a defensive measure against escalade. Further defensive modifications included increasing the height of the banks around the castle. Musket shot recovered from the excavations, as well as the scars from musket fire that pepper the castle walls, provide us with a reminder of the fighting that took place here.

To date the Ashby project has yielded remarkable results, principally the potential dating of a surviving earthwork garden to the early 16th century. Such evidence is extremely rare. Current work includes detailed analysis of the finds and a programme of documentary research to determine whether or not there is any primary evidence for the creation of the garden and significantly, who ordered its construction. Fitting the garden to a historical and cultural context is a challenge but would be a remarkable achievement.

Most importantly, the results of all this research will be brought quickly to the public. During the excavations, two open days proved very popular. A new interpretation scheme is being prepared, including a guidebook and several site panels that will focus on and make links between the castle, garden and surrounding landscape.

Paul Pattison, Sarah Newsome, Jim Leary, Louise Martin, Matt Canti and Annabel Brown

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.

THE HISTORIC LANDSCAPE OF THE MENDIP HILLS AONB

The Mendip Hills Area of Outstanding Natural Beauty (AONB) lies to the south of Bristol and covers a total of 198 sq km. The central feature of the area is the gently undulating Carboniferous Limestone plateau which rises to over 300m and largely comprises agriculturally-improved pasture, supporting scattered farmsteads. The area is noted for its outstanding prehistoric remains which range from early cave deposits to Neolithic mortuary monuments and the more enigmatic ritual monuments such as the Priddy Circles.

English Heritage, in partnership with the Mendip Hills AONB, the associated local authority heritage teams, local groups and other interested parties, have recently embarked on a landscape-based research project aimed at enhancing our understanding of the historic environment of the Mendip Hills AONB. The multi-disciplinary project will involve various teams from within English Heritage, including Archaeological Survey and Investigation, Architectural Investigation and Aerial Survey and Investigation, as well as external organisations and individuals. The initial phase of the project is now underway and involves systematic rapid investigation, through field reconnaissance, of known sites to assess their potential for more detailed examination and recording. The aerial survey team have also begun mapping the whole of the AONB using aerial photographs as part of English Heritage's National Mapping Programme (NMP). The whole of the project area will also be mapped using airborne lidar (Light Detection and Ranging). This work was commissioned by the Mendip Hills AONB and flown by the Unit for Landscape Modelling at Cambridge University.

