Discovery, Innovation and Science in the Historic Environment

RESEARCH

Historic England

ISSUE 24
COLLABORATIVE RESEARCH SPECIAL 2023

Welcome...

...to this collaborative research special issue of Research.

In this issue we focus on Historic England's growing number of externally-funded research partnerships, providing a snapshot of the range of collaborative heritage projects that support our corporate priorities and those of the heritage sector. Much of this research has become possible since we were awarded Independent Research Organisation status in 2017.

Here we explain what having that status means for the development of our research activities and the kinds of partnerships, programmes and projects that have resulted. These extend from multi-million pound projects such as 'Unpath'd Waters' to projects like 'The Matrix' that looks at archaeological practice to provide guidance for the sector through to technical conservation projects like the one on fibrous plaster we have undertaken with the University of Bath.

We also look at the support we provide to PhD researchers hosted with partner universities through our collaborative doctoral partnerships scheme funded by the Arts and Humanities Research Council. These partnerships allow us to help shape research that underpins our work, whilst introducing researchers to our ways of working as part of their career development. We hear from the students about their research that extends from technical conservation and heritage science through to data on our historic high streets as well as the fruits of research into the collections of the Historic England Archive.

Apprenticeships offer another route into a career in heritage as our research co-ordinator apprentice explains.

Our research is not just limited to England as shown by the 'Outreach to Ownership' Project, which is partnership with Historic Environment Scotland. Some of the projects we are involved in have a European dimension: such as a project on phytoliths funded by the science hub for the European Science Cloud.

There are many other emerging opportunities for fruitful research collaborations and we have proposals in development with a wide range of partners and research funders.

John Cattell
National Head of Research
with Historic England.

Front cover image: Montana Shop Graffiti workshop, part of 'Building on History'.

We are the **public body** that **helps people care for, enjoy** and **celebrate** England's **spectacular historic environment**

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Developing Historic England's research funding partnerships

Working in partnership to deliver innovative research into the historic environment.

Above: : A family learning about Jewish heritage from one of our PhD students at the 2022 Research Kitchen event at Kenwood House, London. © Historic England

Historic England's research status and capability

Historic England's research is 'applied' as it directly supports the understanding, enjoyment, protection and management of England's historic environment. Research is a vital part of our work supporting much of the activity in our Corporate Plan. It is very wide-ranging, encompassing research on archaeological sites, landscapes, historic buildings and areas, research to support the development of heritage policy and guidance, socio-economic research, technical conservation and heritage science among other areas.

Alongside our internal regional and national programmes, we also commission and provide grant funding through our Heritage Protection Commissions Programme to support the Heritage Sector. Currently this amounts to £3.4m each year.

When in 2017 UK Research and Innovation, the umbrella body for the Research Councils, awarded Historic England Independent Research Organisation status it opened a third channel of potential research resourcing, external funding. The award was to the Historic Buildings and Monuments Commission for England, the formal title for Historic England and incorporating the English Heritage Trust.

Independent Research Organisation status is awarded to organisations that have an in-house capacity to carry out research that substantially extends and enhances the national research base and can demonstrate an independent capability to undertake and lead research programmes. There are other legal and financial criteria that must be met. Arts and Humanities Independent Research Organisations are eligible to bid for funding from the Arts and Humanities Research Council and other UK Research and Innovation Councils in the same way as a university. >>

Support for development as an Independent Research Organisation

In this issue we focus on the growing portfolio of externally funded research collaborations and projects we have been developing since becoming an Independent Research Organisation. To support our new Independent Research Organisation status we published our Research Agenda in 2017. This sets out the priority themes, topics and research questions for the historic environment in England, to have emerged from external and internal consultation. The agenda provides a 'shop window' for the research we feel is most needed and which serves as a starting point for establishing research partnerships with universities, fellow-Independent Research Organisations and other bodies.

To help exploit the opportunities afforded by our Independent Research Organisation status a new post of National Head of Research, to which I was appointed, was created in early 2019 in part to lead development of Historic England's externally-funded research partnerships. This post was augmented by a Research and Academic Partnerships Manager, Dr Jo Byrne, in late 2020 with, among other tasks, specific responsibility for the management of our Collaborative Doctoral Partnerships, funded by the Arts and Humanities Research Council. The National Research Team has been further strengthened with an apprentice research co-ordinator (see the article by Adam Vamplew), with additional support provided by a Senior Business Co-ordinator and colleagues in our Finance and Legal Teams.

The team provides advice and support to colleagues across the organisation in identifying funding opportunities that align with our priorities, formulating and submitting research funding proposals and supporting grant-funded projects post-award. It has also commissioned research integrity, good conduct and ethics statements and policies for the Historic Buildings and Monuments Commission for England.

Applying for UK Research and Innovation grants is a highly competitive process and only some proposals get funded. Even when they are not successful, the partnerships involved in the development of proposals often result in subsequent collaborations. As our knowledge of the external funding process and partnerships has grown so has our success rate in terms of grant capture.

Since becoming an Independent Research Organisation Historic England has been represented on the arts and humanities Independent Research Organisations Consortium. This comprises the Heads of Research from 23 of the leading cultural and heritage organisations in the UK who come together in a mutually supportive knowledge-sharing forum. The research carried out by the Independent Research Organisations is highly valued by UK Research and Innovation, and the Consortium is increasingly asked to contribute to the development of the Arts and Humanities Research Council's future strategy and funding streams. We have found our involvement with the Consortium to be very beneficial. I, as National Head of Research, am the current Co-chair with Pip Willcox, Head of Research at The National Archives. >>

Above: Outreach to Ownership partners visiting CoActive Arts at their space in the Ridings Shopping Centre, Wakefield, facilitated by the Makey Wakey project. © Emily Ryalls

Since becoming an Independent Research Organisation Historic England has been represented on the arts and humanities Independent Research Organisations Consortium.

Establishing research partnerships

In 2018, as a test bed for research partnership development, Historic England established an Academic-Heritage Partnership with the Institute of Sustainable Heritage at University College London as part of a five-year strategic collaboration. This has strengthened knowledge exchange between academic and policy environments and involved Historic England staff contributing to the delivery of an Institute for Sustainable Heritage pilot course on heritage evidence, foresight and policy, as well as to joint development of research funding proposals.

In 2021 we ran a knowledge exchange programme on heritage and wellbeing with the Cambridge Heritage Research Centre and others at the University of Cambridge. This has proved helpful in forging research relationships and in shaping our thinking on the connections between heritage, wellbeing and place. Beyond these more formal arrangements many partnership projects emerge from existing contacts between Historic England staff, academics and other partners.

Supporting postgraduate research

The Historic Buildings and Monuments Commission for England has since 2013 been an award holder in the Collaborative Doctoral Partnerships Scheme funded by the Arts and Humanities Research Council. To date 30 PhDs on priority research themes have been completed or are in progress. This amounts to a significant amount of important heritage research that we would otherwise struggle to procure. Jo Byrne provides a fuller account of our involvement in the Collaborative Doctoral Partnership and of the Doctoral Training Partnership scheme later in this issue, and we hear from some of our Collaborative Doctoral Partnership and Doctoral Training Partnership students about their research. >>

To date 30 PhDs on priority research themes have been completed or are in progress across Historic England and English Heritage under the Collaborative Doctoral Partnerships scheme.

Above right: Landscape Futures and the Challenge of Change Project: Waves overtopping Mullion Harbour, Cornwall, in 2014.
© Russell Johnston

Left: Michael Kunst (German Archaeological Institute) and Alex Bayliss (Historic England) on a site visit to the Copper Age fortifications at Zambujal, Portugal, as part of the Seascapes project. © Eve Derenne

Recently, we have learned that the Historic Buildings and Monuments Commission for England's application to run a fourth round of the Collaborative Doctoral Partnership programme has been successful, with a new call for proposals due to be issued in Summer 2023.

Current research projects

Historic England staff play a variety of roles in UK Research and Innovation-funded projects, including project leader and senior project team member, ('Principal Investigator' and 'Co-investigator' respectively in research council parlance). In larger projects, funding is also provided for project staff who are sometimes hosted with us. Our biggest grant awarded to date is for the £2.9m 'Unpath'd Waters' Project led by Barney Sloane and involving university, Independent Research Organisation, and marine/maritime organisation partners. Barney updates on the project in this issue.

We have been funded by the Arts and Humanities Research Council to deliver a pilot 'Galleries, Libraries, Archives and Museums' and heritage research hub project, 'Outreach to Ownership'. This partnership with Historic Environment Scotland and the Arts and Humanities Research Council involves us funding and supporting five partners to deliver community-based culture and heritage research projects in England and Scotland. Charlie Garratt and Ben Thomas describe this exciting initiative. We also take a look at other recently funded projects led by Historic England such as Keith May's Arts and Humanities Research Council Leadership Fellowship, 'The Matrix'.

Examples of projects where we have supplied a Co-investigator include 'Landscape Futures and the Challenge of Change' led by Prof Caitlin DeSilvey, University of Exeter, with Dr Hannah Fluck, as Co-investigator, which focuses on the accelerating effects of climate change on heritage and on strategies to address these impacts, and 'Seascapes: Tracing the emergence and spread of maritime networks in the Central Western Mediterranean in the 3rd millennium BC', a joint Arts & Humanities Research Council and German Research Foundation UK-German Funding Initiative in the Humanities project led by Dr Lucy Cramp, University of Bristol, to which our Co-investigator , Prof Alex Bayliss, contributes scientific dating expertise. In a further international collaboration, this time via the European Open Science Cloud - Life programme, researcher Emma Karoune is currently hosted by Historic England's Investigative Science Team, researching how to make phytolith data findable, accessible, interoperable and reusable ('FAIR').

New opportunities

In the research infrastructure area, the Arts and Humanities Research Council is awaiting final approval of a bid for £80m over five years to fund a distributed centre of excellence for conservation and heritage science research known as 'Research Infrastructure for Conservation and Heritage Science RICHeS'. Other funding opportunities are in the area of Culture and Heritage Capital, and for Historic England to host an early career fellow in culture and heritage. Recently, we have learned that the Historic Buildings and Monuments Commission for England's application to run a fourth round of the Collaborative Doctoral Partnership programme has been successful, with a new call for proposals due to be issued in Summer 2023. In October 2023 we will also be joined by an Arts and Humanities Research Council Innovation Scholar in Architecture and Design, Dr Johnathan Djabarouti of the Manchester School of Architecture, who will work with us to research the interface between historic places and intangible heritage.

Through these initiatives and others, such as the revision of our research agenda and development of a research funding framework, we continue to take a strategic approach to growing our external research income. This will support our mission, and, importantly, build our internal capacity to take maximum advantage of the many opportunities for Historic England to work in collaboration. The benefits are mutual: Historic England gains influence and learns from our partnerships, and the heritage sector gains from our research, advice and engagement at international, national and local levels ■

The author

John Cattell IHBC, FSA

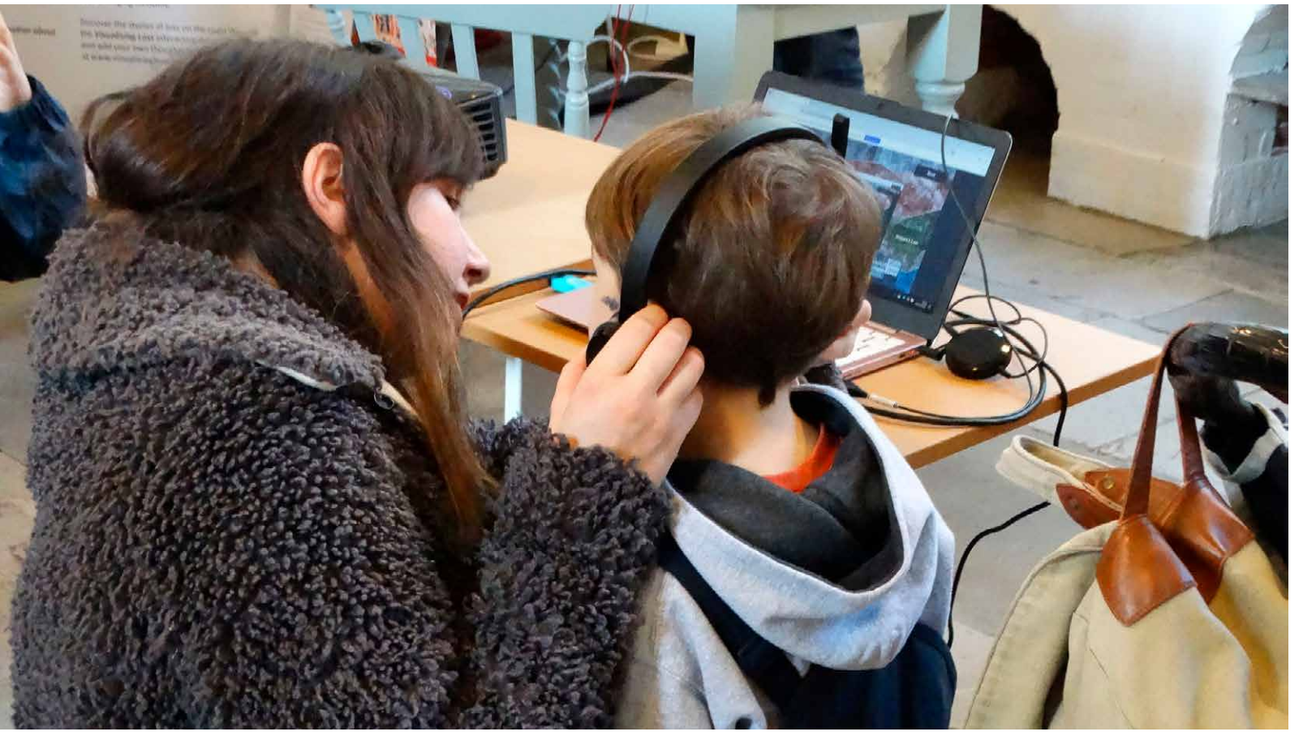
National Head of Research.

John has worked for Historic England and its predecessor organisations for 34 years in a variety of roles including Chief Building Historian and Head of the Investigation and Analysis Department. He is Co-chair of the Independent Research Organisations Consortium and a Trustee of the Society of Architectural Historians of Great Britain.

Just what the doctor ordered

Examining the activities, angsts and achievements of doing a collaborative PhD with Historic England.

Doctoral research delivered in partnership with UK universities makes a significant contribution to our work at Historic England. All our activity is underpinned by knowledge and evidence and there is much to investigate. Can documentary filmmaking help us to address the emotions surrounding archaeological loss in coastal areas? How can engagement with minority religious communities offer a more diverse understanding and representation of historic places of worship? What could an analysis of large-scale archaeological excavation tell us about the effectiveness of geophysical survey? These are questions being answered by PhD students currently delivering collaborative research with Historic England and UK universities.



Researching Together

Historic England may not be the first name that springs to mind when thinking about PhD training, but our programme is as broad as our organisation's purpose to improve people's lives by championing and protecting the historic environment and is essentially collaborative and applied in nature. In 2005, the Art and Humanities Research Council introduced a new kind of funded doctoral research degree. Collaborative Doctoral Awards took PhD research beyond its typical university setting and out into the professional world of heritage and culture. The Awards bring together universities and cultural institutions to support student-led research targeted to the problems or scenarios that arise in the day-to-day work of the cultural sector.

From 2013, Collaborative Doctoral Awards became integrated into training programmes that are organised and funded across multiple research organisations. Doctoral Training Partnerships are groups of Higher Education Institutions or universities that deliver PhD degrees with the support of industry partners. Historic England is participating in eight Doctoral Training Partnerships, such as the Midlands 4 Cities, and for these initiatives we can offer career development opportunities, industry placements and occasionally co-supervision. However, our main doctoral programme is the Art and Humanities Research Council-funded Collaborative Doctoral Partnership – a scheme where cultural and heritage organisations work with Higher Education institutions and universities to develop PhD projects that directly respond to cultural sector agendas. Historic England's Collaborative Doctoral Partnership is managed jointly with our sister organisation, English Heritage. Between the two organisations we have 17 current students and 13 alumni and have worked in partnership with twenty universities working in areas ranging from heritage science and technical conservation to the relationships between heritage and climate change, wellbeing and inclusion. In April this year we received the good news that our funding bid to the Arts and Humanities Research Council to support further PhD studentships has been successful. From October 2024, we look forward to welcoming three new students each year for three years, providing nine new opportunities for innovative doctoral research. >>

Our programme is as broad as our organisation's purpose to improve people's lives by championing and protecting the historic environment and is essentially collaborative and applied in nature.

Far left: Visitors to an outreach event listening to an 'I-Doc' by collaborative PhD student Tanya Venture on coping with loss of coastal heritage. © Historic England

Left: Collaborative PhD Student Jessie Clarke stands ready to explain Jewish Heritage in England at an outreach event held at Kenwood House in 2022. © Historic England

Mutual Benefits

Engaging with doctoral research is beneficial for Historic England. The Collaborative Doctoral Partnership programme contributes to a rich portfolio of four-year, in-depth, collaborative projects that extend beyond what we could deliver alone. It is a chance for our historic environment specialists to connect with scholars and doctoral researchers to produce fresh perspectives, solve problems and generate new knowledge whilst building closer relationships between academia and heritage institutions. In addition, the Collaborative Doctoral Partnership reflects our commitment to support heritage sector skills and careers by training early career **applied** researchers who can work flexibly between academia and heritage policy and practice.

Our students too have plenty to gain. During their PhD, our Collaborative Doctoral Partnership students benefit not only from academic insight delivered by the university partner, but also from Historic England's practical expertise in understanding historic places: how and why they are significant and how they are cared for, investigated, interpreted, managed and conserved. The students learn too about the role of the historic environment in creating a sense of place and the connection between past, present and future in heritage-led planning. Each Collaborative Doctoral Partnership studentship includes a programme of training, mentoring and a three to six-month work-based placement, either with Historic England or with another cultural or heritage sector organisation. At the end of the journey, students have acquired skills in applied research, whilst at the same time delivering outcomes that have genuine public value. >>

Above: Learning Together: Collaborative Doctoral Partnership students based with cultural organisations across the UK gather to present papers and network for the first time in person since the start of the COVID-19 pandemic, September 2022.
© Benedict Johnson

At the end of the journey, students have acquired skills in applied research, whilst at the same time delivering outcomes that have genuine public value.

Healthy Outcomes

Anyone who has completed a PhD will tell you that the road is not always smooth. Managing your own four-year research project typically brings with it doubts, sleepless nights and changes of direction as you build the know-how and confidence to become an independent researcher. For collaborative PhD students there are additional challenges. Our students have four supervisors – two from their university and two from Historic England. Students liaise between these organisations, often working across disciplines whilst mindful that their applied research must lead to 'real world' impacts. They may, for example, be required to blend theoretical thinking or experimental techniques with the practicalities of operating a commercial archaeology unit, or to translate the outcomes of their 80,000-word thesis into a briefing document for policymakers or into a tool or guidance note for managing an historic High Street.

