

The Leverhulme Trust

NEWSLETTER

SCHOLARSHIPS FOR RESEARCH AND EDUCATION

JANUARY 2015



ROUND MOUNDS

Were they really built by Normans?



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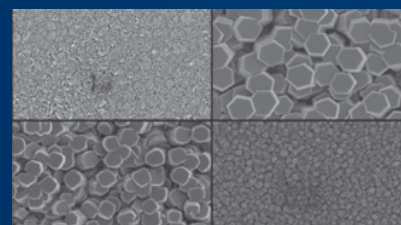
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COMPETITIONS OLD AND NEW



Award winners in no fewer than seven funding streams are announced in this edition of the Newsletter.

We congratulate the recipients of our new Leverhulme Doctoral Scholarship Awards. Fourteen universities will each receive £1 million, over three years, to provide 15 scholarships per institution to address topics as diverse as *understanding maritime futures, climate justice, genetics journeys into history* and *mathematics for a sustainable society*. With match-funding from a number of institutions, some 300 students will benefit. A second call for bids follows in 2017.

Other schemes will be familiar to those who follow the Trust's activities. Five Philip Leverhulme Prizes (each worth £100,000) were awarded in: *Biological Sciences, Mathematics and Statistics, History, Sociology and Social Policy, Philosophy and Theology, and Law*. Again, competition was intense, with individual subject areas attracting between 50 and 100 nominations. Many congratulations to the thirty winners. The 2015 Prizes will be in six different subjects – so please visit the Trust website for details.

Major Research Fellowships and Early Career Fellowships continue to be hugely popular, and applications for both schemes rose again. Early Career Fellowships are targeted at what is clearly a persistent pinch-point of entry to the scholarly and research professions,

and the latest round produced over 750 applications, so we were very pleased to be able to make 100 awards. Competition to secure one of these Fellowships is obviously fierce – so many congratulations to those who succeeded in this particular round.

For the first time, our popular Artist in Residence Grants were made via the competitive mechanism of a single 'gathered field'. Over 100 bids were received, and our expert panel was greatly impressed by the originality of the bids and quality of the field, so the Board was pleased to make additional funds available for a total of 21 awards. The competition will now run annually in this new format.

The 'core business' of the Trust continues to be its Research Project Grants, which typically represent about one third of the Trust's annual spend. The 62 grants agreed at the November meeting cover a typically wide range of fascinating topics in the sciences, humanities and social sciences.

Finally, we have recently announced a major new venture: a competition for Leverhulme Research Centres. The Trust Board's hope is that the competition proves to be of sufficient appeal to the research community that it can be run on a regular basis and become part of our established – and growing – portfolio of awards.

Professor Gordon Marshall

SCHEME NEWS

LEVERHULME RESEARCH CENTRES

The Leverhulme Trust has announced the launch of a major new initiative to establish Leverhulme Research Centres in the UK, representing a commitment of up to £10 million over 10 years for each Centre. The objective is to fund innovative research of the greatest originality and to encourage bold, 'disruptive' thinking, capable of creating a step-change in the field and transforming our understanding of a topic of significance to contemporary societies.

The expectation is that Centres will draw upon a range of disciplinary perspectives and expertise, perhaps bringing new disciplinary mixes to bear on an emerging topic of societal significance. They should have the capacity to become internationally-recognised 'centres of research excellence' in the chosen area. The Trust has a reputation for encouraging research which is often fundamental or curiosity-driven (so-called 'blue skies'), multi-disciplinary, and perhaps somewhat higher risk.

The scheme is now open, and each UK university will be permitted to make one bid as the principal applicant institution. Full details and application information are available on the Leverhulme Trust website.

WHY THE LEVERHULME TRUST?

Application forms for Research Project Grants and International Networks require applicants to explain why they are applying to the Trust. Peer reviewers and Trust Board members place considerable weight on your reply, so give very careful thought to what you write and take note of the tips on the Leverhulme Trust's website.

CONTACTS

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For more profiles of current research and full awards listings, please visit the Leverhulme Trust website (www.leverhulme.ac.uk). To order additional copies of this newsletter, please contact Bahia Sheppard at bsheppard@leverhulme.ac.uk.

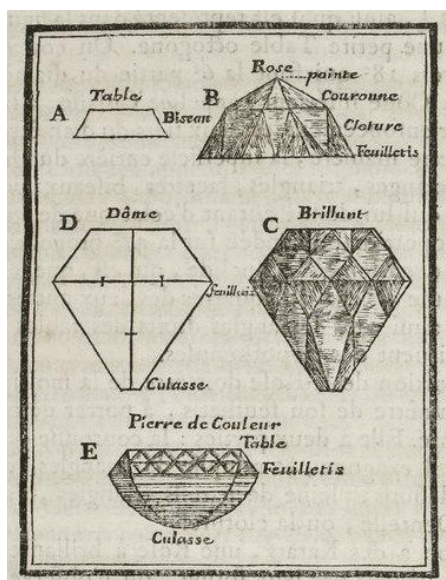
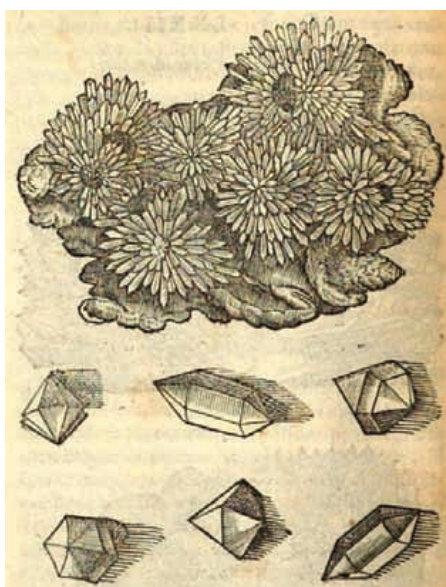
Jewellers, travellers and the science of gems in France, 1630–1830

