SCIENCE MUSEUM GROUP

RESEARCH & PUBLIC HISTORY **ANNUAL REPORT 2017–2018**

FOREWORD

SALLY MACDONALD

Director, Science and Industry Museum, Manchester

Welcome to our fourth Research and Public History Annual Report, covering the academic year 2017/18.

This year saw the adoption of the Science Museum Group's new Research Strategy, which sets the framework for our research activity for the coming five years. The Strategy (see pp xx) declares our bold ambition to be globally the most research-informed science museum group, so that research underpins most aspects of our work, from collections management through to exhibition development and the design of new galleries and digital resources. In order to do this, we've committed to supporting our colleagues across many teams to develop their research potential. And we want to build our research networks to support an even wider range of collaborations.

Our conferences and workshops are vital for building such networks, and this year's *Report* highlights several focused on specific topics of current interest: for example, workshops on electricity to support *Electricity: The Spark Of Life* exhibition at the Science and Industry Museum Manchester, symposiums on *Wounded* as part of the Science Museum's research for developing medicine galleries, and a workshop on China looking ahead to future collaborative exhibitions with Chinese museums.

Increasingly, the *Science Museum Group Journal* provides an excellent channel for highlighting current research activity and encouraging more colleagues to publish their work. This year's output (issues 08 and 09) highlights the many forms that this can take. One article might focus on a specific category of material culture – telegraphic instruments or prosthetic limbs, for example; another takes the form of an 'in conversation' between an archivist and artist, while yet another discusses the challenges and opportunities of collaborating across disciplines and different 'habits of mind'. Our Spring *Journal* this year, guest-edited by Frank Trentmann of Birkbeck University, took the theme of energy as a starting point. With essays covering topics from the meaning of the fireside in post-war Britain, to attitudes to refrigeration in 21st-century India, it addressed the challenge – very pertinent for museums – of making energy visible.

ABOVE:

Sally Macdonald
Director, Science and Industry Museum, Manchester

Our collaborative doctoral students continue to make a major contribution to our research activity, influencing everything from the way we think and talk about our collections to the development of new galleries.

This year's *Report* highlights the variety of their studies, emphasising the impact not only for our museums but for the partner institution and the students themselves. The quality of this work shines through on these pages. We're also delighted that one of our current students, Joshua Butt, was joint winner of the *Science Museum Group Journal* essay prize for his article *Adapting to the Emergence of the Automobile* (published in issue 08).

Increasingly, our research activities are carried out in collaboration with colleagues from across the world. If you'd like to join in, then please get in touch by emailing **Research@sciencemuseum.ac.uk**; we'd love to hear from you.

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COLLABORATION **AT THE HEART OF SCIENCE MUSEUM GROUP RESEARCH**

TIM BOON
Head of Research and Public History

COLLABORATION **AT THE HEART OF SCIENCE MUSEUM GROUP RESEARCH**

LEFT:
'Freedom 7' exhibition (1965), a visitor-focused display

Research in museums is necessarily a collaborative affair. To be sure, each of us ploughs a solitary furrow much of the time when we are actively pursuing our research interests, but we do that within an enabling framework provided by others, whether in funding, discussing or reporting our developing understanding. What is true of the individual researcher is also true of the research organisation; the Science Museum Group also pursues its own research, but, increasingly, it does so with the support of a widening – and international – network of collaborators.

One agreeable task for me this year has been the development of a new Science Museum Group Research Strategy (see page 86). As I wrote in last year's report, research is often a long-term business, and it follows that, when it operates in institutions that have long cycles of activity there are moments when it is appropriate to consider and re-articulate our mission. One such convergence revealed itself in the wake of the 2017 publication *Inspiring Futures*, SMG's statement of strategic priorities up to 2030. It was clear that it would be valuable to our colleagues and research community to spell-out how research activity can help our museum group to achieve its ambitions.

The discussions that shaped the research strategy produced some valuable clarifications. We have set ourselves the exalted aim to become the world's most research-informed science museum group by building on our core strengths in collections-based history, whilst collaboratively developing expertise in areas including international, digital and audience research. To get there, it is clear that SMG can, and should, apply everything that the research department has learned since its formal launch in 2012 to the benefit of the whole of SMG; in this sense, the research department becomes a service department for everyone in the Group. Whereas this has been true *de facto* for a few years, the strategy allows us to reassert this principle. Some aspects of our research enterprise have already shown their benefits across the Group; the doctoral scheme and *Science Museum Group Journal* are good examples. Other programmes are also beginning to be shared; for example, research grants; the National Science and Media Museum is hosting Bradford's National Museum, its major research project in collaboration with the University of Leeds. It is also partner in one of the AHRC-funded 'creative clusters' recently announced (as indeed is the Science Museum). We can look forward to substantial research projects supporting work at all our museums.

Where there is research to be done, then there is also the scope to enhance its confidence, quality, efficiency and visibility.

Another important change in perception relates to the kinds of research that the department seeks to support. We believe that it is important to recognise and value the whole range of research activity that goes on in our organisation, not just the funded academic work, but also the investigations and fact-finding that are an everyday part of colleagues' working lives. As the strategy states, 'Where there is research to be done, then there is also the scope to enhance its confidence, quality, efficiency and visibility'. And so, the new document contains measures for helping staff to enhance their research skills, including the introduction of a regular curriculum of training. We believe that a graduated scale of research skill expectations can also help us to deliver the other emphasis, namely an enhancement of the number of successful applications for funded research to support the Museums' forward programmes.

COLLABORATING – NATIONALLY AND INTERNATIONALLY

SMG's collaborative research culture means sharing our research interests with colleagues, as we do in our annual research conference. It also involves being a generous host to colleagues in the universities and other museums as they discuss subjects of relevance to the broad interests of science museums; that is why we are keen to partner on conferences and workshops, and also welcome many kinds of contribution to the *Science Museum Group Journal*. Whatever the outcomes in detail of EU exit negotiations, the Science Museum Group will continue to collaborate with colleagues in Europe and, indeed, across the world, because our collections, subjects and their scholarly investigation know no customs barriers. This intent was signalled particularly strongly this year by our China research project. Here, research activity is in at the start of a cluster of related projects that will enable the Science Museum, working in the UK and in China itself, not only to plan an exhibition that illuminates what is particular to Chinese science and technology, but also to emphasise the long history of relations between our two countries. This is exemplified by the news we received over the summer that we have been successful in

applying for funding to create online resources related to Beijing's Palace Museum clock collection, which includes many examples of 18th-century London-made clocks. Our international links are also demonstrated by the continuing success of the Artefacts Consortium, whose 22nd meeting, welcoming colleagues from across the globe, was held at the Musée des Arts et Métiers in Paris in October 2017. The same month saw the publication of the latest Artefacts book: *Challenging Collections: Approaches to the Heritage of Recent Science and Technology*, edited by SMG's Alison Boyle and Johannes-Geert Hagmann from the Deutsches Museum in Munich.

Our most international project of recent years was on the History of Nuclear Energy and Society (HoNESt). This interdisciplinary consortium of 24 institutions, a collaboration of historians and social scientists across Europe and the United States, links historical research to the understanding of contemporary attitudes. It examines how nuclear energy and society have interacted across Europe, both East and West, and indeed the world, from 1945 to the present day. Taking place over a period of three and a half years, the project began with a focus on understanding the history of nuclear energy in the 21 countries examined, and short country reports for each nation made available on the project website (honest2020.eu). Through the work of a specially recruited post-doctoral fellow, Dr Stuart Butler, and of Research Keeper Dr Robert Bud, The Science Museum has been responsible for the historical interpretation of the British experience, for the authoring and co-authoring of a number of scholarly papers, for reaching out through project blogs, and for contributing to the management of the project as a whole.

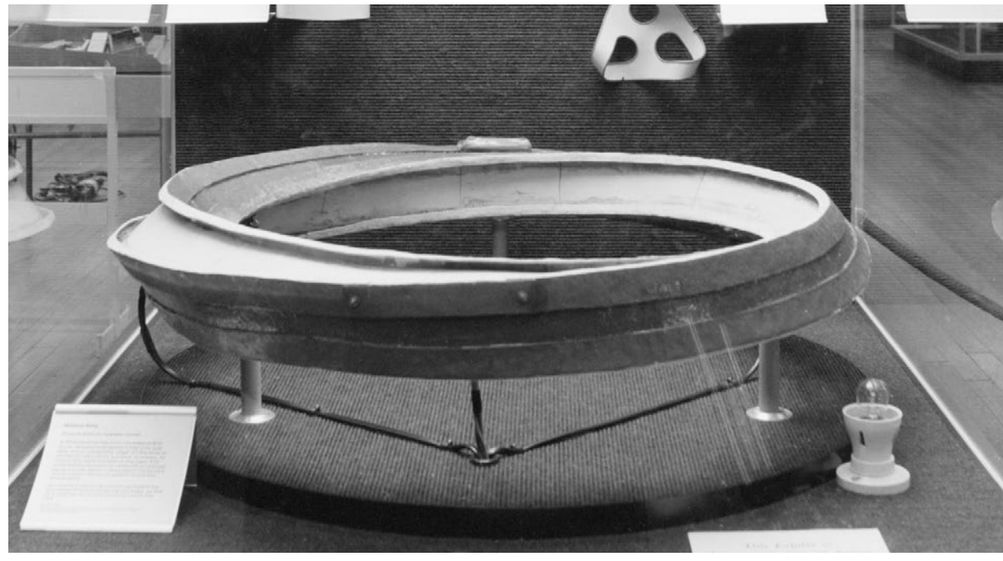
Collaboration is also a matter of individual mobility; one of the new research policy areas where the research strategy promises development is in fellowships and exchanges. Here, as researchers into science and technology, we are inspired by the comparison with art historians, whose careers often include periods in universities as well as museums, both on short and long timescales. We propose that welcoming more scholars to work with us will hugely support the academic study of science museums and collections, while sending staff out to experience other university and research environments will enlarge their horizons and enrich their own and the Group's work. In the year under report, I was able to test this approach with a Cheney Fellowship awarded by the University of Leeds. This funded me to work with colleagues in several departments on a conference whilst also ploughing the more solitary furrow of research, developing a book on the public culture of science. The experience was not only productive in terms of publications, it also enabled the development of several new potential research collaborations. If the new policy can produce similar outcomes for scholars visiting us, and for our staff experiencing new workplaces, then it will do good work for our collaborative ethos, and for the richness of the SMG museums' research and practice.

SCIENCE MUSEUM LONDON HIGHLIGHTS

This Report, for the second year is explicitly for the Science Museum Group, not simply the Science Museum, London. As research activity increases across the Group, there will be a more equal balance in entries between the museums. For the moment, we have retained our tradition of carrying local roundups for our northern museums and it therefore also makes sense to say a little about the general research activity in London. For example, over the last few years we have re-established our own seminar series, with Tuesday lunchtime meetings and the occasional special early evening event. In the year under report, Bergit Arends, Alison Hess and Oliver Carpenter all had a hand in the programming. Building on our tradition of inviting external academics and our own students and staff to speak, contributors included Edward Gillin, from the University of Oxford on 'The Science of Parliament: building the Palace of Westminster in industrial Britain', our doctoral student Gemma Almond on combining objects with documentary sources in her research into 19th-century spectacles, and Associate Curator of Chemistry Rupert Cole on electrical engineer Eric Laithwaite's relationship to the Science Museum. As a special evening event in March, we held an Alumni Seminar featuring graduates from our AHRC-funded collaborative programme; the speakers were Laura Newman, Hannah Reeves, Tom Richards, Cat Rushmore, Thomas Spain and Jacob Ward. It really feels that our doctoral programme is coming of age, and it is a pleasure to recognise it in this way.

Every spring term for the last four years, Science Museum curators and research staff have taught a ten-week master's option, 'Curating science and technology' on behalf of the UCL Science and Technology Studies department. The sixteen students following the option this year were introduced to the relationships between the reserve and displayed collections, and the processes that curators follow in creating public displays on topics as diverse as 17th-century natural philosophy and 21st-century particle physics. For the first time, one of our masters students has successfully applied for one of our doctoral projects, on 'audience-mindedness' at the Museum since the Second World War. This is another sign of research becoming a natural component of SMG's everyday activity.

We are always happy to discuss potential research funding applications with colleagues and researchers from other organisations, including universities. Indeed, such discussions and the bids that result comprise a significant part of the Research and Public History Department's activity. As a selection of these goes live, we continue to record progress in the individual reports that feature in this Annual Report. Please see 'opportunities to study and work with us' if you would like to join in with our growing research enterprise.



RIGHT:

Möbius strip model with racing cars powered by a linear motor, by Eric Laithwaite,subject of a seminar by Rupert Cole this year

COLLABORATION **AT THE HEART OF SCIENCE MUSEUM GROUP RESEARCH**

NATIONAL SCIENCE AND MEDIA MUSEUM RESEARCH HIGHLIGHTS

GEOFF BELKNAP
Head Curator, National Science and Media Museum

LEFT:
Sound and Vision Collections Activity, Bradford Science Festival

In the past year, research has continued to play a central role in the way that we collect, talk about and display our collections both inside and outside the Museum. To reflect this, we have launched the NSMM Research Seminar series. The seminar gives staff members across all departments in the Museum, PhD students and visiting researchers the opportunity to present their ongoing research in a welcoming and collaborative environment.

This year has also seen our major collaborative project – Bradford's National Museum project (funded by the Arts and Humanities Research Council, AHRC) – take off. The project is a three-year exploration of how the Museum can become more open to, engaged with and better connect with Bradford. The project was collaboratively designed with a range of partners who have well-established community development practices and strong local networks. It is an action research project, which means we are learning together through doing and experimentation (you can read more about the project on p39).

RIGHT:
Midas XL3, 40 channel, Live Performance Console from 1990, serial no.003, in flight case

We are also very excited that the NSMM has become a project partner on an AHRC Creative Industries Cluster Partnership, entitled *Creative Media Labs: Innovations in Screen Storytelling in the Age of Interactivity and Immersion*. Based at the University of York, this project is one of nine successful Cluster Partnerships and has been awarded just over £5.4 million from AHRC with other partners including the BBC, British Film Institute (BFI), Screen Yorkshire, and Game Republic. The main aims of the cluster are to translate cutting-edge research into screen-based industry and business contexts that will maximise impact regionally, nationally and internationally. It also aims to ensure that storytelling and content-creation methods and opportunities evolve to meet the expectations of audiences experiencing the next generation of digital, interactive and immersive screen-based technologies.

Our collaborative doctoral students have had an equally productive year. Phillip Roberts, who has been working on our magic lantern collections, has successfully completed his dissertation, and is now working with Birmingham Museums. Rebecca Smith, who is writing her PhD on the *Daily Herald* Archive, has been collaborating with colleagues from the Imperial War Museum to understand how the same prints from the *Herald* collection have been incorporated into different collections. We have also welcomed a new student, Edd Wilson-Stephens into the Museum. Edd started his PhD in October and is working on the 'Objects of Electronic Sound and Music' (OESM) Collaborative Doctoral Project, co-supervised by the Associate Curator of Science and Technology, Dr Annie Jamieson, and Dr James Mooney, School of Music, University of Leeds. Edd will be exploring techniques used in the display and interpretation of OESM (a category which includes the technological infrastructure of electronic music, such as microphones, amplifiers, mixers and loud speakers, as well as instruments) through a series of object-based case studies, working with makers, users and audiences.

A continuing focus of our research activity in the Museum is the development of new permanent galleries which tell the integrated histories of sound and image technologies. These exciting new galleries are built upon the most recent research from a range of fields, including the history of science, museum studies and audience research. These new galleries – which we plan to open in 2022 – will offer a new way for visitors to engage with and interpret our core collections, by showcasing the different ways that we shape and are shaped by photography, film, television and sound technologies.

Another ongoing piece of research we have been conducting – which has been supported by appointing a new Library and Archives Manager, Claire Mayoh – has been to improve the depth and scope of our knowledge about our collections. In addition to helping us improve our collections access, having a dedicated professional archivist on the team means that we can engage with some of the big 'what's next' questions across the Science Museum Group – in particular, important questions about how the NSMM and the Group can collect, curate and take care of born-digital collections. We look forward to continuing these conversations, both inside and outside the Museum, and bringing research into every part of our collections and engagement work.

NATIONAL RAILWAY MUSEUM RESEARCH HIGHLIGHTS

ED BARTHOLOMEW
NRM Lead Curator Collections and Research

NATIONAL RAILWAY MUSEUM RESEARCH HIGHLIGHTS

LEFT:

Launch of the *Railway Cultures* book published in conjunction with the University of Sheffield (© University of Sheffield)

Research has been at the core of an intensely busy year for the National Railway Museum, with staff and students engaged in all kinds of outreach, exhibition planning and support, and academic research and publication.

Our ongoing partnership with the University of Sheffield, developed over the previous year, has continued to flourish. This past year the *Railway Cultures* programme saw scholars and students from Sheffield's Faculty of Arts and Humanities take part in an array of activities about the cultural impact and legacy of the railways. This resulted in two publications: a collection of essays edited by Amanda Crawley-Jackson and Chris Leffler entitled *Railway Cultures*, and an issue of the creative writing journal *Route 57* dedicated to the theme of railways. Supported by Thomas Spain, Oli Betts, and Ed Bartholomew, the season also featured a display at Sheffield station of photographs by Laura Page with accompanying text; a pop-up exhibition at the Sheffield offices of law firm DLA Piper featuring models, paintings, and photographs inspired by the collection; and a conference held at the Museum attracting museum scholars and practitioners from across the UK and further afield.

Other collaborations have also furthered the connections between the Museum and academic groups. Supporting a highly-rated module on Reading in the Archive, open to students from the University of York's English Department, has been a great opportunity for our archivists and curators to inspire students to pursue museum projects. It has also led to Oli Betts and Karen Baker crafting a doctoral project on 'Industrial Relations: Britain's Teenage Railway Queens 1925–1975' with Dr Trev Broughton, which is currently under consideration by the White Rose AHRC Consortium. Alison Kay and Thomas Spain spoke to Dr David Turner's Railway Studies students from York's Centre for Lifelong Learning at their residential weekend this year, while a broad team of archives and conservation staff hosted a visit by the Attingham Trust group to the Museum.

The Museum's large collection of railway worker testimony and related objects have twice been under the research lens this year. The launch of the AHRC-funded Piston, Pen and Press project has seen Oli Betts begin to work with scholars from the Universities of Manchester and Strathclyde to explore the literary outpourings of Victorian railway workers. Meanwhile, Search Engine volunteers, led and supported by Karen Baker, have been poring over accident reports from the turn of the century. The work has produced analytical data for the Railway Work, Life, and Death project (led by Dr Mike Esbester of the University of Portsmouth), which assesses the impact of railway accidents on the lives of workers. As always, working with our fantastic collection relies upon the expert support of John Clarke.

Our CDA students have also been active. Sophie Vohra has presented her work exploring the commemoration of railway pioneers at a number of conferences, most recently at the International Federation of Public History at Brazil's University of São Paulo and at the BBC's History Weekend in York. Meanwhile Elizabeth Adams and Amanda Stevens are both continuing their archive research, both at the Museum and further afield, and new CDA projects on environmental railway history are planned for next year.

Beyond the academy, our researchers have been busy adding value and insight to all manner of projects. Anthony Coulls, Andrew McLean and Thomas Spain have been consultants for the Severn Valley Railway as it seeks to re-examine how it tells railway history to its public and explores how a relationship with the Museum can help. Bob Gwynne and Anthony Coulls have taken curatorial lead in supporting two public programmes, Testing and Future Engineers, whilst the archive team have brought our incredible collections to the public across a series of exciting events. In June 2018 the Museum hosted the Early Mainline Railways Conference, bringing together some 90 scholars and researchers from across Britain and beyond to discuss the origins of the railway system.

Publications and public events have been almost too numerous to list! We continue to work towards building academic networks, particularly through the workshops and conferences of the newly-invigorated Institute of Railway Studies. In May 2018 the Museum hosted an international workshop looking at 'New Uses for Old Railways' and all of the current CDA students spoke about their research at this event. Staff have presented at conferences across Britain and abroad, spanning topics as diverse as archive practice, heritage railways, urban history, and the visual image and have published a similarly broad range of material.

With a renewed Masterplan increasingly drawing together at the Museum, the next academic year will bring new and exciting challenges for the staff as we look anew at our collection and the stories they can tell.

SCIENCE AND INDUSTRY MUSEUM RESEARCH HIGHLIGHTS

GEORGINA YOUNG
Head Curator

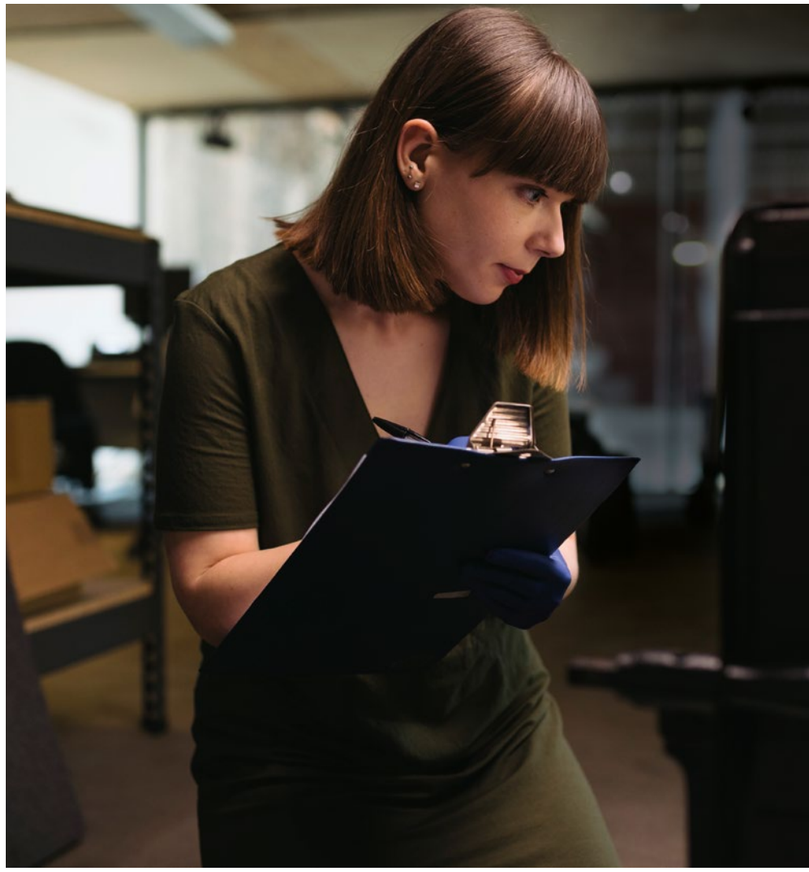
Research at the Science and Industry Museum (SIM) in the academic year 2017/18 has been characterised by continuity and growth. The *Electricity: The Spark of Life* exhibition, collaboratively developed by SIM with Wellcome Collection and the Teylers Museum, continued to provide a focal point for research activity. This ranged from targeted exhibition content development workshops with the University of Manchester Tyndall Centre for Climate Change Research and the University of Lancaster DEMAND Centre, to helping shape proposed public engagement activities for the upcoming *Communicating Material Cultures of Energy: Five Challenges for Energy Communications* project led by Hiroki Shin (SMG), which follows on from the Museum's involvement in the *Material Cultures of Energy* research network.