Support is available from university and Historic England supervisors and staff, as well as from our heritage sector networks. And just as there are added challenges, there is also the reward of seeing your research make a difference to the understanding, care and enjoyment of the historic environment. In career development terms, Collaborative Doctoral Partnership students become a new generation of flexible doctoral graduates who can move between the dual languages of academia and practice. Alumni careers are a witness to this, with our graduates holding positions that range from academic research management to project delivery, finds liaison, and conservation and archival roles within national, regional and local historic environment organisations and museums. Some alumni may go on to work for us: former student Sam Rowe is now our North West Science Advisor working from Historic England's Manchester office.

Support is available from university and Historic England supervisors and staff, as well as from our heritage sector networks. And just as there are added challenges, there is also the reward of seeing your research make a difference to the understanding, care and enjoyment of the historic environment.

Above left: Knowledge Exchange: Historic England Collaborative Doctoral Partnership student Bronwen Stone shares her work with fellow PhD researchers at the British Museum, September 2022. © Benedict Johnson

In this sub-section of Historic England Research magazine, three current doctoral students tell us about their own collaborative PhD research. Alfie Lien-Talks and Bronwen Stone are students in our Collaborative Doctoral Partnership programme. Alfie explores how digital datasets produced by diverse organisations can be collectively accessible to support the future planning of historic High Streets. Bronwen's analysis of monastic window glass is providing a better understanding of the development of the English medieval glass industry whilst also assesing the best imaging methods to capture decoration and monitor changes to degraded medieval glass. Sadie Levy Gale's studentship is the result of our partnership with the South West and Wales Doctoral Training Partnership. Sadie's work examines visual representations of healthcare between 1920 to 1950, drawing upon Historic England's photographic archive and producing new interpretations that will open up collections to wider audiences. We also hear from Adam Vamplew, our Historic Environment Advice Apprentice Research Co-ordinator, who talks about his role in supporting postgraduate research. Together these articles illustrate how our collaborative doctoral programmes, with their focus on knowledge, evidence, experience and insight, contribute to ensuring that our work at Historic England remains in the best of health ■

The author

Jo Byrne
Research and Academic Partnerships Manager with Historic England.

Jo's role involves developing external research collaborations, supporting research funding bids and co-ordinating Historic England's postgraduate programmes. She completed her own Arts and Humanities Research Council-funded collaborative PhD with the University of Hull and Hull Maritime Museum in 2015. Jo's career has spanned practice, research and research management in the cultural, heritage and higher education sectors. Her research interests include critical heritage studies, oral history, cultural geographies, maritime heritage and port-city cultures.

Further information

https://historicengland.org.uk/research/support-and-collaboration/researchopportunities/collaborative-doctoral/

Data and the historic High Street

Lessons from the High Streets Heritage Action Zones.

History is important to us all, and through research we can ensure that the information we generate is accessible for future generations. History can also help us plan for better future communities by providing insights into how past societies have organised themselves, addressed social and economic challenges, and navigated political systems. By studying past communities, we can learn from their experiences and make informed decisions that promote the well-being of our own communities. Additionally, understanding historical patterns of social and economic development can help us to identify opportunities for growth and development in the future. >>

Left: Aerial photograph of Northallerton High Street. © Historic England Archive. Aerofilms Collection, EPW029492

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Right: Bishop's Palace rendering by 'Heritage360', University of York

This unprecedented intervention and activity in our urban heritage raises some important questions about the data being generated by these projects and about what might happen to it in the future.

The High Streets Heritage Action Zones

The challenges faced by traditional High Streets across the country regularly make media headlines – from changing retail habits, including the rise of online shopping, to the decline of big chain stores. As previous editions of this Research magazine have noted, while vacant properties, especially closed department stores, remain an issue, it is important to acknowledge the positive transformations taking place. Many high streets are being re-invented to embrace diverse uses, including the promotion of town-centre living. Initiatives such as High Street Heritage Action Zones (HSHAZ) are addressing these challenges and new directions in innovative ways. However, this unprecedented intervention and activity in our urban heritage also raise important questions about the data being generated by these projects and what might happen to it in the future.

My research

What do we mean by data? Why is it important that we think about it now? And what role can archaeologists play in identifying how data can have long-term value? These are the questions being addressed in my current PhD project in collaboration with Historic England's Geospatial Survey and Architectural Investigation teams in York and colleagues at the University of York's Archaeology Data Service.

What is data?

Archaeology sits at the interface of heritage and development, and archaeologists generate vast quantities of data, from geophysical evidence from activities such as ground-penetrating radar surveys, to excavation records, standing building surveys, photographic records and archival research. Heritage statements and 'grey literature' reports are uploaded to planning portals (an online platform that provides access to information and services related to the planning and development process in a particular area or region) and, if required, to Historic Environment Records (which serve to keep a comprehensive and accurate record of heritage assets in a region to inform and facilitate the management of heritage resources). Yet archaeologists also use data generated by other stakeholders – records made by utility companies, architects and developers' plans, local history and community groups' oral histories and research projects – and of course, data from previous archaeological interventions in the historic environment. >>

Data created during research and development projects has the potential to inform our understanding of the historic environment, helping to make evidence-based decisions about future changes to it.

What can we do to look after data?

Today, much of this material is being created or saved in digital formats which can quickly become inaccessible, as software is updated and systems change. For over 25 years, the Archaeology Data Service at the University of York has been leading initiatives to encourage good practice in the long-term preservation of digital data, working alongside organisations such as the Digital Data Preservation Coalition, research councils and Historic England. The aim is to identify and develop areas in which guides to best practice are needed, supplementing existing documentation such as those found in Historic England's Advice pages https://historicengland.org.uk/advice/ to ensure that the data created by research and development projects can be easily found, accessed and reused by different stakeholders, not only during a project but also after it has ended.

Why does this matter?

Data created during research and development projects has the potential to inform our understanding of the historic environment, helping to make evidence-based decisions about future changes to it. Many of the High Street Heritage Action Zone projects have involved gathering oral histories, photographs and memories from residents to support placemaking and creating an important community asset for future generations. Ensuring that this material is deposited physically or digitally ensures that it can be found and shared and prevents it disappearing on a redundant website. This is important, as it means that future stakeholders can reuse rather than repeat this work.

The High Street Heritage Action Zone projects provide me with an opportunity to explore how these principles are working in practice, through a series of case studies. My first case study has been Northallerton (North Yorkshire).

Northallerton

Northallerton is the county town of North Yorkshire and its High Street Heritage Action Zone project has been led by Hambleton District Council. The project has involved physical improvements to the historic streetscapes, renovation of historic shop fronts, a programme of community consultation, and oral and local history projects. Various digital initiatives have visually reconstructed lost sites such as the Bishop's Palace and the historic marketplace in an augmented reality experience (a way for visitors to use their smartphones to see virtual information about the history of the area overlaid onto the real world creating an immersive experience of the town's heritage), printed heritage trail and interactive Heritage Hub (accessible to all, local and visitors, alike to discover and share the local heritage). >>

Above left: A conversation with the local community. © Virginia Arrowsmith

Bottom left: Photo of some of the material brought into the Heritage Hub. © Virginia Arrowsmith

Sharing and reuse of information

What has emerged from a close analysis of this case study is a sense of the diversity of data being used, reused and shared between project partners.

LiDAR data (a technology that uses lasers to create 3D maps of the environment by measuring the time it takes for the light to bounce back), maps, photographs, historic diaries, letters, bills and invoices, digital sound files and newspapers have all been gathered, as well as existing local history studies and archaeological reports.

The project has yielded great examples of data sharing and reuse, especially between those producing digital outputs of visualisations (CGI images and videos that illustrate the proposed changes and improvements to the buildings and streetscape in the area, allowing stakeholders and the public to visualise the potential outcomes of the heritage-led regeneration project) and the augmented reality heritage trail.

Thanks to Community Engagement Lead for the Heritage Action Zone programme Virginia Arrowsmith, there has also been a strong commitment to ensuring that the Northallerton project website is secured for future years by negotiating longer-term data deposition agreements with the North Yorkshire County Record Office. This should ensure that the digital as well as the physical legacy of the project lasts well into the future, and this must be signposted to ensure it remains reusable and accessible.

What has emerged from a close analysis of this case study is a sense of the diversity of data being used, reused and shared between project partners.

The value of historic High Street community and digital data

The Northallerton case study has raised important questions about how long-term preservation and archiving of data is thought about during the commissioning, tendering and procurement of major projects with diverse stakeholders and data sets. What is clear is that the data being created in places and projects like Northallerton is of great value for understanding the stories of people and communities at grassroots level, so that conservation and protection reflects local values. I hope that sharing examples such as Northallerton through my research over the next few years will prompt useful questions about how good data management practices can be implemented on the ground, ensuring that initiatives such as the High Streets Action Zones leave a strong and accessible digital as well as physical legacy to help with the conservation and management of the historic environment ■

Acknowledgments

Within this work, I would like to thank my supervisors Dr Kate Giles, Kieron Niven, David Andrews and Simon Taylor for their unending support. I would also like to thank Hambleton District Council, Heritage360, York Archaeology, PEEL X and Virginia Arrowsmith for their support and advice during my research and the project.

The author

Alphaeus Lien-Talks
Student at the University of York.

Alfie is an Arts and Humanities Research Council-funded Collaborative Doctoral student at the University of York, working with Historic England and the Archaeology Data Service.

Further information

The Northallerton Heritage Hub project website https://www.northallertonheritage.uk/

The Northallerton High Street Heritage Action Zone https://www.hambleton.gov.uk/events-2/northallerton-high-street-heritage-action-zone

The Archaeology Data Service https://archaeologydataservice.ac.uk/

The origins and use of medieval glazing in England

Researching window glass from England's medieval abbeys.

Little is known about the origin and use of early English glass in glazing and few archaeologists have studied excavated window glass fragments, which are often small, corroded and hard to interpret. This Collaborative Doctoral Partnership aims to draw on this previously relatively little researched material to explain the development of the industry in medieval England.

About 900 religious houses were built in England during the medieval period; from the late 12th century these were vast, stone-built Gothic constructions with pointed arches and the structural strength to carry expansive glazing schemes. Up until the 13th century all window glass was imported into England from the continent, especially from northern France and Germany.

Archaeological evidence and documentary sources show that during the 13th century a glassmaking industry developed in England in the Weald on the Surrey-Sussex border, and in the 14th century in Staffordshire. These areas had a local source of the main raw materials used in medieval glassmaking, basically, sand to form the glass and wood both for the flux to reduce the melting temperature and for the huge amounts of fuel needed for the furnaces. However, very little is known about what stimulated the market for English-made window glass, how the industry grew, or who was consuming the glass.

This research aims to illuminate the growth of this fledgling industry through a study of excavated window glass from seven monastic sites across England. Despite its use of commonly available raw materials, window glass was only installed in high-status buildings such as abbeys that had the finances to fund extensive glazing schemes and the architecture to carry them. >>

This research aims to illuminate the growth of this fledgling industry through a study of excavated window glass from seven monastic sites across England.

Reconstruction illustration by Judith Dobie, depicting the interior of the choir of Whitby Abbey church, as it may have appeared in the 15th century. © Historic England Archive, IC148_009

The sites studied are four Benedictine and three Cistercian abbeys in England: Whitby and Rievaulx in the north, Alcester and Bordesley in the midlands, Bardney and Louth Park in the east and Hyde in the south. The distribution allows an examination of spatial and temporal variation in window glass use, so a key part of the project is to date the glass as accurately as possible to provide a chronology of glass consumption at each site.

The glasses come from dissolution layers – material dumped during or soon after the Dissolution of the Monasteries in the 16th century and excavated over the last 200 years. Given the sometimes limited contextual information about the sites, one of the challenges of the project has been to develop ways of interpreting the small, often corroded, fragments of excavated glass.

The glasses have been loaned to the project from a number of places: Historic England, English Heritage, local museums and archives, the University of Reading's Bordesley Abbey Project and the Hyde900 community archaeology group. It is very fortuitous not just to have access to so much material but also to have curators and archaeologists interested in the project and keen to learn more about their collections of medieval window glass. The research is based in the Department of Archaeology at the University of Sheffield, supervised by Professor Caroline Jackson and Colin Merrony, and at the Historic English Materials Science laboratories at Fort Cumberland, supervised by Dr Sarah Paynter and Dr Francesca Gherardi. >>

Above left: Reconstruction illustration by Peter Dunn showing Cistercian monks processing through the south transept of Rievaulx Abbey church, from the night stairs to the choir, as the scene may have appeared in the 15th century. © Historic England Archive, IC086_012

Above right: Fragments of 15th century glass from Hyde Abbey. © Historic England

It is very fortuitous not just to have access to so much material but also to have curators and archaeologists interested in the project and keen to learn more about their collections of medieval window glass.

How will I use this material?

The first stage of the project has been to characterise each assemblage through a stylistic assessment which allows dating of the glasses, followed by a technical assessment to understand how the glasses were made. Chemical analysis is then used to obtain a chemical composition to group the glasses and try to provenance them to an English or continental origin.

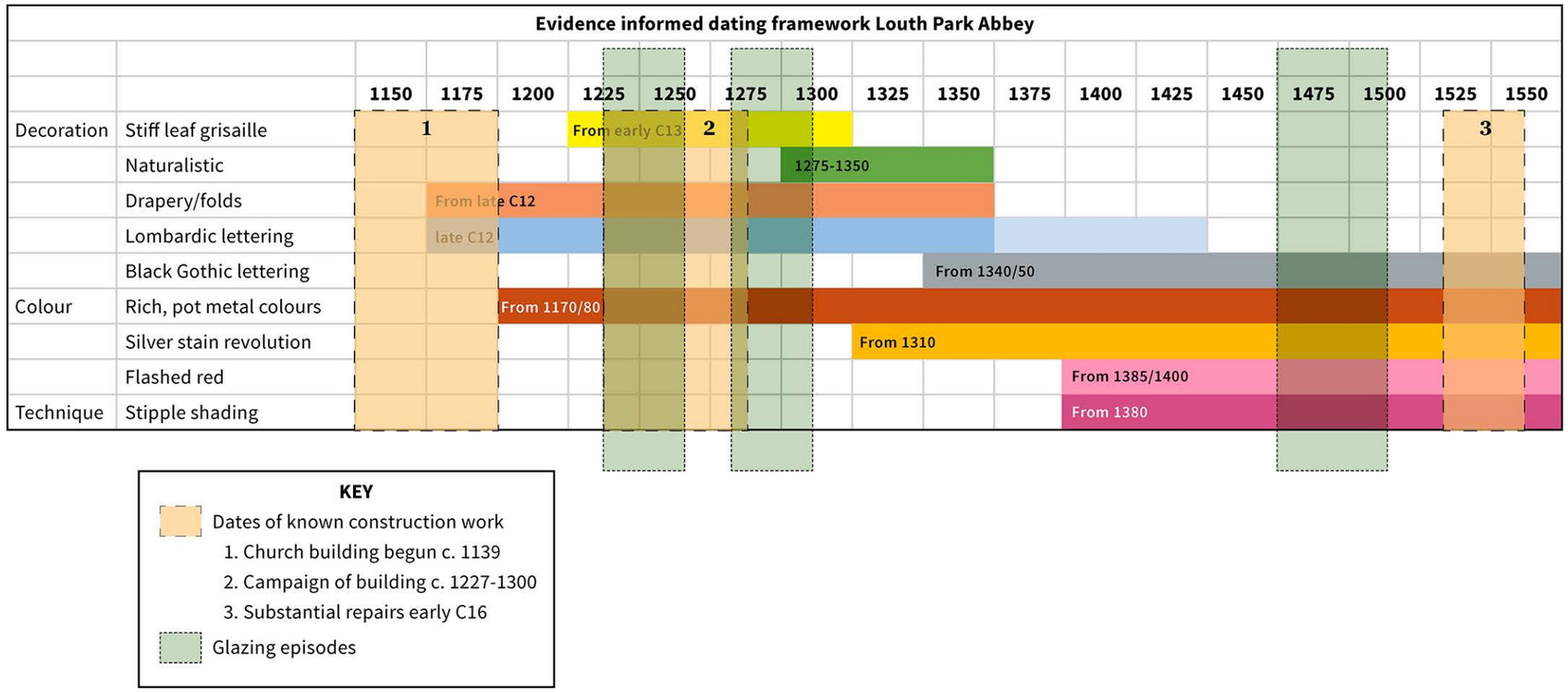
Stylistic: Dating each assemblage is achieved by matching the painted decorative motifs on the excavated fragments with similar motifs on extant, in-situ windows of known dates. These are called dated parallels. Some motifs have been found to have a long date range, such as gothic lettering and depictions of micro-architecture. Others, such as heraldic and naturalistic motifs, are shorter lived. A framework has been devised that helps refine the dates of the excavated glass and establish glazing episodes by combining several types of evidence together in a visual graphic, here called an Evidence Informed Dating Framework – EIDF.

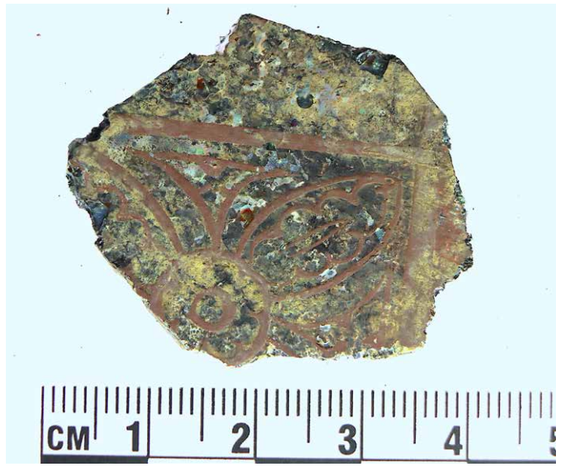
This works in the following way, using the Louth Park Abbey assemblage as an example (please see below).

The three types of evidence from Louth Park Abbey are: a) a timeline of motifs represented in the assemblage; b) events at the abbey that are known from sources such as the Louth Park chronicle; and c) known building phases. By putting the evidence together, well defined glazing episodes at each site and a more accurate pattern of supply and use over time can be determined.

Technical: This consists of a macro and microscopic examination of the fragments to determine how the glass was made. In the medieval period all window glass was hand-made using the crown or cylinder methods. Crown glass was spun on the end of a pontil rod and centrifugal force was used to widen a disc. This technique can sometimes be recognised by the concentric rings and bubbles in the glass orientated in a circular pattern. Cylinder, or broad, glass was created by blowing a long, thin tube that was cut, opened up and flattened and can be recognised by a fire-rounded edge where the hot glass slumped and by elongated air bubbles. A high resolution imaging microscope is used to observe bubble orientation and help determine forming techniques.