Exploring the emergence of the ‘science of gems’, Michael Bycroft’s research will shed light on how a shared interest in precious and semi-precious stones brought collectors, experimenters, craftsmen and merchants together in early modern Europe

What can you do with a diamond? ‘Science’ may not be the first answer that comes to mind, but it was a common one in early modern France. Naturalists collected diamonds, displayed them in cabinets, and arranged them in classification schemes. Experimenters rubbed them to draw out their ‘electric virtue,’ heated them to study luminescence, and weighed them with precision balances. Chemists created diamonds (or so they thought) with dyes and furnaces, and destroyed them with giant mirrors in their studies of light and combustion. As for diamonds, so for rubies and emeralds, amber and quartz, and many other precious and semi-precious stones. All were part of a burgeoning science of gems that brought collectors into contact with experimenters and that brought both into contact with jewellers and international travellers. These points of contact are the focus of a monograph and two international workshops that I will work on over the next three years.

Surprisingly little has been written about the early modern science of gems, in France or elsewhere. The assumption seems to be that scientists ceased to see gems as a properly scientific category some time around 1600. It is true that, in the seventeenth century, philosophers and experimenters began to question the magical and medical properties that had long been ascribed to these intensely symbolic materials. But this questioning did not spell the end of gemology as a serious field of research. It was only at the very end of the eighteenth century that mineralogists began to drop ‘precious stone’ as a category in their classification of minerals.

Throughout the preceding period, the collection and classification of gems went hand-in-hand with experimentation. Experimenting and collecting are both hot topics in the history of science, but the relationship between these two activities is poorly



understood. This is especially true in the history of physics, where historians have given far more attention to the instruments that experimenters built than to the materials that the instruments measured. Gems address this problem because they were used to study phenomena (such as heat, light and electricity) that are part of physics rather than biology or the earth sciences.

Gemology not only united different branches of early modern science but also bound the sciences to trade, travel and the decorative arts. Gems arrived in France on the ships of the French East India Company, in the hands of globe-trotting merchants, and in the luggage of adventurous astronomers and naturalists. Paris-based scientists relied on these travellers for their raw materials. They also shared the merchants’ interest in detecting counterfeits and drew on the practical skills of jewellers and gem-cutters.

To build on these connections I will be studying a range of sources that include mineralogical treatises, jewellery manuals, and the archives of the Paris Academy of Science, the Paris Natural History Museum, the Paris jewellers’ guild, and the French East India Company.

*Dr Michael Bycroft
University of Warwick
Early Career Fellowship*

TOP TO BOTTOM *Painting of specimens in a mineral cabinet, by the French painter Alexandre-Isidore Leroy de Barde (late eighteenth century). Source: Web Gallery of Art, <http://www.wga.hu>; Woodcuts showing rock crystal specimens, from Anselmus Boethius de Boodt, *Gemmarum et lapidum historia* (1647). Source: Google Books; Diagram of diamond cuts, from Antoine-Joseph Dezallier d’Argenville, *Oryctologie* (Paris, 1755). Source: Gallica.*



Were round mounds recycled?

Every schoolboy and girl knows that castles with large earthen mounds, the latter known as mottes, were built by the Normans; a wooden tower on a mound of earth is our archetypal image of the time. But were they really built by the Normans? A new project, led by Jim Leary, will challenge this medieval sacred cow by investigating whether all mottes were constructed anew or if some represent re-used prehistoric mounds

The Marlborough castle mound in Wiltshire, now within the grounds of Marlborough College, is undoubtedly a medieval motte. And yet its appearance is reminiscent of a smaller version of the iconic Neolithic mound of Silbury Hill, located a little over 8km to its west and which forms part of the legendary Stonehenge and Avebury World Heritage Site. It was this similarity and a nagging

doubt over the Marlborough mound's origin that caused me – with suitable funds and resources from both the Marlborough Mound Trust and English Heritage – to put together a small project to drill two boreholes from its summit down to its very base. The resultant cores were removed for analyses, and small samples of organic material were taken from various points within the core and radiocarbon dated. This conclusively showed that the mound was built at the same time as Silbury Hill, around 2,400 BC; it was a Neolithic mound that had been re-used and adapted in the medieval period.

The obvious question that follows on from this, then, is how many other mottes from around England are actually prehistoric ceremonial mounds which were adapted in the medieval period for a different use? A new Leverhulme-funded project will seek to address this

question. The project will identify mottes in England with prehistoric potential, and through a targeted programme of coring, survey work and scientific analyses, will determine their date of construction, sequence of development and environmental context.

If it is shown that many, or even just some, of the mottes investigated are prehistoric, it will have considerable implications for our understanding of Neolithic monumental mounds – a monument type that is poorly understood and currently extraordinarily rare – improving our knowledge of their distribution and form. The research will be of importance for the medieval period too, helping us understand the influence prehistoric mounds had on shaping subsequent histories, and potentially helping us to define more tightly the development of medieval mottes in England.

Large mounds provide focal points in the landscape, and this work will demonstrate the manner, sequence and environmental context of mound construction, as well as illustrating the length of the national tradition.

*Dr Jim Leary
University of Reading
Research Project Grant*

ABOVE AND COVER *Silbury Hill at sunrise.*

LEFT *Marlborough castle mound.*

Image credits: Steve Marshall



The Amerikan steppe: Russian influences on the Great Plains

A new project by David Moon challenges the perception that the American Great Plains were shaped largely by the West, by demonstrating the pivotal role that Russian and Ukrainian farming practices played in the American West

We think of the Great Plains as quintessentially American. The home of cowboys, Stetsons and the tumbling tumbleweed has been immortalised by Hollywood. We also tend to think that the West has been the origin of most innovations, which have then spread around the globe. This project challenges these ideas. The American Plains were shaped by influences from the Russian and Ukrainian steppe. When Euro-American settlers ploughed up the Plains from the 1860s, they drew on the prior knowledge of Slav, German and Mennonite settlers on the steppe, who had already accumulated several decades of experience farming in drought-prone environments.