Elaine Jamieson, Barry Jones, Krystyna Truscoe

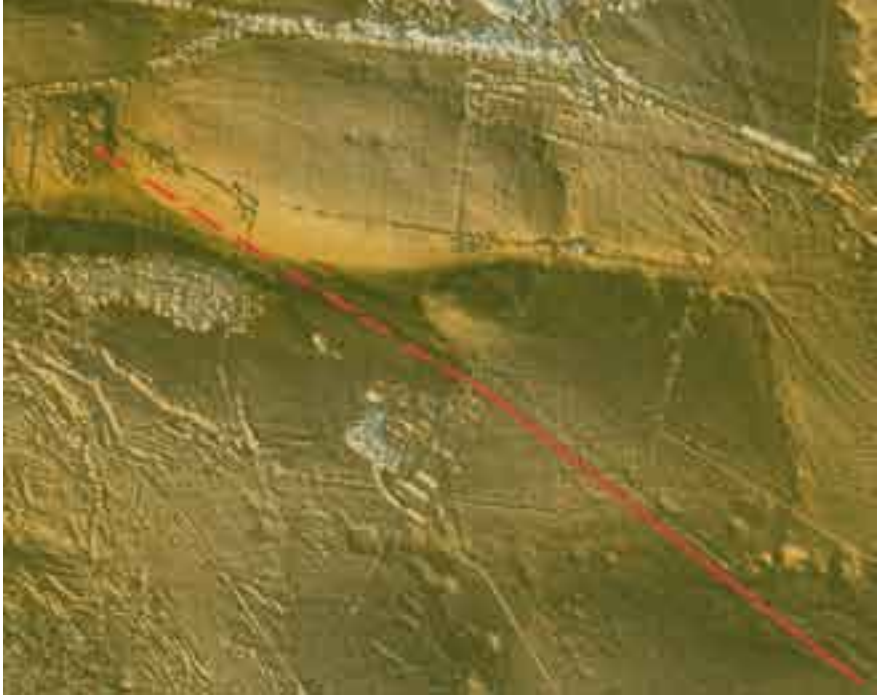
The Mendip Hills looking west

STREET LIGHTING: USING AIRBORNE LASER SCANNING TO RECOVER THE COURSE OF A ROMAN ROAD

As part of the landscape-based research project being carried out on the Mendip Hills AONB Aerial Survey and Investigation are carrying out mapping as part of the NMP. As well as using standard aerial photographs they are also using airborne lidar (Light Detection and Ranging), a technique that has only recently been used for archaeological research. Lidar survey is based on the principle, long familiar in terrestrial survey, of measuring distance through the time taken for a pulse of light to reach the target and return. Airborne lidar does this with a pulsed laser beam which is scanned from side to side as the aircraft flies over the survey area, measuring between 20 to 100 thousand points

per second to build an accurate, high resolution model of the ground and the features upon it. Once imported into a GIS package it is possible to use a combination of exaggeration of the vertical scale with lighting from low angles to emphasise very slight features. Working with the Charterhouse Environs Research Team (CHERT) who had been trying to trace the course of the Roman Road from Charterhouse to Old Sarum and Uphill Aerial Survey and Investigation examined the lidar data to see whether the known course could be extended. The road was recorded as an earthwork south of Ubley Warren Farm and its course was presumed to head towards the Roman settlement at Charterhouse, but no trace had been found on the ground. Using the vertical exaggeration and low lighting, the road shows quite clearly heading from the farm towards the settlement, just skirting a barrow south of Nether Wood. Examination of the data to the west of Charterhouse also suggested possible traces for the course of the road, but these need further assessment.

Simon Crutchley



Original lidar data © Mendip Hills AONB 2005; Source: Cambridge Unit for Landscape Modelling

False sunlit lidar image of the course of the Roman Road from Charterhouse to Old Sarum using vertical scale exaggeration. The road shows as a raised earthwork crossing the image from top left to bottom right above the red line. The solid line marks the previously recorded earthwork; the dashed the newly recorded section

ENGLISH HERITAGE HISTORICAL REVIEW

English Heritage Historical Review, edited by Richard Hewlings, is a new and unique source of historical research and interpretation. Published annually, the journal will focus on discoveries from the English Heritage estate, including landscapes, structures and their contents. It reveals English Heritage's fundamental commitment to, and core skills in providing new historical interpretation which will stimulate further discussion and debate. The contributors to the journal include English Heritage historians, archaeologists and curators, and other experts writing on English Heritage properties. The research is previously unpublished and lavishly illustrated throughout.

Contents of Volume 1, which has just been published, include:

- *The Roman Amphitheatre at Chester: An Interim Account*
- *The Dating of the Pyx Door*
- *Thomas, Earl of Lancaster, and the Great Gatehouse of Dunstanburgh Castle*
- *Moreton Corbet Castle*
- *The Staircase from Anderson Place, Newcastle upon Tyne*
- *The Later Stuart Portraits in the Suffolk Collection*
- *Three Drawings by John James at Audley End*
- *Painting like Devis: Edward Haytley*
- *Thomas Hyde Page and Landguard Fort, 1778-1803*
- *Calshot Castle: The Later History of a Tudor Fortress, 1793-1945*