Chemical: Compositional data is obtained using both portable X-ray fluorescence and also micro X-ray fluorescence (Micro XRF) to determine the major and some minor elements in the glass composition. For each assemblage, 30-50 representative samples are analysed in more detail using both methods. Scatterplots of the ratios of different chemical elements are plotted so that compositional groups as determined by the recipe can be seen. These compositional groups will then be tested to see if they can be linked to the chemistry of glasses from known production sites and to indicate which glass is English-made and which is imported from the continent. >>





The first stage of the project has been to characterise each assemblage through a stylistic assessment which allows dating of the glasses.

Above left: The three types of evidence from Louth Park Abbey are: a) a timeline of motifs represented in the assemblage; b) events at the abbey that are known from sources such as the Louth Park chronicle; and c) known building phases. By putting the evidence together, well defined glazing episodes at each site and a more accurate pattern of supply and use over time can be determined. © Bronwen Stone

Above right: A fragment of 14th century 'grisaille' glass from Bardney Abbey. The grisaille technique involves an ornamental non-figurative line design painted on colourless glass. © Historic England

The 13-15th centuries were a time of dramatic social, economic and political change, so it will be interesting to see what impact technological innovation, agricultural improvements, war and the Black Death, for example, had on the supply and use of window glass in England.

One of the advantages of using excavated material is it fits easily into the micro X-ray fluorescence chamber. In addition, both analytical techniques are non-destructive, which is a key factor that will hopefully encourage museum curators to offer their window glasses in future projects.

The analytical work is now near completion and the data will be used alongside historical research to help understand the development of the English industry and try to elucidate if Benedictine and Cistercian abbeys were consumers of window glass made in England. The 13-15th centuries were a time of dramatic social, economic and political change, so it will be interesting to see what impact technological innovation, agricultural improvements, war and the Black Death, for example, had on the supply and use of window glass in England. Transport networks, trade routes and the procurement process in the medieval period will be examined, alongside the role of the guilds and immigrant workers from the continent as drivers of change ■

The author

Bronwen Stone

PhD Candidate at Department of Archaeology
University of Sheffield.

Following a career in business Bronwen returned to academia in 2016 to complete an MA in Cultural Materials at the University of Sheffield's Department of Archaeology, and in 2020 began her PhD. Bronwen loves working with medieval material culture, especially glass, "not just because of the colours and the decoration but also because it is possible to glimpse the artisan behind the artefact, be it in a tool mark, the flick of the paintbrush, or the undulating surface of a crown-made pane".

Further information

Historic England 2018: **Archaeological Evidence for Glassworking: Guidelines for Recovering, Analysing and Interpreting Evidence**
https://historicengland.org.uk/images-books/publications/glassworkingguidelines/

Below right: Preparing a fragment from Bordesley Abbey for Micro XRF analysis at Historic England's laboratory at Fort Cumberland. © Historic England

Retracing the history of the Topical Press Agency medical collection

A recently discovered medical photography collection sheds light on how healthcare was visualised in interwar and wartime Britain.

I am a PhD candidate at Cardiff University's School of Journalism, Media and Culture, working on an Arts and Humanities Research Council- funded Collaborative Doctoral Award with Bristol University and Historic England. My research explores visual representations of healthcare settings, staff and medical procedures that were produced in Britain and across its empire between 1920-1950. During this period, photography depicting medicine and healthcare settings increasingly appeared in the press, as the emergence of new photo-mechanical techniques and subsequent proliferation of mass media transformed visual culture in Britain. >>

Left: Prams lined up outside the Pioneer Health Centre. Source: Historic England Archive, MED01/01/0042

The Topical Press Agency collection offers unique insights into the visual representation of healthcare between 1938 and 1942.

What we know about the collection

The Topical Press Agency medical collection, acquired by Historic England in 2018, is one of the key photographic collections I have been researching for my thesis. Comprising over 4,000 photographs, the Topical Press Agency collection offers unique insights into the visual representation of healthcare between 1938 and 1942. Taken by Norman Kingsley Harrison, a press photographer and pioneer of British medical photography, the collection features photographs of patients undergoing a variety of medical procedures at the hands of a doctor or nurse, and receiving care in a range of new specialist health clinics and hospitals. Together, the images shed light on how photography of public health provision in Britain projected a vision of the nation as a world-leader in medical care, such that medical press photography became a useful form of propaganda to raise public morale as the country went to war. I'm exploring the extent to which the collection also illustrates how good health and good citizenship were viewed as inextricably linked in the interwar and wartime years; the photographs visually reinforce a connection between modern citizenship, an individual's health, and the wider health of the nation.

Below left: A group of women at the Pioneer Health Centre watching a game of Badminton while waiting their turn to play. Source: Historic England Archive, MED01/01/0041

The Pioneer Health Centre was an internationally renowned health club which promoted 'positive health' by offering families 'health overhauls' and exercise and recreation facilities on-site.

The Pioneer Health Centre

These intersecting themes can be identified in a series of Topical Press Agency photographs of the Pioneer Health Centre in Peckham in 1938. Opened in 1926, the Pioneer Health Centre was an internationally renowned health club which promoted 'positive health' by offering families 'health overhauls' and exercise and recreation facilities on-site. Images of the centre in the Topical Press Agency collection picture focus predominantly on 'Peckham mothers', suggesting the photographs might have been commissioned by an illustrated magazine aimed at female readers. One photograph pictures empty prams lined up outside the centre in the 'perambulation garage'. The accompanying caption describes how 'the occupants are inside the building enjoying themselves in the nursery while the mothers, free from responsibility for the moment, indulge in recreation'. The other photographs picture women participating in a range of physical exercises, from badminton to swimming. In all of the images, the women are smiling and engaged, apparently enjoying the 'keep fit' exercises the captions tell us are a hallmark of the Centre. >>

Below right: The original description reads "Following […] "keep fit" class, mothers enjoy a swimming lesson […] tutorship in the up-to-date swimming […]." Source: Historic England Archive, MED01/01/0039

Above left: The original description read: "Peckham mothers can keep that schoolgirl figure." 31 Oct 1938. A group of women taking part in an exercise class at the Pioneer Health Centre, St Mary's Road, London. Source: Historic England Archive, MED01/01/0040

The emphasis on women's health and maternal welfare in these photographs reflects governmental concern in the interwar years about Britain's declining birth rate and the poor health of the population after the First World War.

The emphasis on women's health and maternal welfare in these photographs reflects governmental concern in the interwar years about Britain's declining birth rate and the poor health of the population after the First World War. In 1938, Britain was on the brink of another war, fuelling national anxiety about the fitness of recruits as the country prepared for the mobilisation of its army. This culminated in a far greater focus on women's reproductive health issues and child welfare in the interwar years, with clinics such as the Pioneer Centre focusing on maternal health in a bid to ensure future populations would be healthy. Photographs such as the image of women watching a swimming instructor perform a pedagogical function, instructing their presumed female viewers to take responsibility for their own health in order, it is implied, to sustain the future industrial, economic and imperial health of the nation. The perspective on health reform these photographs promote is implicitly eugenicist in its suggestion that unfitness is inherited and can be 'bred out' if maternal health is addressed. Many social reformers and urban planners across the political spectrum held eugenicist views in the interwar period; Innes Hope Pearse, one of the founders of the Centre, was in regular contact with Julian Huxley, the president of the British Eugenics Society, even giving a speech for the Society in 1943 (see Lewis J and Brookes B: 1983). The photographs of the Centre are one example among many of how the Topical Press Agency photographs express shifting conceptions of healthcare and social reform in these years. >>

Researching the publication context of the photographs

To date, very little is known about the Topical Press Agency collection; there is no detailed record of where the photographs in the collection were published, or if they were seen by the public at all. During my research, I have identified various Agency medical photographs in publications like 'Illustrated London News', 'Nursing Mirror' and 'Tatler', but there remains a great deal of work to do to retrace the circulation networks of these images.

How my research will benefit Historic England

My objective is to better understand the intended audiences and publication contexts of the Agency's photographs, and in doing so contribute to the body of research that underpins Historic England's collections. This will help to open up the collections to a wider audience, laying the groundwork for future public engagement activities with the photographs with relevant groups, from researchers to healthcare workers and members of the public. The photographs also feed into wider historical understandings of healthcare provision before the formation of the National Health Service in 1948. The collection has already been shown to four nurses who worked in hospitals in the North-West in the 1940s and 50s; their interviews can be watched on the Historic England website. The collaborative element of my PhD has also created opportunities for academic engagement with other Historic England photographic collections; my supervisors from Cardiff and Bristol University – who are both historians specialising in photo history – have visited the archive with me, enabling us to view a variety of photographic materials together. Their ideas and insights into the collection have fed into my PhD thesis, but also inspired them to use Historic England's collections in their own research.

Cross-collection themes

My project provides an opportunity to explore the Historic England photographic archives with a fresh perspective, asking research questions that might not have been considered before. I am hopeful that this will lead to connections being made between discrete archive collections that haven't been placed in dialogue with each-other until now; I am in the process of identifying cross-collection themes that will bring different collections and archive items together. This research also has the potential to enrich the Archive's catalogue records and add new contributions to Historic England's Enrich the List application. In doing so, my project will provide a case study for how Historic England's archives can be used by future researchers, to engage diverse audiences and help the public to learn about contested heritage and challenging histories ■

An opportunity to explore the Historic England photographic archives with a fresh perspective, asking research questions that might not have been considered before.

The photographs feed into wider historical understandings of healthcare provision before the formation of the National Health Service in 1948.

The author

Sadie Levy Gale
PhD student at Cardiff University's school of Journalism, Media and Culture.

Sadie is a second-year PhD student at Cardiff University's school of Journalism, Media and Culture, undertaking a collaborative doctoral award with Bristol University and Historic England. Her research explores visual cultures of public health in Britain and its empire, 1920-1955.

Further information

Gruffudd, P. 'Science and the stuff of life': Modernist Health Centres in 1930s London', **Journal of Historical Geography**, 23 (2001)

Historic England Archive Collection page for the Topical Press Agency medical collection

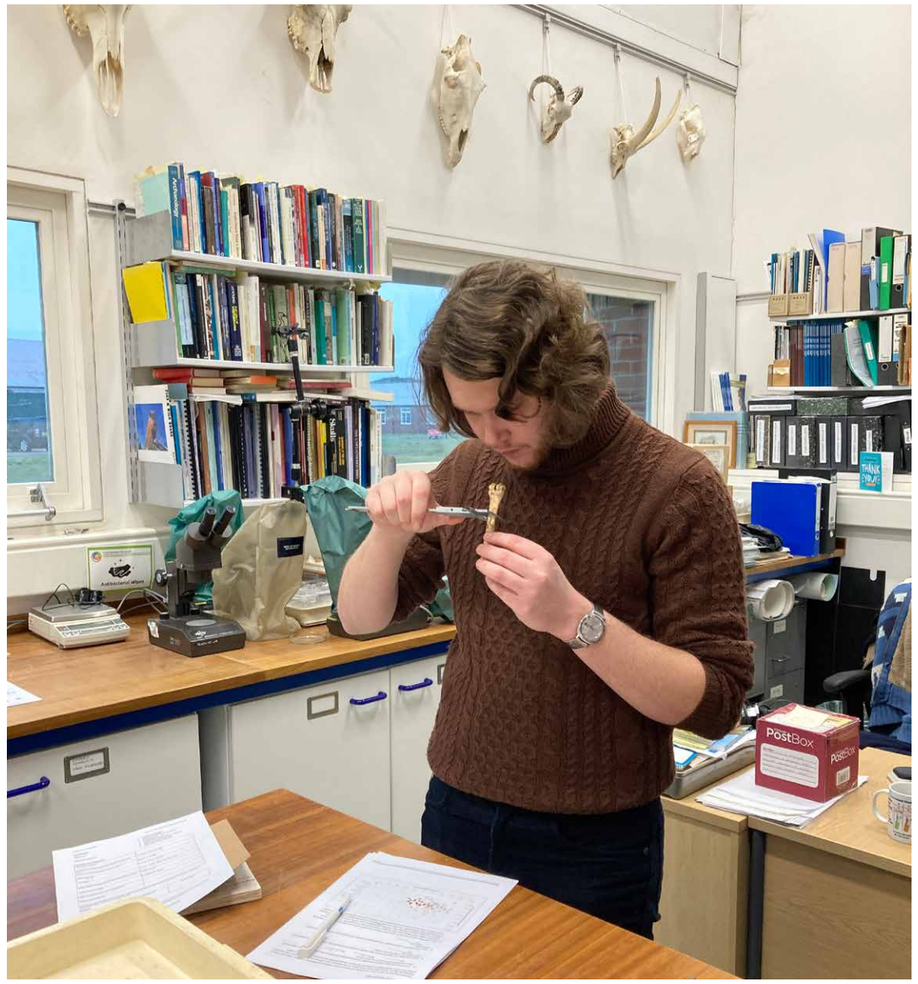
Lewis J and Brookes B. 'A Reassessment of the Work of the Peckham Health Centre, 1926-1951', **The Milbank Memorial Fund Quarterly. Health and Society,** Spring, 1983, Vol. 61. No. 2, pp. 307-350.

Pearse, I. **The Peckham Experiment: A Study of the Living Structure of Society**, (Edinburgh: Scottish Academic Press, 1985)

Weindling, P. 'Julian Huxley and the Continuity of Eugenics in Twentieth-century Britain', **Journal of Modern European History**, 10 (2012)

Historic England apprenticeships: an unexpected opportunity

How an apprenticeship with Historic England has helped to set me on a career path I didn't think possible.



Above right: Measuring iron age sheep bones with Vernier callipers, Fort Cumberland, January 2023. © Historic England

In the summer of 2021 I was unemployed, having taken a year off work to focus on renovating my house. I had taken the decision to return to regular employment with no real 'plan of action' as to what sort of a job I actually wanted. I had made several unsuccessful applications to a whole plethora of vacancies including 'vehicle valeter', 'prescription delivery driver', and even 'dog-walker'. With hindsight, I'm extremely grateful none of these adverts responded to me, or I wouldn't be where I am today.

I have always had a passion for history and heritage, but until I discovered the Historic Environment Advice Assistant apprenticeship with Historic England, I thought it was a world I wouldn't be able to break into without a university degree. Seeing a job advert on a historic architecture forum certainly changed my life, and has given me a leg up in a career I hope to pursue for many years to come.

Since starting my apprenticeship in September 2021, I have learned many new skills and gained a tremendous amount of knowledge about the heritage sector and the work that Historic England carries out. Two years ago, I'd never even heard of Historic England, but since then I have not only learned about the work that Historic England does, but also been able to contribute to it, at both local and national levels. Since starting, my apprenticeship has taken me all over the country, from Bishop Auckland in the North East, St Austell in the South West, Aldeburgh on the Suffolk Coast to inner-city Birmingham, with multiple journeys to the capital, all while being based in the historic city of York.

The main bulk of my time is spent helping to run and administer Historic England's Collaborative Doctoral Partnership programme, funded by the Arts and Humanities Research Council. This aspect of my work includes a wide variety of tasks, such as liaising with students, university tutors and Historic England and English Heritage supervisors; organising our twice-yearly online meetings; organising events for students; and gathering vital information for our Key Performance Indicators and our annual report to the Arts and Humanities Research Council. >>

Being Human Festival

In 2022 I was tasked with being the lead organiser for our Collaborative Doctoral Partnership entry into the Arts and Humanities Research Council's 'Being Human Festival', an annual celebration of the arts and humanities held each November. The 2022 theme was 'Breakthroughs'. With my line manager, Dr Jo Byrne, and Dr Andrew Hann from English Heritage and with six of our Collaborative Doctoral Partnership students, I helped to put together an event at Kenwood House in London to show the public the amazing research being carried out by our PhD students.

For the better part of nine months I led our participants through the organising process. The students each designed and produced interactive activities for the public, as well as each creating content for the production of individual 'roller banners', illustrating and explaining our event. I was charged with liaising with the Historic England Creative Studio and the students to ensure that banner designs were up to standard and specification.

The Creative Studio team also designed postcards to hand out at the event, on which visitors could record their thoughts and their own personal breakthroughs, as well as a 'questions trail', which attendees could answer by visiting each exhibit.

At the event, over 200 people spoke to our students and learned about the research being carried out across a wide range of topics. People were able to share their memories of their local historic High Street, design their own medieval stained-glass window, and even have a go on a fully interactive documentary on heritage loss. Following the first part of the Festival, which was held as a public drop-in session, we held a ticketed evening event where the students each gave a five-minute presentation on their work and then fielded questions from the audience.

The feedback we received for the event from the general public was incredibly positive, with most learning about Historic England's Collaborative Doctoral Partnerships for the first time. This, along with getting our students some public-facing experience, was our main motive for holding the event. It was therefore viewed as a highly successful endeavour on all accounts. >>

The feedback we received for the event from the general public was incredibly positive, with most learning about Historic England's Collaborative Doctoral Partnerships for the first time.

Above: One of the Research Kitchen Event banners invited the public to share their heritage discovery stories. © Historic England

Above: On site at St Stephens Beacon, Cornwall, February 2023. © Historic England

I found the experience to be incredibly rewarding, and despite the rapid learning curve of grasping the various survey techniques I was able to make a useful contribution to both surveys.

Fieldwork

I have also been lucky enough to gain a wide range of experience in different departments at Historic England and the wider heritage sector. Twice I have assisted the Landscape Archaeology Team in conducting earthwork surveys, learning valuable fieldwork skills and getting to know the methods of recording earthworks using Total Station survey techniques. The two sites I have been fortunate to work on were very different. The first, in March 2022, was a medieval monastic site, looking at hand-dug fishponds and water channels built to serve the abbey. The second site, in February 2023, was a hillfort spanning several periods, mainly from the Neolithic to the Bronze Ages. I found the experience to be incredibly rewarding, and despite the rapid learning curve of grasping the various survey techniques I was able to make a useful contribution to both surveys.

Block Release

A large portion of any apprenticeship is, of course, learning, and the Historic Environment Advice Assistant course is no different. There are nine Historic Environment Advice Assistant apprentices, working across five organisations, and we all meet once every three months for a week of block release, with online learning sessions every fortnight or so. The block release weeks take place all over the country: we have experienced college-based learning in Somerset and met in various Historic England offices, such as York, Portsmouth and Birmingham.

Block releases are vital aspect of the apprenticeship. Not only do they afford us the opportunity to see a different part of the country and learn about the local heritage challenges, but it also allows us to see a wide variety of heritage landscapes and meet numerous heritage professionals with unique specialist knowledge. So far on block releases we have learned about designed landscapes in registered parks and gardens, discussed various methods of adaptive building reuse and discovered how climate change can affect historic buildings and heritage landscapes – but this is only scratching the surface of what we are learning. >>

Conclusion

At the time of writing, I am 18-months through the 27-month apprenticeship, and in the limited space I have been given for this article I have only been able to offer a snapshot of the work I have been carrying out. I am deeply grateful for the opportunity of working for Historic England, especially given the strength of the other candidates I sat my group interview with. The scheme has shown its value by giving me, and my fellow apprentices, an insight into how the heritage sector works and by equipping us with new knowledge and skills. My only wish at this moment in time is that this apprenticeship is the beginning of a long, rewarding career in the heritage sector. My new purpose and hope is that with each passing year I can continue to make a contribution to conservation and public awareness of our nation's fascinating history and heritage ■

The scheme has shown its value by giving me, and my fellow apprentices, an insight into how the heritage sector works and by equipping us with new knowledge and skills.