The SIM curatorial and archives team's own research outputs and activities also coalesced around the energy theme. *Electricity* lead curator Jan Hicks presented on all-electric houses at the XXXVII Scientific Instrument Symposium (Leiden and Haarlem, The Netherlands) and published *The language of Electricity: Jan Hicks in conversation with Bill Morrison* in Issue 9 of the *Science Museum Group Journal*. This specially themed edition also included a co-authored article by Curator of Science and Technology Alice Cliff and Jenny Rinkinen (University of Lancaster), *Visualising electricity demand: use and users of a 3D chart from the 1950s*. Meanwhile Curator of Industrial Heritage Katherine Belshaw and Head Curator Georgina Young hosted a working group visit to the Science and Industry Museum as part of the Energy in Store project in December 2017, with the latter also speaking as part of a panel at the public workshop to mark the conclusion of the project in June 2018.

The Science and Industry Museum's collaborative doctoral award researchers continued to provide new insights into the Museum's archive collections, with both Josh Butt (*The rise and fall of the Manchester motor industry, 1896–1939*) and Paul Coleman (*Security of supply: the role of the State in Britain's emerging national electricity network, 1914–1956.*) submitting their theses and awaiting *viva*. We also welcomed Francesca Elliott (*Power-assisted learning? Exhibiting, interpreting and teaching on technology in the twentieth century industrial city*) into the team. SIM and SMG have already benefitted extensively from Francesca's research around models in the collection and her science communication expertise; particularly notable are her paper at the SMG Research Conference and her contribution to content development for the upcoming design and interpretation refresh of the Power Hall.

The delivery of a previous design and interpretation refresh in the Textiles Gallery in July 2018 concentrated thinking on areas of our textiles industry archive collections that have exciting untapped research potential. These include records relating to the business activities of several Manchester textiles trading firms, including Langworthy Brothers and Co., Stavert Zigomala, Paterson Zochonis and Thomas Barlow and Brother, which together span a period of over 150 years (around 1825–1980s). The project also highlighted priorities for research in order to deliver our long-term vision for a Cottonopolis gallery, particularly around how we acknowledge, explore and represent the relationship between the cotton industry, technologies and transatlantic slavery and how we bring to the fore commerce, trade and global connectedness on-gallery.

Further future research directions are suggested by our NWSSDTP CASE studentship *Transitions in the technologies and practices of office work: Manchester's administrative industries* (1960–2017) with Elizabeth Shove (University of Lancaster), which commences 2018/19 and enables us to explore a new interdisciplinary approach to objects and practice. The ongoing doctoral project Soundtracks, organised through REALab, is another example; here doctoral researchers from the University of Manchester and the Royal Northern College of Music are composing music in response to the Museum's site and industrial themes while running a process blog and digital engagement project alongside.



RIGHT:

SIM Curator Katherine Belshaw studies a model cotton gin by W Jamieson of Manchester c.1860 in preparation for the Textiles Gallery Refresh (photo Science Museum Group/ Drew Forsyth)

LEARNING AND AUDIENCE RESEARCH

KAREN DAVIES
Head of Learning Research and Resources

JANE RAYNER
Head of Audience Research

ABOVE:
Young visitors try to tell reflection and reality apart in Wonderlab at the National Science and Media Museum

LEARNING AND AUDIENCE RESEARCH

Since 2012 Science Museum Group Learning has been working with King's College London, University College London and BP on Enterprising Science, a research project to define and understand the concept of science capital. (A person's science capital is a measure of their engagement with science and is made up of what they know about science, how they think about it, what science-related activities they do and the people they know who use and talk about science.) The concept is central to our drive to create a more scientifically literate and engaged society and the research has given us an academic framework that underpins everything that we do. As the project came to a close our emphasis this year has shifted to turning findings into practice. We are now using the science capital framework and wider science education research to understand how to support people from the widest possible backgrounds to engage with science. We are also using it to shape our learning resources, events and exhibitions.

As a STEM focused group of museums, where science and cultural engagement is at the heart of our work, the concept of science capital speaks to our SMG mission and values. Indeed, in SMG's *Inspiring Futures* strategic priorities 2017–2030 document the Group made it their number one core priority to 'grow science capital in individuals and society'. To deliver this ambitious strategic priority, we recognised that we had to put an organisation-wide effort into translating science capital learnings into operational realities. To embed the science capital approach in a sustainable way, all staff need to feel empowered and motivated to use the concept and not view it as something that is only relevant to the Learning department. But, with almost 2,000 staff and volunteers working in our SMG museums over 30 different departments this brings many challenges.

Thus the team's focus has shifted to disseminating and embedding the Enterprising Science research findings across the Science Museum Group and beyond. This has involved developing training workshops and other communication channels and creating science capital informed resources and science engagement tools for target audiences.

To make the messages and content feel as relevant to our SMG staff as possible, we are personalising and localising the training and resources. For instance, we have developed a series of face-to-face courses to share practical ideas and tools for public-facing and exhibition content teams, and we have also created an online course to give all staff an introduction to the research. A suite of resources, including a desktop 'at a glance' summary and a more detailed overview booklet, has been created and distributed to all teams across the Group, alongside a toolkit of resources to support staff to embed the science capital approach into their work. We have created a set of reflection points, which are informed by the dimensions of science capital and wider science engagement best practice. Staff are encouraged to use these reflection points to review their own work, and to support everyone to think critically about our visitors' experience. The legacy of the Enterprising Science project continues through the establishment of a new SMG Academy of Science Engagement, which launched in October 2018. The aim of the Academy is to be a centre of excellence in informal science engagement, delivering outstanding training and resources to teachers, museum and STEM professionals, nationally and internationally. The Academy is rooted in SMG's experience and creative approach for engaging all audiences with STEM through contemporary science, hands-on experiences and object interpretation. For example, we have been training STEM professionals in audience engagement for over 15 years and have delivered training to the scientists and volunteers presenting and exhibiting at the Royal Society's Summer Exhibition, the Royal College of Pathologists, Kew Science Festival, and the Manchester Science Festival. Through the Academy we have been able to re-develop these courses to include science capital research best practice and tools. This will help more STEM professionals apply the science capital concept into their own science engagement activities, thus broadening the impact the Group makes on the sector and on society.

The *Transforming Practice* blog which can be found on the Science Museum Group website continues to share our personal reflections of science capital and wider research around STEM engagement. It includes examples of how we are working to embed the research into our different museum functions and contexts as well as examples of good practice we have seen and found on our travels.

OBJECT ENCOUNTERS: PAST, PRESENT AND FUTURE

Over the last year we undertook a piece of research with University College London to situate our practitioner research on object engagement within academic learning research frameworks. The aim was to facilitate more collaborative research partnerships focused on how visitors engage with objects in a museum setting.

This work developed into an idea for a workshop on object engagement which we ran in June 2018. The two-day workshop was called 'Object encounters: past, present and future' and it invited academics, curators and learning and interpretation practitioners to come together to share their understanding and ideas about the interactions between audiences and objects in our museums. In particular, we were interested to think about how object encounters can contribute to the development of science capital.

Some key aims of the workshop included examining how academics and practitioners can work together in support of a learning research agenda around museums, visitors and STEM object engagement. We also wanted to establish a shared vocabulary between researchers interested in object engagement.

The overarching theme that developed in discussion over the two days was how prior knowledge, interests, culture, belief and personal experience can all be considered as both enablers and barriers to engagement and will influence an individual's response to specific objects and content.

A report that captures the outputs from the proceedings will be published by the end of the year. We hope that some of the papers, partnerships and discussions from the day have provided a shared vision for collaboration between researchers, practitioners and academics and we plan to publish some journal articles in the next year.

MOVE2LEARN RESEARCH PROJECT

The Learning and Audience Research teams have joined a collaborative research project called Move2Learn, funded by the Wellcome Trust, the Economic and Social Research Council and the National Science Foundation. The project brings together academics and museum/science centre practitioners from both the UK and the USA, including Sara Price from the Institute of Education in London and Andrew Manches from Edinburgh University.

Move2Learn explores how embodied learning experiences, such as those that children have through interactive exhibits, might help children to develop their science understanding in the early years.

The first stage of the project investigates the gestures which children spontaneously produce when communicating science ideas and links these gestures to their embodied learning experiences with exhibits.

An initial study conducted in a nursery setting showed that gesturing enables very young children to communicate complex science ideas at a level that they are unable to express through speech alone. The findings also suggest that children use gesture to aid their own thinking about these science ideas and point to specific sensorimotor interactions that are important in supporting science learning in young children.

This is a promising start, as it suggests that gestures are a rich source of information about children's understanding, which is relatively underutilised when it comes to interacting with young children about science. Studying gesture may provide a window into the kinds of sensorimotor experiences that can be designed into exhibit interactions to generate successful STEM learning outcomes.

At the Science Museum we are exploring how children communicate and enhance their understanding of the science content of the Gravity Run exhibit (in WonderLab) and the Water area (in the Garden). The findings from this project will help inform a whole new offer that is currently being developed for our younger visitors.

COM'N'PLAY: A HORIZON 2020 LEARNING RESEARCH PROJECT ON THE OUTCOMES OF PLAY, MAKING AND CODING ACTIVITIES

The Science Museum Group is one of ten partners across Europe who are working on a Horizon 2020 funded research project to investigate the importance of play, making and coding activities on STEM engagement for young people. The aim of this project is to help European partners better understand the ways in which informal science learning is taking place through various coding, making and play activities that young Europeans are increasingly engaged with outside the classroom. The research will explore

RIGHT:

The Science Museum brings science alive for a young visitor in Wonderlab: The Statoil Gallery (© Plastiques Photography, courtesy of the Science Museum)

the impact of participating in these types of activities and will provide an evidence base for policy makers involved in making these kinds of activities available to all young people.

The project has several phases: firstly we aim to develop an appropriate conceptual and methodological framework and identify, pool and analyse existing coding, making and play-based practices taking place outside formal education. We will then conduct in-depth, learner-centred, participatory research on selected practices to gain a deep understanding of the impact that this kind of informal science learning has on formal science education, and young people as learners and citizens. Finally we will communicate the messages and disseminate them to practitioners and policy-makers as well as suggesting avenues for future research in this area.

The Science Museum Group are involved as leading practitioners for these types of activities and as well as submitting our own practices for research, we are advising on how to convert the findings from the project into meaningful frameworks for other practitioners to apply to their work.

We look forward to an academic study which will support us in communicating why the type of outside-of-the-classroom activities that we offer are an integral part of STEM learning and engagement.

LIBRARY AND ARCHIVE RESEARCH PROJECTS

NICK WYATT
Head of Library and Archives, Science Museum

LEFT:
Evershed and his family with other men in Indian dress in front of a telescope. From a collection digitised this year

The Science Museum's Library and Archives are a rich resource for research for a wide range of fields. Museum staff, academic researchers, students, subject enthusiasts and the public have benefitted from its world-class collections over many years. The potential for further study has increased as the collections have grown, and more material is catalogued on-line. Access in London has been enhanced for material normally stored at the National Collections Centre, Wroughton (NCC) and around two-thirds of archives are now consulted in the Dana Research Centre and Library. As our Archive Collections Manager, Beata Bradford, demonstrated in last year's *Research and Public History Annual Report*, several researchers have recently benefitted from enhanced access to archives and in turn they have helped to catalogue, list and interpret these collections.

The Library collections are also the subject of more intense research as we encourage CDA students and other researchers to focus on our printed collections. One doctoral student, Kevin Tracey (Swansea University), is nearing the end of his three-year doctoral research which has focused on the Library's early printed books on mathematics and related subjects. He has discovered significant evidence of their provenance and historic use, recording previous owners and tracing the history of individual books as they have passed through individual and institutional hands and auction houses to end up in the Science Museum Library. This research was ignited by one book, John Seller's *A Pocket Book, Containing Several Choice Collections: In Arithmetick, Astronomy, Geometry, Surveying, Dialling, Navigation, Astrology, Geography, Measuring, Gageing*, published in London in 1685, which came into the Library when it was founded in 1885. This copy is heavily-annotated in tiny manuscript writing in multiple hands which Kevin has deciphered and interpreted. There is evidence of three owners from the 17th century, whom Kevin has identified, tracing their use of the book and the influence of other authors through their various annotations and manuscript diagrams.

Thus, the re-interpretation of individual items can spark a broader interest in often neglected areas of research. The Head of Library and Archives, Nick Wyatt, has undertaken such a study after attending the Science Museum's training in asbestos awareness, which all collections staff must attend. His focus has been the use of asbestos paper for writing and printed books and his interest was roused by just one book in the collection, Franz Ernst Brückmann's *Historia Naturalis Curiosa Lapidis Ton Asbestos…*, published in Braunschweig, Germany, in 1727. Four copies of the original edition were printed on paper made from Hungarian asbestos with only one copy known to have survived, in a German library. Nick Wyatt has researched the history of this book and concluded that the Museum's copy is not one of the lost asbestos copies. He found that the earliest written description of asbestos paper was made in 1671 by Marco Antonio Castagna who proposed creating a book of asbestos paper, sewn with asbestos thread and printed with gold, which would be known as the *Book of Eternity*, an idea so compelling it was repeated well into the 19th century. Nick has also charted early experiments in making asbestos paper from the 17th century onwards to its later use in a handful of printed books and more recently in bookbinding. He will be writing up his research for submission to the *Science Museum Group Journal*.

One of the most important functions of the Library and Archives is to facilitate research and it does this by enabling access in its reading rooms, by listing, cataloguing and digitising its collections and by subscribing to electronic resources. There have been significant developments this year, which are described below.

The Museum was successful in applying for Wellcome Research Resources funding for a six-month project to catalogue and re-package archives relating to genetically-modified crops and food. A Project Archivist, Sophie Smith, was appointed for the task. The project also digitised audio-visual items, and our methodology for this will influence how we deal with such material in other collections.

Our *One Collection* archivist, Jack Garside, has been managing un-accessioned archives liberated from storage in Blythe House, by cleaning, re-boxing, researching, cataloguing and adding them to the collections. These include a collection of drawings and technical documents from the scientific instrument maker W.F. Stanley and Co, dated between 1940 and 1975.

Recent acquisitions continue to be catalogued, and Beata Bradford completed the arrangement and cataloguing of the archive of Laporte Industries Ltd., acquired in 2017. The company was once a major British chemical engineering business.

John Underwood (Library Collections Manager) and Doug Stimson (Library and Archive Collections Assistant), have been cataloguing books within the Library's Patrick Moore collection and the Walt Patterson nuclear collection.

Library and Archive Collections Assistants Amanda John and Doug Stimson have been digitising archives and dyelines. Amanda has been adding the archive images to the Science Museum's *Collections Online*, including photographs from the John Evershed Archive and other items. One notable example is an undated manuscript, *Le Trésor des Trésors*, attributed to the alchemist Nicolas Flamel, which has great potential for a historian of alchemy.

Our Research Services Librarian, Prabha Shah, added the British Newspaper Archive to our electronic resources, which are available to staff across the Science Museum Group.

Research remains the mainstay of the Science Museum Group's Library and Archive services in London and at the NCC and it has been critical for understanding, arranging and cataloguing large and complex archives. Staff are continually improving our services and researchers can now access files relating to the Museum's administration, exhibitions and objects in the Dana Research Centre and Library. This has proved popular as researchers can not only consult these in an inspiring setting but also gain access to the library's physical and electronic resources at the same time.

This year has seen a transformation in access but there is much still to do, including adding digitised images from the Library's printed collections to *Collections Online* and converting lists of trade literature so they can be searched on the Library catalogue. So, watch this space!

LOOKING BACK AT RESEARCH AT THE SCIENCE MUSEUM

ROBERT BUD
Emeritus Keeper

In November 2018, Robert Bud, long-serving senior Science Museum curator and scholar, retired from the Museum, and is now continuing as Emeritus Keeper. We asked him to reflect on the history of historical research at the Museum; this short essay is his response.

Proud member of the elite club of national museums for more than a century, the Science Museum once also seemed to be a maverick. In the first half of the 20th-century and for two decades after, the Museum proudly stood apart from many of its peers with their interest in antiquity, timeless beauty and the test of time. The Science Museum dealt instead with a populist interpretation of the present, prospects for the future, and a distinctly recent past, treated as an antecedent to the present.

The Museum's relationship with those academic disciplines that deal with the past were also atypical. Whereas the great art galleries were close to the 'history of art', and archaeological museums to the discipline of archaeology, the 'history of science' as taught in a few universities with its traditional emphasis on ideas had little relevance to an institution whose heart lay in the interpretation of objects.

In the 1960s, linkages between the Museum and the history of science and technology department at Imperial College under the leadership of Rupert Hall were disappointingly weak. Even if there were intersections and overlaps, in, for instance, shared interests between academics and curators in the lives and work of such 'great men' as John Dalton, Charles Wheatstone and James Watt, the foci of interest were different. It is true that individuals from the Museum could play important roles in the organisational life of the discipline. In the 1960s, Chemistry-Keeper Frank Greenaway, and before him the 1950s-Director Sherwood Taylor, were well-known faces in the History of Science community. Early in the institution's life, in 1931, the Museum had hosted the international congress on the history of science. But, the session dealing with pure and applied science organised by the host had little relationship to history, and in general, the material culture of science which plays such as important part for museums was a minority interest within the academic discipline.

Since the early 1980s, however, thinking in both universities and museums has changed. Academic history of science has been enriched by its intellectual engagement with sociologists and the emergent discipline of 'STS' [Science, Technology and Society] whose society 4S was founded as recently as 1976. The interest in practice exemplified by the study of the air pump by Schaffer and Shapin emphasised the importance of instruments. A concern with what came to be called 'technoscience' at the boundaries of science and technology called in particular for interests in a wide variety of stakeholders and how their engagement was represented in material artefacts. Thus the pioneer of social construction of technology, a key part of the intellectual framework for STS, Wiebe Bijker, took a keen interest in the collections and exhibits of the Science Museum when he was studying bicycles and bakelite early in the 1980s.

Thinking about museums also developed in the same decade. Whereas historically they presented the fruits of distinct, often elite, cultures to deserving audiences who were treated as eager to learn, the 'new museology' emphasised the engagement of audiences with the exhibits. This could apply even to museums of science. Science Museum curators such as Alan Morton and Ghislaine Lawrence were pioneers in engaging with thinkers about museology. Such interests were increasingly evident across the entire museum sector. Seminars hosted at UCL by the late Professor David Lowenthal, geographer and intellectual, brought together investigators from diverse London institutions.

The ambition of the Science Museum in particular changed. Links with its German counterpart, the Deutsches Museum in Munich, had long been close, and that museum took a leadership role in the development of history of science in Germany. In the United States, staff at the Smithsonian Institution's Museum of History and Technology (now the Museum of American History) led the American community from its foundation in 1962. At the Science Museum, from the 1980s, under a succession of directors, scholarship and a place in the scholarly community came to matter too. Margaret Weston and then Neil Cossons allowed sums small in museum terms, but generous by academic standards of the time, to be spent on bringing academic scholars to museum seminars even from overseas: Wiebe Bijker and Bruno Latour were early speakers. Such directors

RIGHT:
Robots exhibition at the Science Museum, London

allowed time to be spent on training museum curators to become qualified scholars themselves, and several curators gained doctorates in relevant specialisms as a result. Cossons encouraged the hosting of one of the first international meetings of the US-based Society for the History of Technology (SHOT) in 1996. He also encouraged the Museum's support of the new consortium of museums and academic historians under the title Artefacts, which was led by the Science Museum, the Deutsches Museum and the National Museum of American History.

Under the directorship of Ian Blatchford from 2010… a new genre of scholarly, richly-illustrated catalogues emerged.

Its first meeting in 1996 at the time of the SHOT conference brought together academics and curators internationally. Within the Museum, when the Collections Division was reorganised into a functional structure at the end of the 1980s, research had been accepted as one of the four functions and research outputs were included in the Museum's performance indicators. Subsequent directors built on this foundation. In reorganisation in the last decade, public history has been added to its remit.

Historically, finance for research and scholarly training had been taken from the Museum's own funds. That changed with the emergence of the Arts and Humanities Research Council and changing rules on the funding of museums. Since 2013, doctoral students have been co-supervised by museum staff and academic departments, funded through grants given to the Museum. From 2009, the Museum also became eligible to receive research council funding, so its staff could hold fellowships and join or even lead research-council funded networks.

The outcome of this research could be felt across a wide range of Museum activities, whether in the permanent displays such as the Making the Modern World gallery or in multiple temporary exhibitions such as *Robots*, the selection of imaginative acquisitions, or popular and academic publications. The rapid developments of the world-wide web and governmental/lottery support for experimental new resources around the year 2000 enabled the production of large research-based sites, Making the Modern World and Ingenious. The Museum had rarely after the Second World War produced publications closely associated with its exhibitions. Under the directorship of Ian Blatchford from 2010 that however changed and a new genre of scholarly, richly-illustrated catalogues emerged.

There are of course tensions between the urgent demands on time of new exhibitions and infinite appetite for attention of the long-term research project. Resolving such tensions is an ever-renewed challenge and headache. Yet in principle scholarship closely connected to contemporary academic priorities can nourish both museum activities and scholarly discipline. The Science Museum is a natural base for looking at science and technology as human activities embodied in artefacts rich in symbolic meaning and functional detail; with meanings both to specialists and to multiple publics; represented in laboratories and factories, daily life and museums, in popular magazines and on television screens; and consequential for large numbers of people.

LEFT:

The Making of the Modern World gallery, Science Museum

The Science Museum is a natural base for looking at science and technology as human activities embodied in artefacts rich in symbolic meaning and functional detail.

ABOVE:

Robots exhibition at the Science Museum, London

LEFT:

"An Experiment on a Bird in the Air Pump" by Joseph Wright of Derby

SMG RESEARCH CONFERENCE

ALISON HESS
Research and Public History Manager

Each year the Science Museum Group holds an annual research conference at one of its museums. This year the conference was back at the Science Museum in London, and once again offered attendees an opportunity to learn and reflect on the exciting new research taking place across the Group. As always it has been a busy year for research as Sarah Dry, Science Museum Group Trustee and Chair of the Research and Collections Committee, reflected in her introduction to the conference. With collaborations, students and researchers uncovering new things about the collections throughout the year, there was plenty to discuss at this year's meeting.