The Great Plains and the steppe share similar environments and environmental histories. Both were grasslands, with semi-arid climates and periodic droughts, but very fertile soil. Both were settled by farmers, attracted by the fertile soil, but facing recurring shortages of water.

Russians and Americans recognised the similarities, and realised they could learn from each other's experience. The extent to which Russians learned from American experience, for example of mechanisation, has been well researched. This project focuses on the other side of the story.

From the 1870s, ethnic German farmers from the Volga region of Russia and Mennonites from southern Ukraine migrated to the Great Plains. Their crops and farming techniques proved well suited to the Plains environment, and were adopted by other farmers. The US Department of Agriculture played a key role. One of its scientists, Mark Alfred Carleton, became acquainted with Mennonites on the Plains and visited their previous homes on the steppe to collect crop varieties, including a hard, red, winter wheat – known as Turkey Red in the USA – which became a mainstay of Plains farming.

In the 1920s, under Curtis F. Marbut, the US Soil Survey adopted a new approach to conceptualising soils, as the products of the environment in which they had formed, which was based on pioneering work by the Russian soil scientist Vasilii Dokuchaev on the steppe in the 1870s–80s. Marbut learned about it from one of Dokuchaev's students, Konstantin



Glinka, and tested the approach on the Great Plains. In the 1930s, the fertile black earth of the Plains was categorised on American soil maps as 'chernozem': the Russian term.

Perhaps the most enduring influence from the steppe on the Great Plains is the tumbleweed. Ironically, this icon of the American West was introduced by Mennonite migrants in the late-nineteenth century, by accident in a sack of flax seed, and, despite efforts to thwart it, became a classic example of an invasive species.

*Professor David Moon
University of York
Major Research Fellowship*

ABOVE Curtis F. Marbut and Konstantin Glinka (2nd and 3rd from left) on the transcontinental excursion following the 1st World Congress of Soil Science, Washington, DC, 1927. Curtis Fletcher Papers (C3720), folder 134 © The State Historical Society of Missouri, reproduced with permission.

A new method of nanostructure in films

The unique properties of thin films give them multiple real-world applications, and Geoffrey Hyett's research on the control mechanisms of microstructures promises significant advances for scientific researchers and industry

A nanoscale thin film is a thin layer of a material with an overall thickness of around one millionth of a metre, composed of particles on the scale of 1 billionth of a metre. The extremely small scale of both the films and the particles they are composed of – approaching the scale of the atom itself – endow thin films with unique properties vital for their use in numerous optical, electronic and catalytic devices. An example of this is titanium dioxide. In bulk it is a simple white pigment used in paints, cosmetics and even foodstuffs – but as a thin film it is the active layer in the widely marketed self-cleaning windows.

The shape and orientation of the particles in a thin film, known as the *microstructure*, also plays a key role in determining the film properties. This has

been frequently demonstrated in research laboratories, where the small scale, but relatively expensive, synthetic routes available to researchers allow particle size and shape to be controlled. As the influence of particle shape and orientation on materials properties has become increasingly apparent, it is also the case that a method of synthesis that also allows control of these parameters is necessary not only for researchers, but also for industry. However, it has not been previously possible to directly control film microstructure using the low cost, scalable synthetic techniques, such as chemical vapour deposition (CVD), that are required for commercial exploitation of materials.

My research group has recently shown that such control is possible for one material, zinc oxide, using a CVD technique and structure directing additives, which bind selectively to the particles during growth, generating a defined shape and more importantly, a uniform size on the nanoscale. With funding from the Leverhulme Trust we plan to capitalise on

these preliminary results to fully investigate the origin and mechanism of this control on microstructure, and expand its use to a wide range of commonly used functional materials. This holds out the promise of providing a CVD route in which the microstructure of a film can be a controllable parameter, which would provide enormous benefit to both researchers and industry. Materials scientists will be able to experiment directly with the microstructure using CVD, treating it simply as an additional film parameter, confident that if applicable their work could be scaled up directly for industrial use.

*Dr Geoffrey Hyett
University of Southampton
Research Project Grant*

COVER Examples of some of the different microstructures found with zinc oxide thin films using different structure directing additives, under 75,000 times magnification.

Becoming radical in the English Revolution

Why did members of radical movements feel compelled to abandon their traditional lives? Alexander Ryrie's Fellowship focusses on the mid 1660s when England saw an explosion of religious and political radicalism, from the Fifth Monarchists to the Quakers

The period of the English Civil War and Revolution (1640–60) is notorious for the emergence of radical religious and political movements – from now-established groups like the Baptists and Quakers, through short-lived and ill-defined groupings like the Ranters and Seekers, to political agitators such as the Levellers, Diggers and Fifth Monarchists. We have a fair idea of why political and religious normality broke down under the pressure of war and social collapse during this period, but we don't truly understand this explosion of radical creativity. The radical groups are usually treated as distinct from each

other and from 'mainstream' society, but most of their members had come out of that mainstream society and often passed through numerous radical groups during their lifetimes.

My project aims to map the radicalism of this era – how the groups related to each other and to their supposedly orthodox brethren – from the perspective of religious experience and the history of emotions. We have an underexploited wealth of personal testimonies from radicals: I will be working with these to ask why it made emotional sense for these people to abandon their traditions and embrace something new. Or, indeed, why these new sects now seemed the best way to be faithful to what they had always believed. And I will be asking how far these radical undercurrents can be seen in those who never openly joined radical groups, and in those living outside England (in particular in Ireland

and the American colonies). In this period of turmoil, even royalists and Anglicans were forced into asserting startling new positions, as the old ones gave way beneath them: in one sense, simply to live in these times was to be a 'radical'.

I will also be asking what tied the 'political' and 'religious' radicalisms of the age together. It is well known that some radicals anticipated later ideals such as tolerance, democracy and socialism, but the power of these ideals depended on the very particular religious motivations and experiences that drove them. We cannot properly understand the ideals which that first blossoming of English radical politics has left to us without appreciating how deeply it was grounded in Puritan and post-Puritan religious sensibilities.