The author

Adam Vamplew
Apprentice Historic Environment Research Co-ordinator.

Adam has had a strong interest in history and heritage since childhood, with a particular focus on industrial heritage and gothic/neo-gothic architecture. As an alternative to the traditional university route, the apprenticeship has enabled him to gain knowledge of the UK heritage sector, as well as to meet and learn from leaders in their field.

Further information

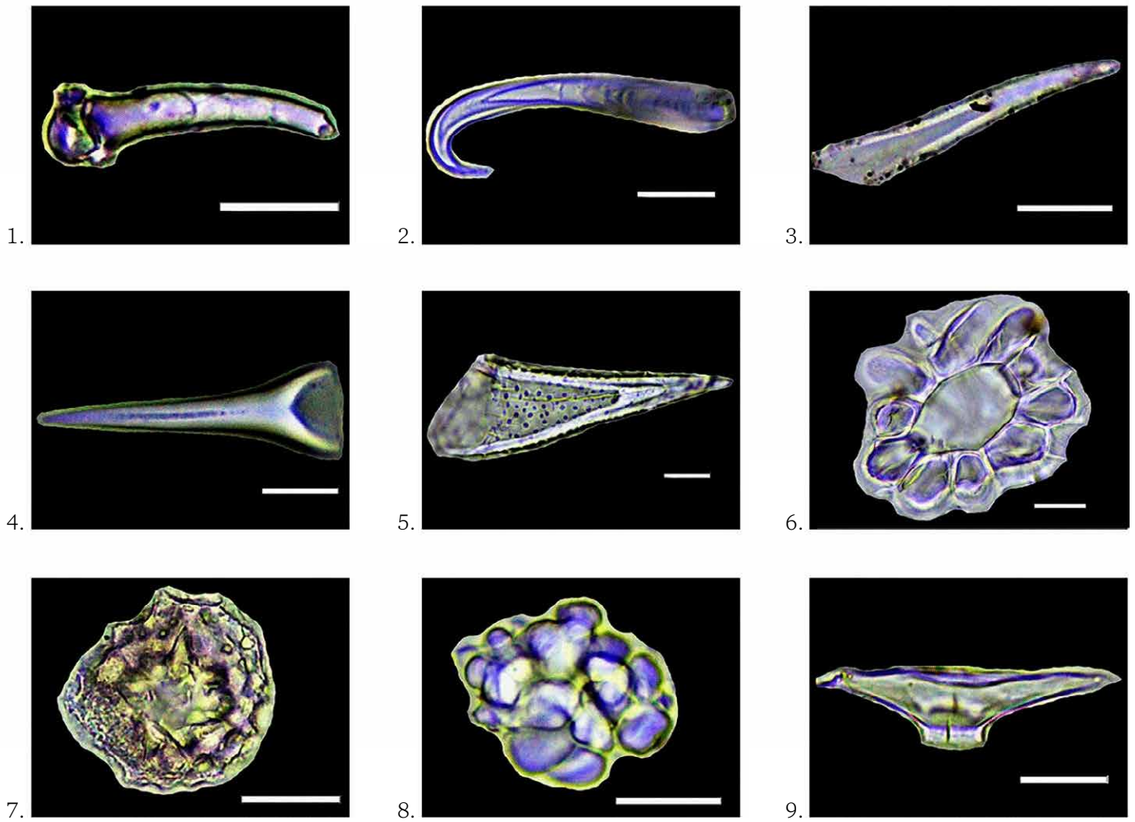
The Research Kitchen Event at Kenwood House, London
https://historicengland.org.uk/research/support-and-collaboration/researchopportunities/heritage-research-kitchen-at-kenwood-house/

Historic Environment Advice Assistant Apprenticeships
https://historicengland.org.uk/services-skills/training-skills/work-based-training/heritage-apprenticeships/heaa/

Above: All four Historic England Historic Environment Advice Assistant apprentices at Moseley Road Baths, Birmingham, October 2021. Left to right Peter Layfield, Michael Clarke, Josie Parry, Adam Vamplew. © Historic England

Making data on microscopic archaeological plant remains more findable, accessible, interoperable and reusable

Working to create a global open phytoliths community to improve data sharing.



Above: Phytolith types. Source: Yong Ge, Houyuan Lu, Can Wang & Xing Gao, CC BY-SA 4.0 https://creativecommons.org/licenses/by-sa/4.0, via Wikimedia Commons. **1.** Rosa helenae, leaf; **2.** Smilax sp., leaf; **3.** Leptopus chinensis, leaf); **4.** Morus australis, leaf; **5.** Ficus tikoua, leaf; **6.** Acer komarovii, leaf; **7.** Euptelea pleiosperma, leaf; **8.** Populus sp., leaf; **9.** Cornus controversa, leaf). Scale bars are 20 µm.

What are phytoliths?

Phytoliths are microscopic plant remains made of inorganic silica that are formed within living plant cells through the uptake of groundwater. These remains are incredibly robust and therefore persist in sediments for hundreds of thousands and even millions of years. Phytoliths are a useful environmental proxy when preservation of organic plant remains on archaeological sites is poor.

Better stewardship of data will lead to better research

Archaeological data is a rich resource but we must consider how to best preserve it for future research. Our datasets have the potential to be reused multiple times, which makes their collection much more cost effective. However, data can only be reused if it is carefully documented and archived so future researchers can fully understand it.

Our project 'Increasing the FAIRness of phytolith data' (commonly known as the 'FAIR Phytoliths Project', website – https://open-phytoliths.github.io/FAIR-phytoliths/) is a collaboration led by Historic England and University of Pompeu Fabra in Barcelona, but also includes members from the Spanish National Research Council and Texas A&M University. The project is a case study of how a particular discipline of scientific archaeology might improve the management, publishing and archiving of data.

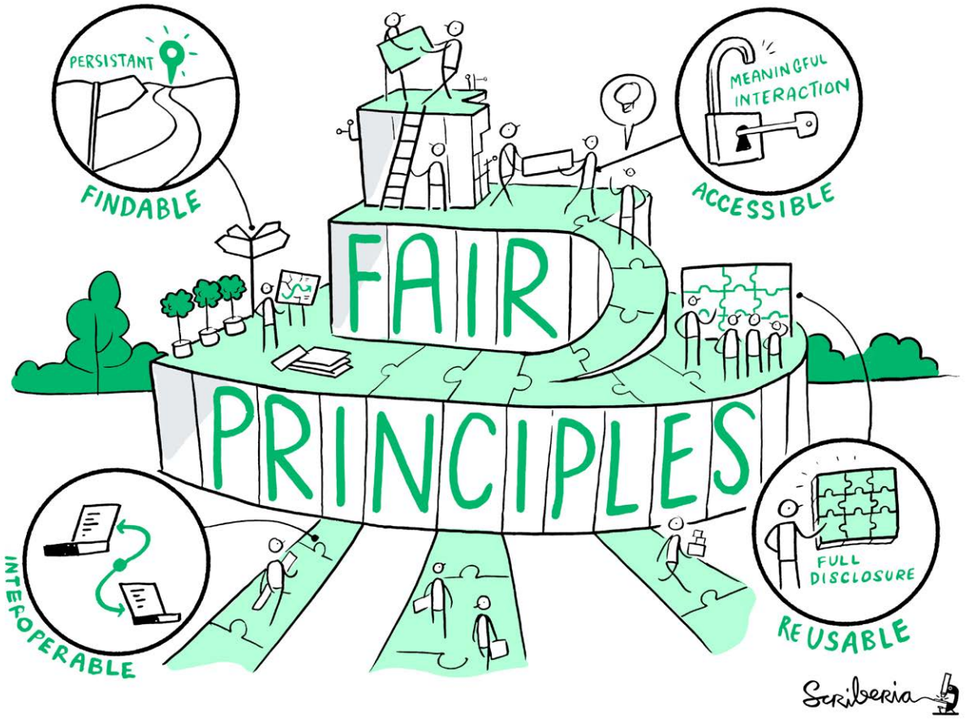
Our aim is to increase use of the 'FAIR' data principles (Wilkinson *et al*. 2016) in phytolith research. 'FAIR' stands for findable, accessible, interoperable and reusable, and these principles constitute a set of data stewardship guidelines to increase the sustainability of research data. Essentially these principles help researchers to publish and archive data to a higher quality in terms of transparency and accessibility. Data can then be fully validated by reviewers when submitted for publication and it also allows other researchers the opportunity to fully understand the data, increasing its reuse potential for future research.

We have four main goals for the 'FAIR' Phytolith project:

- To find out more about current data sharing and opinions of open science practices in our community by conducting a survey.
- To complete a 'findable, accessible, interoperable and reusable: FAIR' assessment of existing phytolith data from two regions – Europe and South America.
- To offer training in 'findable, accessible, interoperable and reusable; FAIR' data and open science tools to the phytolith community and related disciplines.
- To draw up 'findable, accessible, interoperable and reusable' data guidelines for existing and future phytolith data. Others communities can use them to think about how they could do this for their disciplines.

Achieving these goals will start to improve the quality of phytolith data sharing that will lead to an increase in the quality of research in this discipline. Creating findable, accessible, interoperable and reusable data is one of the practices encompassed in what are termed Open Science (also known as Open Research) practices that aim to open up research so that it is more reproducible, transparent, reusable, collaborative, accountable, and accessible to other researchers but also to wider society. Embracing open science practices, and therefore improving data sharing and the sharing of research more broadly, enables greater confidence in the applications of phytolith research in archaeological and palaeoecological studies. >>

'FAIR' stands for findable, accessible, interoperable and reusable, and these principles constitute a set of data stewardship guidelines to increase the sustainability of research data.



Above left: The 'FAIR' Principles. This illustration is created by Scriberia with The Turing Way community. Used under a CC-BY 4.0 licence. DOI: 10.5281/zenodo.3332807

Above right: The community building approach. This illustration is created by Scriberia with The Turing Way community. Used under a CC-BY 4.0 licence. DOI: 10.5281/zenodo.3332807

Why is an assessment of data sharing important in this discipline?

In the last two decades, phytolith research has evolved quickly and is used in a wide range of scientific disciplines including archaeobotany, palaeobotany, geology and plant physiology. Phytolith analysis can be used to answer research questions about past environmental and landscape changes as well as inform us about past dietary and agricultural regimes.

With the expansion of this discipline has come increased publications and the data associated with them. Methods and techniques have been developed in different research groups and this has led to considerable differences in how data is produced, analysed and published. In a study conducted in 2020 (Karoune 2022) looking at phytolith research publications, I found there was a clear lack of data sharing (only 53% shared data in any format) and data reusability was very low – just 4%. In the 'FAIR' phytolith project we are looking in more detail at how phytolith data is published and assessing it in terms of the 'Findable, Accessible, Interoperable and Reusable: FAIR' principles. This will let us understand how to approach phytolith data sharing to make it more sustainable.

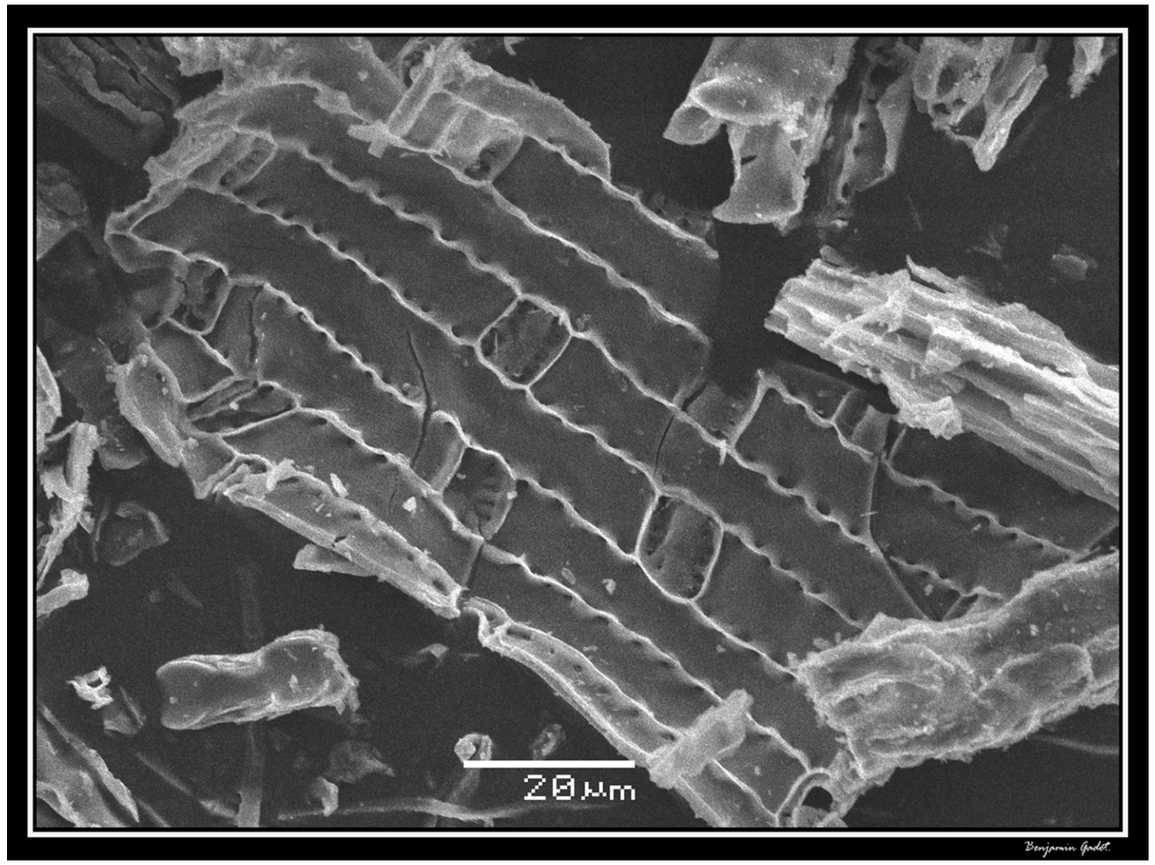
Working with multiple organisations

The multiple organisations involved in this project meant that we adopted a fully open-source approach. We initially trained all of our core team members in using open source tools such as GitHub – an advanced version-control system that can be used as a digital workspace for developing data science projects. This approach has allowed us to work collaboratively on the different project work packages from different locations and time zones.

Our project is funded by European Open Science Cloud Life (https://www.eosc-life.eu/), which is the life sciences hub for the European Open Science Cloud. European Open Science Cloud Life is building a digital space for life science research and we are one of eleven projects across Europe to demonstrate how the 'Findable, Accessible, Interoperable and Reusable: FAIR' data principles can be implemented in specific research domains.

Working with European Open Science Cloud Life has enabled us to draw on experts to tackle specific challenges in our work. One of these challenges is the interoperability of phytolith data (interoperability is the ability to connect and merge datasets). In phytolith research the sticking point is the way that phytoliths are named by researchers. To be able to reuse data, we need to understand what the name given to each type of phytolith means. One of the ways to approach this is to develop a standardised vocabulary (or this can be called nomenclatures) for these remains. We have two standardised nomenclatures for phytoliths (Madella *et al.* 2005 and Neuman *et al.* 2019), however many phytolith researchers do not use them as they prefer their own systems of naming phytoliths that are more specific to their regional floras.

We found in our project's 'Findable, Accessible, Interoperable and Reusable: FAIR' assessment that out of 100 published articles which we examined only 27 fully used one of the standardised nomenclatures. This means that the majority of phytolith datasets in our study are difficult to fully understand and therefore not interoperable. >>



Above: Phytoliths observed through a Microscope. Source: Benjamin Gadet, CC BY-SA 3.0 <https://creativecommons.org/licenses/by-sa/3.0>, via Wikimedia Commons.

We have therefore been looking at ways to improve interoperability of phytolith data and this has led us to experts from the European Molecular Biology Laboratory-European Bioinformatics Institute, which specialises in standardised vocabularies and ontologies. With their help, we have started to develop an ontology (a classification system) for phytoliths that does not force researchers to change their habits of naming phytoliths but draws connections between different naming systems so we can understand the relationship between different names. Once completed, the ontology will allow phytolith researchers to take another researcher's data set and transform the names to match their own naming conventions making data sharing and reuse more possible.

Global community development

Another important aspect of our project has been to develop a community of researchers interested in this approach – the Open Phytoliths Community (https://open-phytoliths.netlify.app/). It is important for the impact of our project to involve our whole community from the start so that we consult with them to co-create our 'Findable, Accessible, Interoperable and Reusable: FAIR' guidelines and provide training in open research skills.

Training is key to changing research culture to be more open. Practising open research requires the development of new skills such as sustainable data management, open publishing, and computational skills.

Through training, our community can learn of the benefits of open research and hopefully then want to start using these practices in their own work.

We therefore created the International Committee on Open Phytolith Science, which is a standing committee of the International Phytolith Society. We now have 12 members covering 5 continents – North America, South America, Asia, Africa, and Europe.

We are working together on initiatives such as the 'Findable, Accessible, Interoperable and Reusable: FAIR' phytolith project, the phytolith ontology and an open publishing guide. We are also currently running a series of workshops on Open Research Skills, which is being funded by another European Open Science Cloud Life grant. This series provides workshops in multiple languages to be fully inclusive and accessible to our whole community.

The work of the 'Findable, Accessible, Interoperable and Reusable: FAIR' Phytoliths Project and our wider international committee is having an impact on the wider archaeological community. We are working with projects such as the 'Rewilding Later Prehistory Project' (https://rewilding.oxfordarchaeology.com/) to contribute to workshops and we are providing training open to researchers in other disciplines. We see our project as a case study for other related disciplines to consider how to implement the 'Findable, Accessible, Interoperable and Reusable: FAIR' data principles and the results of this project can be considered more widely as part of Historic England's new digital strategy ■

Acknowledgements

The author would like to thank the members of the 'Findable, Accessible, Interoperable and Reusable: FAIR' Phytoliths Project team – Carla Lancelotti, Celine Kerfant, Juan José García-Granero, Javier Ruiz-Pérez and Marco Madella – as well as the other members of the International committee on Open Phytolith Science.

And also thanks go to Historic England's Investigative Science Team for hosting this project especially Gill Campbell, Matt Canti and Jen Heathcote.

The author

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She leads the 'Findable, Accessible, Interoperable and Reusable: FAIR' Phytoliths project at Historic England and is the chair of the International Committee on Open Phytolith Science. She also works at The Alan Turing Institute in the Tools, Practices, and Systems programme where she brings her open research skills to multidisciplinary projects across the Institute. Emma is a Software Sustainability Institute Fellow and Elixir-UK as a 'Findable, Accessible, Interoperable and Reusable: FAIR' Data Stewardship Training Fellow working to develop training resources for open research and 'Findable, Accessible, Interoperable and Reusable: FAIR' data management.