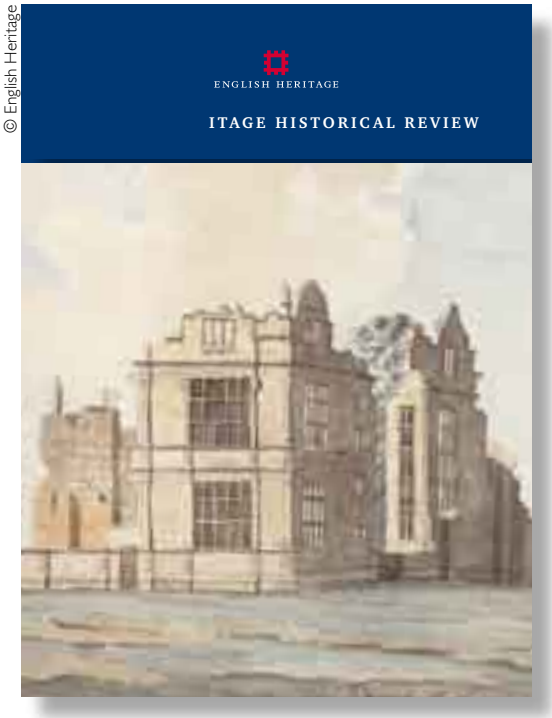
Anna Keay, Director of Properties Presentation at English Heritage, said: "The journal reflects not only the breadth of the English Heritage estate but the rigour behind the organisation's efforts to interpret and re-interpret history… Historical research is the key to understanding the nation's past and the journal makes available for the first time such work conducted on our properties and the collections they hold to a wider audience."

Full details can be found on: www.english-heritage.co.uk/ehhr

For information about an annual subscription or to buy a copy of the journal (£20 +P&P) call 01761 452966 or email: ehsales@gillards.com

Di Owen

Front cover of Volume 1 of ***EHHR***



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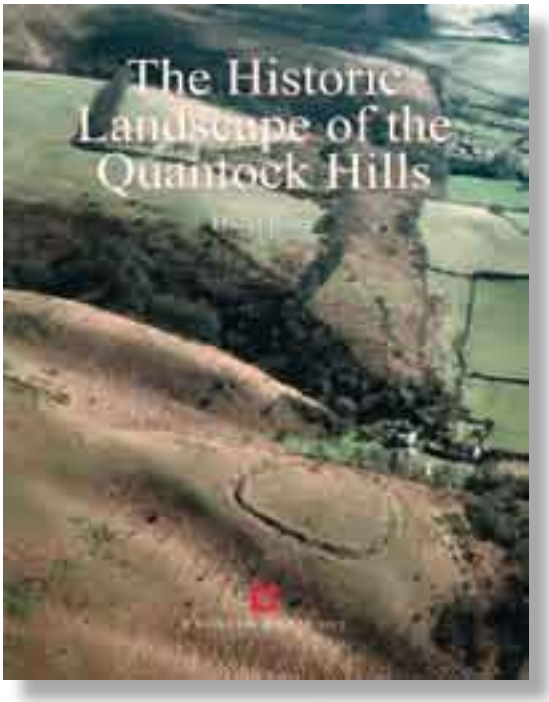

Cover of *The Historic Landscape of the Quantock Hills*

BOOK LAUNCH: *THE HISTORIC LANDSCAPE OF THE QUANTOCK HILLS*

English Heritage and the Quantock Hills AONB Service celebrated the launch of the new English Heritage book *The Historic Landscape of the Quantock Hills* by Hazel Riley in November. The book was formally launched by Lady Gass, Lord Lieutenant of Somerset, Pete Topping of English Heritage and Tom Mayberry, Head of Somerset County Council's Heritage Group. The book is based on a three-year survey project, with input from the Archaeological and Architectural Investigation Teams and the Aerial Survey Team's National Mapping Programme. The project was set up in partnership with the Quantock Hills AONB Service and Somerset County Council in order to survey, analyse and interpret the historic environment of the Quantocks, which was, until our survey work, a poorly recorded and under researched protected landscape.

As well as putting the heritage of the Quantock Hills on the map, the project team have been working in partnership with the Quantock Hills AONB Service to engage the local community (who form the majority of visitors to the hills) with their heritage. We have organised walks and talks as part of the AONB Annual Events Programme and the Volunteer Ranger Service have helped us with site access and survey work. *The Historic Landscape of the Quantock Hills* presents the results of the English Heritage survey work in an accessible format and is aimed at all who want to find out more about their heritage.