*Professor Alexander Ryrie
Durham University
Major Research Fellowship*

Women's work in rural England, 1500–1700

Surprisingly little is known about ordinary women's working lives in the centuries before the Industrial Revolution. Jane Whittle aims to develop a new methodology to map and measure women's everyday work activities in early modern rural England for the first time

While sixteenth-century commentators noted that women's work 'has never an end', historians of pre-industrial England have struggled to move beyond generalisations and find systematic evidence of women's activities. This project develops a new methodology which aims to illuminate the majority experience – unpaid work in rural households – as well as tracing forms of waged work; gathering and analysing evidence of women's and men's everyday working lives.

Historic patterns of women's work are widely misunderstood. Ideas about women's work in pre-industrial economies vary from 'golden age' views suggesting women once did virtually every type of work, to the opposite assumption that women's traditional work roles were restricted to housework and childcare. In the absence of accurate data, such views are used to support arguments about women's roles in the modern family and workplace. In 1993 the UN revised its guidance on national accounting to include unpaid work within the home, in recognition of the fact that women's work and work on small peasant farms was being grossly under-valued in modern estimates

of GNP. It adopted a definition of 'work' as any activity that could be replaced with paid labour or purchased goods. This project applies that definition of work to early modern England for the first time.

The methodology involves collecting incidental evidence about work activities from manuscript court documents that describe what people were doing when a crime, dispute or accident occurred. For instance, evidence from a disputed marriage contract in Devon in 1562 records a female servant collecting water, a farmer's daughter doing laundry by the well, and a tailor's wife watching them while sewing in the doorway of her house. Individually, such records are interesting, but collected in their thousands, they allow the prevalence of different work activities to be measured, offering an unprecedented window into ordinary working lives. The project also includes a PhD studentship to analyse women's waged work using household

and farm accounts: a more conventional approach to women's work which will provide an essential comparative element, anchoring the research in existing debates. Evidence will be drawn from a swathe of sites in south and west England from Hampshire to Cornwall, selected for their range of agricultural regimes and rural industries, some of which favoured women's employment and some of which did not. The aim is to be able to describe and explain the differences between the types of work tasks and forms of employment of women and men, with particular attention given to unpaid work, including income-generating work in small farming households and work caring for the family.

It is hoped that the findings will have ground-breaking implications for our understanding of gender and economic development in pre-industrial Europe by revealing detailed patterns of commercialisation and occupational structures as well as the lived experience of work.

*Professor Jane Whittle
University of Exeter
Research Project Grant*



LEFT A man harvesting wheat while a woman brings him food. Trevilian, Thomas, b. ca. 1548, *Trevelyan Miscellany* of 1608, V.b.232. Used by permission of the Folger Shakespeare Library under a Creative Commons License.

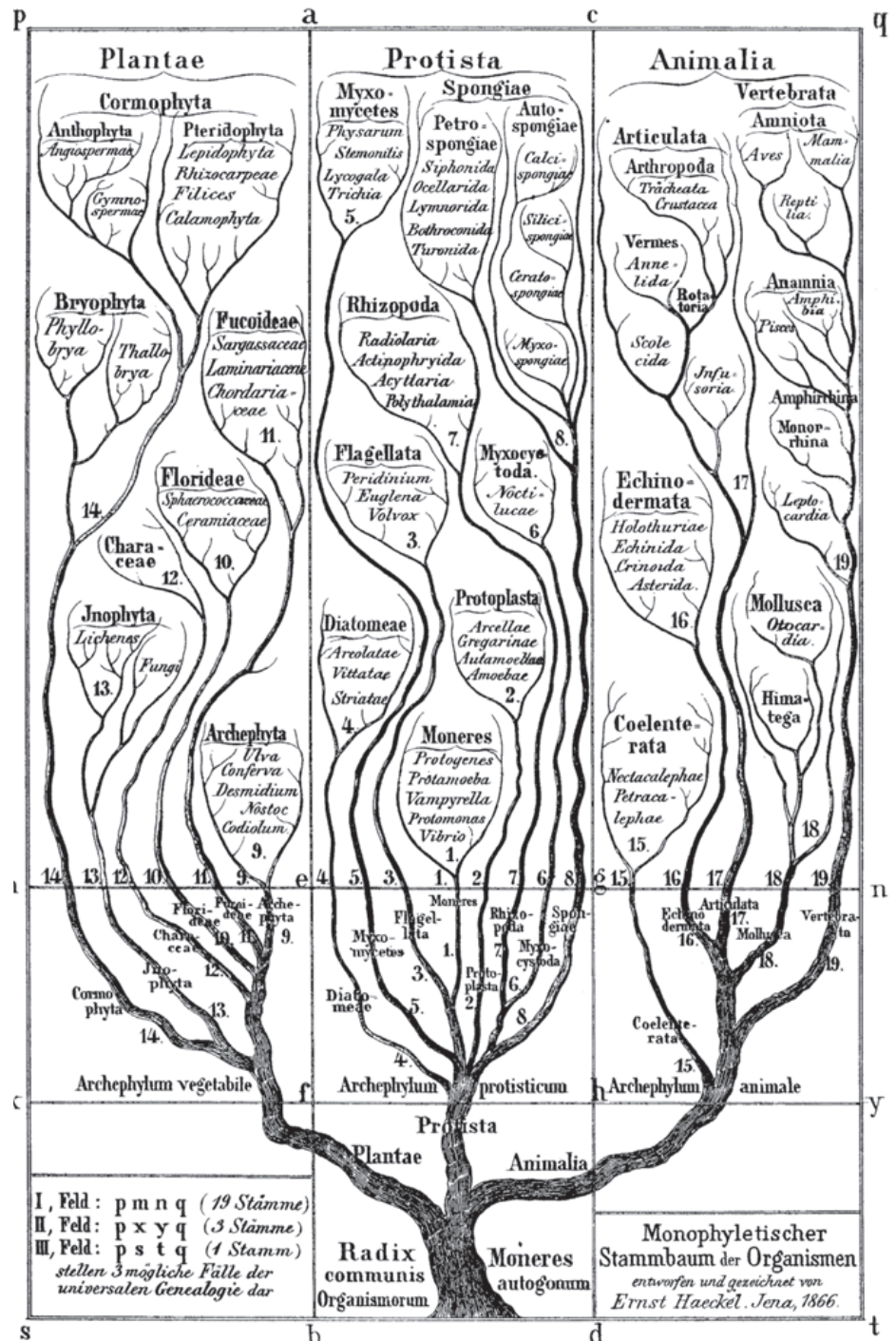
Linking genome diversity to how biological functions evolved