Further information:

Karoune, E., 2022: 'Assessing Open Science Practices in Phytolith Research'. **Open Quaternary 8**, 3. https://doi.org/10.5334/oq.88

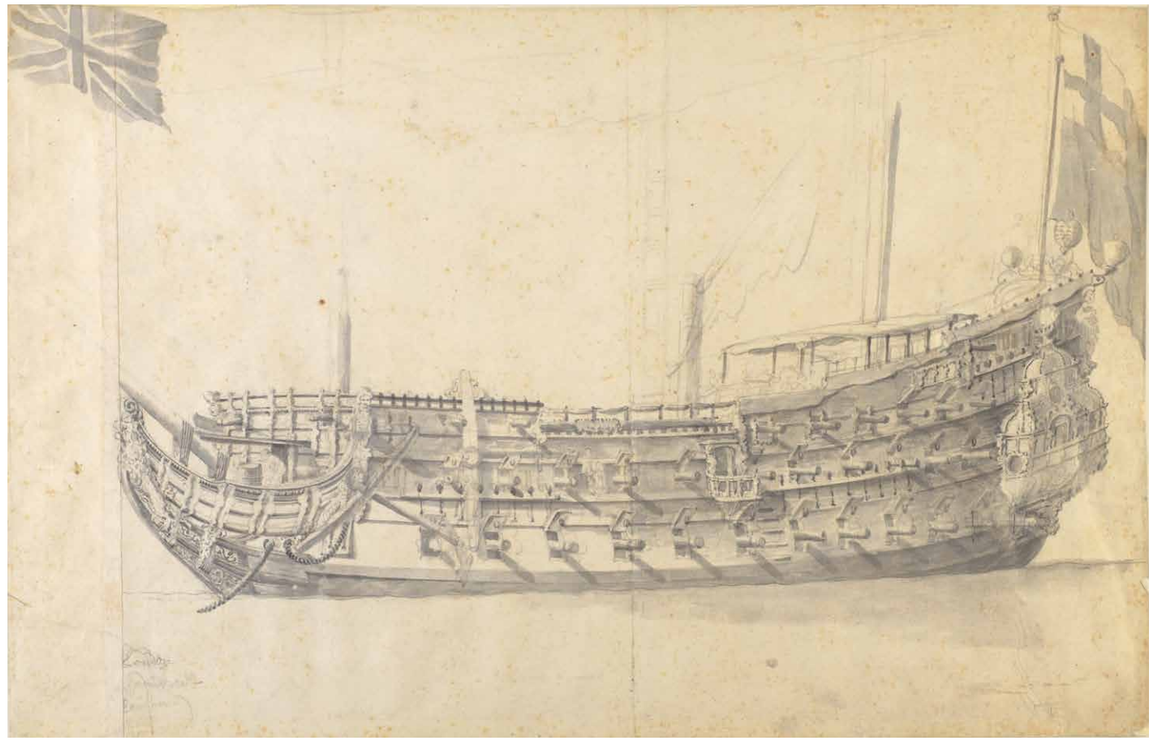
Madella, M., Alexandre, A., Ball, T., 2005: 'International Code for Phytolith Nomenclature' 1.0. **Annals of Botany 96**, 253-260. https://doi.org/10.1093/aob/mci172

Neumann, K., Strömberg, C.A.E., Ball, T., Albert, R.M., Vrydaghs, L., Cummings, L.S., 2019: 'International Code for Phytolith Nomenclature (ICPN)' 2.0. **Annals of Botany 124**, 189-199. https://doi.org/10.1093/aob/mcz064

Wilkinson, M.D., Dumontier, et al, 2016: 'The FAIR Guiding Principles for scientific data management and stewardship'. **Sci Data 3**, 160018. https://doi.org/10.1038/sdata.2016.18

“To unpath’d waters, undream’d shores”

Connecting the UK’s marine and maritime collections through partnership.



Above right: Portrait of The *London* by Willem van de Velde © National Maritime Museum

‘Unpath’d Waters’ is a major project led by Historic England which aims to discover how best to link up the rich, extensive and varied collections relating to our marine and maritime heritage. It is funded by the Arts and Humanities Research Council and is one of five Discovery Projects within the ‘Towards a National Collection’ initiative. It focuses on collections with a digital component, but also looks at the issues of connecting physical or analogue collections.

An extensive collaboration

The three-year, £2.9m project is being delivered by one of the largest research collaborations we have ever forged, bringing together eight universities across the UK (Southampton, Portsmouth, Bradford, and York in England, Bangor in Wales, Ulster in Northern Ireland, and Glasgow and St Andrews in Scotland), four Independent Research Organisations (ourselves, Historic Environment Scotland, Museum of London Archaeology, and the National Maritime Museum), and five Collaborating Organisations (Mary Rose Trust, Maritime Archaeology Trust, Nautical Archaeology Society, the Royal Commission on Ancient and Historical Monuments in Wales, and Wessex Archaeology).

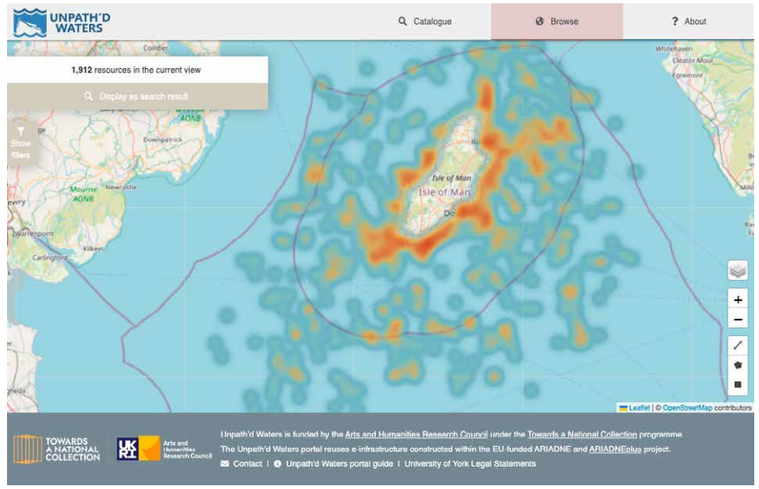
In addition to these seventeen organisations, we have eight strategic partners: the Marine Management Organisation, Cadw (the Welsh government heritage arm), Department of Communities (Northern Ireland), Manx Heritage, the Protected Wrecks Association, Lloyd’s Register Foundation, the Corporation of Lloyd’s of London, and the British Geological Survey.

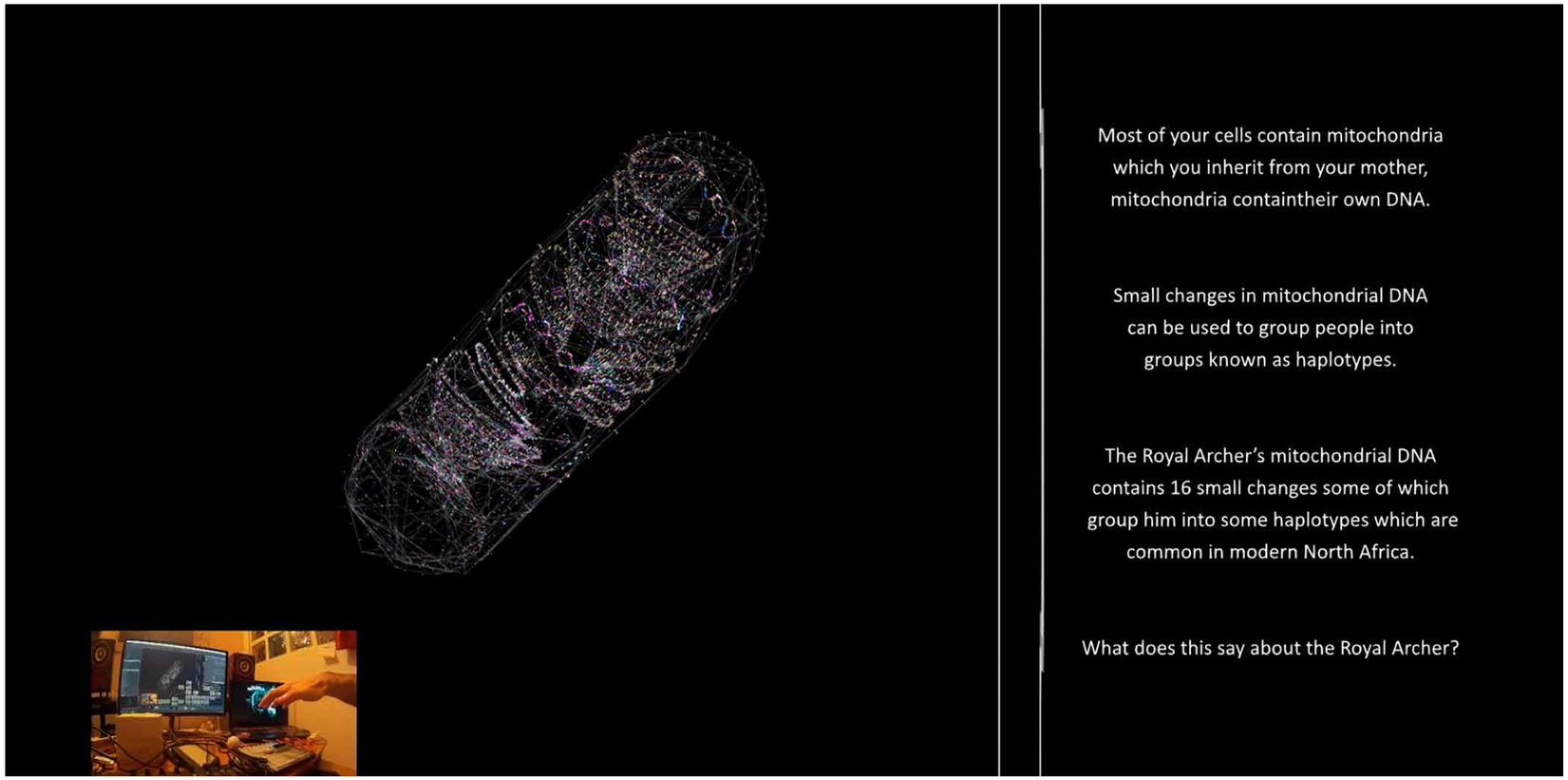
The objectives of the project

Running from November 2021 for 36 months, Unpath’d Waters will fulfil the core objectives of the ‘Towards a National Collection’ programme. These are to:

- Carry out world-class interdisciplinary research in key thematic areas.
- Grow and diversify audiences by introducing the public to new ways of engaging with the collections.
- Devise technological and organizational solutions to the barriers between online collections and catalogues.
- Deliver benefit to collections and other heritage organisations of varied scale and geographic location, including organisations beyond metropolitan centres.
- Create a sound evidence base for the future development of a virtual ‘national collection’.
- Produce evidence-based policy recommendations to inform the delivery of the relevant DCMS strategic objectives and those of the devolved nations.

By doing so, we aim to discover ways of dissolving barriers between collections by looking at technological, organizational and other issues that stand in the way of an integrated virtual ‘national collection’ for the UK; enhance research capability to address cross-disciplinary research using collections; and develop more inclusive public access through major research-driven public-facing outputs – which we are currently calling the ‘UNPATH Portal’ and the ‘UNPATH Navigator’. The project is tackling its research objectives through a number of different strands of activity. >>





Above left: Image of the UNPATH Portal showing the data relating to marine heritage around the Isle of Man (ADS and Manx Heritage, based on data provided by Adrian Corkhill).

Right: A still from one of the student hackathon creations – a gesture-controlled application that, using a Leap Motion Controller, allows the user to interact with and move 3D images relating to the DNA of the skeleton of an archer recovered from the *Mary Rose*. By permission University of Portsmouth and Mary Rose Trust. Created by Enrico Dorigatti, Matilde Antunes Ribeiro Gabriel, Panagiotis Papageorgiou, Stanley Thompson and Yusuf Hani Hamadeh

First, we needed to gather information (metadata) about the range of collections we wanted to explore. To make sure that we can cross-link these data we needed a common framework (ontology) which could be used to join data fields together: that has now been created. The kinds of collections we are looking at are very varied, including the national inventories for England, Scotland, Wales and Northern Ireland (plus, through our partnership, the Isle of Man), marine archaeological investigations, borehole data, findspots, images, museum artefacts and more. Access to many of these datasets have now been made available through the UNPATH Portal, developed by the Archaeology Data Service (but please note this is not a permanent service – it is a trial area acting as a proof of concept. For active use for planning purposes, please refer to the relevant authorities).

Next, we are interested in how we can use Artificial Intelligence and Machine Learning to see how we can improve and enrich these data, and how we might find new links between them which previously could not be found easily, or indeed at all. The University of Southampton has led on this work and has already begun to unlock the potential of these relatively new technologies to enrich our national inventories through tagging information held within text fields, thus making cross searching and analysis far swifter and more productive.

We are interested in how we can use Artificial Intelligence and Machine Learning to see how we can improve and enrich these data.

We want to test these emerging tools in real-world research scenarios, so we have three separate activities doing just that.

The first is called 'People and the Sea' and is being led by the University of Portsmouth with help from the Mary Rose Trust, the Coastal and Intertidal Zone Archaeological Network, the Nautical Archaeology Society, the Maritime Archaeology Trust and Wessex Archaeology. It is looking at how people can engage with and appreciate the significance of wrecks and their associated finds which are displayed in museums compared with those which are still on the seabed. It is focusing on the Solent/Channel area. To this end we have used some of the *Mary Rose* collections as the basis for a student hackathon to trial how people might wish to engage with collections from the wreck. This will be a chance to free-think all sorts of digital solutions to a problem as part of a group. >>

The second – 'Science and the Sea' – is aimed at using collections to help identify wrecks in the Irish Sea whose locations are known from surveys, but whose identities are either entirely unknown or likely to be incorrect. Bangor University is leading this work, aided by the University of Ulster and the Royal Commission on Ancient and Historical Monuments in Wales. Linked collections relating to the wrecks themselves, the seabed and water conditions, the construction records and loss data can all help to obtain a precise identification. This can help not only with heritage management but also in assessing potentially hazardous cargoes.

Our third research trial involves 'Lands Beneath the Sea'. Led by the University of Bradford, this is developing a detailed dynamic model of the prehistoric landscapes inundated by the North Sea between 18,000 and 5,000 years ago. Researchers and the public will be able to access this model to interact, gaming-style, with imaginary prehistoric populations and to explore the effects of massive climate change. This has a more practical side, as we intend that the model can be used to help identify likely areas of prehistoric activity in the context of increasing development of the seabed represented by, for example, windfarms.

The results of these research activities will all feed into our key piece of work which trials access to the linked collections through something we are currently referring to as the UNPATH Navigator. This will be co-designed with three target audiences: cross-disciplinary researchers, communities culturally and/or physically distant from the sea, and visually impaired people. The last of these will be a particularly exciting challenge as so much of marine and maritime heritage is visual in nature. We will be working with VocalEyes and other organisations to ensure that what we create will work.

Our work with our audiences will be fully evaluated to ensure that the lessons we are learning are properly evidenced and can be confidently used to help develop future policies for creating a fully integrated national collection ■

The author

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National Specialist Services Director with Historic England.

Barney has extensive experience of working in the Cultural Heritage sector, including strategic management, commissioning research and archaeological survey. He is a Fellow of Society of Antiquaries of London and on the Board of the European Archaeological Council.

Further information

Unpath'd Waters website
https://unpathdwaters.org.uk/

Historic England's Unpath'd page
https://historicengland.org.uk/research/current/discover-and-understand/coastal-and-marine/unpathd-waters/

Previous article on the use of GIS tools in the Unpath'd project
https://historicengland.org.uk/whats-new/research/opening-access-to-our-rich-maritime-heritage/

The results of these research activities will all feed into our key piece of work which trials access to the linked collections through something we are currently referring to as the UNPATH Navigator.

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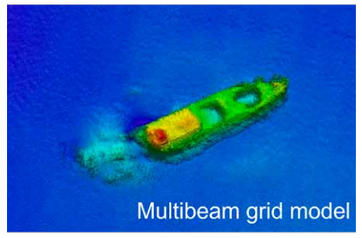
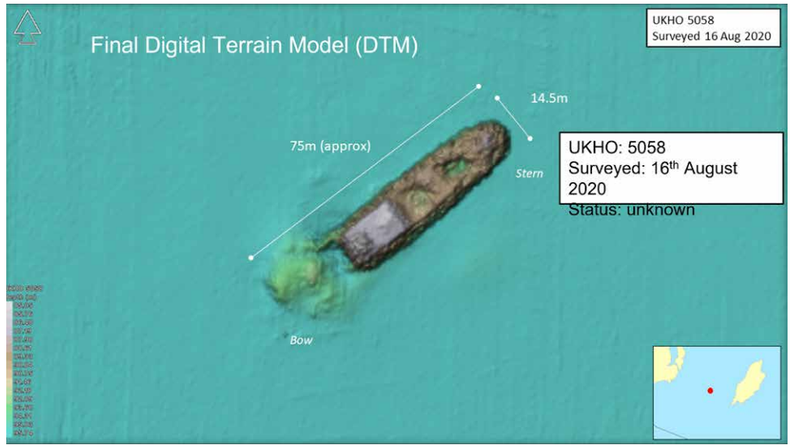
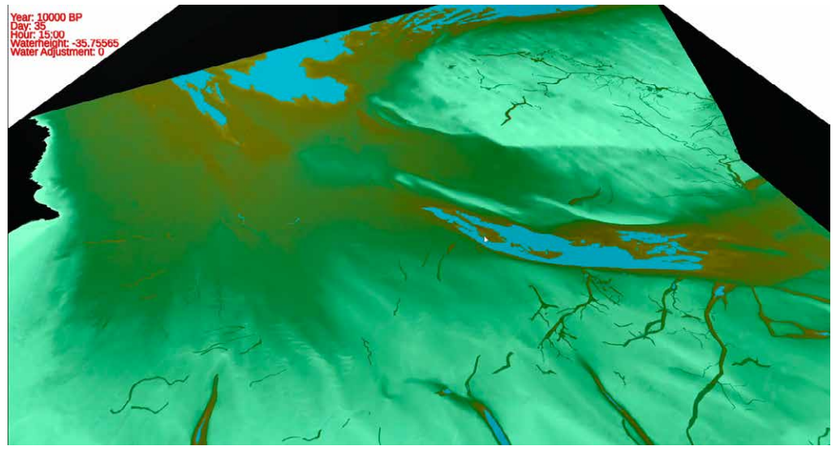






Far left: Image of an unidentified wreck. © Bangor University

Left: A snapshot of part of prehistoric Doggerland – the submerged landscapes of the southern North Sea – showing the water level as it was 10,000 years ago, based on integration of a wide range of data collections. The current coast of England can be seen on the far left in black (Courtesy of University of Bradford).