The first session explored museum histories and their impact today. Papers from Cate Watson and Ben Russell delved into the early years of the Science Museum's history, by exploring the permanent galleries on display in 1930, and the legacy of the former Keeper of Mechanical Engineering H W Dickinson, respectively. Both offered insights into the politics and mission of the Science Museum as it established a place in Britain between the wars. In the aftermath of the First World War, H W Dickinson was concerned with properly commemorating British engineers and shaped the Science Museum's core collection to reflect this. The final paper in this session presented the lessons learned as part of the 'Railway Work, Life and Death' project, a collaboration between the National Railway Museum and the University of Portsmouth. The project has involved a team of National Railway Museum volunteers working with railway worker accident reports produced between 1911–15. Volunteers have extracted key data from the reports, creating a database of accidents which reveals much about working practices on Britain's railways, the incidence of occupational accidents, and the lives (and often deaths) of those involved. The presentation by Mike Esbester at Portsmouth and Karen Baker at the National Railway Museum helped

LEFT:

Wagons being prop-shunted at Willesden, London, 1915 (an image related to the 'Railway Work, Life and Death' project). The practice is no longer considered safe

demonstrate the opportunities that collaboration and crowd-sourcing from specialist communities can bring to a museum collection.

The conference then split into two themed parallel sessions: one exploring 'The Medicine Collection Beyond the Galleries' and the other 'Researching Visual Culture in the Science Museum Group Collections'. The Medicine panel discussed the ways in which the medicine collection lives beyond the galleries, through oral histories, scholarly research, public engagement events and on-line. Using a series of case studies, this panel reflected on the different ways objects have been used, encountered and presented in this context along with the challenges and opportunities this presented. The papers included a presentation on the Science Museum's collection of spectacles from Gemma Almond, one of the Science Museum's collaborative doctoral students. This was followed by two papers from the Medicine Galleries team – Katie Dabin and Imogen Clarke – who spoke about their experience of bringing objects to life through oral history and of celebrating the NHS at 70. The session ended with a paper by Emily Fildes and Lalita Kaplish on how the medicine galleries would be presented to online audiences.

The 'Researching Visual Culture' session (organised by Katy Barrett and Geoff Belknap) brought together historians, curators and artists who use the image collections in the Science Museum Group to discuss the nature of visual research. Papers focused on questions such as: 'What are the boundaries of image collections?'; 'What are the potential uses of visual historical sources?'; 'How does the SMG collect, store and display visual sources?'; and 'How can historical images inform and inspire new forms of artistic production?'. The session included Professor Jo Stockham, Head of the Printmaking Programme at RCA, Martha Fleming, Senior Research Associate, British Museum, and Allison Ksiazkiewicz, Faculty of History, University of Cambridge, as well as one of the Science and Media Museum's collaborative doctoral students, Rebecca Smith, who discussed her work on the *Daily Herald* Archive.

After lunch the conference moved on to consider the theme of 'Industrial change, people and objects' with three more individual papers. These included papers from Philip Roberts, a former National Science and Media Museum student who explored the science and industry collections of Birmingham Museums, followed by a paper from a current student at the Science and Industry Museum on powered model engines in technical education in Manchester. The final paper was given by Annie Jamieson, curator at the Science and Media Museum, on the XL3 mixing desk: an exciting and well-travelled new acquisition for the Museum. The XL3 presents a great opportunity to interview engineers, audiences and artists about the experience of delivering live music performances and help build some compelling stories for our audiences.

The conference ended with a final discussion addressing the question: 'What is the Public History of Science?'. The discussion was prompted by three provocations from Jack Kirby, Alison Hess and Tim Boon which drew on recent experience of the AHRC 'Energy in Store' project, the renewal of family history work as a way into the collections, as well as a longer view of the curator's role in relation to science and history. The discussion chaired by SMG trustee Ludmilla Jordanova of Durham University pointed to a renewed focus on public history at the Science Museum Group. As part of this reinvigoration of the Public History agenda Ludmilla and Tim announced that there would be a conference in 2020 on the Public History of Science. Please join us for the next SMG Research Conference which will be at the Science and Industry Museum in Manchester in September 2019.

EUROPEAN SOCIETY FOR THE HISTORY OF SCIENCE MEETING

The Museum's own conference was deliberately held on the eve of this year's conference of the European Society for The History of Science, held over the weekend following, so as to enable cross-fertilisation between the two meetings. This international biennial conference, co-organised on this occasion by the British Society for the History of Science, was seen as an opportunity to assert the internationalism of research in this discipline. With many sessions of the conference housed at the Institute of Education in Bloomsbury, we seized the opportunity to hold all the sessions concerned with the material, visual and public cultures of science here at the Museum, a most appropriate setting for these themes that are so much a focus of our own research enterprise.

SMG JOURNAL **REPORT AND REFLECTIONS**

SMG JOURNAL **REPORT AND REFLECTIONS**

KATE STEINER
Science Museum Group Journal Editor

LEFT:
Two-way socket appearing in an advertisement of an electric kotatsu (as featured in Issue 09 of the *SMG Journal*). Matsushita Electric Company, 1928. Courtesy of the Kounosuke Matsushita Museum

As the *Journal* enters its sixth year, there is a growing sense of its solidity and permanence within the Research and Public History Department, the Group as a whole and the wider research community. Reliably appearing Spring and Autumn issues have been swelling in size from 9–10 articles in the first issues to 12–14 more recently. Submission rates grow from within and outside of the Group and we are working with streams of content two to three issues ahead. In the year covered by this report the *Journal* has been read by just over 25,000 individuals over 30,000 sessions, and there are indications that this will rise next year.

This stability of production gives us the freedom to be a little experimental. This year, Issue 09 saw our first guest editor in Professor Frank Trentmann of Birkbeck University who helped us bring together a special issue on the material cultures of energy. This had been a topic of a series of workshops in partnership with the Science Museum Group and it felt like a logical continuation of the relationship to share a publication. The topic is extremely pertinent to several museums in our Group, in particular the Science and Industry Museum in Manchester, which was planning to display an adapted version of *Electricity: The Spark Of Life* exhibition, then on at Wellcome Collection. Frank's approach was very consciously to bring academics across several disciplines into contact with museum practitioners who were thinking about how to make energy visible and accessible through display. In fact, Issue 09 is divided between museum practice-based articles and academic pieces, with international contributions in both areas.

On the practice side we featured a new-to-the-*Journal* format of a conversation between SIM archivist Jan Hicks and artist Bill Morrison on his use of the Museum's film archive to create art pieces for *Electricity: The Spark of Life*. Alongside this were reflections on exhibition approaches from the Deutsches Museum (Sarah Kellberg, Christina Newinger), the Museum of Electricity and Life in Germany (Sabine Oetzel) and National Museums Scotland (Elsa Cox, Katarina Grant, Haileigh Robertson) as well as an object biography of a previously under-researched object (a 3D model of electrical demand) in the Manchester collections (Alice Cliff and Jenny Rinkinen). Scholars contributed articles with a truly global perspective, including a study of refrigeration in Southern India (Harold Wilhite), a discussion of the take-up of electricity in Japan and Canada (Heather Chappells and Hiroki Shin), a lighting project in Brazil (Joanne Entwistle and Don Slater) and a look at the cultural meanings of the coal fire in post-war Britain (Lynda Nead).

Issue 08 has been discussed in the 2016/17 *Annual Report*, but here it is worth returning to one aspect of it: the inclusion of a mini-collection of thematically linked papers within an otherwise open issue (the Museum Theme collection looking at contemporary approaches to collecting and display in Science Museums across Europe). The mini-collection is proving a fertile device for the *Journal*. It allows a thematic approach without taking over an entire issue (and hence blocking the content pipeline and delaying publication for other authors). Often emerging from conferences and symposia, a collection allows ideas from academics and museum practitioners to cross-pollinate, showing the power of museum research in the wider academy. The recent Issue 10

played with this idea in presenting a collection of papers relating to women in science and engineering, again in an otherwise open issue. This allowed us to nod to the 2018 centenary of women's suffrage and spotlight some pioneering female engineers in the Year of Engineering while also featuring papers on other topics relevant to museum practice. With two more mini-collections in the pipeline for Issue 11, we are working with software designers to make sure these are clearly connected and elegantly signposted for readers.

This year we ran our second writing prize, which reinforced for me the benefits of encouraging early career scholars. The pieces were from a range of universities and of very high quality; we plan to publish the winning article – by Jules Skotnes-Brown – in Issue 11. Jules's paper 'From the White Man's Grave to the White Man's Home: Visions Of Empire, African Tropical Health, And Visitors' Experiences At The 1924–1925 British Empire Exhibition', looks at records both from visiting publics and organisers of the largest exposition in colonial history. It argues that while curators sought to encourage settlement and investment by suggesting that tropical medicine had transformed Africa into a land of infinite wealth for the intrepid capitalist, the sensorial qualities of the exhibition and the actual experience and reactions of visitors tended to reinforce existing attitudes. The paper includes some fascinating photographs and footage of the exhibition which we look forward to showcasing in the *Journal*.

This last year has emphasised the symbiotic relationship between the work of the Research and Public History Department and the *Journal* (a relationship which is further reinforced in the renewed Research Strategy, see pages 75–78). For its content, peer reviewers and collaborative ventures the *Journal* draws from the networks, connections, projects, conferences and the work of the CDA student cohort nurtured by the Research Department. There is also an increasing connection between the *Journal* and the research work of the wider Museum Group, with staff and research fellows initiating conversations, suggesting papers and assuming a publication element will be part of exhibition and other project work. Of course, this progresses at different rates at the different sites depending on the various projects and priorities at each one – Manchester staff have been particularly active in publishing this year, for example. On top of this, the ability of the *Journal* to provide a peer-reviewed, open access and visually beautiful platform for research related to collections and practice in museums is clearly attractive to external scholars and museum practitioners. Indeed, this year has seen enquiries about how to create a journal from three national organisations who would like one too.

SMG JOURNAL **REPORT AND REFLECTIONS**

ABOVE:

Girton College Fire Brigade 1878, including Hertha Ayrton, (as featured in Issue 10), (Credit: The Mistress and Fellows Girton College, Cambridge)

CONFERENCES

LEFT:

Chinese stand at the Great Exhibition, Crystal Palace, London, 1851, discussed at our June Chinese Science workshop

10 October 2017
Modernism and Technology Seminars (National Railway Museum)

Led by Dr Trev Broughton from the Department of English and Related Literature at the University of York. Participating students were also given museum tours and archive handling sessions.

2 November 2017
Royal Holloway HARI Launch Event (Science Museum)

Lecture by Professor Ursula K Heise (UCLA) on 'Where the wild things used to be: Narrative biodiversity and multispecies justice', celebrating the launch of the Humanities and Arts Research Institute (HARI) at Royal Holloway, University of London.

3 November 2017
Sound Talking (Science Museum)

For audio engineers, psychiatrists, linguists, musicologists, and historians of literature and medicine, this conference explored the complex relationships between language and sound, both historically and in the present day.

6 November 2017
Managing the Experience of Hearing Loss in Britain, 1830–1930 – public lecture and reception (Science Museum)

Celebrated the publication of Managing the Experience of Hearing Loss in Britain, 1830–1930 (2017) by Graeme Gooday (University of Leeds) and Karen Sayer (Leeds Trinity University).

16 November 2017
Museums Association Conference evening networking event (Science & Industry Museum)

Hosted by the Science and Industry Museum as part of the largest conference for museum and heritage professionals in the UK.

23–24 November 2017
Annual SMG Research Conference at the National Science and Media Museum (National Science & Media Museum)

Explored opportunities and challenges of researching and displaying objects linked to sound and vision technologies, including the ways that the histories of photography, film, television and sound can be brought to life through research and exhibition. This conference was reported on in the 2016–17 Annual Report.

28 November 2017
NACIRA Conference and AGM – 'Science Asia: Shining a Light on Resources' (Science Museum)

Annual conference of the National Committee for Information Resources on Asia. Included talks on 'Resources for the study of British Library Arabic Scientific Manuscripts'; the history of the Needham Research Institute and its role as a 'hub for resources on the history of Chinese science in the UK'; and 'Medical and Botanical Science in the India Office Records'.

30 November 2017
Energy Transitions in the 20th Century: Lessons from the Past for the Future (Science Museum)

This final event of the Material Cultures of Energy project showcased key findings from the research, and featured interactive sessions exploring energy supply and transitions in the past, new ways of thinking about the roles of people and communities in this, and the implications for future policy.

1 December 2017
Collaborative Doctoral Partnership Connect Scheme – site visit (National Railway Museum)

Part of the Collaborative Doctoral Partnership Connect Scheme; participants took part in networking, a discussion around masterplan thinking, and site and archive tours.

3 February 2018
Powering the Future workshop (Science & Industry Museum)

Content development workshop for the *Electricity: The Spark of Life* exhibition, organised with the University of Manchester Tyndall Centre for Climate Change Research.

15 February 2018
ABTEM Guidelines for the Care of Larger and Working Historic Objects launch (Science & Industry Museum)

For practitioners from the industrial and transport heritage sector who had contributed to – or wished to know more about – this publication.

28 February 2018
Wounded: Conflict, Casualties and Care – symposium (Science Museum)

Based on the *Wounded: Conflict, Casualties and Care* exhibition, this symposium focused on the conception and creation of the exhibition as well as the themes that it explored.

16–17 March 2018
Medical and Metaphorical Wounds from the Middle Ages to the Boer War – workshop (Science Museum)

Explored understandings of wounds and wounding across history, including discussion topics on Pre-Modern Wound Care Practices, Civic and National Wounds and Wounding, and Wounds and Wounding in the Museum.

19–20 April 2018
Museums in Context Conference (National Railway Museum)

Co-hosted with the University of Sheffield as part of the Railway Cultures project, this conference explored how museums and the heritage sector can work with museums to each better the other.

11 May 2018
Railway Heritage and History workshop (National Railway Museum)

International seminar, hosted with Dr Hugo Pereira of the New University of Lisbon, focused on 'New Uses for Old Railways' and the survival and reuse of railways in the heritage, post-steam age.

3–4 June 2018
Chinese Science, Technology and Medicine: Cultures, Histories and Global Connections – workshop (Science Museum)

This international workshop was the Group's first event for academics and museum professionals to share knowledge, to build relationships and to gain new perspectives and insights into Chinese science, technology and medicine. This conference is reported on in this issue.

21 June 2018
Manchester Literary and Philosophical Society Annual Manchester Lecture (Science & Industry Museum)

Comprised introductory talk by Dame Mary Archer DBE, titled 'From Babbage to the "Baby": the Science Museum Group's Computer Collection', followed by a lecture from Dr James Sumner (University of Manchester) on 'Bringing up Baby: establishing and promoting computers in Manchester', to mark the 70th anniversary of the creation of the world's first stored-program computer.

21–22 June 2018
Object encounters: past, present and future – seminar (Science Museum)

Organised by the Learning and Audience Research teams at the Science Museum for academics, curators, and learning and interpretation practitioners, to share their ideas about the interactions between audiences and objects, and their contribution to the development of science capital. This conference is reported on in this issue.

21–24 June 2018
Second Early Mainline Railways Conference (National Railway Museum)

Brought together academic and public researchers from across the UK and abroad to discuss the early railways of c1800–1850.

28 June 2018
Objects of Electronic Sound and Music in Museums (National Science & Media Museum)

A diverse group of curators and conservators, music industry professionals, musicians and technicians, and academics from a range of disciplines were brought together to explore strategies for the interpretation and display of Objects of Electronic Sound and Music. Co-organised by Annie Jamieson (NSMM) and James Mooney (University of Leeds).

17 July 2018
Knowing Things workshop (Science & Industry Museum)

Organised by the University of Manchester Institute for Cultural Practices, explored materiality, collections and the power in things.

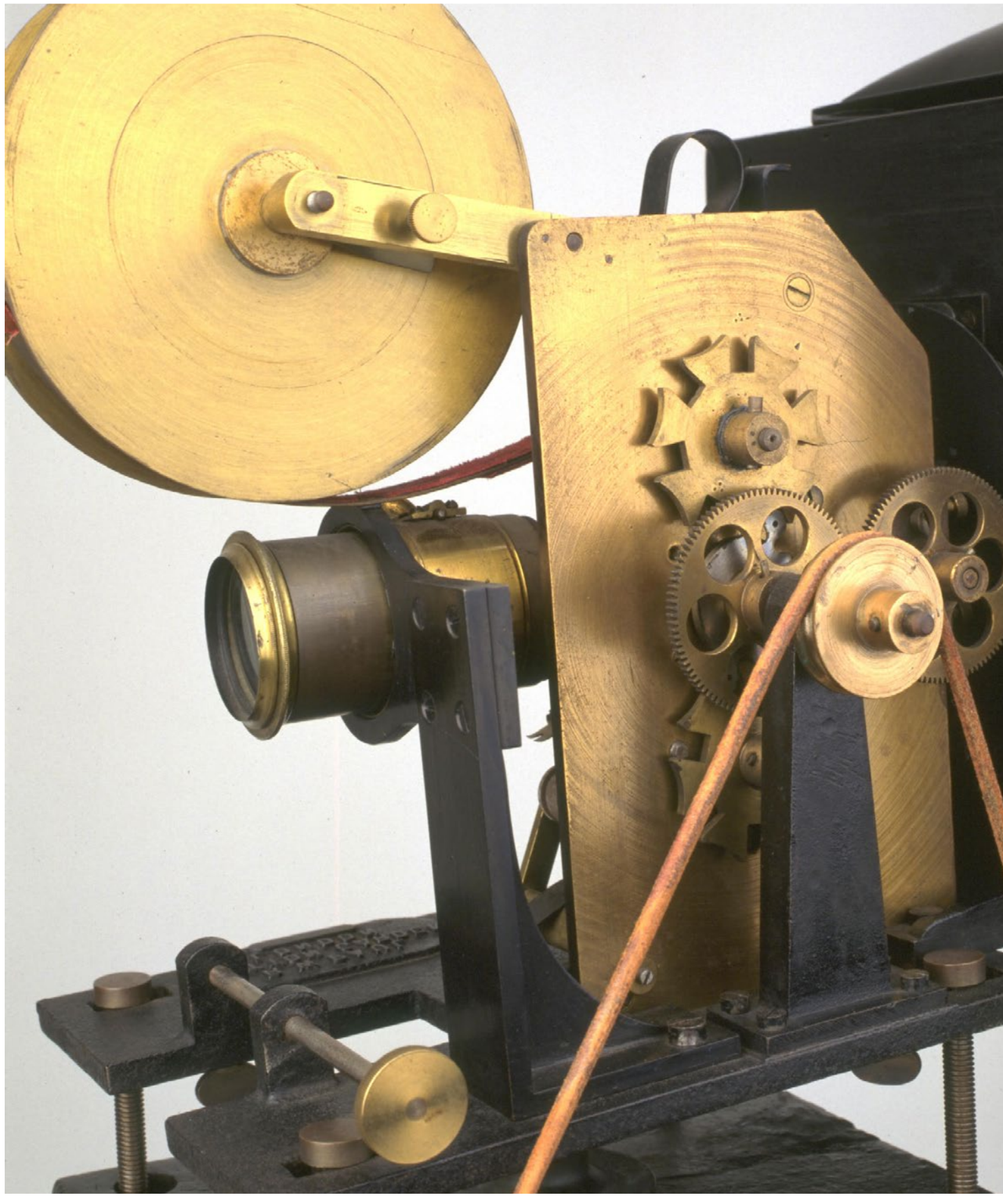
4–5 September 2018
Demons of the Mind – symposium (Science Museum)

Symposium as part of a collaborative, interdisciplinary project between the University of East Anglia and the University of Manchester (in partnership with the British Science Association) studying interactions of the psy sciences and cinema in the 1960s.

14–17 September 2018
SMG Third Annual Research Conference and ESHS Biennial Conference (Science Museum)

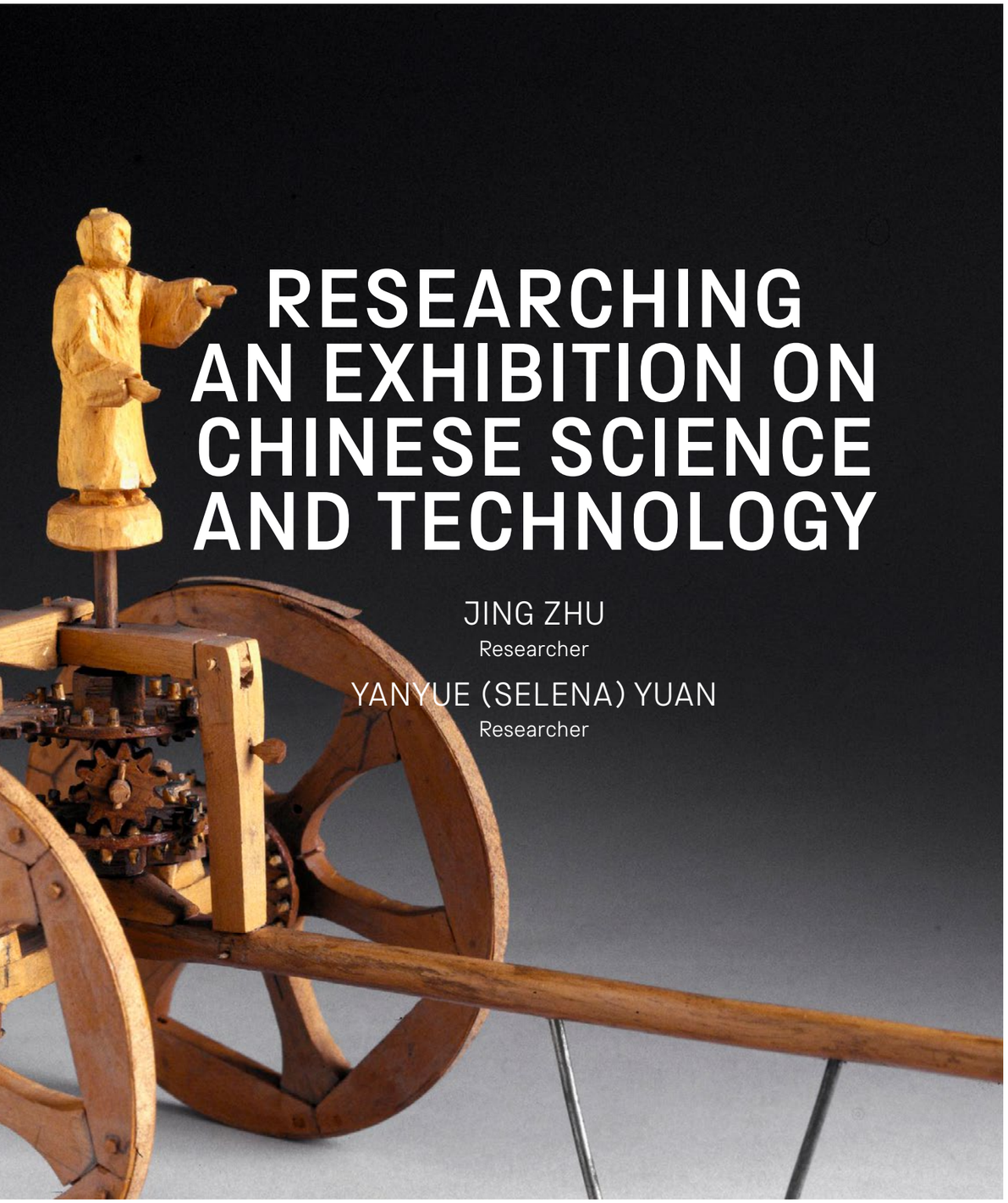
Included panels exploring 'The Medicine Collection Beyond the Galleries', 'Researching Visual Culture in the SMG Collections' and 'What is the Public History of Science?'. The conference was also held adjacent to the biennial conference of the European Society for the History of Science (ESHS), co-organised by the British Society for the History of Science, themed around Unity and Disunity. This conference is reported on in this issue.