There is still a long way to go in understanding how life diversified, but Thomas Richards aims to bridge a major gap in knowledge by bringing together genomic analysis with technologies to study microbial function and so help trace the evolution not only of genes but also of functional characteristics

The 2000s promised us a unified and accurate tree of life: a diagram that would allow us to pinpoint how living organisms are related to each other. This was thought possible because genome sequencing became easier, allowing us to sample a large number of genes for many different species. These sequence data could then be compared mathematically to create a diagram describing the evolutionary relationships of the organisms sampled: a phylogenetic tree.

Yet these data promised even more exciting progress. Chiefly, comparisons of how gene repertoires have altered across the tree would allow us to identify the changes that underpinned the diversification of life and the rise of biological complexity. This hope proved naïve, and the prevailing message from this work is not stepwise acquisitions of genes mapped on to the tree, which can be related to biological characteristic, but rather complex cases of gene duplication, loss and, vexingly, transfer of genetic material between unrelated lineages. These results have made understanding the relationship between the tree and gene content evolution difficult and has demonstrated that the tree, in many cases, does not predict the functional capability of an organism.

So where does this leave us? To understand how biological capabilities evolved we need more data, specifically two more sets of information. Firstly, we need to sample more of the diversity of life. This sampling needs to include both closely related lineages and organisms representing distant and unsampled branches in order to capture every major branch on the tree of life. This is problematic because conservative estimates suggest we can only grow about 1% of microbial diversity in laboratory conditions and most of the diversity of life is microbial. To solve this problem we are developing approaches to capture single microbial cells from the environment and sequence their genomes directly. Such approaches will allow us to understand the true genomic diversity of life.



Secondly we need improved tools for understanding the phenotype encoded by a gene. This means we need to develop new approaches for knocking-out genes, adding genes to model organisms, and importantly testing how these genetic changes alter phenotypes across a wide array of conditions. If we can do this on a systematic scale we can start to flesh out comparative genomic analysis with phenotype data and tie comparative observations to actual biological functions. Such comparisons will allow us to trace the evolution of functional characteristics not just genes.

I will use my prize funds to try and bridge the gap between observing changes

in gene content and understanding the phenotypic effect of these changes. This will require bringing together comparative genomic analysis with technologies that allow rapid and parallel comparisons of microbial function under altered genetic conditions.

Dr Thomas Richards
University of Exeter
Philip Leverhulme Prize

ABOVE Reproduction of Ernst Haeckel's genealogical oak tree depicting the Kingdoms Plantae (plants), Protista (micro-organisms) and Animalia (animals), from *Generelle Morphologie der Organismen* (1866).

New materials, new worlds: understanding the uses of Bronze Age axes

The microscopic study of wear marks on bronze axes forms the basis of Rachel Crellin's endeavour to reach a new understanding of the use and value of new materials in the ritual and daily life of the Early Bronze Age

New materials change the worlds we live in. They make new kinds of activities possible and lead to varied innovations. They change relations between peoples, places, objects, animals and other materials.

My research explores the impact of the new material bronze at the start of the Early Bronze Age (c.2200–1500 cal BC) in Britain and Ireland. Bronze axes are arguably the most important

object in understanding the start of metallurgy in Britain and Ireland; a process of material transformation that irrevocably altered the prehistoric world. Yet we cannot sufficiently answer key questions such as 'what were bronze axes used for?'. At present studies of bronze objects tend either to focus on stories of their production, with a strong emphasis on chemical composition and metallography, or they concentrate on narratives surrounding their deposition. This focus on production and deposition means that we do not fully appreciate the impact these objects had and the varied uses to which they were put; we fail to address large parts of their biographies. What is needed to understand the impact

that bronze had on other materials and prehistoric worlds is a study that appreciates all the existing contextual data but also seeks to address the 'use-life' of these iconic objects.

Use-wear analysis is the microscopic study of wear marks left on the surface of prehistoric copper-alloy objects as a result of their use. Copper-alloy use-wear analysis is still a relatively new field with few specialists and often varied methods: it has yet to see true critical appraisal. My research will seek to establish the first reference collection of use-wear marks for Early Bronze Age flat axes from Britain and Ireland (to be made freely available online). Ten accurate replica axes will be used in a series of controlled experiments that will combine both embodied use of the tools and laboratory-based, repeatable testing. The axes will be used in a variety of ways on a range of materials including stone, wood, animal carcasses and copper-alloys. The reference collection established through these tests will be used as the basis for a large-scale microscopic analysis of axes from across Britain and Ireland. A range of flat axes of different types, and from different places, will be examined in order to try to explore different and changing patterns of use. The use-wear analysis will then be considered in the light of the existing contextual information about the axes. This will be used as the basis for a consideration of the impact of copper and bronze as new materials in Britain and Ireland. How were the new materials used? What properties were exploited? Moreover, how did this impact on the lives of people in the Early Bronze Age? How did these materials transform the worlds they existed within? This will allow new understandings of ritual and routine in the Early Bronze Age to emerge and a more detailed and sophisticated sense of the use and value of bronze.