Outreach to ownership

a community-focused research pilot

Public heritage bodies in England and Scotland working in partnership to empower community-led research in the cultural sector.

Above right: Montana Shop Graffiti workshop, part of 'Building on History'. © Dr Ana Souto, Nottingham Trent University

The Project

In July 2021, The Arts and Humanities Research Council put out a funding call for Independent Research Organisations to deliver a pilot research project for the Galleries, Libraries, Archives and Museums sector.

The idea was simple: how could Independent Research Organisations support community-led research that would help to understand the value of the arts and humanities and promote more inclusive engagement with culture and heritage. The call fitted well with Historic England's priorities, and we put together a bid with colleagues at Historic Environment Scotland based around supporting community-led research at all levels of community cultural activity 'from outreach to ownership'. We were awarded £250,000 at the end of 2021 and secured a further £150,000 at the end of 2022 to continue the work until July 2023.

While integrating heritage organisations and the historic environment more strongly into the overall pilot was a strong driver for us, our pilot hasn't restricted its work to just those themes, and we've supported organisations from the arts, museums, and archives sectors as well as heritage organisations.

Our pilot follows a 'hub and spokes model'. Historic England and Historic Environment Scotland run a central 'Outreach to Ownership hub' that has designed and delivered capacity building and other support functions, while our 'spokes' are partner organisations from across England and Scotland who bid to us through a competitive process to take forward research projects of their own design. Our partners have been:

- Heritage Lincolnshire, whose project 'Building on History' explored the potential of a co-created digital tool to recognise diverse heritage.
- The Scottish Council on Archives, whose project 'Everyone's Stories Matter' explored the obstacles and opportunities around managing community archives in Scotland.
- MSDS Marine and Moder Dy, whose project 'Cladaichean to laebraks: Maritime heritage and engagement on Skye and Shetland' explored inclusive heritage engagement in island communities
- The Art House, whose project 'Makey Wakey' sought to understand the impact of creatively using vacant shop spaces in the Ridings Centre in Wakefield.
- The Churches Conservation Trust, the Heritage Trust Network, Historic Churches Scotland and Churches Trust for Cumbria, whose consortium project 'Bridging the Gap' explored the barriers and solutions to sustainable community ownership of historic rural churches. >>

Above left: ‘Mojatu’ Women’s group workshop showing participants in traditional Angolan clothing.
© Dr Ana Souto, Nottingham Trent University

Above right: ‘Everyone’s Stories Matter’ workshop in Glasgow. © Scottish Council on Archives

The place of heritage

The Arts and Humanities Research Council’s call for the pilots came just after the Government’s Community Ownership Fund was first announced. We were therefore keen to use the work to understand directly from communities what this agenda meant to them, and what kind of support they might need to take on and run heritage assets. But the ambitions of the Arts and Humanities Research Council call also fitted neatly with Historic England’s active participation approach set out in its ‘Future Strategy’ document as being designed to ‘create opportunities for people to get involved by providing information’, and with our commitment to connecting communities by developing and delivering ‘heritage programmes and projects in inclusive and participatory ways’. By working with Historic Environment Scotland, we’ve also been able to learn more about the community empowerment agenda in Scotland: the pilot was seen as something that could contribute significantly to the development of this policy priority .

The hub and spokes structure for our pilot project was an innovative way for Historic England and Historic Environment Scotland to partner with smaller cultural organisations and helped us to work directly with community groups to amplify their voices. It also offered an opportunity to test out a more democratic approach to grant-giving than is always possible through our core grants programmes. And in supporting community-led research not into history or archaeology but into concepts such as ownership, inclusive engagement, and the economic and social value of culture and heritage, we’ve created new ways to empower communities to have a say in the issues affecting them.

The capacity building programme

‘Active participation’ was at the heart of our design for ‘Outreach to Ownership’. Not only did we want to encourage our partners to focus on community needs and interests, but we also wanted the capacity building programme itself to be co-created and delivered.

We undertook a light-touch skills audit which allowed us to design a programme of training and development activities to be delivered online through a variety of formats. This programme was split across a development phase focusing on subject-specific workshop sessions in which partners could refine the ideas set out in their initial applications, and a delivery phase when we undertook troubleshooting and facilitated peer-to-peer support as issues arose during the running of projects.

The capacity building programme was delivered by our Project Co-ordinator but drew on support from academics brought in to advise on specific issues and our evaluation consultants. Virtual workshops supplemented a small online library of content for partners to draw upon.

All of this was designed and delivered at pace, and it’s a great credit to Dr Desmond Clarke – our Project Co-ordinator that the programme ran so smoothly. >>

Above left: ‘Cladaichean to Laebraks’ participant coastal survey on Skye. © MSDS Marine

Above right: ‘Makey Wakey’ workshop prompt in Merrie Studios. © Emily Ryalls

Some benefits of the ‘Galleries Libraries Archives and Museums hubs’ model

A key benefit of the hub and spokes model which we implemented has been that it enables us to bring together partners from different sectors around a common theme. Partners have been able to learn from each other as well as from us, and we know from our evaluation that they’ve found this inspiring as well as helpful. In fact, our partners have now begun to support each other outside of their ‘Outreach to Ownership’ work through sharing knowledge or contributing to events.

The creation of local or sectoral impact with research by placing the needs and interests of communities and practitioners alongside academic or ‘expert’ knowledge has also been a central impact of the ‘Outreach to Ownership’ hub model. By giving ownership to communities, and empowering them to take work forward, we have reached a range of people and organisations that both Historic England and Historic Environment Scotland often struggle to engage. This in turn has highlighted the potential of research to foster greater collaboration between research organisations and community groups active in the cultural sector, playing into UK Government place and levelling up agendas, and Scottish Government’s community empowerment agenda. >>

Below right: ‘Makey Wakey’ print making workshop in progress. © Emily Ryalls

The impact of the pilot so far

The 'Outreach to Ownership' project has had extensive geographical reach across England and Scotland, with a diverse range of stakeholders and communities engaged through the five projects and their activities. Across the 'Outreach to Ownership' projects:

- Approximately 440 people took part in 30 workshops either in person or online.
- 159 people responded to surveys.
- New or strengthened partnerships were created with 79 community groups.
- 652 people attended pop-up exhibitions or events.

Evaluation of the pilot by our independent evaluation consultant Bright Culture continues as we move into our second phase of funding. But to conclude, one of our partners puts it best:

"It was a huge learning experience for me. I literally Googled what research was when we applied for this project because I had no idea where to start, and I really thought it wasn't something that I would ever be able to do.

When we applied, the thing that was most exciting was the learning part of the project, we saw it as a huge professional development opportunity.

The workshops and the really interesting discussions with partners gave me a lot of confidence that what we think is important has the right to be the subject of research. I'm really, really proud of what we've achieved and excited to carry it forward.

I feel so confident now!" ■

Above: A 'Bridging the Gap' workshop run by the Churches Conservation Trust and partners. © The Churches Conservation Trust

The authors

Charlotte Garratt
Tendered Projects Manager with Historic England.

Charlotte is a Heritage professional with 16 years' experience in the Historic England grants team. She is the Project Manager and Co-Investigator on the Outreach to Ownership Pilot. Charlotte has extensive experience of working alongside community organisations to develop and support delivery of funded projects.

Dr Ben Thomas
Research Manager for Historic Environment Scotland.

Ben is Research Manager for Historic Environment Scotland, and the Principal Investigator on the Outreach to Ownership project. Ben's work focuses on how heritage can empower and enable community groups in Scotland, and how heritage can create social and economic benefits.

Further information

Historic England's "Outreach to Ownership' project page
https://historicengland.org.uk/research/current/social-and-economic-research/outreach-to-ownership-pilot/

Historic Environment Scotland News Article 15 November 2021: 'New Pilot Scheme Explores Inclusive Ways to Empower Community Organisations'
https://www.historicenvironment.scot/about-us/news/new-pilot-scheme-explores-inclusive-ways-to-empower-community-organisations/

Historic Environment Scotland's advice on supporting communities
https://www.historicenvironment.scot/advice-and-support/communities/

The Arthouse website: 'Makey Wakey Receives Support from Outreach to Ownership Research Pilot'
https://the-arthouse.org.uk/news/makey-wakey-receives-support-from-outreach-to-ownership-research-pilot/

Heritage Lincolnshire's Outreach to Ownership Project Page
https://www.heritagelincolnshire.org/projects/outreach-to-ownership-project

Visiting Churches Website: Exploring Community Ownership of Churches with 'Bridging the Gap' News Article 22 August 2022.
https://www.visitchurches.org.uk/what-we-do/news/bridging-the-gap.html

Heritage Trust Network: Exploring community ownership of churches with 'Bridging the Gap' News Article
https://www.heritagetrustnetwork.org.uk/bridging-the-gap/

MSDS Marine: Cladaichean to Laebraks: Maritime Heritage and Engagement on Skye and Shetland
https://msdsmarine.com/projects/intertidal-fieldwork/cladaichean-to-laebraks/

Scottish Council on Archives: 'Everyone's Stories Matter Research Project'
23 May 2022
https://www.scottisharchives.org.uk/latest/everyones-stories-matter-research-project/

The Matrix

Connecting and reusing digital records and archives of archaeological investigations.

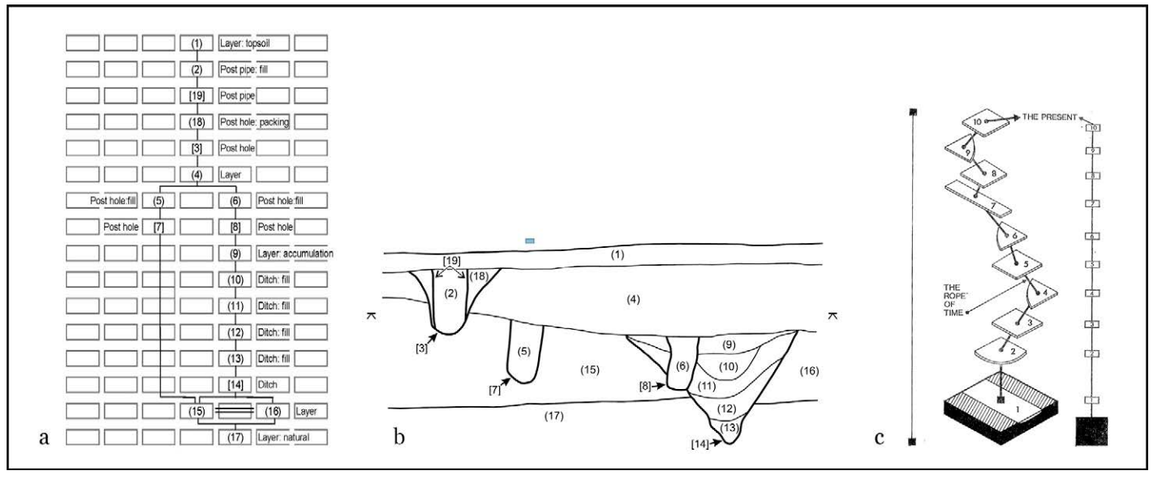
Stratigraphy is created freely and is everywhere… in chains

Stratigraphic data form the backbone of archaeological records from most excavated sites and, along with the phasing and interpretive information derived through stratigraphic analysis, are essential for chronological modelling, broader synthesis of inter-site phases and periods and, we argue here and elsewhere, should be a required component in digital archives of the growing body of archaeological data and reports generated through the commercial archaeological sector in the UK and internationally (May, Taylor, Binding 2023). The stratigraphic record that quantifies, characterizes and sequences the different types of stratigraphic units (see top right) is a primary piece of 'evidence' for how, and in what order, a site was excavated.

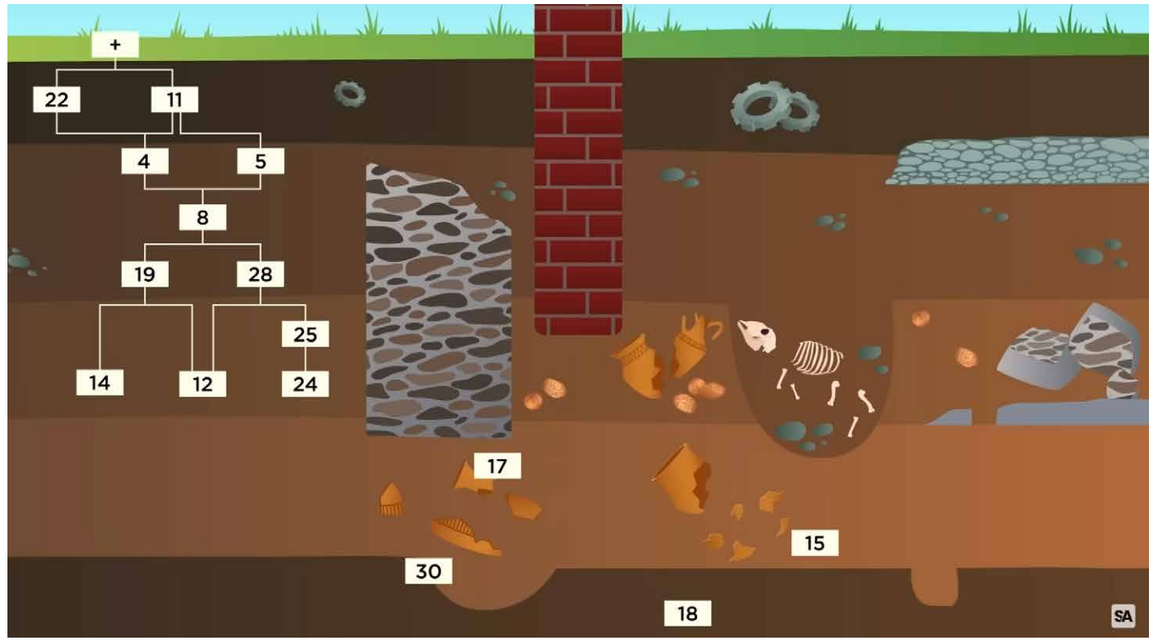
Stratigraphy helps understand a site's life story

Not every site has complex stratigraphy, but understanding the nature of the stratigraphy, be that deep or shallow, complex or otherwise, enables researchers to piece together the underlying details of how the excavator(s) arrived at the interpretations they have made about the site. A short explanation of the importance of stratigraphy and the use of stratigraphic Laws and Principles in archaeology, as set out by Dr Edward Harris from the 1970s onwards (Harris 1989), is provided in this video animation. >>

The stratigraphic record that quantifies, characterizes and sequences the different types of stratigraphic units is a primary piece of 'evidence' for how, and in what order, a site was excavated.



Top: (a) Example of a simple stratigraphic matrix diagram derived from analysis of the section in **(b)**. Example section (**a & b** taken from Historic England's recording manual). **(c)**: illustration of a similar looking hypothetical sequence, showing a succession of stratigraphic units and temporal interludes (After Harris 1979 Fig 2).



Bottom: Illustration of archaeological stratigraphic laws and principles. Still taken from animated video 'What is The Matrix? How do archaeologists use stratigraphy?' © SciAni

Exploring issues in archaeological digital archives

Because an archaeological excavation cannot be repeated, archaeologists have long been concerned that the records of excavations should be published, archived and preserved safely for future research. Once the archaeology in the ground is dug away then increasingly the digital records and reports held on computers may be all that remains to enable future researchers to find out and understand what has been discovered. Such digital records remain at some risk, unless that information is deposited in digital repositories such as the Archaeology Data Service and the reports and metadata are made available through online reporting systems such as OASIS – the online system for reporting archaeological investigations in the UK (https://oasis.ac.uk/). But many archive records are often still only held on paper and frequently the analytical phasing data used to support the interpretations presented in written reports is not digitally archived consistently, if at all. This results in key archive records, such as scanned copies of matrix diagrams being, at best, siloed and re-buried in repositories, else unfindable and unsearchable, and most often requires lengthy and wasteful re-keying of data (top right).

#Inform – The Matrix research questions

The Matrix project directly addresses two topics from the Historic England Research Agenda (#inform). The first aim is to encourage the sharing, re-use and interoperability of archaeological data and information derived from the commercial sector. The second aim is to ensure the consistent development, application and enforcement of technical information and data standards. The overall aim is to maximize public value and enhance the research potential of the archaeological data being recorded and preserved.

FAIR Principles for archaeological data

The Matrix project findings suggest that archaeological records of our stratigraphic data should be archived in a manner that is 'Findable, Accessible, Interoperable and Reusable' (FAIR Principles) and ideally openly available too. But 'FAIR' data isn't currently the norm in commercial archaeology, as digital archiving is only now just becoming a requirement in some development control practice and 'Open data' even less so.

The Open Data institute defined open data as:

> 'Open data is data that anyone can access, use or share. Simple as that. When big companies or governments release non-personal data, it enables small businesses, citizens and medical researchers to develop resources which make crucial improvements to their communities'.

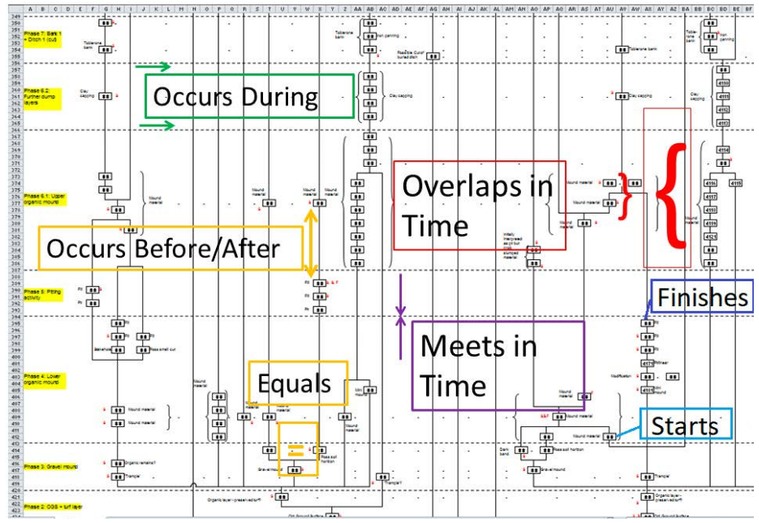
Data Management Plans are also not commonly used (yet) by the commercial archaeological sector, or even consistently in academia, despite the good work identifying their importance in the recent publication of the CIfA Dig Digital guidance. The Matrix project team, along with other authors, have identified the need for a cross-sector set of common guidelines (including, e.g. A data package for stratigraphic and chronological data) to reflect and enshrine best practice in post-excavation analysis work.