Hazel Riley

Hazel Riley (centre) and the Quantock Hills Rangers celebrate the launch

TWO NEW *INFORMED CONSERVATION* BOOKS

Autumn saw the launch of two new titles in the English Heritage *Informed Conservation* Series: *Bridport and West Bay: The Buildings of the Flax and Hemp Industry*, and *Behind the Veneer: The South Shoreditch Furniture Trade and its Buildings*. They are the eighth and ninth books in this successful series of accessible, authoritative and attractively-produced publications aimed at general and specialist readers alike. The purpose of the series is to highlight the distinctiveness of key historic areas, many of which are facing pressures for redevelopment, and to reinforce the critical importance that research and understanding plays in promoting good conservation.

The Bridport book, written by Mike Williams of the Architectural Investigation Team (West) and produced in partnership with West Dorset District Council, was launched by the Earl of Sandwich, a local resident, on 14th September in the historic Bridport Town Hall. The event coincided with Dorset Architectural Heritage Week and has attracted considerable interest among residents and the regional press. Bridport, a town synonymous with the production of rope, twine and netting, has a highly distinctive townscape shaped by an 800-year old tradition of manufacturing goods from locally-grown flax and hemp. This ancient industrial legacy is reflected in the town's historic built environment and its urban spaces, which it is hoped can be used as vital building blocks in the regeneration of this important historic place.

Behind the Veneer by Joanna Smith of the Architectural Investigation Team (South) and Ray Rogers of the London Borough of Hackney was launched as part of an evening seminar on South Shoreditch held in the Shoreditch Town Hall on 18th of October. South Shoreditch is a compact district that lies immediately to the north of the City of London. Today the area lies at the centre of a band that has become known in development contexts as the 'City fringe'; a strategic zone earmarked for considerable change. But Shoreditch is also an area of considerable historical interest, with a richly varied and visually compelling architectural legacy of Victorian and Edwardian commercial buildings. Much of the inheritance derives from the area having been a major centre of the furniture trade from the mid-19th century to the mid-20th century. The management of change in the City fringe is a major public policy issue; using South Shoreditch as a model, English Heritage, in partnership with the London Borough of Hackney and the Greater London Authority, has been exploring ways to manage future development through a co-ordinated planning approach. Arising from a comprehensive appraisal of the historic character and significance of the area by English Heritage, this publication highlights the architectural legacy of the trade and Hackney's evolving policy, aimed at encouraging a sustainable and prosperous future for the district.

Dr David Evans, Director of Planning and Environment, West Dorset District Council (speaking); John Cattell, Chief Buildings Historian, English Heritage (centre); and the Earl of Sandwich at the launch of the Bridport Publication

Books are £7.99 each, plus £1.50 p&p per copy (over 3 copies £5)

John Cattell

If you would like to order copies of the new titles, please call EH Sales on 01761 452966, email: ehsales@gillards.com, or send a cheque payable to English Heritage with your order to:
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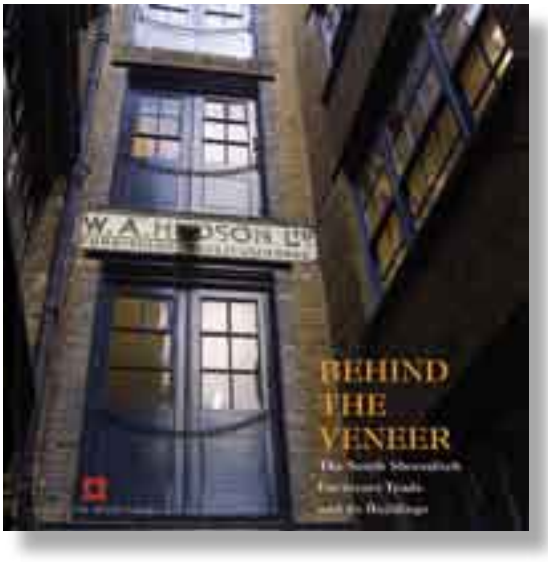