*Dr Rachel Crellin
University of Leicester
Early Career Fellowship*

LEFT Early Bronze Age Flat Axe from the Isle of Man. Image reproduced with the kind permission of Manx National Heritage, property of the author.



Different ways of seeing the world



Lynne Chapman, illustrator and urban sketcher, will be joining the Morgan Centre for Research into Everyday Lives as a Leverhulme Artist in Residence. The collaboration will explore the possibilities of sketching as a way of understanding and commenting on everyday life

Conceptually, there are similarities between the ethos of urban sketching and a lot of the research we do at the Morgan Centre. We share a curiosity about the everyday world around us. We have a real fascination with things like emotions and experiences which are notoriously hard to pin down in words. We are committed to exploring the world around us in innovative and creative ways.

And yet, our respective ways of working would look very different to an observer. Urban sketchers work quickly and intuitively, selecting which parts of their environment to include in or leave out of their sketch. Unlike most photographs, sketches often capture a period of time rather than a fraction of a second, and some sketchers – including Lynne – choose to highlight small, yet significant, details or include snatches of

conversation in the drawing. Urban Sketchers aim to be truthful to the scene, “showing the world, one drawing at a time”, but through personal interpretation rather than a reproduction.

At the Morgan Centre we use qualitative research methods, for example interviewing people or observing them. We also incorporate visual research methods, using photography or video, although we usually ask the people taking part in our project to do this bit for us. We are experienced in combining different research methods to shed light on a particular issue. Our projects usually span months or years. Our most common way of sharing our knowledge is – like all academics, really – through lengthy articles.

During the residency, Lynne will be documenting a year in the life of the Morgan Centre through her sketches – coincidentally, our tenth anniversary year – and coming with us while we carry out our research to trial sketching as a research method. She will also be teaching us how to sketch (good luck, Lynne!) and taking us on ‘SketchCrawls’ so we can experiment for ourselves. Throughout the residency, we will be

sharing our reflections and our sketches on a blog, and we will produce a toolkit for other researchers interested in using sketching in their work.

As we look forward to the collaboration starting, we have lots of questions buzzing around in our heads, from philosophical wonderings about perspective and knowledge, to smaller doubts about whether some social scientists are simply too bad at sketching to use this method. The beauty of this grant scheme is that we now have a supply of pencils and pens, and the luxury of Lynne Chapman’s time to explore these questions, big and small.

*Professor Sue Heath
Morgan Centre, School of Social Sciences,
University of Manchester
Artist in Residence Grant*

If you want to follow our progress, you can find out more about us at:
www.manchester.ac.uk/morgancentre |
www.lynnchapman.co.uk | Twitter:
[#morgancentre](https://twitter.com/morgancentre) [#SketchingResearch](https://twitter.com/SketchingResearch)

ABOVE Lynne Chapman at work during a SketchCrawl in Sheffield.

Tiny treasures of the Welsh Borderland

The microscopic debris from wildfires that smouldered over 415 million years ago holds clues to the earliest pioneers of life on land. Carolyn Allen, of the Trust, reports on the work of Professor Dianne Edwards and her team

When plants moved from water to land, it heralded a period of evolutionary innovation with far-reaching consequences for the Earth's environment and for all the organisms that inhabit it. But the fossil record of the early chapters of this momentous story is patchy at best.

Although genetic analyses show that the earliest land plants were allied to bryophytes – a group that includes the liverworts, mosses and hornworts of today – there is little direct fossil evidence of these pioneers of life on land. The oldest fossils of recognisable parts of plants (megafossils) are found in sediments laid down in the middle Silurian (around 425 million years ago) but these are the remains of vascular plants that had already evolved most of the adaptations needed to survive in relatively dry environments.

Traces of earlier stages in land plant evolution are found in microfossils including an abundance of spores dispersed throughout sediments as far back as the mid-Ordovician (475 million years ago). Although the land plant origin of some of these fossilised spores is undisputed, bearing strong similarities to those found attached to the megafossils of vascular plants, there is also a large and diverse group that are known as cryptospores because it is not clear what type of plants could have produced them.

In 1995, Professor Dianne Edwards and her team at Cardiff University published the first evidence unequivocally linking cryptospores to land plants. They had discovered tiny charcoaled plant fossils, termed mesofossils, in early Devonian rocks (around 415 million years old) collected from the Welsh Borderland. Usually, fossil plants are compressed sheets of coal, but these millimetre sized plant fragments had been charred in smouldering wildfires; a process that exquisitely preserved their three dimensional anatomy. Amongst the charcoaled fragments isolated from a sample of the rocks were the fertile tips of land plants containing cryptospores fossilised in situ.

“This was very exciting because it was the first time these spores had been found attached to the parent plant,” Dianne explains; it also raised the tantalising possibility that mesofossils still hidden in the rock collection could help fill some of the frustrating gaps in the fossil record of early land plant evolution.