The Matrix: Some key outcomes and results

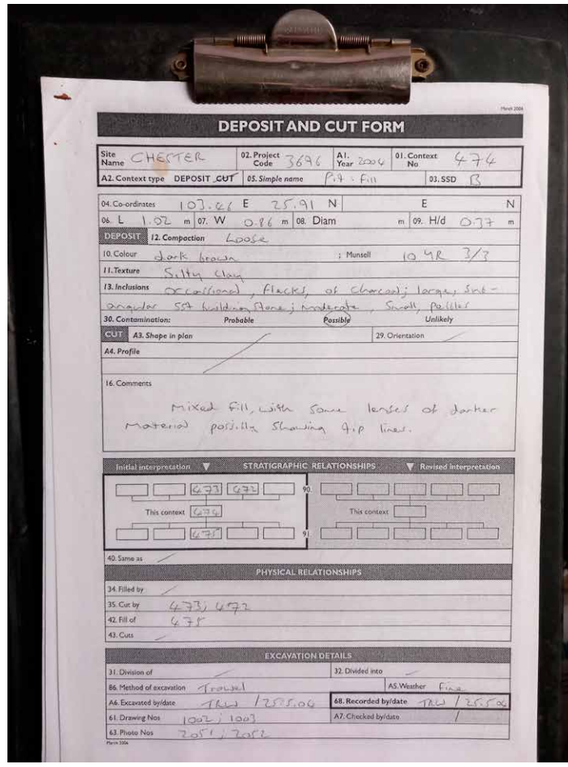
The Matrix has highlighted several areas of archaeological practice where stratigraphic data needs to be queried, revisited, updated, and integrated into new datasets or otherwise re-used, re-mixed and recycled (Huggett 2018).

1. Greater transparency: Evidence in data for interpretations in publications

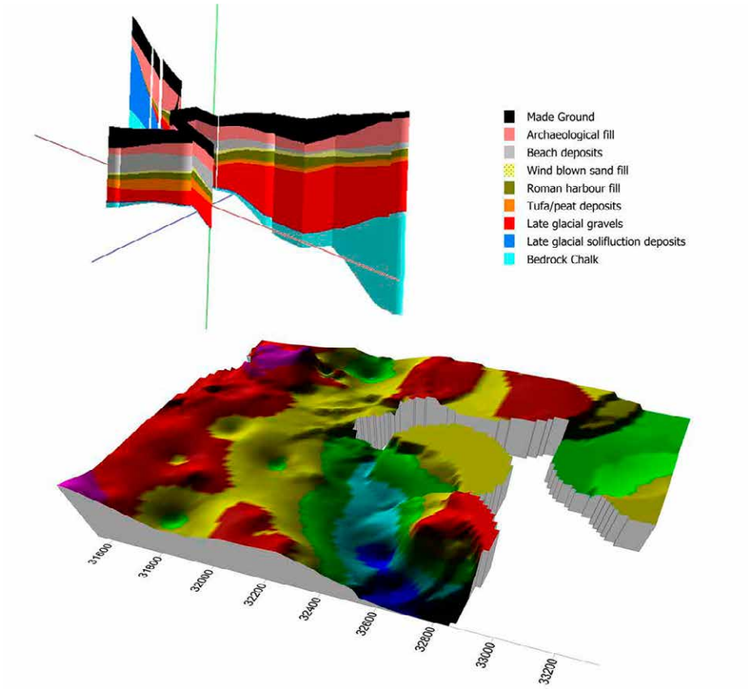
Where the stratigraphy is pivotal to the interpretation of excavation data, there is a professional ethical imperative on archaeologists to make the 'raw' stratigraphic data available in the digital archive. This goes hand in hand with a scientific responsibility for any related stratigraphic analysis data about a site to be made more 'Findable, Accessible, Interoperable and Reusable' in order to lay bare the evidence for our interpretations of the 'raw' stratigraphy (bottom right). >>



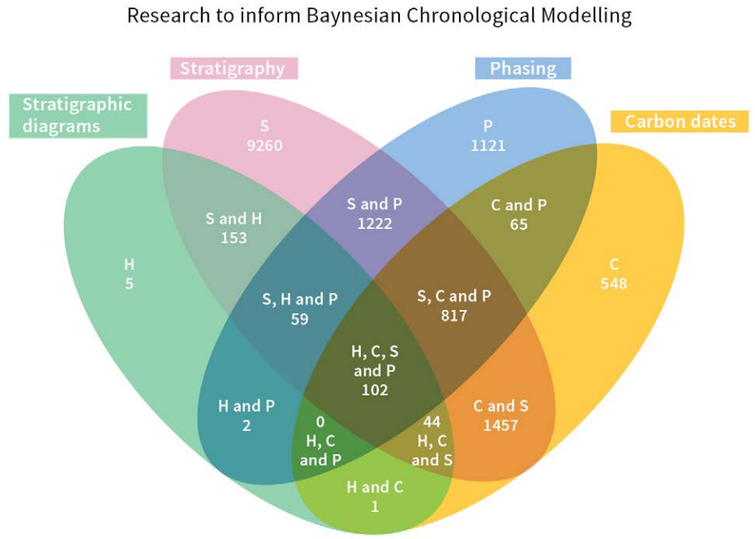
Above left: Example of current practice. Harris Matrix diagram of Silbury Hill drawn in an MS Excel spreadsheet. Note the author's coloured annotations to show additional temporal relationships not explicitly expressed in the drawing, or associated data. Silbury Hill. English Heritage. DOI: https://doi.org/10.5284/1024570 downloaded from Archaeology Data Service (ADS) archive.



Bottom left: A traditional paper context sheet including a section for recording the context's position in the site matrix.
Bottom right: Opposite recording digitally at Low Ham, South Somerset. © Historic England



Above left: Stratigraphy of Dover town centre illustrated in a fence diagram, with topographic plot of gravel surface. Cover image from Historic England's guidance on Deposit Modelling and Archaeology.



'Digital Data Reuse in Archaeology: three case studies with varying purposes and perspectives'. Moody, B., *et al*

Above right: Venn diagram showing the total numbers of documents from a sample of 10,000+ OASIS reports containing each combination of chronological dating evidence types as defined by each segment label. Moody, B.C. (2019) Heritage Data Analytics Year 1 Report: The Quality and Utility of Resources in Digital Heritage Repositories. England: Historic England. Unpublished.

2. Reinterpretation: revisiting and reusing multiple digital data sets

The recent increase in large-scale infrastructure projects (e.g. HS2, Crossrail, etc.) with associated digital project management systems has emphasised the need for better 'joined up' data at a landscape scale. These inter-site project management methods are currently more commonly used on urban development sites, and more often enable broader synthetic publications.

3. Deposit modelling: a need for interoperable stratigraphy

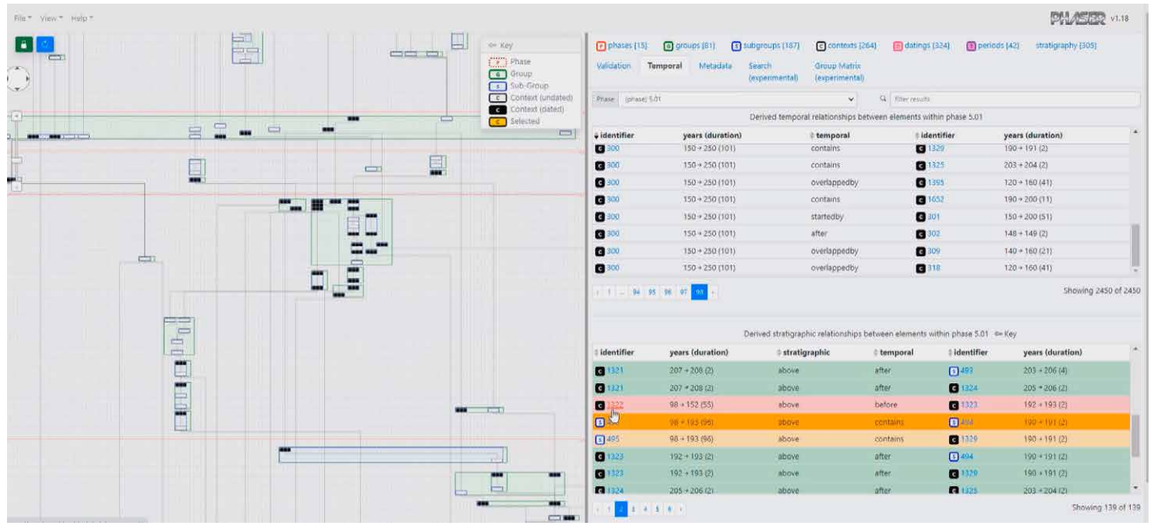
Deposit modelling, especially in urban environments, has effectively become a requirement within planning policy guidance to mitigate and monitor the effects of large-scale developments. Reliable, and 'Findable, Accessible, Interoperable and Reusable', stratigraphic data is increasingly important alongside deposit modelling to cost-effectively assess the potential for archaeological remains on development sites (top left).

When dealing with scientific dating of specific sites, Bayesian chronological modellers regularly seek to drill down into legacy stratigraphic data for those sites...

...so 'Findable, Accessible, Interoperable and Reusable' access to that stratigraphic data is particularly important to them.

4. Bayesian chronological modelling: vive la révolution

The so-called Bayesian Revolution continues to have a profound impact on archaeological dating. When dealing with scientific dating of specific sites, Bayesian chronological modellers regularly seek to drill down into legacy stratigraphic data for those sites, so 'Findable, Accessible, Interoperable and Reusable' access to that stratigraphic data is particularly important to them. Recent PhD work in Heritage Data Analytics (Moody *et al.* 2021) as part of an Arts and Humanities Research Council funded Collaborative Doctoral Partnership between Historic England and Sheffield University School of Maths and Statistics has shown the considerable problems caused for Bayesian Chronological modellers, by a lack of standardized approaches to the archiving of stratigraphic data (top right – with thanks to Bryony Moody). >>



Above left: Phaser software: screen grab showing novel tools for checking temporal reasoning using combined stratigraphic and dating evidence and highlighting inconsistencies. © Historic England

Partnership research as an Independent Research Organisation

The Matrix project has developed a very successful partnership between Professor Keith May on behalf of Historic England, Dr James Taylor, lecturer in the Archaeology Department of the University of York, and Ceri Binding, a senior researcher, lecturer, and computer programmer at The University of South Wales. The Matrix project builds on earlier successful research in partnership with the Hypermedia Research Unit at the University of South Wales to research and develop computing technologies for searching for information and data written in different natural languages (different semantics), and reasoning about spatial and temporal relationships (spatiotemporality) in archaeological data (Tudhope *et al*. 2011).

Phaser: prototype software Research and Development

Keith May's and James Taylor's main work on The Matrix project has focused on consulting with fellow archaeologists about their use of stratigraphic methods and processes, along with gathering suitable test data and specifying requirements for stratigraphic software. Ceri Binding has developed prototype software initially to help explore how the archaeologists use and manage their stratigraphic data, but has also focused his Research and Development (R&D) on the use of new technologies to improve the methods for analysis of complex stratigraphic data. The prototype software for stratigraphic analysis has been nicknamed Phaser. A simple website explaining more about The Matrix project and Phaser has been created https://stratigraphic.github.io/matrix/. Hosting of the Phaser application and associated documentation is via a GitHub Pages site, enabling a working deployment of the prototype and ensuring that documentation persists beyond the end of the funded project.

The prototype software draws upon experiences of archaeologists who use existing software for matrix drawing and analysis, while incorporating some novel new technological solutions, such as using built-in Linked Open Data vocabularies (Perio.do) to standardize the terminologies (HeritageData.org) used when entering archaeological data and searching online (left).

Conclusions and further work – what next?

Feedback from The Matrix project consultations suggests that a collective approach, amongst archaeologists, to tackling the digital archiving issues would be most effective in delivering a sustainable and FAIR outcome. A successful application has been made by May and Taylor to the Arts and Humanities Research Council for Follow-on Funding of a new project to investigate how a consortium of archaeological organizations might address some key issues. The new project, 'The Archaeologist's Guide to Good Practice – Handbook' (AG2GP-Handbook), is due to begin in May 2023.

The AG2GP-Handbook project (AH/X006735/1) will combine the collective expertise of archaeological contractors across the UK to produce an online handbook of common archaeological methods used during post-excavation activities, focused initially on stratigraphic analysis. The project team, in consultation with other stakeholders from the sector such as FAME & CIfA, will build a consensus on what online documentation, tools and resources are needed to support best working practice. The project will also make recommendations to develop a sustainable Community of Practice that can maintain the best practice guidance and online tools while investigating the potential for e-learning resources to be used in Continuing Professional Development and for teaching students. To make such a Code of Practice most widely applicable across archaeological fieldwork worldwide, the project is also aiming to draft an International Convention on Archaeological Stratigraphic and Chronological Methods and Data ■

Acknowledgements

This work was supported by the Arts and Humanities Research Council via funding under their Leadership Fellowship grant (ref AH/T002093/1).

The authors would like to thank Professor Doug Tudhope, Professor Caitlin Buck, Dr Holly Wright, Tim Williams and Barney Sloane, for their helpful inputs as the project's Advisory Panel along with Dr Edward Harris, Steve Roskams, Dr Tom Dye, and Dr Jen Heathcote who have helped with invaluable advice along the way. Particular thanks to Bryony Moody, whose complementary Collaborative Doctorial Partnership PhD research has often helped inform the directions we have taken. Likewise, thanks to the staff at ADS who have helped to track down various data items we could not find or helped confirm what were the "known unknowns" in the ADS archive. Special thanks to the team at MoLA for so diligently archiving the outputs of their work, particularly on the XSM10 project, in ways that enabled FAIR play with their data.

We would also like to sincerely thank the numerous other workshop participants and various consultees, including several colleagues in Historic England, whose participation and feedback was essential for our research, both in understanding disciplinary needs and evaluating prototypes of the Phaser software, including: Dr Kenneth Aitchison, Dr Alex Smith, Dr Claire Christie, Dr Dominic Perring, Guy Hopkinson, Ian Milstead, Vicki Ridgeway, Becky Haslam, Dr Gill Hey, Ken Welsh, Gail Wakeham, Dr Alistair Barclay, Dr Dave Gilbert, John Layt, Guy Hunt, Dr Manda Forster, Doug Killock, Dr Matt Edgeworth, Prof Alex Bayliss, Dr Peter Marshall and Prof Dominic Powlesland.

The Matrix project builds on earlier successful research in partnership with the Hypermedia Research Unit at the University of South Wales to research and develop computing technologies.

Feedback from The Matrix project consultations suggests that a collective approach, amongst archaeologists, to tackling the digital archiving issues would be most effective in delivering a sustainable and FAIR outcome.

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https://southwales.academia.edu/KeithMay (Academia)_

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https://www.york.ac.uk/archaeology/people/academic-staff/james-taylor/

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https://pure.southwales.ac.uk/en/persons/ceri-binding

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Moody, B.C., Dye, T., May, K., Wright. H., Buck, C. (2021): 'Digital Chronological Data Reuse in Archaeology: Three Case Studies with Varying Purposes and Perspectives'. **Journal of Archaeological Science: Reports 40** (11) DOI: 10.1016/j.jasrep.2021.103188

Moody, B.C. (2019): **Heritage Data Analytics Year 1 Report: The Quality and Utility of Resources in Digital Heritage Repositories**. Historic England unpublished internal report.

Tudhope, D., May, K., Binding, C. and Vlachidis, A. (2011): 'Connecting Archaeological Data and Grey Literature via Semantic Cross Search', **Internet Archaeology 30**. https://doi.org/10.11141/ia.30.5

Relevant Online Resources

HeritageData.org LOD vocabularies: https://heritagedata.org/live/schemes.php (Last accessed 28/02/2023)

Perio.do LOD gazetteer of Periods: https://perio.do/en/ (Last accessed 22/02/2023)

FAIR Principles https://www.force11.org/group/fairgroup/fairprinciples (Last accessed 22/02/2023)

The Matrix project web page: https://stratigraphic.github.io/matrix/ (Last accessed 22/02/2023)

Science Animated (SciAni) animation of Stratigraphic Laws & Principles https://youtu.be/xv-Yqoktyjg (Last accessed 17/04/2023)

The domed ceiling of the Bristol Hippodrome.
© Barrie Dams

An overlooked heritage: fibrous plaster in the UK

The University of Bath, Historic England and partners are researching the behaviour of fibrous plaster ceilings and decoration.

Overview and the importance of research

'Fibrous plaster' is a composite material patented in the UK in 1856 by Frenchman Alexander Desachy, with the rights subsequently purchased by George Jackson and Sons. The material matrix consists of gypsum plaster, also known as 'Plaster of Paris.' Reinforcement in fibrous plaster was typically provided by hessian fibres, produced from jute plants native to India. Within ceiling panel elements, supporting timber laths are also used at regular spacings. A fibrous plaster ceiling typically has two layers of hessian woven fibres, or 'scrim' [Figure 1(a]). Fibrous plaster ceilings are often suspended from timber or steel structural elements below roofs or fireproof floors using fibrous plaster 'wads' [Figure 1(b)]. In addition to gypsum and hessian, wads sometimes contain a steel wire for additional reinforcement. **All modern wads include steel wires, but operatives in the fibrous plaster industry frequently observe degraded historic wads without a steel wire.**

Fibrous plaster was used extensively to provide distinctive and prestigious decorative ceilings and features in theatres, higher status private residences and civic buildings, particularly in the late Victorian and Edwardian eras. It became more efficient to mass-produce in comparison to previous lime plaster methods. Figure 1(*c)* and (*d*)show fibrous plaster ceilings from the underside and e and f show wads above the ceiling attached to roof structural members (images from different buildings). Figure 1 (g–i*)* shows holes in historic ceilings made to facilitate modern ventilation, light and sound systems.