CONFERENCES



RIGHT:

Robert W Paul's theatrograph projector, No. II Mark I, made in Britain in 1896, and featured in an object talk at the SMG Annual Research Conference at the NSMM in November 2017



RESEARCHING AN EXHIBITION ON CHINESE SCIENCE AND TECHNOLOGY

JING ZHU
Researcher

YANYUE (SELENA) YUAN
Researcher

RESEARCHING AN EXHIBITION ON CHINESE SCIENCE AND TECHNOLOGY

LEFT:
Model of a south-pointing Chinese chariot, Chou Kung; Huang Ti, China, 1122–1155 BCE

In March 2018 Yanyue (Selena) Yuan and Jing Zhu began a five-month residency at the Department of Research and Public History at the Science Museum as UK-China Rutherford Curatorial Research Fellows. The project was funded by the Department for Business, Energy and Industrial Strategy.

During the research residency, Selena explored possible narrative frameworks for a major touring exhibition on the history of Chinese science and technology. The exhibition is planned for 2022/2023 and will be launched at the Science Museum first and then tour to other museums. At the same time, Jing studied the China-related collections at the Science Museum. Together they co-convened a workshop to summarise and disseminate the research. This article summarises their major activities and provides some reflections and thoughts on the project.

CONTEXT OF THE PROJECT

A major aim for the Science Museum Group in the next decade is to enhance its international profile and collaboration, and China is viewed as a priority. In early 2018, when this research project was announced, the Science Museum was hosting two temporary exhibitions on India: one focusing on material culture entitled *Illuminating India: 5000 Years of Science and Innovation* and the other a photography exhibition, *Illuminating India: Photography 1857–2017*. Before the exhibitions on India, little curatorial work had been done looking at specific geographical areas. This posed a major challenge in terms of identifying the Museum's own China-related objects (currently scattered across different themed collections), widening curatorial practices through loans and acquisition, and establishing collaborative partnerships with other museums and institutions.

BUILDING CONNECTIONS AND OPENING UP DIALOGUE

Working on the project involved literature reviews, archive and collections research, but authors also grasped and created opportunities to initiate scholarly discussion on the topic in its widest sense. One example is the research workshop entitled *Chinese Science, Technology and Medicine: Cultures, Histories and Global Connections*, which was held at the Science Museum in early June. The workshop brought together 50 delegates from 15 cities and five countries. Many delegates cautioned against attempts to present an all-encompassing history of science, technology and medicine in China. Some key lessons from the workshop included:

1) An understanding of science and technology involves more than the collection of key inventors and specific inventions. We need to focus on the stories behind complicated knowledge creation and knowledge transfer processes that often involve multiple human and non-human agents.

2) The one-word term 'China' is problematic and unpicking it is key to building a nuanced awareness of the changes and dynamism involved across time and geographical areas.

3) It will be important to experiment with interdisciplinary possibilities and using new media to tell stories.

The authors also conducted several research trips to museums in the UK as well as in Europe to widen such dialogue. Apart from discussing the exhibition topic itself, discussions over curatorial work at a practical level also proved to be essential. For instance, the curator at Manchester Museum mentioned one of their major plans was to open a new gallery on China, which will focus on the migrant community in Manchester. Such conversations will help both museums to be aware of possible collaborative opportunities while avoiding unnecessary overlaps.

Towards the end of the research residency, Jing invited leading scholars to see the treasures of the Science Museum stored at Blythe House. Visitors included Francesca Bray, one of the most important scholars on Chinese science, technology and medicine and former president of the Society for the History of Technology (SHOT), Professor Craig Clunas, one of the most influential art historians of China at the University of Oxford, and Jessica Harrison-Hall, Head Curator of the China collection at the British Museum. With Museum colleagues Tim Boon and Emma Stirling-Middleton, the group discussed future research opportunities on Chinese themes at the Science Museum. Together with the ideas gathered at the workshop 'Chinese Science, Technology and Medicine: Cultures, Histories and Global Connections' these conversations laid a good foundation for building networks with scholars specialising in China.

HIGHLIGHTS OF RESEARCH ON COLLECTIONS AND PAST EXHIBITIONS

Jing identified and evaluated the major collections at the Science Museum relating to China. Overall, there are more than 2,000 such objects, with a very wide range of associations, including medicine, measurement, astronomy, mathematics, transportation, metallurgy and some scientific illustrations in the collections of the Museum. The majority of these objects were collected between the 1850s and the 1960s, and many of them were part of the collection of Henry Wellcome, on permanent loan to the Museum since the 1970s.

Delving into some major exhibitions in Europe, Jing became particularly interested in the ways that, historically, Chinese science has been exhibited in Europe. She uncovered and challenged the conventional model of 'four great ancient Chinese inventions', the traditional division into four topics – astronomy, mathematics, agriculture and medicine – in the narrative and framing of previous Chinese exhibitions. This work suggests that an investigation into the history of collecting and displaying China will be very helpful in constructing the narrative of future exhibitions. Exhibition developers will need to look closely at meanings of superiority, status and national identities carried within terminologies of science and technology.

DEVELOPING AN EXHIBITION NARRATIVE FRAMEWORK

Selena's work focused on the creation of an innovative narrative framework that would provide an approach to the history of Chinese science and technology within a wider timeline encompassing its past, present and future. The framework entails choices and balances in three areas in particular: whether to attract audiences, funders and collaborating partners with a blockbuster-style exhibition or whether to propose an innovative and experimental approach; critical and creative thinking vs. cultural diplomacy; an encyclopaedic approach with grand narratives vs. more specific areas with detailed narratives.

Selena proposed four curatorial themes which might guide a future exhibition:

- China, Made From… (with a focus on the different materials and connections with the natural world)
- How China Works (problem-solving approaches and the value and attitudes attached to different types of labour)
- Chinese Science, Technology (and Medicine): Connections and Encounters (serendipity and purposeful acts in scientific and technological advancement and how this is manifested in responses towards knowledge exchanges)
- How China Moves (mobility of people and objects and international connection and collaborations).

By further reflection and revision of these four possible routes, Selena then collated and integrated them into one narrative framework: *Shaping China: Materials, Mobility and Transition*. This framework highlights mobility at both the physical level (how people and objects move) and metaphorical level (how ideas travel) and explores how mobility is achieved and influenced by different kinds of materials and problem solving approaches.

Selena's work also highlighted the significance of using a forward-looking perspective that can be helpful in demystifying any misconceptions audiences might have, fostering cultural diplomacy relations, and nurturing cross-sector collaborations. This can be achieved through a more encompassing framework that gives space to multiple forms of material culture (including, for example, contemporary artwork), and creating an educational programme.

The China research project was disseminated in several ways: two talks on 'Collecting, Displaying and Interpreting Chinese Science, Technology and Medicine in Europe' were delivered at the curators' meeting and at the Science Museum's lunchtime research seminar series. The China conference was recorded and is presented on the Science Museum Group Research and Public History website, along with a full report from the research project (in both English and Chinese).

RESEARCHING AN EXHIBITION ON CHINESE SCIENCE AND TECHNOLOGY

FUTURE PROSPECTS

The authors' residency provides only a preliminary and exploratory narrative framework. In retrospect, both authors believe that by starting early, this project can grow strategically and steadily with more time and space for reflection and contingency plans. For example, Jing's work suggests potential research topics for future researchers relating to the Group's China collections, including the global trading of oriental medicine; the history of weight measurement; the reconstruction of Chinese ancient machinery; and a study of Chinese Junk models from the 19th and early 20th century. Selena has also identified key challenges and possible routes for further research, including museum-wide engagement, collaboration with audience research teams to understand more about the different audiences in the different touring sites; researching oral histories; building an interactive database; and the commissioning and collection of artworks.

Both authors are confident that building on the lessons they learned and the early-stage research they delivered, the project can be continued with future contributions by colleagues at the Science Museum. This project experience may also provide a frame of reference for other international research projects and collaborations.

RIGHT:

Chinese zodiac figures, pottery figures showing signs of Chinese zodiac

ENERGY IN STORE

JACK KIRBY
Group Head of Collections

ELIZABETH HAINES
Researcher

ANNA WOODHAM
Lecturer & Researcher,
King's College London

The project Energy in Store, an AHRC-funded collaborative partnership between King's College London and the Science Museum Group ran between July 2017 and July 2018, bringing together a working group of curators and 'enthusiast experts' for a series of discussions and site visits to the stored collections of the Science Museum Group (SMG). The SMG collections are huge, encompassing more than 425,000 objects. Up to 10% of these are currently on display, with some objects on loan to different organisations. Nonetheless most of the collection will remain in the stores for the foreseeable future. An earlier small-scale collaborative research project, Who Cares? Interventions in 'Unloved' Museum Collections had shown that there was a need to better understand how museums can meet the needs of diverse audience groups but in particular, of 'enthusiast experts'. Enthusiasts have, arguably, received little attention in recent years, yet they form a dynamic research community and are also deeply committed champions for the preservation of industrial and technical heritage across the UK. It should be explained that the term 'enthusiast expert' was hotly contested during the project.

We believe, however, that there is a useful distinction to be made between the research interests and practices of this group and those of academic researchers. The research enquiries of the Energy in Store working group have a basis in practical questions about historic objects and systems. Almost all the group are also simultaneously campaigning for the preservation of technical heritage. This is in contrast to academic historians who are more likely to be using objects as an adjunct source for written publications that address concerns primarily driven by other academic scholars.

The enthusiast experts participating in Energy in Store all had previous experience of using SMG collections, but had diverse research interests and goals. They included former and current engineers, industrial archaeologists, a metallurgist and a model builder. The small group also represented, unofficially, a large range of interest groups including the Newcomen Society, the Association for Industrial Archaeology, the International Stationary Steam Engine Society, the Heritage group of the Chartered Institute of Building Services Engineers, and many more. Through the project we aimed for an exchange of points of view between the expert enthusiasts and museum staff and to explore potential strategies for enriching collaboration between these two groups.

It was a revelation to most of the enthusiast experts to see just how much happens behind the scenes when a research visit is requested...

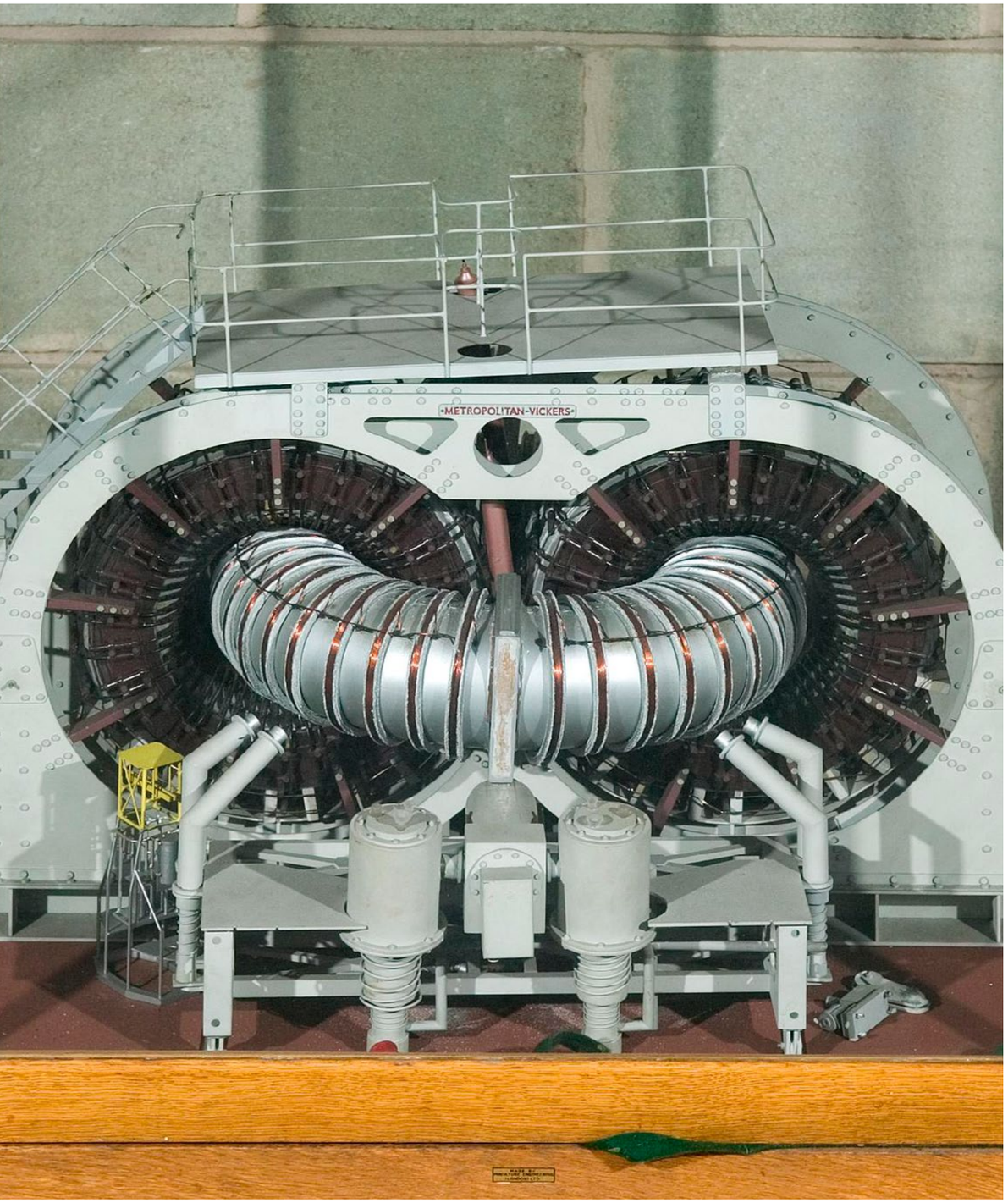
The project was primarily structured around visits to different SMG stored collections in London, Manchester and Wiltshire. These visits were punctuated by table-based discussion and reflection, and discussion over email and on a private online forum. The project events were facilitated by information designer and community arts expert John Wallett from Livingmaps, and were recorded in a short documentary film by Aura Films. At the end of the project we convened a larger workshop with around 40 representatives from other museums, interest groups, and heritage organisations. We presented the themes that had emerged and received further excellent ideas and comments. What appears below are reflections from both the Energy in Store working group and the participants at our final workshop. Some of the comments and proposals take the form of recommendations that might be specific to SMG, others addressed more general challenges around collecting and researching heritage.

ABOVE:
Science Museum Group's Wroughton site: storage facilities in the Hanger C1

RESEARCHER ACCESS TO THE STORED COLLECTIONS

It was a revelation to most of the enthusiast experts to see just how much happens behind the scenes when a research visit is requested and how much time this work can take up. Multiple parties are likely to be involved in coordinating a visit and various requirements have to be met: the object has to be sound enough to be moved to a viewing area and it mustn't pose a health risk to the researcher. SMG follows rigorous procedures to protect visitors and staff from any risk associated with objects containing hazardous substances such as asbestos. There are also logistical challenges: in storage locations with high racking, objects need to be retrieved with forklift trucks, for instance. Nonetheless, the group made useful suggestions for ways in which current research enquiry processes at SMG could be streamlined, and through which enquirers could be kept fully informed of the status of their request. These are being addressed.

The working group also noted that it isn't always very helpful for a researcher to be shown a single object on a research visit. Comparison between a number of similar objects can be an important way for a researcher to analyse a historical collection. This mode of accessing objects isn't currently very easily accommodated but SMG will be considering how this can be worked into the design of future storage facilities and systems.



LEFT:

ZETA fusion reactor model, one of the unique energy-related objects in SMG's collection (Made by Metropolitan-Vickers Co. Ltd. c. 1954)

ACCESS TO MUSEUM DOCUMENTATION

The Energy in Store team made a strong case for better access to the documentation about the collections that is held by SMG. We looked at the Science Museum's documentation files which record the stories of the objects from their acquisition by the Museum through exhibitions and conservation projects. The files are an important resource for the curators, conservators and other staff in the ongoing business of the Museum. However, while the files are available for consultation by the public, they are not currently publicly listed and awareness about them in the research community is low. SMG will be exploring ways to make them a more accessible research resource in the long term.

DIGITAL FUTURES

Much of the discussion in the project focused on the possibilities of the digital. How can museums make their collections digitally available (both records and images) in ways that suit the needs of researchers? SMG recently launched an open-access digital catalogue: *Collection Online* (see **http://collection.sciencemuseum.org.uk**). The Energy in Store group discussed – with the digital team – the specialist requirements of researchers when using digital catalogues. Together they considered how researchers' needs could be accommodated and balanced against the potential of *Collection Online* to capture new audiences.

SOCIAL NETWORKS AROUND STORED COLLECTIONS

A final point explored by the working group was the importance of personal networks and specialist interest groups in generating and sharing knowledge about the collections. Both museums and specialist interest groups suffer from inter-generational loss of knowledge, and struggle to sustain networks and connections when key individuals inevitably move on. The Energy in Store group recommended that SMG manage these relationships more actively as an important and sustainable asset, by recording them better and by encouraging and strengthening connections through networking events.

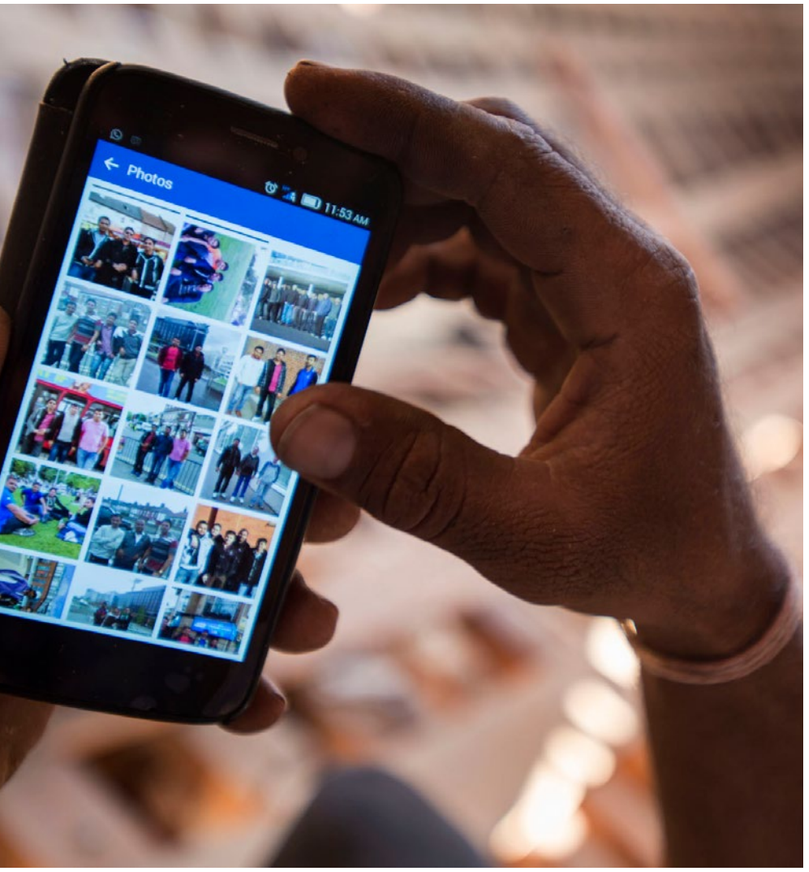
Over the coming months, the working group will be submitting a formal report to SMG and publishing their discussions and findings in other forums. Video clips and the project film, produced by John Wallett and Aura Films, can be viewed at: **https://figshare.com/s/16dc/018998fe3cf18137**

"We need to make the conceptual leap from viewing 'the store' as a collection of objects, to viewing and maintaining it as 'the knowledge' about those objects – the technical, material, nostalgic – that people have."

Participant, Public Workshop

BRADFORD'S NATIONAL MUSEUM

HELEN GRAHAM
Associate Professor, School of Fine Art,
History of Art and Cultural Studies, University of Leeds



LEFT:
A boat builder in Diu, Gujarat, India, looking at photos of friends in the UK on his mobile phone (photo by Tim Smith)

Bradford's National Museum research project is a three-year project exploring how the National Science and Media Museum (NSMM) can become more open, engaged and collaborative and, through this, better connected to Bradford, the city and district in which it is based. The project is conceived and run by a collective of people based inside and outside the Museum. Each of the project's external collaborators have innovative, well-established and flourishing community development approaches and extensive local networks.

The project draws on action research approaches and our core questions are being explored through doing, trying things out and experimentation. The action research is specifically designed to give time and space for staff, community organisations and local people to reflect on institutional process, practice and values and to explore how everyday Museum practice might develop and change. One way we've been doing this is through

LEFT:
A collection of portraits of a family who have migrated to the UK, the USA, east Africa and Fiji, on display in the original family home in Gujarat, India (photo by Tim Smith)

Open Conversations, led by Bradford Community Broadcasting (BCB), which has opened up discussions with lots of different people about Bradford and about the Museum. We are now using these recordings, drawing on a community radio tradition of voice, community empowerment and social change, as a vital part of workshops with all members of the Museum's staff (from volunteers to senior staff). Alongside listening to the recorded conversations and seeing the Museum, the city and the district through lots of different people's eyes, the workshops will draw on appreciative inquiry approaches, building on what staff feel is already going well, collaboratively identifying key research questions and building a plan for the how the Museum might develop.

EXHIBITION AS ACTION RESEARCH

A key aspect of our research design is to use an exhibition (*Above The Noise: 15 Stories From Bradford*, opening in March 2019), halfway through the three-year project, as a way of examining how the Museum's collections and themes can address issues which generate interest and energy in Bradford and in how Bradford's stories can open up new and distinctive ways of interpreting the Museum's collections. In keeping with the action research approach, the very process of creating the exhibition allows us to take the project inquiry into core areas of practice (such as conservation, registration and design) and into working relationships with people across the Museum so that the Museum can explore how it might work differently in the future.

Drawing on research strands from the first phase of the project – including open conversations with different people in Bradford – we've decided that the exhibition will explore how different communities in Bradford have sustained their own life-worlds by adapting or re-purposing available technologies, sometimes bypassing or deliberately confronting national power structures and mainstream media. In particular, it will explore how Bradfordians have become active in creating cultural continuity and political change by recording their own histories and making their own social spheres. They have done this by making use of local-to-local connections and alternative distribution networks.