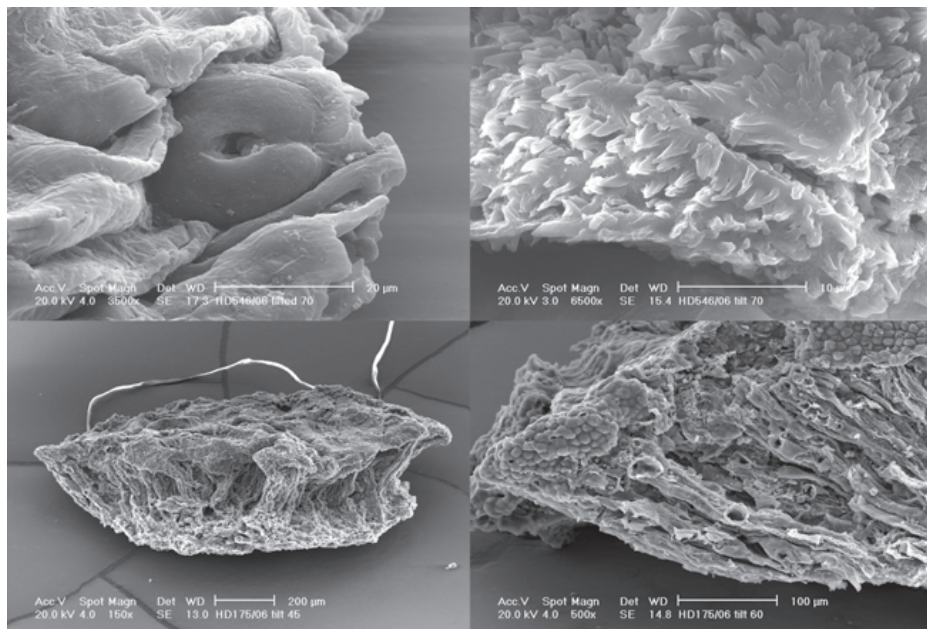
Identifying mesofossils is a painstaking process; all that can be seen with the naked eye are tiny smudges of carbon on the surfaces of some of the rocks: first the rock must be dissolved in hydrofluoric acid; then the resulting rock macerate is sieved before potentially interesting charcoaled fragments can be collected for analysis.

Over the years, Dianne and her team isolated a large collection of the Devonian mesofossils, and in 2009 they were awarded a Leverhulme Trust Research Project Grant to screen and analyse this potential treasure trove. Using a combination of light, scanning and transmission electron microscopy

techniques, the researchers discovered a previously unrecognised group of small plants, which they have named cryptophytes. Cryptophytes have simply branching stems characteristic of early vascular plants, terminated by sporangia (simple sacs) of spores whose internal construction and configurations are closest to those of the bryophytes, and particularly the liverworts of today. They also have stomata (pores that allow gas exchange), a character found only in mosses, hornworts and vascular plants. “This combination of characters is unknown in any plant groups today,” Dianne says. “Indeed, they became extinct shortly after the horizon we were studying in the Welsh Borderland; their spores disappearing from the fossil record.”

In rocks of the same era but from another site, the researchers found plant megafossils in the same locality as the tiny mesofossils, showing that they must have co-existed. As Dianne explains, this showed that the mesofossils they had found were not just the fertile tips of larger plants: “We were able to show that the two types of vegetation existed together, one creating a turf that would have brushed your ankles, and another creating a shorter turf that would have brushed your toes. We think this shorter turf represents a pool of primitive land plants from which eventually evolved the first bryophytes and then the vascular plants.”

The mesofossil collection also contained examples of some even more enigmatic fossils, found interspersed with cryptophytes in the fossil record. Their three-dimensional preservation enabled the researchers to conclude that these fossils were probably lichens – the symbiotic association of fungi and either algae or cyanobacteria often found thriving in more inhospitable environments today. This predates previous records of lichens with similar architecture by some 195 million years and the similarities between these mesofossils and fragments (microfossils) extending back to the Ordovician, helps to confirm the important role they must have played in early terrestrial ecosystems.



LEFT Top L-R: scanning electron micrographs of Cryptophyte, *Partitathica splendida* showing stoma at sporangium base; spores in situ (1200x). Bottom L-R: SEMs of lichen (*Nematothallus* sp.) intact whole fragment (150x); fragment at higher magnification (500x).

Medieval socio-cultural history

Hanna Skoda's Prize will allow her to work on two little-studied aspects of the later Middle Ages: firstly, the relationship between stereotypes and misbehaviour in the student population and secondly, the role of nostalgia at a time of cataclysmic change

In my first project I will be exploring student misbehaviour in fifteenth-century Oxford, Paris and Heidelberg. I explore misbehaviour ranging from laziness to bullying, from playful pranks to murder. It is challenging to uncover student deviance in the records, because so much of it appears to be highly stereotyped in the ways in which it is represented. However, it is the very prominence of these stereotypes which interests me: late medieval students were aware of the labels by which they were denigrated, and responded to, and manipulated these labels in the ways in which they misbehaved. Drawing on criminological labelling theory and the

insights of anthropology, I am trying to uncover the many-layered reciprocity of how people misbehave, and what others say about their misbehaviour. The scholarship on late medieval universities is enormous, but exploration of their social history is a relatively new and expanding field. My research offers a perspective on medieval universities as more than intellectual hothouses. More importantly it contributes to histories of dysfunctional behaviour, by stressing the complex relations between stereotypes and misbehaviour.

The second project will examine the role of nostalgia in the Middle Ages. The long fourteenth century is often labelled the century of catastrophe in Western Europe. A fairer assessment describes profound socio-economic, cultural and political changes which transformed ways of thinking: contemporaries faced epidemic disease, economic change, massive urbanisation, wars lasting for decades and debilitating

entire landscapes, religious change with a dislocated and eventually schismatic papacy, social mobility, disappointment and rebellion. Many contemporaries reacted in profoundly nostalgic terms to these changes and catastrophes. This is a perspective on the period which has hitherto received almost no attention, but which will nuance our understanding of reactions to change right across the social spectrum. I will be drawing particularly on recent anthropological and philosophical work which has highlighted the counter-intuitively hopeful aspect of nostalgia. In many ways a cross-cultural concept, it was articulated in powerful, lyrical and often subversive ways in the fourteenth century.

In this project, my work is structured around a series of nostalgic ideals. *An Aesthetic Ideal*, will focus on urbanisation and land clearing: I will research townspeople of all social ranks nostalgic for a pastoral idyll. *A Moral Ideal* explores sermon evidence and sumptuary legislation nostalgic for a world of fixed social hierarchies. *An Economic Ideal* considers the rise of commerce and banking and the reactions of moral theorists. *A Chivalric Ideal* focuses attention on knights, challenged by changing practices of warfare. *A Political Ideal* returns to townspeople: urban rebels often articulated their demands by citing a golden past.