The cover of the new English Heritage publication on South Shoreditch

NEW PUBLICATIONS

Barber, M 2006 'Of No Earthly Use: military aerial photography and archaeology'. *Sanctuary* **35**, 38-41

Crutchley, S 2006 'Light detection and ranging (lidar) in the Witham Valley, Lincolnshire: an assessment of new remote sensing techniques' *Archaeological Prospection* **13:4**, October/ December 2006, 251-257

Guillery, P (with Neil Burton) 2006 *Behind the Façade, London House Plans 1660-1840*, Reading: Spire Books Ltd

Guillery, P, 2006 'Housing the Early-Modern Industrial City: London's Workshop Tenements', in (eds) A Green and R Leech, *Cities in the World 1500-2000*, Society for Post-Medieval Archaeology Monograph **3**, 117-131

Guillery, P 2006 'London's Suburbs, House Size and the Hearth Tax' in (eds) P S Barnwell and Malcolm Airs, *Houses and the Hearth Tax: the later Stuart house and society* (York: Council for British Archaeology), 35-45

Harwood, E 2006 'From the Personal to the Public: Cadbury-Brown's Public Sector work', in ARQ, *Architectural Research Quarterly*, supplement, **10**, 2006, Cambridge University Press

Harwood, E 2006 'Building for Span and the Public Sector', in Barbara Simms, ed., *Eric Lyons and Span*, RIBA Publishing 2006, 52-69

Mills, J, Barber D & Bryan P 2006 'Advice and guidance to users on laser scanning in archaeology and architecture' www.heritage3d.org

Mills, J, Barber D, Bryan P 2006 'An Addendum To The Metric Survey Specifications For English Heritage - The Collection and Archiving of Point Cloud Data Obtained by Terrestrial Laser Scanning or Other Methods'

Newman, P 2006 'Recording Dartmoor's Extractive Industries' *Industrial Archaeology Review,* **28.2**, 87-95

Newman, P 2006 'Tinworking and the Landscape of Medieval Devon 1150-1700' in Turner, S, (ed) *Medieval Devon and Cornwall. Shaping an Ancient Countryside* (Windgather Press)

Newman, P 2006 'The Work of the English Heritage Archaeological Survey and Investigation Team' *Dartmoor Magazine* **85**, Winter 2006

Pattison, P 2006 'Thomas Hyde Page and Landguard Fort 1778-1803' *English Heritage Hist Rev*, **1**, 92-101

Riley, H 2006 *The Historic Landscape of the Quantock Hills*, (English Heritage)

Robinson, D E, Boldsen, I & Harild, J A 2006 'Arkæobotaniske analyser af prøver fra udgravningen ved Ribe Posthus (Archaeobotanical analyses from the excavation at Ribe Posthus)', in Feveile C (ed.) Det Ældste Ribe. Udgravninger på nordsiden af Ribe Å 1984-2000 (The Earliest Ribe. Excavations on the north side of Ribe river 1984 – 2000) Vol. I. Ribe Studier 1.1. Jysk Arkæologisk Selskabs Skrifter 51. Aarhus. 107-132

Smith, J and Rogers, R 2006 *Behind the Veneer: The South Shoreditch Furniture Trade and its Buildings.* (English Heritage)

Williams, M 2006 *Bridport and West Bay: The Buildings of the Flax and Hemp Industry*. (English Heritage)

Wilmott, T, Garner, D and Ainsworth, S 2006 'The Chester amphitheatre, an interim statement' *English Heritage Hist Rev*, **1**, 7-23

Wiltshire, P J, and Bayliss, A 2006 The Easterton Brook palaeochannel, in *Market Lavington, Wiltshire: an Anglo-Saxon cemetery and settlement* (P Williams and R Newman), Wessex Archaeol Rep, **19**, 118-21

RESEARCH DEPARTMENT REPORT SERIES: September – December 2006

62. Arnold, A J, Howard, R E and Litton, C D 'Exeter Cathedral, Exeter, Devon: Tree-Ring Analysis of Timbers from the Roof of The chapel of St John The Baptist'
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