A wide range of different stories are under development, the majority of which are being developed in collaboration with people in Bradford who have a stake in telling the story. The stories have three sub-themes indicating the different strategies Bradfordians have adopted in dealing with power and powerful media.

In a strand entitled 'Create: Make your own world' we will explore how people have used sound and vision technology to keep in touch with people and places elsewhere. For instance, studio photography (such as those from the Belle Vue Studio archive in Manningham) and changes in related technologies have shaped the way we take, keep and send family photographs to one another. In the same way, cassettes were once used to tape and send audio letters overseas through the post. We'll also be exploring how technologies of amplification, narrowcast, broadcast and mobile technologies are used by people in different ways – for instance, to create Islamic soundscapes between mosques and people's homes.

A second strand, 'Bypass: Get around dominant power structures by creating alternatives', is inspired by the DIY culture of Bradford. It will identify how people have set up their own media, communications and distribution networks. This strand will tell the story of BCB, an internationally-recognised

community radio station with over 200 volunteer presenters producing radio that reflects the cultural diversity of Bradford and which uses radio to bring people together across cultures, neighbourhoods and generations. We'll also explore how the Bradford-based Polish diaspora sought to get news into Poland during the Cold War and how specific and unorthodox distribution processes enabled the Bradford Pakistan Film Club to flourish.

Finally, through 'Critique: Take on political inequalities and the dominant narratives put out in national policy and media', we will look more directly at the negative representation of Bradford and its communities and explore ways in which they have been challenged. We'll be exploring the story of the Bradford 12 (1981), a group of young Asian men who took to the streets in order to confront the threat of a racist attack on their community and were arrested. Despite admitting making petrol bombs, they argued that 'self-defence is no offence' and were acquitted. We'll explore the Bradford 12 campaign's alternative networks of newsletter distribution that both challenged national media representations and built networks of solidarity. We'll also be developing an intervention in contemporary media culture through a Bradford Slow News Bureau that will retell key news stories in Bradford history – the kind of stories that hit national headlines and shape national perceptions of Bradford – in multi-perspectival and contextual ways.

There will also be a display of contemporary artists' work produced in dialogue with the Museum. We are working with Amar Kanwar, who is based in New Delhi. His films and multi-media works, which explore the politics of power, violence and injustice, are characterised by a poetic engagement with the personal, social and political. Lahore-born Basir Mahmood, now based in Amsterdam, uses film to explore the social and historical terrains of the extraordinary in the ordinary.

The exhibition will not feel like a finished product but is intended to have the feel of the beginning of a conversation, providing a social experience, raising questions and prompting and encouraging interaction and contributions both from the people of Bradford and beyond.

INFORMING THE REST OF THE RESEARCH PROJECT

The exhibition – alongside other ongoing strands of work – will inform the research agenda for the rest of the research project. As we move into the post-exhibition phase of the project, the aim will be to create a deeper understanding of the potential and existing connections between the Museum and Bradford. And, as the project's action research design implies, we think one of the ways these crucial dynamics will become clearer is through the very process – and all the ins and outs – of making the exhibition.

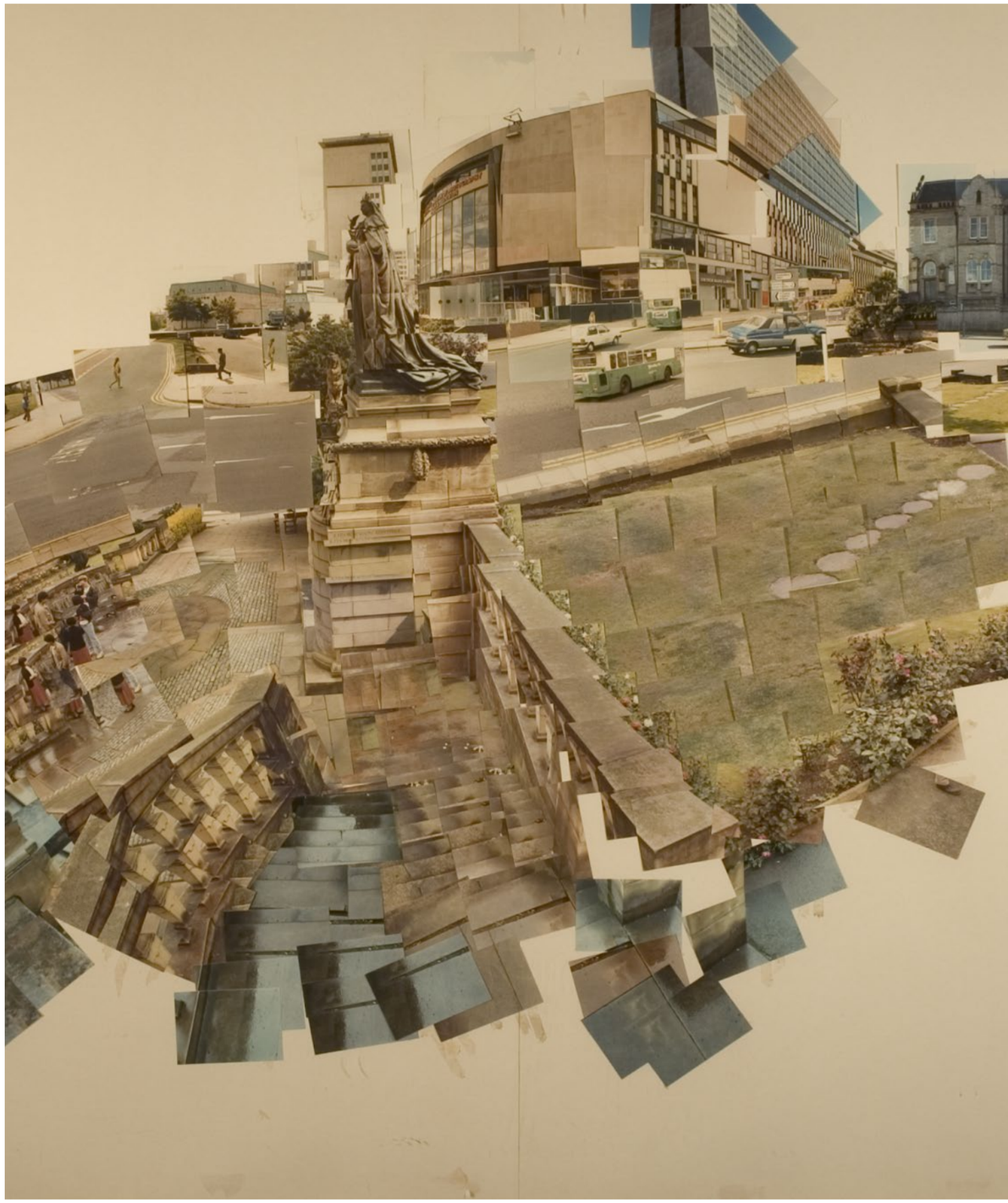
The Bradford's National Museum project team – including the NSMM team making the project exhibition happen – are:

Julia Ankenbrand (University of Leeds), Caroline Carr (University of Leeds), Vicky Clifton (NSMM), Aamir Darr (Kahani Reading Project), Mary Dowson (Bradford Community Broadcasting), Will Gould (University of Leeds), Seán McLoughlin (University of Leeds), Alice Parsons (NSMM), Nima Poovaya-Smith (Alchemy), Jo Quinton Tulloch (NSMM), Sarah Rawlins (NSMM), Sarah Richardson (University of Leeds), Tim Smith (photographer and curator), Michael Terwey (formerly NSMM), Lynn Wray (University of Leeds)

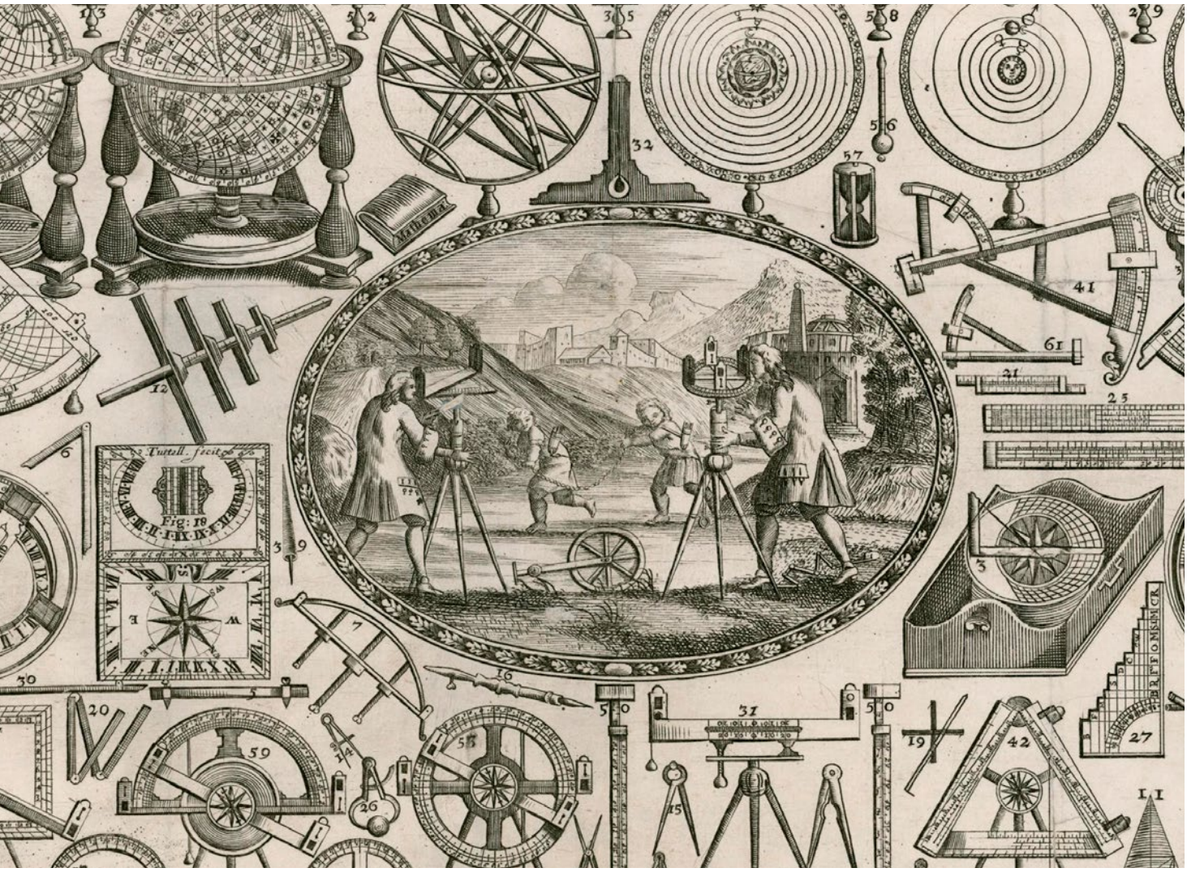
You can read more about the project and the collaborators at: https://bradfordsnationalmuseum.org/

RIGHT:

Composite photograph of the National Museum of Photography, Film and Television, created by David Hockney and staff in 1985



BRADFORD'S NATIONAL MUSEUM



LEFT:

Trade card of Thomas Tuttell, c.1700

METROPOLITAN SCIENCE

REBEKAH HIGGITT

Lead, Metropolitan Science project,
and Senior Lecturer in History of Science, University of Kent

METROPOLITAN SCIENCE

We are now about half way through the three-year research project, *Metropolitan Science: Places, Objects and Cultures of Practice and Knowledge in London, 1600–1800*, which runs in tandem with the Science Museum's Science City gallery (due to open in Autumn 2019).

One of our main focuses for this year has been the production of a special issue of the *British Journal for the History of Science*, to be published next summer. This draws on selected papers from the project's inaugural workshop, held in the Dana Research Centre on 16–17 June 2017, and will be edited by me and Professor Jim Bennett, the project's Consultant and Keeper Emeritus at the Science Museum. It will include the work of the project's postdoctoral researchers, Dr Jasmine Kilburn-Toppin and Dr Noah Moxham, as well as contributions from workshop speakers, and allows us collectively to consider the roles of natural knowledge and artificial practice in a range of London institutions and less formalised communities.

On 6 July 2018 we held a second workshop, this time at the University of Kent. This was on *Material Cultures of Urban Knowledge Communities, 1500–1800*, and drew speakers from across the UK and beyond to discuss a wide range of case studies, helpfully exploring various aspects of the urban built environment as well as scientific instruments, print and natural historical or anatomical collections. We would like to thank the members of our project advisory board, several of whom acted as commentators or chairs, as well as our excellent speakers. Thanks also go to the Centre for the History of the Sciences for funding the event.

The project's researchers have had the opportunity to share their work at a range of other events over the last year. These included this September's European Society for the History of Science annual conference in London, where we hosted and contributed to a panel at the Science Museum on *Unity and Disunity in Metropolitan Science: Overlapping Knowledge Communities in London, c.1600–1800*. We have also given seminar or conference papers at, among other places, the University of Cambridge, University of Oxford, University of St Andrews, Antiquarian Horological Society, Institute of Historical Research and Worshipful Company of Goldsmiths; in Paris and Halle; and have contributed to Kent's Medieval and Early Modern Studies Summer Festival.

We have also enjoyed contributing to the Museum's *Science City* project. I have written a chapter of the book that will accompany the gallery, edited and co-written by curators Jane Desborough and Alexandra Rose. Noah and Jasmine have been able to provide some background research and sources to assist with particular elements of the displays. We will also be contributing to plans for the public events programme to accompany the gallery. We are already beginning plans for an end-of-project conference, which will also celebrate the gallery, to be held at the Institute of Historical Research and at the Museum in Spring 2020. The conference will include gallery tours as well as academic sessions and, it is hoped, museum- and digital-focused workshops.

Our plans for the coming year include further individual published papers with Jasmine exploring the community of assayers working between the Royal Mint and the Goldsmiths' Company, and Noah looking at the institutional and rhetorical uses of scientific knowledge by the East India Company toward the end of our period. Jasmine will publish her research on the spaces of instrument makers' shops, which has drawn on the Museum's collection of trade cards. I aim to explore the Museum's 17th- and 18th-century collections further, adding to research I recently published on the Royal Society's instrument collections, many of which are on long-term loan to the Museum. Planning for the project book, which aims to tell a broad story about London and its cultures of knowledge and practice,is also underway.

The *Metropolitan Science* project is based at the University of Kent and funded by the Leverhulme Trust, with the Science Museum as a partner. Details of the project and some of its activities can be found at the project website: **https://metsci.wordpress.com/**.

RESEARCH IN THE MEDICINE COLLECTION

SARAH WADE
Research Manager, Medicine Collection

In Autumn 2019, five landmark new medicine galleries will open at the Science Museum. Over 2,000 objects relating to the past, present and future of health and medicine will be on display alongside oral histories, contemporary art commissions and installations of an early 20th-century pharmacy and even a padded cell. These galleries will be of international significance and have been conceived on a scale that has seen them described as a 'museum within a museum'. Yet these vast new galleries will only present a small portion of the medicine collection. The Science Museum's medical collection is unrivalled. At its core lies the Wellcome Collection, the result of a lifetime of collecting around the world by the pharmacist, philanthropist and entrepreneur Sir Henry Wellcome (1853–1936). Since 1976, this collection has been on permanent loan to the Science Museum and curators have continued to build upon it ever since.

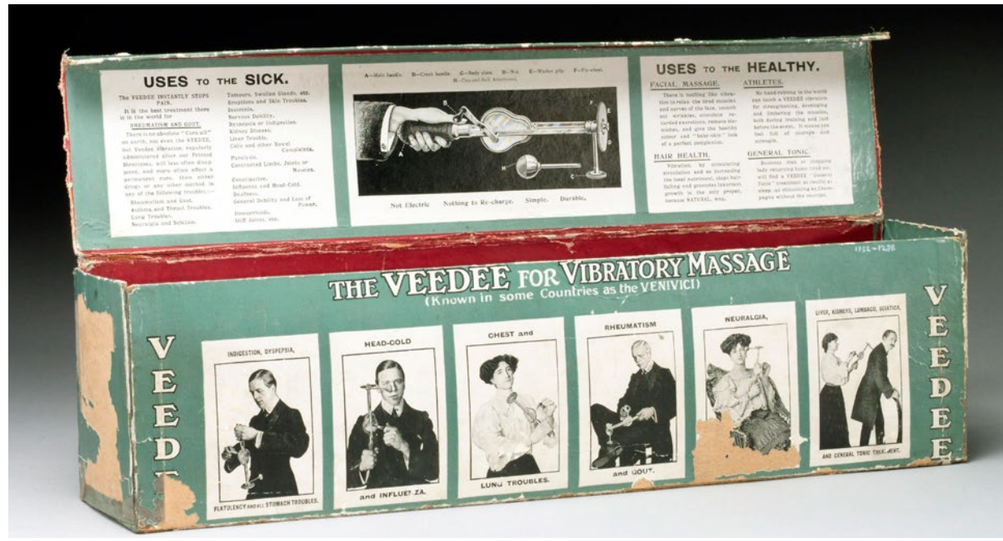
A collection of such importance and variety has huge research potential. Members of the medicine team regularly present work on the collections they care for at public events and international conferences. This year they also prepared manuscripts for two books that will be published to coincide with the launch of the new galleries. Yet in addition to this work undertaken by the curatorial team, we also support and host external researchers at different career stages, enabling them to engage with our collections and encouraging participation in the research community at the Science Museum. Furthermore, we invite colleagues from other medical collections to share their research with us. The ultimate aim is for the Science Museum to become a hub for the medical humanities and for museum professionals and academics to come together to forge a lively culture of research.

MEDICINE GALLERIES RESEARCH FELLOWSHIPS

To coincide with the ambitious Medicine Galleries redevelopment project, the Science Museum was awarded funding from the Wellcome Trust to support research on the collections. The purpose of this research is to inform the gallery project and to contribute to its legacy. It goes without saying that this has provided an excellent opportunity to learn more about the collection and to engage diverse audiences with the objects it contains. So far, fellows have researched object histories to provide detailed reports for curators, helped shape the interpretation text for the galleries, enhanced museum catalogue entries and shared their work on the medical collection and the history of medicine more broadly at international conferences, through peer-reviewed journals and via various public engagement activities.

At the beginning of 2017 Julie Ackroyd carried out research into the Giustiniani Medicine Chest. This 16th-century medicine chest has long been one of the highlights of the medicine collection. Julie focused on the contents of the chest, charting these objects' movements from their point of origin to their inclusion in this Genoese medicine chest. Yet this research also brought with it some surprises, revealing a hidden compartment and casting doubt on aspects of the chest's provenance – findings that fed into the gallery interpretation text. Another researcher, Sara Oldberg Stradal, carried out a year-long research fellowship throughout 2017/18, focusing on medieval and early modern medical tools. During her time at the Museum, Sara produced detailed reports on 11 objects and wrote an essay to contextualise this material culture in the medical landscape of the era, providing new insights for curators. Sara took the opportunity to present her research at national and international conferences, taking both the medicine collection and her research to a global audience. She also ran a two-day workshop at the Museum bringing academics from around the country together to discuss their work in relation to the theme of 'Medical and Metaphoric Wounds from the Middle Ages to the Boer War'. This event catalysed a collection of essays that is currently being edited as a 'mini collection' for inclusion in the *Science Museum Group Journal*.

This fellowship programme continues to grow in 2018. Kay Nias has been appointed as Medicine Galleries Research Fellow to develop her project on the history of physiotherapy. Objects in the medicine collection will be crucial to this research and the hope is for Kay's project to enrich our understanding of these, as well as the broader history of the practice itself. A second fellow will soon be recruited to work on a project co-developed and co-supervised by the Science Museum and Wellcome Collection. It will focus on policies and best practice with regards to the storage, interpretation and display of culturally sensitive objects. This project clearly addresses important issues. Yet it is also timely given the Science Museum's One Collection move, which will see the entire contents of the Museum's stores in Blythe House, Kensington, move to a purpose-built facility in Wiltshire, as well as the digital presentation of the collection online. How to best navigate working with culturally sensitive objects in such circumstances is of great importance and this fellowship will generate crucial research to help guide this activity. Further fellowships are anticipated to start over the next 12 months, addressing priorities in the medicine collection and responding to the Museum's wider research strategy.



RIGHT:
'Veedee' vibratory massager with two attachments. One of the phsyiotherapy devices studied by Kay Nias. German, early 20th century

The ultimate aim is for the Science Museum to become a hub for the medical humanities and for museum professionals and academics to come together to forge a lively culture of research.

WELLCOME SECONDMENT FELLOWSHIPS

During 2017/18, the Science Museum hosted two researchers as part of the Wellcome Secondment Fellowship Scheme. This programme offers humanities and social science researchers already funded by the Wellcome Trust the chance to work in a context outside of the university to pursue health-related research projects. Candidates can elect to be based at one of four partner institutions for a period of between 3–6 months, including Science Museum Group. These secondments allow fellows to develop their research, hone existing skills and acquire new ones. They also provide the chance for researchers to experience a different working environment, gaining an alternative perspective on their research and its applications outside the university context.

At the Science Museum, such a scheme presents numerous possibilities. Fellows might carry out research on the collections and contribute to enhanced catalogue entries, increasing understanding of the Museum's objects. They might help communicate knowledge relating to the collections with Museum audiences through blogs or research papers. Fellows can also be involved in the organisation and delivery of temporary exhibitions. We are open to suggestions relating to these and other activities across the Museum, encouraging candidates to get in touch to discuss their ideas so that we can ensure that their proposal is both practical and productive for researcher and Museum alike. When successful, these fellowships should result in reciprocal benefits, leading to long-lasting professional relationships between fellows and institutions.

Thanks to the various forms these secondments can take, the topics of recent and future fellowships at the Science Museum are diverse. In 2017/18 David Saunders joined the Museum from Queen Mary University of London where he is currently a PhD candidate at the Centre for the History of the Emotions.

LEFT:
Prognosticator, brass, inscribed with date 1538, probably french an object from the medical collections

During his fellowship, David improved research access to the objects and archives of the Burden Neurological Institute Collection by producing a digital catalogue of the archives. He also collaborated with artists to create an audio-visual installation addressing the themes of love, desire and neuroscience as part of the Science Museum's 'Lates' programme, inviting the public to engage with these topics. The fellowship enabled David to develop his archival skills and the infrastructure of the Museum provided outlets through which his work could be disseminated to various audiences, for instance, through an article in Issue 10 of the *Science Museum Group Journal*. In the same year, University of Cambridge PhD candidate Annie Thwaite was awarded a Wellcome Secondment Fellowship to work on amulets and the material culture of healing. This fellowship followed on from a report Annie produced about the Science Museum's amulet collection, which fed into the development of the new medicine galleries. Through this secondment, Annie gained experience working with the Museum's curators and produced enhanced catalogue entries for a selection of amulets. The blog post '5 Amulets for 5 Senses' and an article forthcoming in the *Science Museum Group Journal* were two of the outcomes of Annie's research. She has also presented a paper on these topics at the Science Museum Research Seminar.