Fibrous plaster degrades over time and the early 21st century witnessed failures of fibrous plaster elements in historic buildings. The highest profile example was the partial ceiling collapse in the Apollo Theatre, London, in December 2013, when 58 people were hospitalised. It resulted in the Association of British Theatre Technicians 2015 guidance, stipulating that fibrous plasterers and structural engineers should regularly inspect the condition of ceilings. Further failures reinforced the need to ensure that ceilings continue to remain safe for human occupancy. There is extensive empirical knowledge of the material within the fibrous plaster industry; however, there is also a significant absence of data relating to material properties. >>

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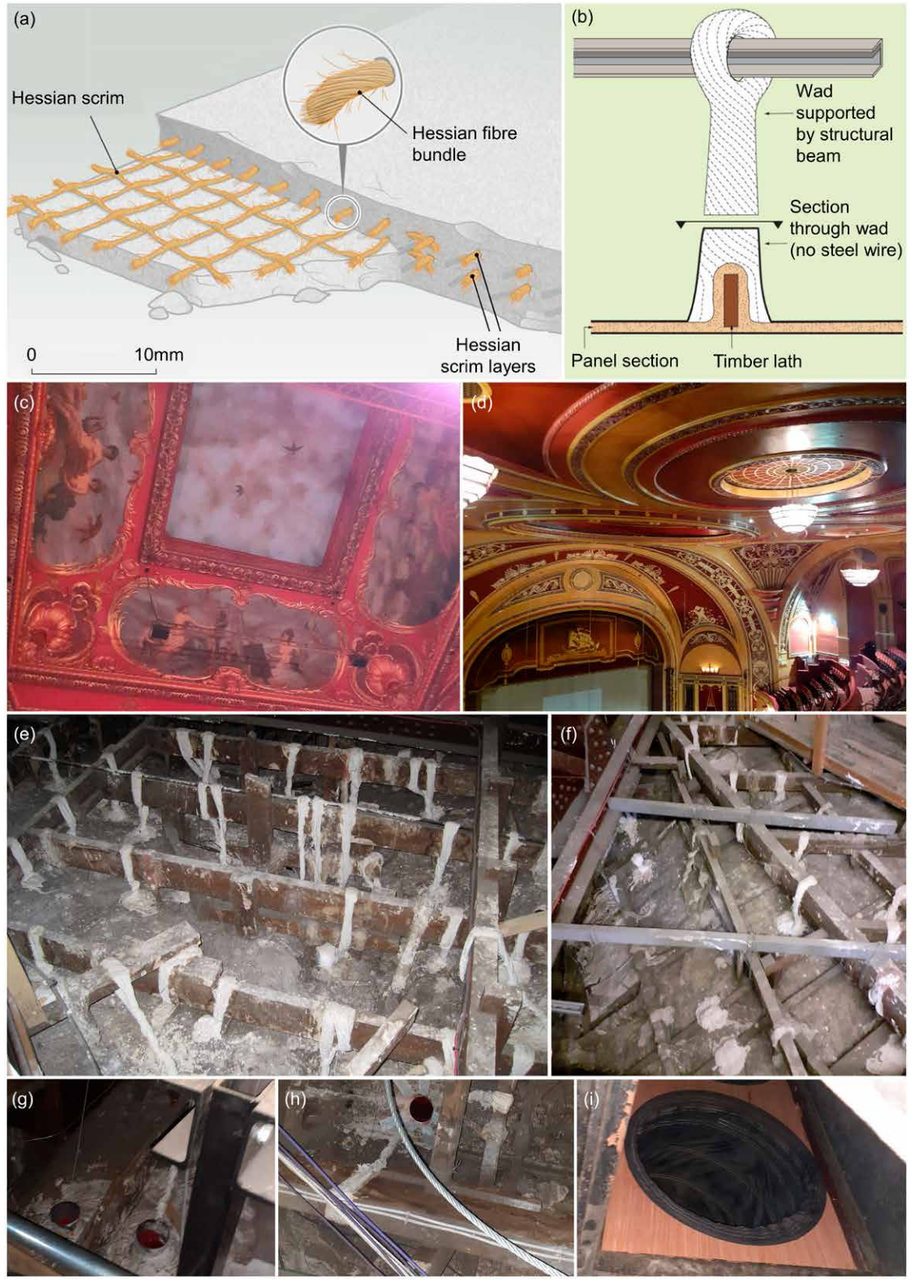


Figure 1: Fibrous plaster ceilings – all images by the authors except where noted. Images show examples of a variety of different ceilings and features in different buildings. a) Schematic illustration of a fibrous plaster ceiling panel (© Historic England, Awang-Ngah *et al*., 2020), b) Section drawing of a wad suspended from a roof beam (© Historic England, 2019), c) and d) ceiling features from the underside (© Historic England Archive), e), f) Wads of varying lengths and orientations attached to ceiling topsides and structural elements, g) h) and i) Holes created in ceilings to accommodate modern services such as ventilation, lights and sound systems.

Research and application to conservation

Following the Apollo Theatre incident, Historic England initiated a research project in 2017 and commissioned the University of Bath to investigate the properties and behaviour of fibrous plaster. The results will be published in a book, “Fibrous Plaster: History and Conservation” (University of Liverpool Press, 2024). These investigations formed the basis for a Leverhulme Trust project in partnership with Historic England and industry stakeholders from the UK and Canada. This research will complement existing empirical knowledge with a scientific element based upon data, with quantification of material properties expanding the current state of the art.

Mechanical properties of fibrous plaster ceiling and wad elements are being investigated using the 1.5m square large-scale ceiling panel shown in Figure 2(a). To date, lateral loading has been applied to panels to simulate building envelope movement resulting from conditions such as subsidence, where wad failure is initiated at the location of attachment to the supporting steel beam, followed by failure at the wad base attachment to the topside of ceiling elements.

Figure 2(b) depicts an individual wad specimen (with internal steel wire) in a test rig for the application of tensile force. Hessian fibres provided an element of ductile failure, and the addition of a steel wire contributed further ductile yielding, providing a warning of impending failure.

Figure 2c shows flexural tests using rectangular flat samples between supports. New fibrous plaster material achieved flexural strengths of approximately 3.5 MPa (mega-pascal, a unit of pressure measurement equivalent to a Newton of force per millimetre squared area). Adhesion properties of modern repair options such as Jesmonite, glass fibres and the reinforcing Canadian product RE Aramid Gel™ with Kevlar® fibres are also being examined. Adhesion tests (Figure 2d,) involved the ‘pull-off’ of 6 mm-thick cylinders comprising a repair material applied to a plaster base representing a wad to panel interface in historic material. Tops of cylinders were affixed to an aluminium block with glue, with the block (with cylinder attached) pulled off both clean and dirty bases with applied tensile force.

Specimens were subjected to a range of applied moisture treatments and exposure to fungal spores. Fourier-transform Infrared Spectroscopy Using Attenuated Total Reflection and deoxyribonucleic acid (DNA) methods were used to identify mechanisms of degradation and types of fungi present on modern and historic specimens. >>

This research will complement existing empirical knowledge with a scientific element based upon data, with quantification of material properties expanding the current state of the art.

Figure 2: Selected images of fibrous plaster tests undertaken at the University of Bath, a) large scale 1.5 metre x 1.5 metre plaster ceiling panel with wads attached to supporting steel beams, b) Tensile testing of an individual wad element, c) Flexural tests of 6 millimetre thick rectangle fibrous plaster panels, d) Adhesion ‘pull-off’ tests rig and close-up images of cylinders representing repair materials applied to bases representing historic plaster material, e) Fourier-transform infrared spectroscopy using Attenuated Total Reflection characterisation of a hessian fibre bundle, f) Environmental sensor on the topside of a theatre ceiling, g) scanning electron microscope image showing suspected fungal spores in a historic fibrous plaster sample, h) Optical microscopic image of paint layers applied to fibrous plaster matrix, and i) Focused Ion Beam image of a single hessian fibre cross section. All images by the authors.

Fourier-transform infrared spectroscopy tests were employed in conjunction with mechanical tests to relate chemical and physical changes and determine which treatments were the most deleterious. Figure 2(e) shows a Fourier-transform infrared spectroscopy scan on hessian fibres. Two wavelength peak values on the resulting spectra of various hessian fibres were chosen; one was divided by the other to produce a peak ratio. Two peak ratios were plotted together on x and y axes as shown in Figure 3, identifying zones which correspond to the moisture or fungal-related conditions endured by fibrous plaster. Distinct clusters are in evidence, with extended fungal exposure on the left working towards moisture-related treatments to the right. Distinct at the top is new, untreated hessian fibre. From flexural test results, it was determined that the most deleterious treatments were exposure to fungal spores for two years, cyclic wetting and drying and full submersion in water, highlighting the potential danger of water leaks to in-situ fibrous plaster.

DNA analysis of historic fibrous plaster is being employed further to identify the fungal species present.

The environment above and below fibrous plaster ceilings in historic theatres is being monitored, with sensors measuring temperature and relative humidity levels as a function of human occupancy and external climate. Figure 2(f) shows a sensor installed just above a theatre ceiling. Data covering the recent winter period, when heavily attended theatre performances occurred on cold nights, is currently being analysed. Analysis will evaluate how performances and weather influence the environmental conditions to which ceilings are exposed.

Optical and electron-based microscopy has enabled examination of the microstructure and chemical composition of fibrous plaster and paint layers providing more information on internal decorative practices and environments. Figure 2(g) is a Scanning Electron Microscope image of suspected fungal spores within historic fibrous plaster. Figure 2(h) is an optical microscope image of paint layers applied to plaster and Figure 2(i) shows an ion-milled cross section of a single hessian fibre.

Results can provide fibrous plaster conservation and commercial repair companies with quantification of material properties including:

- Tensile strength of wads along the wad length (individual wads tests)
- Adhesion strength of wads attached to the topside of a ceiling ('pull-off' tests)
- Flexural and compressive strength of ceilings (rectangular plate and large-scale tests respectively)
- Lateral displacement tolerance of wads (large-scale tests)
- Properties of modern alternative repair materials such as Jesmonite, Re Aramid Gel™ and glass fibres.
- The Fourier-transform infrared spectroscopy using the Attenuated Total Reflection peak ratio method can help identify environment-induced changes in fibre properties.

Conclusion

This ongoing fibrous plaster research combining the knowledge and experiences of the University of Bath, Historic England and Industrial partners will provide a scientific basis of data and quantification to complement conservation and commercial repair work. Data has already been acquired by mechanical testing, investigation of moisture and fungal-related degradation, microscopy, spectroscopy and in-situ environmental monitoring. The preservation of beautiful fibrous plaster ceilings and other ornamental elements involves keeping them in both aesthetically pleasing condition and, of paramount importance, safe for people to enjoy for decades, and indeed centuries, to come ■

Acknowledgements

The authors gratefully acknowledge the funding and support of the Leverhulme Trust (grant number RPG-2021-147) and Historic England. Special thanks to our partners and collaborators, Hayles & Howe (Bristol, UK), Locker and Riley (Chelmsford, UK), Ornate Plaster (Farnham, UK), and Historical Plaster Conservation Services (Canada) for providing materials, test specimens and historic fibrous plaster samples. Thanks are extended to the Bristol Hippodrome and Old Vic Theatre (Bristol, UK) for supporting our on-site studies, and Richard Ireland and Scott Brookes for stimulating discussions.

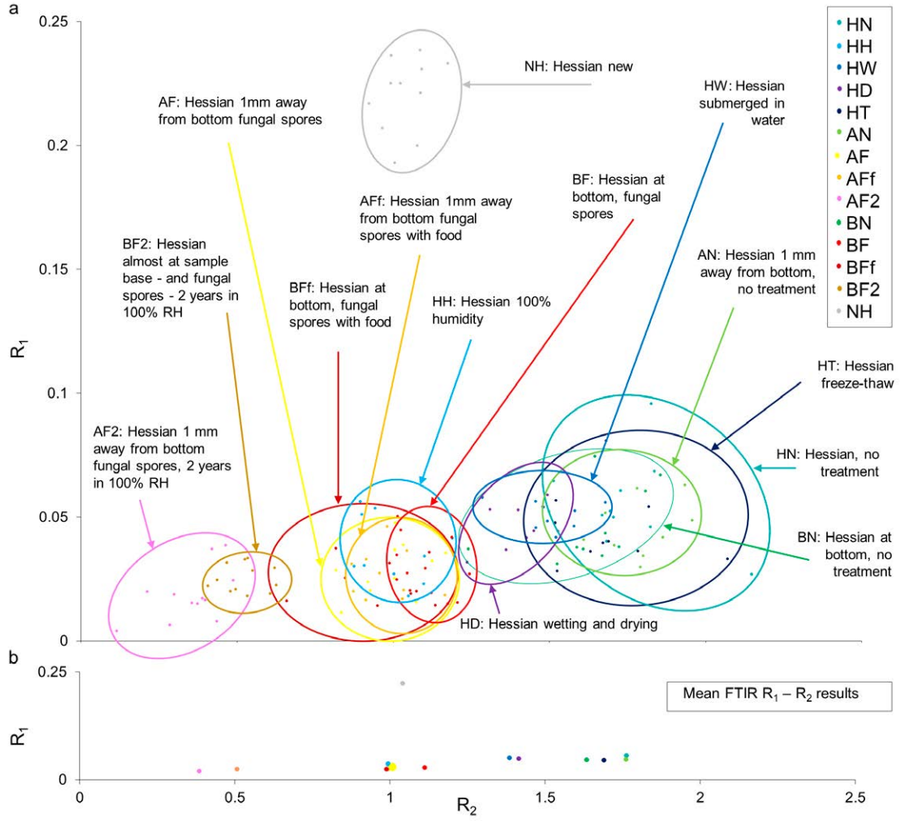
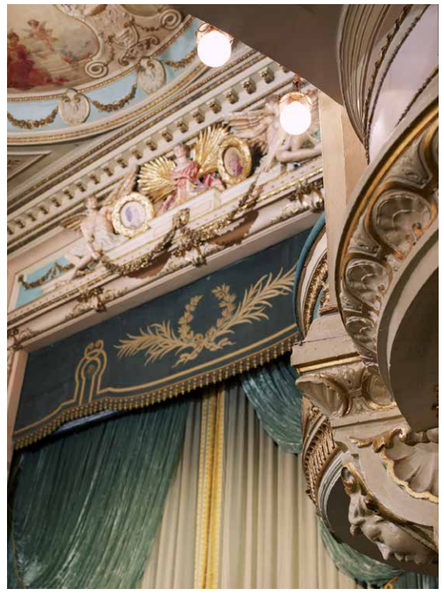
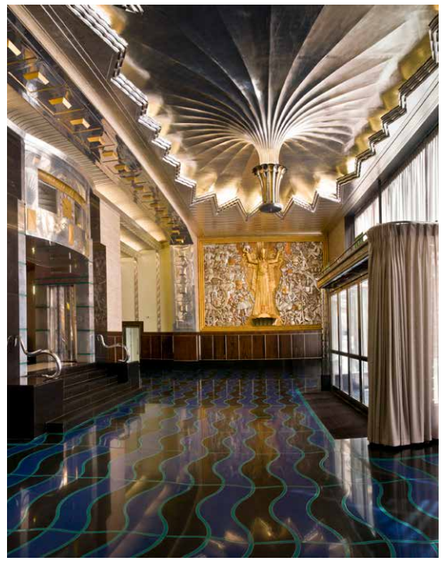


Figure 3: Two peak ratios for hessian fibres, termed R1 and R2 are calculated at different moisture contents and following fungal treatment: a) An R1 versus R2 plot distinguishes the different moisture and fungal treatments for at least ten specimens of hessian fibre forming distinctive clusters. b) Mean R1 and R2 values from the sample sets in part a). (Maundrill, Dams *et al*., 2023).

Top left: Detail of decoration at Northwick Cinema, Worcester. © Historic England Archive, DP005930



Middle left: Details of decoration at Wyndhams Theatre, London. © Historic England Archive, AA025711



Bottom left: Interior view of the entrance hall to the former Daily Express office building, Fleet Street, London. © Historic England Archive , DP132742

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Further information

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Historic Fibrous Plaster in the UK: Guidance on its Care and Management
John Stewart, Gary Buckley, Richard Fenton, David Harrison, Adam Magrill, Jonathan Riley and Brian Ridout. 2019.

Research Reports 2023

An overview of the recent additions to the series between February and May 2023.

Industrial Heritage

Reports about the physical remains of historic technology and industry.

Chances Glassworks, Smethwick, Sandwell: Report On Geophysical Survey, March 2022
Neil Linford

A Ground Penetrating Radar survey was conducted over accessible areas at Chances Glassworks, Smethwick, Sandwell, to locate and determine the likely survival of any remains associated with industrial glass making at the site.

Read the report

Climate Change

We are researching and promoting how the historic environment can positively contribute to overall global sustainability through adapting and mitigating measures.

Ironbridge Gorge World Heritage Site Pilot Study
Kassandra

Climate change has become one of the most significant threats to historic sites and World Heritage properties, including their integrity, authenticity, and their potential for economic and social development at the local level. The Ironbridge Gorge WHS site was chosen as a good example to demonstrate, with an evidence-based pilot study, the connection between the future changes that are likely to affect the overall resilience of the community, the heritage assets, to be able to see the distribution of impacts these changes might have.

Read the report

Built Heritage

Our reports cover investigations into the built historic environment at different levels of detail. Particular focus points of this research is to support heritage-led regeneration and to inform heritage at risk cases.

Murals and the Community Arts in England 1968–86
Geraint Franklin

This thematic study profiles the murals, particularly painted exterior murals, which were completed in the last quarter of the 20th century as part of the community arts movement.

Read the report

A Delicious Retreat: The Marine Villa and its Setting in England, circa 1760 to circa 1840. A Contextual Study
Kate Feluś

This study was commissioned to better understand the significance of Norris Castle on the Isle of Wight as a late 18th century marine villa and landscape.

Read the report

Post-War Gosport (Old Town)
Elain Harwood

An example of a small town's bid to provide modern living conditions for its citizens and to alleviate traffic congestion, the story of what most visitors to Gosport see today has never been fully researched and is itself coming under threat. The new housing charts the stylistic evolution of public housing during the post-war period and the limited role played by conservation.

Read the report

Heritage Science

In addition to reports on scientific dating, our new additions include other heritage science topics including investigative conservation.

Wicken Fen, Cambridgeshire: Wood Identification of the 'Bog Oak' at the National Trust's Visitor Centre
Zoë Hazell

A sample of an excavated subfossil 'bog oak' from Wicken Fen, Cambridgeshire, was analysed to identify its wood type. It was identified as a deciduous Quercus sp. (oak).

Read the report

Scientific Dating

Our reports on scientific dating, including dendrochronology and radiocarbon methods, add new insights to understanding the chronology of buildings and sites.

'7 and 9 Market Street, Chipping Norton, Oxfordshire: Further Dendrochronology and Radiocarbon Wiggle-Matching of Elm and Oak Timbers'
Dr Martin Bridge, Cathy Tyers, A Bayliss, Michael Dee, Sanne Palstra

Radiocarbon dating was undertaken on samples from Nos. 7 and 9 to determine whether they were contemporaneous with those from No. 8.

Read the report

Archaeology

We publish a range of reports on archaeological excavations, monitoring, survey work and archive practice.

Horn Castle: Watching Brief on Suspected Roman Wall, December 2022
Tony Wilmott

In December 2022 a stone wall was noticed in the section of a water pipe trench immediately south of the known line of the south wall of the Roman defences of Horncastle. It proved to be a post-medieval structure constructed using repurposed Roman building material.

Read the report

'Chester Crane Camp, Ord, near Berwick-upon-Tweed, Northumberland: Archaeological Field Survey of a Promontory Fort'
Dave Went, Rebecca Pullen

Chester Crane Camp is a prehistoric bivallate promontory fort on the south bank of the River Tweed. New earthwork and geophysical surveys, have provided more compelling evidence for the site's interpretation as a late prehistoric promontory fort.

Read the report

Aerial Investigation

These reports cover interpretation and mapping of sites, bringing together information on buried features revealed as cropmarks, soilmarks, parchmarks or features visible on the surface such as earthworks and structures, or features identified through Lidar.

East Cambridgeshire Aerial Investigation and Mapping Project Report
Steve Crowther, Maggi Noke

The project combined the mapping and interpretation of vertical and specialist oblique aerial photographs, as well as airborne laser scanning data (lidar), to identify, map and record archaeological remains dating from the Neolithic to the mid-20th century.

Read the report ■

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ISSN: 2058-1858

Product Code: HE0079

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