Dr Hannah Skoda
University of Oxford
Philip Leverhulme Prize



LEFT 'A nostalgic idyll?' June from *Les Très Riches Heures du Duc de Berry*, by the Limburg brothers 1412-16: MS 65, Musée Condé, Chantilly, fol. 6v.

The 'me' in memory



Image courtesy of Dr Josephine Ross, co-applicant on the project.

How young children develop the concept of the 'self' and 'self memory' is a poorly understood area of childhood development; Sheila Cunningham and her team will take an interdisciplinary approach to help fill this important gap in knowledge, providing insights both for theoretical psychologists and practitioners

The self is a concept that influences numerous social, emotional and cognitive processes in adulthood, but we know surprisingly little about its development in childhood. By around three years, children can describe autobiographical memories, use personal pronouns to refer to themselves, recognise their reflection in a mirror, and show embarrassment in self-conscious situations. These developmental achievements suggest that children have established a sense of self by the end of toddlerhood, although self-knowledge and self-reflection becomes more elaborate with age.

An important question is whether this developing self impacts on cognition. Adults and teenaged children show a consistent memory advantage for information processed with reference to self over information processed about other people, or in other contexts. For example, people are more likely to remember being asked the question 'Are you clever?' than questions like 'Is Stephen Hawking clever?'

or 'Is clever a positive word?'. This robust memory advantage is known as the self-reference effect (SRE). Research suggests that the SRE happens for two distinct reasons. First, attention is drawn to information that concerns self (e.g., when we hear our name mentioned in someone else's conversation), enhancing our memory for that information. Second, we have a rich body of self-knowledge (i.e., the objective self) into which new self-relevant information can be easily slotted and stored, again enhancing memory. These systems appear to be additive – any incidental link with self produces a small memory advantage probably driven by attention, but consciously thinking about or evaluating the self leads to a larger effect supported by objective self-knowledge. However, to what extent the SRE operates across childhood (i.e., before ten years) is currently unclear.

To provide clarification, our project uses age-appropriate SRE measures for young children across three to ten years. Children's developing self-consciousness, self-esteem and autobiographical memory are also assessed so that a broad picture of emergent self-systems can be compiled. By being the first research to systematically chart the emergence of critical self-concept and self-memory systems across childhood and the relationship between them, the current project will elicit a significant advancement of knowledge. Further, the

project has potential real-world impact. Recent work suggests that applying self-referencing strategies in the classroom provides learning benefits by increasing student engagement and supporting memory. This promising finding is limited by a lack of insight into when self-referential biases emerge and learning strategies should be targeted, a problem overcome by the proposed project. There are also clear clinical applications. In particular, self processing issues may be important in autism spectrum disorders (ASD), associated with atypical processing of people. An understanding of typical self-processing development is vital to produce successful strategies for children with ASD.

Our research brings together previously isolated lines of research from social, cognitive and developmental psychology and applies them to an understudied issue: the development of children's self-processing systems. This work will form a robust basis for future research in both theoretical psychology and applied fields (i.e., clinical interventions and educational strategies). The project will also allow two early career researchers to collaboratively explore an issue identified by both as an important research gap.

*Dr Sheila Cunningham
University of Abertay Dundee
Research Project Grant*

Ōshima Nagisa: a politics of cinema



The Japanese film director and screenwriter, Ōshima Nagisa is best known for his sexually explicit political allegory *In The Realm Of The Senses (Ai No Corrida)*; however he was also a prolific social critic. Isolde Standish's study will shed light on the impact of his many books and journal articles

In *Politics, Porn and Protest: Japanese Avant-Garde Cinema in the 1960s and 1970s* (2011), I argued that out of the background of war, occupation and the legacies of Japan's post-defeat politics, there emerged in the 1960s a dissentient group of *avant-garde* filmmakers who created a counter-cinema that both challenged mainstream conservative domestic and international political policies, and dominant historical interpretations of Japan's imperialist ambitions on the Asian mainland between 1931 and defeat in the Pacific War in 1945. This counter-cinema addressed a newly constituted, educated and politically conscious youth audience. Although there was no formal manifesto for this cultural movement, through a survey of the writings of prominent

filmmakers of the period, Ōshima Nagisa, Yoshida (Kijū) Yoshishige and Imamura Shōhei, I identified a political sensibility that motivated much of their work: a generational consciousness based on shared experiences as Japan's first post-war generation of filmmakers who, unlike their parent generation, remained untainted by Japan's criminalisation for the War (they were all born around 1930). This sensibility had deep roots in the student movements of the 1950s opposing in the first instance, Japan's logistic support for the US military in the Korean War, and in the late 1950s the ruling Liberal Democratic Party's policy of renewing the joint US Japan Security Treaty (known as the Anpo Struggles).

Ōshima Nagisa (1932–2013) was central to this movement, as not only did he experiment with very different conceptions of visual-style that challenged images and narratives dominant in the films of the mainstream 'major' studios, he was also a prolific writer and social critic publishing thirteen books and numerous journal articles. In this new study, through an analysis of Ōshima's writings in conjunction with his films

and their critical reception in Japan, my aim is to reach an understanding of how Ōshima himself conceptualised and articulated his film-making practices, how these practices were informed by his political beliefs, and how his films impacted on and contributed to counter-cultural debates within Japan. To date, there has only been one book published in English on Ōshima Nagisa by Maureen Turim – *The Films of Oshima Nagisa: Images of a Japanese Iconoclast* (1998). While this volume offers interesting readings of his films, it does not take account of Ōshima's prolific written material. Therefore, a comprehensive study in English of this remarkable man and his impact on a generation of Japanese and European filmmakers is long overdue.

*Dr Isolde Standish
School of Oriental and African Studies,
University of London
Major Research Fellowship*

ABOVE Ōshima on the set of *Merry Christmas Mr. Lawrence*, 1983. Credit: Recorded Pic-Cineventure-Asahi/Oshima/The Kobal Collection.

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Faculty of Law, University of Cambridge
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LifeSpace Science Art Research Gallery, University of Dundee
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£15,000

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