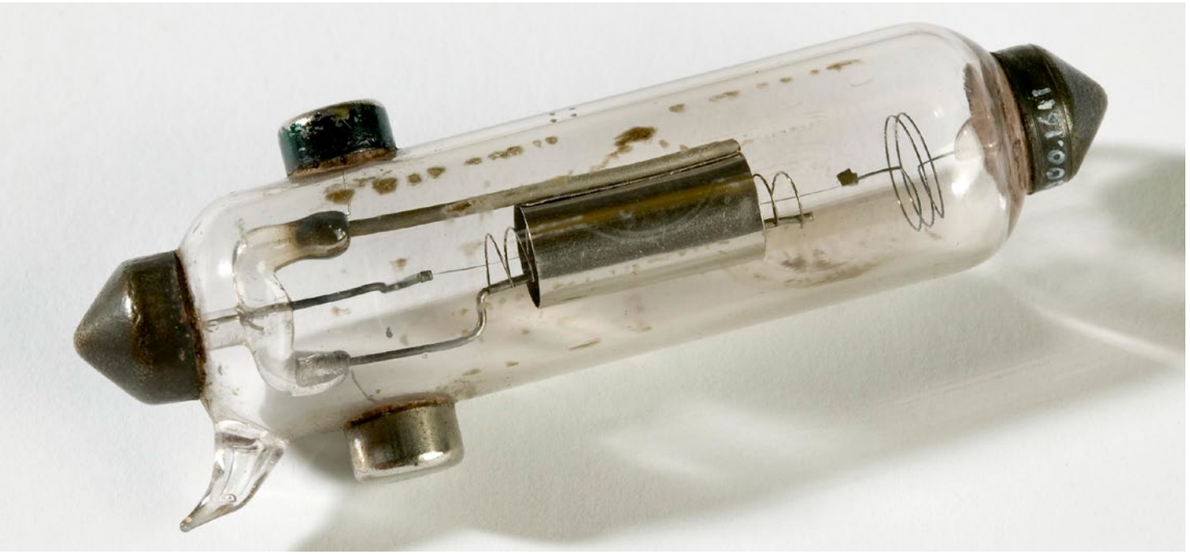
A HUB FOR THE MEDICAL HUMANITIES

Fellowships such as those outlined above provide opportunities for the medicine curators to gain further insight into their collections and to consider the objects in their care from different disciplinary perspectives. Yet in return, it is hoped that academics, be they more experienced researchers or those just starting their career, will gain an equally valuable insight into the workings of a national museum. Impact and public engagement, for example, are increasingly seen as an important aspect of a researcher's work and the Museum provides an excellent framework for carrying out this type of activity. The Science Museum's audiences range massively in scope. These fellowships can therefore provide academics with a platform to develop their research projects, as well as a forum through which to disseminate their work to a wide range of publics.

These research fellowship schemes run alongside Collaborative Doctoral Awards, short-term research projects and a programme of external speakers addressing various medical topics from different disciplinary perspectives. For instance, in September 2018 we hosted colleagues from Philadelphia's renowned Mütter Museum, who gave a series of three talks about what the material culture of smallpox can tell us about the history and ethics of vaccinations and epidemics. Attendees to this event came from across the Science Museum, London medical museums and also from university and practice-based contexts. Throughout the 2018 seminar series, we heard from previous fellows who returned to the Science Museum to present the research conducted during their fellowships, as well as from current Collaborative Doctoral Award students in the midst of their PhD projects. We also arranged a medicine panel at the Science Museum Group Research Conference in which curators, students and members of the wider medicine galleries project team discussed the ways the medicine collection lives beyond the galleries, through oral histories, scholarly research, public engagement events and online.

Over the next 12 months, as we build up to the opening of the new galleries, we plan to continue building upon this research activity, arranging regular events, workshops and study days to create space to bring researchers and Museum staff together to share their research, knowledge and, importantly, their enthusiasm for the medicine collection and the history of medicine more broadly.

RIGHT:
Giustiniani medicine chest, c. 1585, the subject of Julie Ackroyd's research



SMG'S COLLABORATIVE DOCTORAL PARTNERSHIP SCHEME

ALISON HESS
Research and Public History Manager

Research in the Science Museum Group is continuing to evolve, and relationship-building between the museum sector and *academe* is the essence of this change. At its heart is the AHRC-funded Collaborative Doctoral Partnership scheme. The scheme supports doctoral students from universities across the country to work with our staff on projects that are beneficial to the strategic interests of the Museum but that also make an original contribution to academic research.

Our doctoral research projects delve into unsung collections, exhibition-making and audience thinking and develop new methodologies to study our collections' material culture and their social and technological histories. Research methods extend across the sciences and humanities. For example, one project investigates the role of gender in the thermionic valve industry during the inter-war period drawing on the collections of the National Science and Media Museum and the Science and Industry Museum. At the National Railway Museum another doctorate focuses on the design, fitting and decoration of train interiors in the early part of the 20th century through an exciting collaboration with the Art History department of the Open University. (Details of all our projects can be found on pages 51–60.)

These and other collaborative doctoral research projects have been supported by the Science Museum Group and have been funded by the AHRC through the Partnership scheme since 2013.

SMG'S COLLABORATIVE DOCTORAL PARTNERSHIP SCHEME

LEFT:

Thermionic valve triode No V24 51122 made by GEC Ltd, London c.1924. From the electronics collection being researched by Cameron Tailford

The scheme builds on a legacy of postgraduate research at SMG, but has since become more structured and is planned to tie in closely to the Group's *Inspiring Futures* planning priorities. To further extend our network within the science heritage sector we are currently part of the Science Museums and Archives Consortium (SMAC), comprising SMG, BT Archives, The Royal Geographical Society (with the Institute of British Geographers) and the Royal Society. The SMAC funding phase started in 2016, with annual funds for six studentships per year confirmed until and including 2019. Facilitated by the programme, each collaborative studentship is jointly proposed by a university-based academic in collaboration with a member of staff at the Consortium. Doctoral candidates are then jointly supervised by subject specialists at both their Higher Education Institute and at one or more of the institutions of the Consortium. Through the programme we are taking the lead in developing a distinctive area of research into science heritage collections and are building a highly skilled cohort of doctoral researchers.

The scheme provides an exceptional opportunity for mutual learning. The university researchers get to work with unique, world-leading collections, alongside their counterparts at our museums – the staff who bring years of specialist collections' knowledge and an approach to material culture, together with expertise in collections management, digitisation and audience thinking. Doctoral students access distinct but complementary research environments and benefit from a diversity of approaches with an applied translational dimension.

In turn the museums get injections of new thinking from both students and the university researchers. It gives us an opportunity to open up over-looked collections through the dedicated work of the students. To give just one example, Tom Ritchie, based at Kent University, is researching the history of Meccano using the Science Museum collections. However, he has also worked with enthusiast group the 'Meccanomen' to rebuild a particular object in the Science Museum's collections, the Hartree Differential Analyser, gaining an insight into a piece of early computing history. This work has been prepared for sharing with other scholars in an article for our *Science Museum Group Journal*. In another piece of research, Kevin Tracey from the University of Swansea is bringing fresh eyes to the Science Museum's collection of early modern mathematical books. He is uncovering new information about the collection and introducing new digital approaches to how we present and share these findings. Not only do we get to know our collections better through these research projects, but they also establish links of long-term benefit for the collaborating partners, providing access to resources and materials, knowledge and expertise that might not otherwise have been available. Moreover, our doctoral researchers promote the Museum beyond its walls. Several of our students were successful in bringing their research into an international context through the AHRC International Placement scheme. Many presented their work at the recent European Society for the History of Science Conference jointly hosted by the Science Museum in 2018.

How does the programme support the employability of the doctoral student after they have finished their research? Students concluding their research or who were awarded their doctorates this year made headway in their research and professional careers. For example, following his doctorate at the National Railway Museum, Thomas Spain became a member of staff there. Having completed his research at the National Science and Media Museum, Philip Roberts is now Science and Industry Researcher with Birmingham Museums. We are excited about the career paths our students take and look towards developing close ties with our research students to facilitate careers in both the museum sector and within universities. You can read more about our recently completed collaborative doctorates in the sections that follow.

RECENTLY COMPLETED DOCTORAL PROJECTS

JACOB WARD

Information And Control: Inventing The Communications Revolution In Post-War Britain

University College London, BT Archives and the Science Museum

In the late 20th century the British telecommunications system was a pillar of Thatcherism – BT's successful sale in 1984 transformed privatisation into a core Thatcherist policy, proving the viability of selling state infrastructure. Thatcher's ending of BT's monopoly also became a key example of how information technology supposedly necessitated free market economies and a 'small state'. Until now, however, BT's sale has been treated as a top-down political project, enacted by government. This research shows that the technological features and managerial cultures of the British telephone system also shaped Thatcherism from the bottom up. This took place in two main ways.

LEFT:

Goonhilly Earth Station: featured in the Progress poster series, the Post Office built Goonhilly Earth Station to link up with Telstar, the first commercial transatlantic communications satellite, in 1962 (credit: BT Archive)

RECENTLY COMPLETED DOCTORAL PROJECTS

Firstly, from the 1960s engineers and managers expected that an 'information revolution' might threaten the telephone monopoly with competition, and so took steps, using computers and other digital technologies, to harden the telephone system to competition. Secondly, the idea of an 'information revolution' changed the ways that engineers and managers talked about and publicised technology, with ideas becoming entangled with Thatcherist ideals of individual freedoms, free markets, and small states. So, while information technology hardened the telephone system to competition, its rhetoric supported contradictory values.

"Without undertaking an AHRC-funded collaborative doctoral award with the Science Museum, I would not have had the opportunity to use many of these archives and meet so many of the people that helped me appreciate this project's value."

Jacob Ward

The main challenge for this research project was realising the extent of the British telephone system's links with technological and political changes across Britain and beyond. The project started as a laboratory history of telecommunications research at Dollis Hill and Martlesham Heath, the Post Office and BT's research stations. The access that BT Archives allowed to their historical documents soon showed that BT's technological and scientific endeavours spread far beyond its research stations. In turn, this stimulated research trips to archives with connections to BT, from the National Museum of American History's Archives Center (enabled by a Smithsonian Fellowship) to research at the Bank of England Archives into telecommunications in the City of London. Finally, without oral histories of BT research staff and residents that lived near the research station, this project would never have fully captured experiences of privatisation and technological change.

Drawing on this vast array of resources transformed the scope and significance of this project. Without undertaking an AHRC-funded collaborative doctoral award with the Science Museum, I would not have had the opportunity to use many of these archives and meet so many of the people that helped me appreciate this project's value.

HANNA REEVES

Women And The 'Railway Family' (1900–48)

Keele University and the National Railway Museum

My thesis examines the idea ofthe 'railway family' between 1900 and 1948. The term can be used in a variety of ways: firstly, to define the generations of fathers, sons and daughter who worked in the railway industry. It can also describe the occupational community that was created, maintained and extended by the railway companies and trade unions to encompass workers and their families. Finally, it was an experience that was lived in practice by railwaymen, their wives and children. The idea of the 'railway family' was flexible and could be adapted to accommodate the beliefs and needs of the distinctive groups who undertook to disseminate or use the idea for their own benefit.

The approach I have taken towards this thesis has been two-fold. Firstly, I examined the railway company magazines held at the National Railway Museum and the trade union newspapers held at the Modern Records Centre at Warwick University and the British Library to investigate how the railway companies and trade unions created and maintained the idea that all their workers were part of a 'family'. Alongside the articles, adverts and photographs in the newspapers and magazines which utilised the language of family and community, there is evidence that this ethos was instilled into workers' every-day lives by the institutions with which they were surrounded, for example the educational, sporting and social clubs. Over this period, the idea of the 'railway family' expanded to include female railway workers during the First and Second World Wars and the wives and children of railwaymen.

The trade unions concentrated their focus on the 'railway family' towards wives and female railway workers in order to minimise their potentially disruptive influence. The most important policy was a focus on equal pay for equal work, undertaken from the 1910s onwards by the Railway Clerks Association and during the First and Second World Wars by the National Union of Railwaymen (NUR) and the Associated Society of Locomotive Engineers and Firemen (ASLEF). The trade unions felt that if women were part of the 'railway family' and paid an equal wage for the work they did, then they would present less

of a threat to railwaymen's jobs and would be more easily accepted into the workforce. Another important aspect of their dissemination of the 'railway family' was the creation of the Railway Women's Guild in 1900, the official women's auxiliary of the NUR. Set up by the wives of trade union members in order to mobilise support for the trade union, provide political education and social activities, research on the Guild is one of the most important aspects of my thesis primarily because the Guild has never been considered in depth before.

The second part of the thesis focuses on how the idea of the 'railway family' was used in practice by those who it came to represent – railway workers, their wives and children. It focuses in particular on an occupational community within Gloucester. This location was chosen due to the wealth of sources available that concern the railway community in the city, especially the Railway Women's Guild. The minute books of the Guild are held at Gloucestershire Archives and run comprehensively from 1911 to 1947. The case study focuses on how the idea of the 'railway family' allowed railway workers and their families to support each other within their occupational community in a variety of different ways, including financially, politically and with friendship and familial feeling.

PHILLIP ROBERTS

Magic Lantern Culture In Britain (1850–1920): Exhibition, Reception And Mixed Media Landscapes

University of York and the National Science and Media Museum

My project was on the history of the magic lantern in 19th-century England, making use of a huge collection of slides, lanterns, and early-media machines at the National Science and Media Museum. Following my induction and training, I was given more-or-less unlimited access to the collections at the Museum. This was very important because it gave me the chance to return to the objects repeatedly over the course of the research.

I started out thinking that I was going to write an exhibition history of early projected entertainments, since many historians seemed to focus on the technology of the lantern. But as I read more, I learned that the histories they had built were suspect and they were making claims about grand inventors that were not supported by the data I was finding. I began to interrogate the history of technology that underpinned the magic lantern trade, seeking out the businesses and machines that made magic lantern culture possible and slowly unrolling a very different history than I had expected.

I discovered that the media revolutions that catapulted the magic lantern into popular culture were built on the back of poor metalworkers, not genius businessmen. The Kaleidoscope, which pioneered the popular consumption of optical technologies, was only possible because of growing output potentials among Birmingham brass founders. The Improved Phantasmagoria Lantern, the first popular domestic media machine, was built by armies of tinsmiths and glass grinders. I uncovered a network of workshops and showed how working-class labour was driving the emergence of the first optical media networks.

This was a huge discovery because media historians had previously only featured the working classes as consumers of middle-class ingenuity. My research demonstrated that they were integral to the first wave of media expansion in the 1810s and 1820s.

But the effects of the expanding lantern trade on the working classes themselves were ambiguous. While wealthy consumers and classy exhibition venues were enjoying the benefits of an emerging professional trade, the poorer lantern users of the past were being squeezed out of the business. For a century, poor migrant lanternists had told stories and sung songs. They had made their money from richer audiences who could now afford lanterns of their own. Using early slides in the Museum collection and fragments of evidence collected from archives and cheap printed books, I raised the voices of these performers once more. I showed that they were not the grotesque vagabonds that most of the literature describes. These were sophisticated performers who captured the political fire of a transformative moment in history. Their stories mobilised the anxieties and resentments of poor people living in the furnace of revolution, war, depression, and industrial expansion.

The Media Museum supported me in disseminating my research widely. Using a demonstration lantern owned by the Museum, I performed lantern shows and broadside ballads of my own, using original slides and technologies to tell the story of the lantern and the changing world at the beginning of the 19th century. I have performed lantern shows at York, Bradford, Cambridge, Durham, and Hebden Bridge and made this dead medium live. The excitement people felt at hearing the voices of long dead performers was tremendous. My research was also published in the *Science Museum Group Journal* as part of the Spring 2017 special issue on Sound and Vision.

RIGHT:

Milk churns on Platform 1 at Carlisle Citadel station, 1925

THOMAS SPAIN

'Food Miles': Britain's Transition From Rail To Road-Based Food Distribution, 1919–1975

University of York and the National Railway Museum

The 'Food Miles' project was a collaborative research project that explored the wider histories of objects associated with food distribution, providing a body of research that encompassed the themes of freight transport and its decline for incorporation into the National Railway Museum's masterplan. Britain's railways were essential for the development of the British economy throughout the 19th century. But from 1919 their seemingly unassailable position as goods carriers was being eroded by motor transport. With food an essential yet generally perishable commodity, it was imperative that transport minimised the impact of distance and time prior to consumption.

As well as considering transport supply-side factors such as speed, reliability, service and cost, the thesis argues that Britain's transition from rail to road-based food distribution by 1975 was caused by a shift in the character of transport demand as manufacturers, and subsequently retailers, governed the food supply chain. The decisions of stakeholders are assessed though case studies of milk; livestock and meat, confectionery and food retail distribution. The thesis therefore provides an empirical study into the trader's relationship with transport that assesses their role in responding to the challenge of distribution and in driving innovation and technological development in the interests of establishing competitive advantage through supply chain analysis.

The principal finding was that in the cases considered, there was a significant change in supply chain governance across the period, affecting the ability of organisations and systems to manage commodity distribution processes. The growth of mass-consumerism since 1945 coincided with a shift towards self-service retail, and an emphasis upon minimising costs and maximising product availability. Large retail chains therefore sought to reduce transaction costs by promoting the standardisation of distribution and the adoption of distributive technologies such as product packaging. This contrasts with the inter-war situation in which producer, wholesaler and manufacturer-controlled commodity chains were designed to get goods into the market, resulting in a plethora of differing approaches, which were themselves susceptible to changing market conditions.

The research has also highlighted the need to go beyond the archival material held at the National Railway Museum. Whilst strong on objects, staff publications and design specifications, the managerial decisions influencing the transition from rail to road food distribution necessitated access to material held at The National Archives, Kew. Commodity and sector-specific material was obtained from the Museum of English Rural Life (Reading), the Wiltshire and Swindon History Centre in Chippenham, the British Library and the Marks & Spencer Archive in Leeds.

CURRENT STUDENTS

ABOVE:

Caroline Avery, Collaborative Doctoral Partnership PhD Student who is researching 'Making the pulse: the reception of the stethoscope in 19th-century Britain, 1817–1870'

CURRENT STUDENTS

SCIENCE MUSEUM

GEMMA ALMOND

Correcting vision in 19th-century England: a social, cultural, medical and material history of spectacles

Swansea University

CAROLINE AVERY

Making the pulse: the reception of the stethoscope in 19th-century Britain, 1817–1870

University of Leeds

RACHEL BOON

Dollis Hill Project B: the research life of the established 'Station' in the 'long Cold War' – analogue and digital era

BT Archives, University of Manchester

CHARLOTTE CONNELLY

Investigating the flow of electrical ideas through the instruments of their discovery, from 1800–1850

Cambridge University

CAITLIN DOHERTY

Representations of flight: the 18th-century imagination and modern collections

University of Cambridge

ALICE HAIGH

'Research is the door of tomorrow': the networks and culture of the Post Office Research Stations, Dollis Hill and Martlesham, c.1910–1983

BT Archives, University of Leeds

REBECCA KEARNEY

'False Teeth for the Masses': artificial teeth as technologies, prostheses and commodities in Britain, 1848–1948

University of Kent

GEORGINA LOCKTON

Science, technology and road safety in the Motor Age

Leicester University

FRANCES MORGAN

Electronic music studios in musical, commercial and international perspective

Royal College of Art

SARAH MURPHY-YOUNG

Constructing and consuming imagined futures: advertising healthcare to publics and professionals in 20th-century Britain

University of Leeds

BENJAMIN REGEL

Conserving doped fabric aircraft: historic origins; heritage outcomes

Imperial College London

TOM RITCHIE

Meccano: the nuts and bolts of science

University of Kent

JOSHUA SCARLETT

Instruments and their makers: a study of experiment, collaboration and identity in 17th-century London Royal Society

University of York

KEVIN TRACEY

Calculating value: using and collecting the tools of early modern mathematics

Swansea University

DOM WELDON

Mapping the historical growth and cultural context of the British fixed line network

BT Archives, King's College London

NATIONAL SCIENCE AND MEDIA MUSEUM

EMILY MARSDEN

Media in the First World War

Durham University

REBECCA SMITH

The Daily Herald*: popular desires and managing the production of photographs*

De Montfort University

CAMERON TAILFORD

Making electronics in interwar Britain: gendered labour in the thermionic valve industry

University of Leeds

SCIENCE AND INDUSTRY MUSEUM

ERIN BEESTON

Spaces of industrial heritage: a history of uses, perceptions and remaking of the Liverpool Road Station site, Manchester

University of Manchester

JOSHUA BUTT

The rise and fall of the Manchester motor industry, 1896–1939

Manchester Metropolitan University

PAUL COLEMAN

Security of supply: the role of the State in Britain's emerging national electricity network, 1914–1956.

University of Leeds

FRANCESCA ELLIOTT

Power-assisted learning? Exhibiting, interpreting and teaching on technology in the 20th-century industrial city

University of Manchester

NATIONAL RAILWAY MUSEUM

ELIZABETH ADAMS

Literary cultures, social networks and the railway worker, 1840–1920

University of Stirling

SOPHIE VOHRA

Railways and commemoration: anniversaries, commemorative cultures and the making of railway history

University of York

AMANDA STEVENS

Home on the rails: the design, fitting and decoration of train interiors in Britain c.1920–1955

Open University

CURRENT STUDENTS

RIGHT:

Detail of a model of a rotative beam engine made by William Tongue, c. 1805, from research by PhD student Francesca Elliott

NEW STUDENTS STARTING IN 2018

LEFT:

DNA molecular model kit, made by Science Teaching Aids, Wisconsin, USA, 1986. Part of the collection being studied by Rosanna Evans

NEW STUDENTS STARTING IN 2018

ROSANNA EVANS

Instrumental learning? Object lessons in recapturing past science teaching

Science Museum and the University of York

Science museums have traditionally focused on research as the product of scientists' labour. Less attention has been paid to understanding how scientists are themselves prior products of scientific education. By studying the diverse and changing uses of instruments in science teaching, this project will illuminate how scientific creativity is linked to instrumental change. The PhD student will investigate various types of apparatus in the Science Museum's Teaching collection to recover stories of past pedagogy. Object biographies will serve to map instruments' changing nature, use and distribution across schools and these will be correlated to textbook developments, curriculum change and oral histories from former science pupils.

CIARAN JOHNSON

The railways and the making of upland Britain: the lifecycle of an enviro-technical regime

National Railway Museum and the University of Northumbria

Railways have played an integral role in the production of Britain's upland landscapes. They were the keystone of an enviro-technical regime and important agents of social, cultural and environmental change, proving vital to processes of industrialisation and settlement. Their subsequent dismantling and re-use (and sometimes revival) make their long afterlives important vectors for processes of post-industrial transformation – a history that has yet to be written. This project will seek to redress this historical elision and will help the NRM establish a stronger narrative about the crucial role railways have played in the production of some of the UK's most valued landscapes.

RHIANNON LEWIS

Digitised collections and the social museum: the (re)use of images of objects in the collections of the Science Museum Group

Science Museum and the School of Advanced Study

Museums are moving decisively away from viewing visitors as passive consumers of content to seeing them as active participants in the creation of knowledge. This project will explore what that means for museums and their audiences in digital spaces, focusing on the (re)use online of images from the Science Museum Group collections. It will investigate how and why museum visitors share photographs of objects taken in-gallery, as well as the factors that motivate them to engage with digitised images made available through the Science Museum Group online collection, thereby gaining insight into the role of the digital in the development of the social museum.

HENRY ROBERTS

A history of audience thinking at the Science Museum

Science Museum and University College London

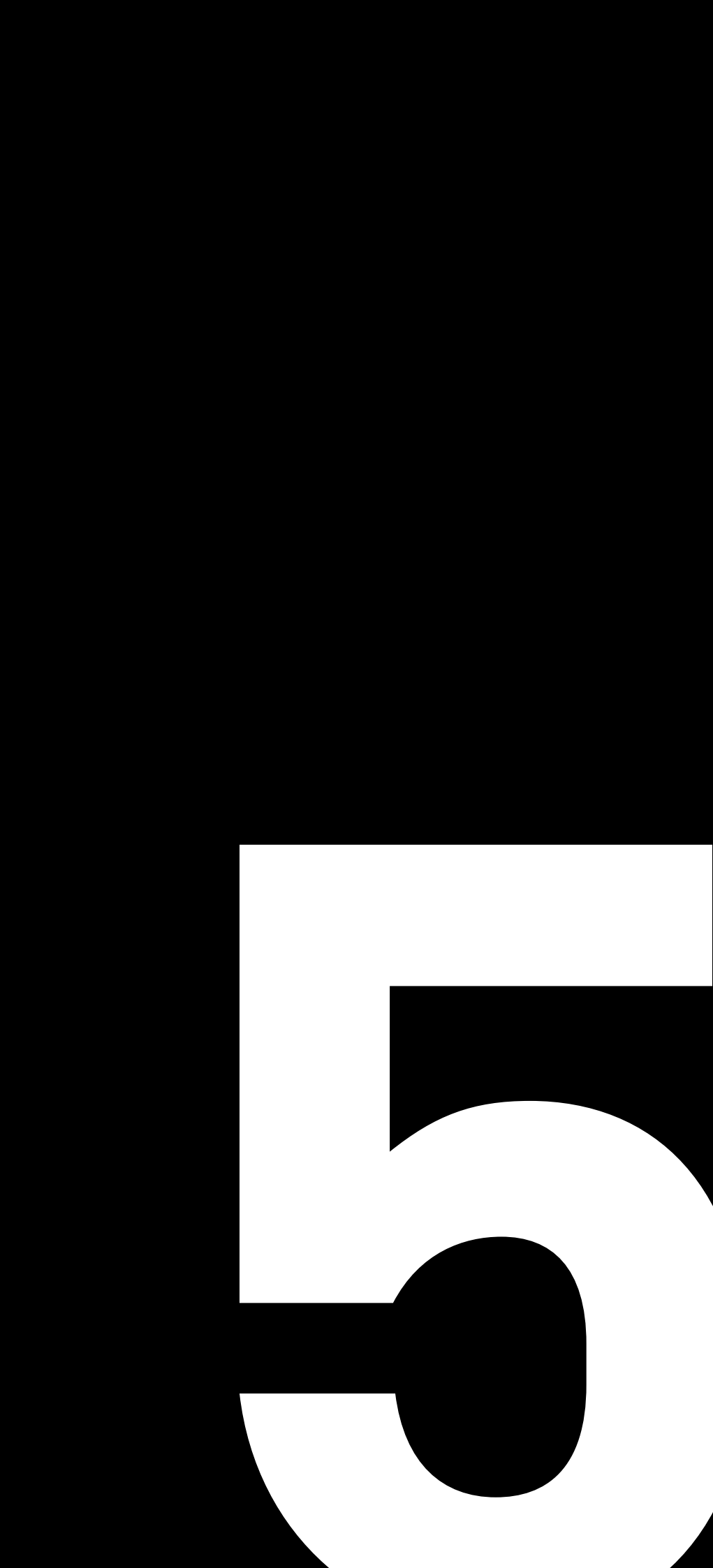
This project researches the history of audience thinking at the Science Museum, from c.1950 to c.2016. It is about finding out how the audience has been understood in this 50-year period, how this understanding has changed and how these changing understandings have successively informed the construction of displays at the Science Museum. This research aims to provide insights about the enduring character of audience thinking at the Museum in relation to its institutional mission. Specifically, the research will map the correspondence between changing conceptions of visitors and changing conceptions of the Science Museum's *raison d'être*.

EDWARD WILSON-STEPHENS

Objects of electronic sound and music in museums

National Science and Media Museum and the University of Leeds

Objects of electronic sound and music (OESM) are increasingly numerous in museum collections, yet effective strategies for their interpretation and display are lacking. The orthodox approach, where glass cases make these sounding objects mute and untouchable, rendering their utility-defining sonic-tactile qualities inaccessible to the museum visitor. Ahead of two planned sound and music exhibitions within the Science Museum Group, this doctoral project will help generate innovative approaches to the interpretation and display of OESM, through close object study and workshops with experts, lay users and curators, with a particular focus on translating the sonic-tactile dimension into the museum environment.



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RIGHT:

PhD student Tom Ritchie, who published an article on Meccano and the Hartree Differential Engine

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'The Unstable Collection: Inside the Lost Museum: Curating Past Present and Future, Steve Lubar, and Science in the Archives: Pasts, Presents, Futures, Lorraine Daston (Ed.) – Book Review'. Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences 68–69 (June 2018): 70–72.

Bud, Robert, Paul Greenhalgh, Frank James, and Morag Shiach, eds. Being Modern: The Cultural Impact of Science in the Early Twentieth Century. UCL Press, 2018.

Bud, Robert, and Frank James. *'Epilogue: Science after Modernity'.* In Being Modern: The Cultural Impact of Science in the Early Twentieth Century, edited by Robert Bud, Paul Greenhalgh, Frank James, and Morag Shiach, 386–93. London: UCL Press, 2018.

Bud, Robert, and Morag Shiach. *'Introduction'.* In Being Modern: The Cultural Impact of Science in the Early Twentieth Century, edited by Robert Bud, Morag Shiach, Frank James, and Paul Greenhalgh, 1–22. London: UCL Press, 2018.

Butt, Joshua. *'Cycling and the Origins of the Manchester Motor Industry'.* Hive: The Postgraduate Journal of the Faculty of Arts and Humanities, October 2017.

Carpenter, Oliver. *'Emerging as a National Figure: Walter Runciman and the Rise of the British Tramp Shipowner'.* International Journal for Maritime History 29, no. 4 (30 October 2017): 816–37.

Cliff, Alice, and Jenny Rinkinen. *'Visualising Electricity Demand: Use and Users of a 3D Chart from the 1950s'.* Science Museum Group Journal, no. 9 (Spring 2018).

Desborough, Jane. *'A Rare Sundial Layout Plate from France'.* Scientific Instrument Society Bulletin 136 (March 2018).

Dennard, Charlotte. *'Anatomy of a Traction Merger: The Archives of GEC Traction'.* ARC magazine, no. 334 Business Issue (June 2017): 36-37

Hess, Alison. *'Authenticity, Alterations and Museum Objects: A Close Encounter with 2LO, the BBC's First Radio Transmitter'.* Journal of Material Culture 22, no. 3 (September 2017): 281–98.

Hess, Alison, Daniel H Mutibwa, and Tom Jackson. *'Strokes of Serendipity: Community Co-Curation and Engagement with Digital Heritage'.* Convergence, 26 April 2018. https://doi.org/10.1177/1354856518772030.

Hicks, Jan, and Bill Morrison. *'The Language of Electricity'.* Science Museum Group Journal, no. 9 (Spring 2018).

Humphreys, Laura. *'Encounter and Exploitation: The English Colonization of North America, 1585–1615'.* In Tudor and Stuart Seafarers: The Emergence of a Maritime Nation, 1485-1707. London, UK: Bloomsbury, 2018.

Kay, Alison. *'Ten Years of Search Engine at York Railway Museum'.* ARC magazine, no. 346 Science and Archives Issue (June 2018): 30-31.

Leskard, Marta. *'Case Study: The Hempcrete Museum Store'.* Studies in Conservation 63, no. Supplement 1 Special Issue: IIC 2018 Turin Congress preprints (September 2018): 5381–83.

Parker, Tania. *'A Bursary Winner's Perspective'.* ARC magazine, no. 339 Conference Issue (November 2017): 37.

Ritchie, Tom. *'Shapin, Meccano, and the Hartree Differential Analyser'.* University of Kent, Science Comma Blog (blog), 20 February 2018.

Saram, Helen de, and Wendy Somerville Woodiwis. *'A Dynamometer Car'.* ICON News 74 (February 2018): 31–34.

Stirling-Middleton, Emma. *'The Science Museum Medicine Galleries: Representing Diverse Patient Experiences in Medical Museums and Galleries'.* Museum Ideas 3 (2017).

Wall, Oisín. The British Anti-Psychiatrists: From Institutional Psychiatry to the Counter-Culture, 1960–1971. Routledge Studies in Cultural History. Routledge, 2017.

Wilson, Sadie, Jannicke Langfeldt, and Ben Regel. *'Soyuz'.* ICON News 76 (June 2018): 19–24.

Wolstenholme, Zoe. *'Researching Anna Atkins in the Talbot Collection'.* ARC magazine, no. 344 Film, Sound and Photography Issue (April 2018): 13–14.

Wyatt, Nick. *'Digitising Charles Babbage at the Science Museum, London: Managing Expectations, Enabling Access'.* Circumscribere: International Journal for the History of Science 21 (1 June 2018): 56–62. http://dx.doi.org/10.23925/1980-7651.2018v21; p56–62.

SMG PUBLICATIONS

RIGHT:

From the launch party of *Being Modern*, co-edited by Emeritus Keeper, Robert Bud (on right).

SMG PRESENTATIONS

LEFT:

Vanessa Applebaum pictured with wooden carrying hand with tenon thumb and left split-hook

Almond, Gemma. *'A "Spectacle" of Vision Aids: Using Collections for Historical Research'*. Presented at the SMG Annual Research Conference, Science Museum Dana Research Centre & Library, September 2018; *'Aesthetics and Stigma: Exploring Resistance towards Spectacles through Nineteenth-Century Objects'*. Presented at the Society for the Social History of Medicine, Liverpool, July 2018; *'Nineteenth Century Spectacles and Eyeglasses: Combining Objects with Documentary Sources in the Science Museum's Collections'*. Presented as part of the Research Seminar Series, Science Museum Dana Research Centre & Library.

Applebaum, Vanessa. *'Caring for Wounded Objects: Preserving Sensitive Materials from the First World War'*. Presented at the Wounded Symposium, Science Museum Dana Research Centre & Library, February 2018; *'Preserving Innovation: Considering the Treatment and Materiality of 3D Printed Objects in Museum Collections'*. Presented at Material Matters 2018: American Institute for Conservation of Historic and Artistic Works (AIC) 46th Annual Meeting, Houston, Texas, USA, 31 May 2018.

SMG PRESENTATIONS

Bailly, Muriel. *'Art and Medicine at the Science Museum: A Case Study'*. Presented at the British Society for the History of Medicine Congress, Edinburgh, September 2017; *'Inviting Visitors to Explore the Invisible'*. Presented at the Models and Molecules: Seeing Structures Conference, University of Durham, November 2017.

Baines, Sarah. *'Introduction to Curatorial Work'*. Presented at the Centre for the History of Science, Technology and Medicine Masters Students' Welcome Week, Science and Industry Museum, 21 September 2018.

Baker, Karen, and Mike Esbester. *'Railway Work Life Death'*. Presented at the SMG Annual Research Conference, Science Museum Dana Research Centre & Library, 14 September 2018.

Barrett, Katy. Chair and Commentator for 'Beyond Disciplinary Boundaries: History of Science and History of Art' at the Association for Art History Annual Conference, King's College, London, 6 April 2018; *'George Gabb, The Physical Laboratory of the Académie Des Sciences and Unpicking the Visual Worlds of the Royal Society'*. Presented at The Visual Worlds of the Royal Society, CRASSH, University of Cambridge, 17 July 2018; *'Science in Visual Culture/Visual Culture in the Science Museum Group: Panel Discussion'* at the SMG Annual Research Conference, National Science & Media Museum, Bradford, 24 November 2017; *'"The Lines, Which Are so Very Fine": John Harrison, William Hogarth and the Trouble with Drawing a Line of Longitude'*. Presented at the Antiquarian Horology Society Lecture, Royal Institute of Chartered Surveyors, London, 15 March 2018; *'"The Pencle of an Able Painter": William Hodges Paints Cook's Voyages of Exploration'*. Presented at the Lichtenberg-Kolleg Lecture Series, Lichtenberg-Kolleg, Georg-August Universitat, Goettingen, 4 May 2018.

Barrett, Katy, and Geoff Belknap. Chair and Commentator for *'Visual Culture Research at the Science Museum Group'* at the SMG Annual Research Conference, Science Museum Dana Research Centre & Library, 14 September 2018.

Bartholomew, Ed. *'Introduction and Panel'* at the Museums in Context & Partnership conference, National Railway Museum, in conjunction with University of Sheffield, 19 April 2018; *'Introduction to Museums in Profusion'*. Presented at the Museums in Profusion conference, organised by Heritage Futures and the University of York, National Railway Museum, 21 September 2018; *'National Railway Museum Masterplan, Interpretation and Public History'*. Presentation to Beamish Museum curators and volunteers, National Railway Museum, 19 January 2018; *'Railway Photography in Britain'*. Locomotion, Shildon, 25 January 2018; *'Railways, Heritage and Public History: Panel'*. Presented at the NRM-University of York Institute of Railway Studies workshop, National Railway Museum, 11 May 2018; Talk and Panel Discussion on *'Science in Visual Culture/Visual Culture in the Science Museum Group'* at the SMG Annual Research Conference, National Science & Media Museum, Bradford, 24 November 2017; *'Terence Cuneo: Painting Power'*. Presentation to members of the Cuneo Society, University of Hull, 1 March 2018; *'Use and Interpretation of Photographic Collections Panel'*. Presented at the SMG Annual Research Conference, National Science & Media Museum, Bradford, 24 November 2017.

Bartholomew, Ed, Karen Baker, and Charlotte Dennard. *'Archives Tour'* for Katrina Dean, modern records archivist at the University of Cambridge, National Railway Museum, 18 September 2018.

Bartholomew, Ed, and Oli Betts. *'Museology and Interpretation of the Collections'*. Museum tour and discussion for students from the universities of York, Lund and Bielefeld, National Railway Museum, 13 June 2018.

Bartholomew, Ed, Martyn Halman, and Chris Binks. *'The Conservation of Queen Victoria's London & North Western Railway Carriage'*. Presentation to the York Consortium for Conservation & Craftmanship, National Railway Museum, 19 July 2018.

Bartholomew, Ed, and Alison Kay. *'Researching Image Collections'*. Facilitated research workshop for the Railway & Canal Historical Society, National Railway Museum, 18 October 2017.

Belknap, Geoffrey. *'Curating and Collecting Born Digital Photography'*. Presented at Museums and digital memory: from creation and curation to digital preservation conference, British Museum, 3 September 2018; *'Curating Photography and Chemistry Roundtable'*. Presented at the European Society for the History of Science Biennial Conference, Science Museum Dana Research Centre & Library, September 2018; *'Images in Periodicals – Participant'*. Presented at Coherence and Interruptions: Seriality in Periodicals Summer School, Bochum University, 12 September 2018; *'Photography as an Interdisciplinary Medium'*. Presented at the Victorian Interdisciplinarity and the Sciences Conference, Leeds Trinity University, 23 February 2018; *'Rationalizing Photography in the National Science and Media Museum'*. Presented at the Photographic History Research Centre Annual Conference, De Montfort University, 18 June 2018; *'The Origins of Photography, Talbot and the National Science and Media Museum'*. Presented at the Origins of Photography Conference, Pushkin Museum (Moscow, Russia), 23 March 2018; *'The Print after Photography – Talbot and the Invention of the Photographic Print'*. Presented at the Origins of Photography Conference, Pushkin Museum (Moscow, Russia), 21 March 2018.

Bennett, Jim. *'Astronomy in Ireland 1780–1870: from astrometry to astrophysics'*. Part of the Royal Dublin Society Winter Lecture Series, Royal Dublin Society, Ireland, 15 February 2018; *'Mathematical instruments in early-modern books'*. Presented at the Bodleian Library Summer School, Bodleian Library, Oxford, 26 June 2018; *'The Origins of the Nautical Almanac, 1767'*. Presented at the Royal Astronomical Society Meeting, Burlington House, London, UK, 13 October 2017.

Betts, Oli. *'Disease, Sanitation and the Victorian Railway'*. Presented at the Urban History Group Conference, University of Keele, 5 April 2018; *'Piston, Pen, and Press Project Launch'*. University of Strathclyde, Glasgow, 20 September 2018.

Blyth, Tilly. *'Building Narratives on the History of Computing'*. Presented at the Constructing Histories of Computing and Digital Media in Museum Environments conference, Centre for Research in Communication and Culture (CRCC), Loughborough University, 18 June 2018; *'Why Does the History of Computing Matter? – Panel Discussion'* the BSHM meeting *'History of Computing beyond the Computer'*, Mathematical Institute, University of Oxford, March 2018.

Bonamy, Angélique. *'Film and Sound Collection: Talk and Film Screening'*. Talk to Friends of the National Railway Museum – South of England group, St Paul's Church, Marylebone, London, 9 April 2018; *'NRM Film and Sound Collection'*. Presented at the SMG Annual Research Conference, National Science & Media Museum, Bradford, 23 November 2017. Curator Talk and Film Show. Presented at the *'Flying Scotsman on show'* programme, Locomotion, Shildon, 30 July 2018.

Bonamy, Angélique, and Zoe Wolstenholme. *'Curator Talk and Film Show'*. Presented at the 'Flying Scotsman on show' programme, Locomotion, Shildon, 30 July 2018.

Boon, Rachel. *'What Is It We Are Talking about When We Talk about the History of Science?'* Panel Session European Society for the History of Science Biennial Conference 2018, Science Museum, London, 15 September 2018.

Boon, Tim. *'Building and Operation of Industrial Museums – Introduction'*. Presented at the 360˚ Science Film Festival, Moscow, 22 October 2017; *'Creating Good Soil for Growing Research Collaborations'*. Presented at the University of Leeds third audio-visual heritage meeting, University of Leeds, November 2017; *'From Histories of Use to Gestures of Making'*. Presented at the Artefacts Conference, Musée des Arts et Métiers, Paris, 8 October 2017; *'Introduction to "Music 625": Performance and Music TV, 1960 and After'*. Presented at the 'Music 625': Performance and Music TV, 1960 and conference, University of Leeds, 8 June 2018; *'Museum Practice as Anticipation: Introduction to Session'*. Presented at Anticipation 2017, Senate House, London, 9 November 2017; *'Museuming and Doing Science: A Way of Thinking about the Curator's Role in Relation to Science and History'*. Presented at the SMG Annual Research Conference 2018, Science Museum Dana Research Centre & Library, 14 September 2018; *'Science on Screen, the First Forty Years'*. Presented at the 360˚ Science Film Festival, Moscow, 24 October 2017; *'Scripting the Postwar Museum'*. Presented at the SMG Annual Research Conference, National Science & Media Museum, Bradford, 24 November 2017; *'"What Manner of Men?" Meeting Scientists through Television'*. Presented at the European Society for the History of Science Biennial Conference 2018, Science Museum Dana Research Centre & Library, 16 September 2018.

RIGHT:

Medicine bottles from the Collection currently in store, discussed in a talk by Natasha McEnroe.

Boon, Tim, and Jean-Baptiste Gouyon. *'Doing the Work of Medicine? TV and Museum Display across the Era of Social Revolution'*. Presented at the BodyCapital Conference, Wellcome Trust, London, 21 February 2018.

Booth, Toni. *'Audiovisual Heritage Panel Discussion'* at the New Approaches to Silent Film Historiography: Technology, Spectatorship and the Archive, University of Leeds, September 2018; *'University of Bradford Media Archaeology Session'*. National Science & Media Museum, Bradford, 7 March 2018.

Boyle, Alison. *'Communicating Science with Integrity: What Are the Challenges?'*. Presented at the Imperial Science Communication Silver Jubilee Conference, Imperial College London, 27 September 2018; *'End of the SIC?'*. Presented at the Scientific Instrument Commission XXXVII Symposium, Museum Boerhaave, Leiden, Netherlands, 4 September 2018; *'Modern Physics in the Museum: Shaping the UK's National Collections in the 20th Century'*. Presented at the Scientific Instrument Collections: History and Heritage conference, Science History Institute, Philadelphia, USA, April 2018; *'Nuclear Legacies in the Museum: British Atomic Artefacts and National Narratives'*. Presented at Nuclear legacies: community, memory, waste and nature, Södertörn University, Stockholm, 14 September 2017; Session Commentary at the How Collections End: Objects, Meaning and Loss in Laboratories and Museums, Whipple Museum, Cambridge, 25 October 2017; *'Social Engagement with (Big) Science'*. Presented at the RCA/CERN Future States: Science and Design for Sustainability Symposium, Royal College of Art, London, 18 January 2018.

Bruton, Elizabeth. *'In Factory and Field: Scientific and Industrial Research Conducted by the Marconi Company in World War One'*. Presented at Marconi e la seconda rivoluzione delle TLC: vicende ed effetti della Grande Guerra (Marconi and the Second Revolution of telecommunications: events and effects of the First World War), Italian Ministry of Economics, Rome, November 2017; *'"Mr Marconi and His Marvellous Invention": Maritime Wireless Telegraphy from the Kingstown Regatta in 1898 to the Sinking of the Titanic in 1912 and Beyond'*. Presented at the IET Ireland/ Engineering Ireland Evening Lecture, Sirius Arts Centre, Cork, Ireland, May 2018; *'The Best of Everything (but Politics): John Reith and the BBC's Coverage of Politics in the 1920s'*. Presented at the Radio and the Public Sphere in Democracy and Dictatorship in the 1920s and 1930s – SHOT Annual Meeting, Philadelphia, USA, October 2017; *'The Lethal Eye in the Sky: The Birth of Airborne Wireless Communications and near Real-Time Aerial Surveillance in the British Air Forces during World War One'*. Presented at The Eyes and Ears of Power – Surveillance, History, and Privacy, Enigma Museum, Copenhagen, Denmark, September 2018; *'Uncertain at Present for Women But May Increase: Opportunities for Women in Wireless Telegraphy during World War One'*. Evening Lecture, Museum of the History of Science, Oxford, April 2018.

Bruton, Elizabeth, and Graeme Gooday. *'Communications and Electrical Warfare in the Russo-Japanese War, 1904–5'*. Presented at the Defence Electronics History Society (DEHS) Autumn Symposium, Swindon, UK, October 2017.

Bruton, Elizabeth, and Anne Locker. *'The History of Women in Engineering in the UK – Conference'*. Funded by the IET History of Technology Technical & Professional Network, IET Savoy Place, London, UK, November 2017.

Bud, Robert. *'Conceptual History, Branding and Technology as Part of the Public Sphere'*. Kranzberg Lecture, Icohtec, St Etienne, France, 17 July 2018; *'Defining Technology through the Instructions of Training'*. Presented at the Society for the History of Technology annual meeting, Philadelphia, USA, 27 October 2017; *'How the Public Invented Penicillin'*. Oxford High School, 28 November 2017; *'New Historical Perspectives on New Museology'*. Workshop on Les mises en scène des sciences et leurs enjeux politiques et culturels (19e-21e siècles), Les Treilles, France, 30 May 2018; *'Science, the Spectacular Exhibition in Britain and the French Example: The Cases of the 1876 Loan Collection of Scientific Apparatus and the 1908 Franco-British Exhibition'*. Workshop 3 of the Universal Histories and Universal Museums project, Nanterre, France, 17 November 2017; *'Talk Introducing Jim O'Neill et al, Superbugs: An Arms Race against Bacteria (Harvard University Press)'*. London School of Hygiene and Tropical Medicine, 26 April 2018.

Burden, Louisa. *'Science Museum Group One Collection: New Storage Building, Wroughton'*. Presented at the IIC Sustainable Museum Storage Seminar, Science Museum Dana Research Centre & Library, 2 October 2017.

Butt, Joshua. *'Compartmentalising Mobility: Manchester's Transport Material Culture, Its Display and Its Role in Interpreting the City's History'*. Presented at the Mobile Utopia: pasts, presents, futures – Annual Transport to Mobility conference, Lancaster University, November 2017.

Clarke, Imogen. *'Celebrating the NHS at 70'*. Presented at the SMG Annual Research Conference, Science Museum Dana Research Centre & Library, 14 September 2018.

Cliff, Alice, and Jenny Rinkinen. *'Three-Dimensional Chart Used by Central Electricity Generating Board Planners, c.1954: Object's Use and Users'*. Presented at the SMG Annual Research Conference, National Science & Media Museum, Bradford, 23 November 2017.

Cole, Rupert. *'Making Heritage: The Journey of a Nairne Electrical Machine'*. Presented at the XXXVII Scientific Instrument Symposium: Instruments and the *'Empire of Man over Things'*, Teylers Museum, Leiden, 6 September 2018.

Coulls, Anthony. *'Managing the National Collection'*. Talk for Friends of the National Railway Museum, National Railway Museum, 13 February 2018; *'Managing the National Rail Vehicle Collection'*. Wensleydale Railway Association, Northallerton, 15 January 2018; *'Railway Photography'*. Speech to the Rail Camera Club, Redworth Hall Hotel, Redworth; *The Amazing Technicolour Scotsman'*. Locomotion, Shildon, 24 July 2018.

Croxton, Andy. *'Archive Tour'*. Part of UK heritage railway tour, National Railway Museum, 26 July 2018.

Dabin, Katie. *'Bringing Objects and Stories to Life Through Oral History'*. Presented at the SMG Annual Research Conference, Science Museum Dana Research Centre & Library, 14 September 2018; *'Collecting HIV/AIDS Objects at the Science Museum'*. Presented at the AIDS Objects in Archives & Museums workshop, University of Amsterdam, 26 July 2018.

Davies, Jack. *'Back in Blighty: Hospital Life in First World War Britain'*. Presented at the Wounded Symposium, Science Museum, London, February 2018; *'"Backwood Australians" and "Angry Anzacs": The Impact of the First World War on Australian and British Relations'*. Presented at the Centenary Conference: *'The End of the War and the Reshaping of a Century'*, University of Wolverhampton, September 2018; *'From Houses to Hospitals: Treatment of the First World War Wounded in Britain'*. Part of the Research Seminar Series, Science Museum Dana Research Centre & Library, 17 October 2017; *'"The Girls Who Work and Strain": Female Caregivers and Disciplinarians in First World War Britain'*. Florence Nightingale Museum, 15 November 2017.

Davies, Karen. *'Engaging All Audiences with STEM: Science Capital and the Science Museum Group'*. Presented at the Family Science Capital: Putting it into Practice workshop, Association of Science and Technology Centers, Connecticut, 30 September 2018.

Dennard, Charlotte. *'Archive Stores Tour for Engie Marketing Department'*. National Railway Museum, 17 January 2018; *'Tour of the NRM'*. Tour for York St John students, National Railway Museum, 16 October 2017.

Dennard, Charlotte, and Angélique Bonamy. *'Inspiring Stories from the National Railway Museum's Archive'*. Locomotion, Shildon, 16 November 2017.

Derry, Lisa. *'How to Create Engagement Events'*. Seminar for UCL MSc Museum Studies students – Practical Exhibitions and Events module, Science Museum, London, March 2018.

Desborough, Jane. *'Networks of Innovation and Collaboration'*. Innovation & Collaboration lecture event, Bonhams, New Bond Street, 11 September 2018; *'Public Science Lectures in a City without a University: London 1690–1730'*. Presented at the Scientific Instrument Commission Conference 2018, Leiden, 5 September 2018.

Elliott, Francesca. *'Engines in the Classroom: Model Engines in Manchester's Technical Education Landscape'*. Presented at the British Society for the History of Science Postgraduate Conference, University of Manchester, 5 April 2018; *'Model Students: Technical Education in Manchester'*. Presented at Ways of Knowing in Modern Britain, Department for Modern British Studies, University of Birmingham, 6 July 2018; *'Technical Education in the Late 19th and Early 20th Century Urban Environment'*. Presented at the Constructing Knowledges Postgraduate Network, University of Manchester, 21 May 2018.

Elliott, Francesca, Jemma Houghton, and James Sumner. *'Collections Research, Visitor Studies and Public Engagement: Lessons from Manchester'*. Presented at the UNIVERSEUM European Academic Heritage Network, The Hunterian, University of Glasgow, 14 June 2018.

Emmens, Stewart. *'Wounded: An Exhibition Out of Time'*. Presented at the Wounded: Conflict, Casualties & Care Symposium, Science Museum Dana Research Centre & Library, 28 February 2018.

Gwynne, Bob. *'400 Years in 40 Minutes'*. Talk for the Rail Development Group, National Railway Museum, 22 May 2018; *'A History of Railway Electrification in Britain'*. Craven U3A Railway Group, Skipton, 17 November 2017; *'Early Railways to Mallard, Steam and Railways'*. Boiler Engineering Skills Training Trust, 6 January 2018; *'Flying Scotsman, Famous for over 90 Years'*. Talk to Pocklington Canal Amenity Group, 16 February 2018; *'Flying Scotsman, the Train, the Locomotive, the Legend'*. Talk to Friends of Malton Museum, Malton, 19 September 2018; *'TOPS'*. Presented at the SMG Annual Research Conference, National Science & Media Museum, Bradford, 23 November 2017.

Hawkins, Beth. *'Building Bridges: Understanding Infrequent and Absent Visitors'*. Presented at the Science Centre World Summit, National Museum of Emerging Science and Innovation, Japan, November 2017.

Hawkins, Beth, and Naomi Haywood. *'The Benefits and Challenges of Collaborations between Museums and Academic Institutions'*. Presented at the Object Engagement conference, Science Museum, London, 22 June 2018.

Hicks, Jan. *'Electricity: The Spark of Life'*. Presented at: the Lancaster DEMAND Centre Workshop, Science and Industry Museum, 13 December 2017; *'Extolling the Virtues of Electricity'*. Presented at Picturing Energy: Approaches to Energy Films, BFI, 6 October 2017.

Hicks, Jan, and Sarah Baines. *'Research Potential of Science and Industry Collections'*. Presented at Knowing Things, Science and Industry Museum, 17 July 2018.

Holroyd, Simon. *'The Reconstruction of Flying Scotsman'*. Talk for the Eastern Counties Welding Institute, TWI, 15 November 2017.

Howles, Matthew. *'"Designing the V&A" Tour and Display Visit'*. V&A, London, 27 November 2017; *'Staging a Demonstration: The Natural Philosophy Experiment Re-Imagined at London's Science Museum'*. Presented at the Scientific Instrument Commission XXXVII symposium, Teylers Museum, Haarlem, Netherlands, 5 September 2018.

LEFT:
Fairlight Computer Musical Instrument – subject of a talk by Annie Jamieson

Hurley, Selina. *'Contemporary Collecting at Science Museum Group'*. Presented at Collecting 21st-Century Science, Technology and Medicine in Scotland, Edinburgh, November 2017; *'New Medicine Galleries at the Science Museum'*. Presented at the Thalidomide Society Annual General Meeting, April 2018; *'Patient and Object Voices: Looking at Wound Care through the Lens of the Science Museum's Collections'*. Presented at the Medical & Metaphorical Wounds from the Middle Ages to the Boer War conference, Science Museum, London, March 2018.

Jamieson, Annie. *'Fairlight Computer Musical Instrument'*. Presented at Lates at NSMM, National Science & Media Museum, Bradford, 19 July 2018; *'Introduction to the National Science and Media Museum'*. Canada Science and Technology Museum, 8 February 2018; *'Looking at Listening: Sounding Objects @ NSMM'*. Presented at Field Studies 2017: Listening After Pauline Oliveros, University of Leeds, 13 October 2017; *'MIDAS XL3 40-CHANNEL LIVE PERFORMANCE CONSOLE, SERIAL NO. 003, 1990 – a New Acquisition'*. Presented at the SMG Annual Research Conference, Science Museum Dana Research Centre and Library, 14 September 2018; *'Precious Instruments: A Guide to Hearing Protection for Musicians'*. School of Music, University of Leeds, 24 January 2018.

Kay, Alison. *'Ambulance Trains'*. Presented to the Harrogate & District Family History Society, St Paul's Church, Harrogate, 21 November 2017; *'Records for Local History at the Railway Museum'*. Talk to the British Association for Local History, 2 June 2018; *'Technical Records in a Museum Context'*. Presented at the Annual Seminar of the Archives and Records Association: Section for Business Records, National Railway Museum, Search Engine, 18 June 2018.

Kearney, Rebecca. *'"The Miseries of Artificial Teeth"? Emotional Dimensions of the Material Culture of Dentures 1848–1948'*. Presented at the Oral Health Conference, University of Kent, 28 June 2018.

Kingston, Charlotte. *'Create, Curate, Connect: Embedding Digital Media into Exhibitions'*. Presented at the Avant-Garde Lab Curatorial School, Jewish Museum, Moscow, Russia, 30 September 2018.

Lawrence, Isabelle. *'Faith, Hope and Fear: Interpreting the Human Experience of Medicine and Health at the Science Museum'*. Presented at A True Reflection? Displays, Stories, and Interpretation, Social History Curator's Group Conference, Beamish: The Living Museum of the North, 19 July 2018.

Leskard, Marta. *'Hempcrete Research: The Hempcrete Storage Project at Wroughton'*. Presented at the IIC Sustainable Museum Storage Seminar, Science Museum Dana Research Centre & Library, 2 October 2017.

McEnroe, Natasha. *'Curiosities and Cures: The Medicine Collection at the Science Museum'*. Presented at the public lecture, The Royal Society of Medicine, 7 June 2018; *'Displaying Medicine: The New Galleries at the Science Museum, London'*. Presented at In Sickness & In Health: Exploring Medical History Collections, Wellcome Trust, London, 12 September 2018; *'Hospitals Under Canvas: Nursing in the Field in the First World War'*. Presented at the Wounded Symposium, Science Museum, London, February 2018; *'Interdisciplinary Entanglements: Towards a Visual Medical Humanities'*. Presented at the Association for Art History Annual Conference Panel,

LEFT:
Part of the Medicine Collection currently in store and discussed by Natasha McEnroe

Courtauld Institute of Art & King's College London, April 2018; *'"The Art and Science of Healing throughout the Ages": Interpreting Medicine at the Science Museum, London'*. Presented at the Society for the Social History of Medicine Conference, University of Liverpool, July 2018; *'VALA2018 Plenary Session 1: Keynote'*. Presented at VALA2018, Melbourne Convention and Exhibition Centre, February 2018.

McEnroe, Natasha, and Katy Barrett. *'Peopling the Medicine Galleries at the Science Museum'*. Presented at Curating the Medical Humanities, Birkbeck University of London, 13 September 2018.

McLean, Andrew. *'Permanent Displays as Nexus of Collaboration'*. Presented at the Museums in Context and Partnership conference, National Railway Museum, 19 April 2018; *'The Significance of Rocket'*. Presented at the Great Exhibition of the North, Discovery Centre, Newcastle, 22 June 2018.

Paquin, Sheldon, and Rachel Bateson. *'Presenting Digital Artefacts in Exhibitions'*. Presented at Museums and Digital Memory: from creation and curation to digital preservation, British Museum, 3 September 2018.

Ritchie, Tom. *'Hornby, Smiles, and Hartree'*. Presented at the BSHS Postgraduate Conference 2018, University of Manchester, April 2018; *'Model Materials and Material Models'*. Presented at the European Society for the History of Science Biennial Conference 2018, Science Museum Dana Research Centre & Library, September 2018.

Roberts, Phillip. *'Building Media History From Fragments: Ephemeral Technologies and Material Economies'*. Presented at the Late Summer Lecture Series, Durham University, 13 September 2017; *'Ephemeral Lives in the History of Media (Using Street-Song and Lantern Projection)'*. Presented at the WRoCAH Conference 2017, National STEM Learning Centre, York, 19 October 2017.

Rose, Alexandra. *'Seismographs on Show'*. Presented at the Scientific Instruments Symposium, Museum Boerhaave, Leiden, 6 September 2018.

Russell, Ben. *'Bryan Donkin and Compound Plate Printing'*. Institution of Mechanical Engineers, 5 December 2017; *'Curatorial Cultures: The Professional Life of HW Dickinson, 1919–1930'*. Presented at the SMG Annual Research Conference, Science Museum Dana Research Centre & Library, 14 September 2018; *'Rise of the Robots: Interpreting the Long History of Robots'*. Deutsches Museum, Munich, 22 February 2018; *'Robots: Interpreting the Long History of Robotics'*. Winter lecture: The rise of the robots, Bristol Museums and Art Gallery, 12 October 2017; *'Six Impossible Things Before Breakfast: Magic and Rationality in Eighteenth Century Science"*. Presented at the York Festival of Ideas, Fairfax House, York, 14 June 2018; *'The Maudslay Collection and Transition in Machine Design 1800–1830'*. National Museums of Scotland, 20 February 2018; *'The Rise of the Robots: From Curatorial Scribbles to Blockbuster Exhibition'*. Presented at the Cheltenham Science Festival, The Crucible, 5 June 2018.

de Saram, Helen. *'The Dynamometer Carriage'*. Presented at the York Museums Forum, Kohima Museum, Imphal Museum, 16 October 2017.

Scarlett, Joshua. *'Fall of Aristotle or Rise of Archimedes? – How Did Optical Instrument Makers in London Present Objects and Their Workshops to Buyers?'*. Presented at the XXXVI Scientific Instrument Symposium, Rijksmuseum Boerhaave, Leiden, 4 September 2018; *'Who Did the Work? Robert Hooke's Network of Scientific Instrument Makers'*. Part of the Research Seminar Series, Science Museum Dana Research Centre & Library, 14 November 2017.

Serveta, Maria, and Sevinc Kisacik. *'SIGNtific at the Science Museum: Communicating a Creative Response for Inclusive Events for the d/Deaf Community'*. Presented at the Special Educational Needs & Disabilities Museums Network Conference, National Gallery, London, 15 September 2018.

Smith, Rebecca. *'Everything in its Place – Locating Movement and Stasis in the* Daily Herald *Picture Library'*. Presented at the SMG Annual Research Conference, National Science & Media Museum, Bradford, 24 November 2017; *'Image, Caption and the Red Pencil: Two Material Readings of Archival Press Photographs'*. Presented at the Material Practices of Visual History – Photographic History Research Centre Conference 2018, Hugh Aston Building, De Montfort University, 18 June 2018; *'Recto/Verso: The Marks of Production'*. Presented at the SMG Annual Research Conference – Researching Visual Culture in the Science Museum Group Collections panel, Science Museum Dana Research Centre & Library, 14 September 2018; *'Tracking* Daily Herald *Assignments Though Material Evidence – Workshop'*. Part of the DMU MA Photographic History study week in NSMM photography collections, Insight, National Science and Media Museum, 8 November 2017.

Spain, Thomas. *'Food Miles'*. Part of the Research Seminar Series, Science Museum Dana Research Centre & Library, 20 March 2018.

Stirling-Middleton, Emma. *'Negotiating Collection "Silences" When Representing Patient Voices in Museum Displays: Facilitating Public Engagement with the Patient Voice in Permanent Galleries at the Science Museum'*. Oxford University, 2017; 'Sound and Vision in the Medicine Galleries'. Presented at the SMG Annual Research Conference, National Science & Media Museum, Bradford, November 2017.

Thorpe, Peter. *'The National Railway Museum Library and Archive Collections'*. Talk to the NYMR South Yorkshire Group, The Railway, Doncaster, 20 March 2018.

Thorpe, Peter, and Angélique Bonamy. *'Driver, Draughtman, Cleaner, Clerk: Discovering Your Railway Family'*. Presented at the Guild of One Name Studies Annual Conference, Cedar Court Hotel, Wakefield, 24 March 2018.

Thorpe, Peter, and Mike Esbester. *'Crowdsourcing, Collaboration, Archives & Accidents: The Railway Work, Life & Death'*. Presented at the Museums in Context and Partnership conference, National Railway Museum, 19 April 2018.

Torres, Vanessa. *'Acquisition Procedure for Contemporary Colour Photography'*. Presented at Institute of Conservation: Photographic Materials Group – A workshop on modern and contemporary photography, The National Archives, 16 February 2018; *'Photographs out and about! Challenges of Lending Early Photographs Overseas'*. Presented at the SMG Annual Research Conference 2017, National Science & Media Museum, Bradford, 24 November 2017; *'Photographs out and about! Challenges of Lending Early Photographs Overseas'*. Presented at the Institute of Conservation: Photographic Materials Group Round Table Discussion, Science Museum Dana Research Centre & Library, 17 November 2018.

Thwaite, Annie. *'Bent Pins to Bezoar Stones: The Place of Amulets in the Material Culture of Healing'*. Presented at Remarkable Things: The Agency of Objecthood and the Power of Materiality, University of Warwick, 10 March 2018.

Tracey, Kevin. *'"A Point Not Only in Respect of the Heavens above Us, but of That (...) Celestial Part within Us": Negotiating Early Modern Mathematics through Books and Instruments'.* Presented at The Sir Thomas Browne Conference, The Treehouse, Berrick Saul Building; University of York, 1 June 2018; *'Calculating Value: Reading the Scribal Technologies of Early Modern Mathematics'.* Presented at the History of Mathematics workshop, British Mathematical Colloquium, University of St Andrews. 11 June 2018; *'Collecting a Mathematical Method: Ramist Rhetoric in Print and Practice in Sixteenth-Century Germany'.* Presented at the HSTM Network of Ireland Annual Conference, Royal Dublin Society, Dublin, 13 October 2017; *'"Disturbed"* by Euclid: Ramus's Readers in the Wittenberg Sammelband'. Presented at Reading Euclid in the Early Modern World, All Souls, University of Oxford, 15 December 2017; *'Paper Instruments as Tools of Unification in Early Modern Practical Mathematics'.* Presented at the European Society for the History of Science Biennial Conference, Science Museum Dana Research Centre & Library, 16 September 2018; *'Print, Persuasion, Paratext: Early Modern Mathematical Knowledge in the Science Museum's Rare Books Collection'.* Presented at the College of Arts and Humanities Annual Postgraduate Conference, Abbey Building, Swansea University, 6 October 2017; *'"Several Choice Collections" (..) in Geometry, Astronomy, and Chronology: Using and Collecting Mathematics in John Seller's A Pocket Book (1677)'.* Presented at the pre-publication meeting presenting draft chapters for volume *'Reading Mathematics in the Early Modern World',* ed. Benjamin Wardhaugh, exp. March 2019, All Soul's College, University of Oxford, 20 April 2018; *'The Library of a Mathematicus: The Use and Dispersal of Nathaniel Torporley's Sion College Bequest'.* Presented at The Thomas Harriot Seminar, Keynes Library; Birkbeck, University of London, 8 September 2018.

Vohra, Sophie. *'The World's First Railway? Commemorations of the Stockton and Darlington Railway, 1875-1975'.* Presented at the BBC History Magazine Weekend, Yorkshire Museum, York, 25 November 2017*; 'Commemorating the Past, Shaping the Future: The Anniversary Celebrations of the Stockton and Darlington Railway, 1875-1975'.* Presented at the Why Public History? conference, Queen's University Belfast; *'Commemorations of the Stockton and Darlington Railway, 1875-1975'.* Curators Talks, Locomotion, Shildon, 22 March 2018; *'The Academic in the Museum: The Benefits and Difficulties of a Collaborative Doctoral Award'.* Presented at the Museums in Context and Partnership Conference, National Railway Museum, 20 April 2018; *'Commemorating the Railway Engineer: Developing the Heroic Identities of George Stephenson and Richard Trevithick'.* Presented at the 5th Annual Conference of the International Federation for Public History, University of São Paulo, Brazil, 24 August 2018.

Wyatt, Nick. *'Creating the Book of Eternity: The Mythology and History of Asbestos Paper Used for Writing and Book Production'.* Part of the Research Seminar Series, Science Museum Dana Research Centre & Library, 28 November 2017.

Young, Georgina. *'Collections Development Theory and Practice'.* University of Manchester Art Galleries and Museums Studies MA taught session, University of Manchester, 2 October 2017; *'Contemporary Collecting – Emerging Practice at Science and Industry Museum'.* Presented at the Contemporary Collecting Working Group, People's History Museum, Manchester, 16 February 2018; *'Introduction to Science Collections'.* Presented at the Centre for the History of Science, Technology and Medicine Masters Students' Welcome Week, Science and Industry Museum, 20 September 2018.

RIGHT:

The artist Terence Cuneo making sketches for his painting *Queen Elizabeth II Embarking from Hull* from a talk by Ed Bartholomew

SMG RESEARCH STRATEGY, 2018

TIM BOON
Head of Research & Public History

LEFT:
Luna Park Billikin, from the Science Museum's amulet collection, the subject of research by Annie Thwaite

Aim: The Science Museum Group (SMG) will become the world's most research-informed science museum group by 2022. It will do so by building on core strengths (e.g. the history and material culture of science, technology, engineering, medicine and the media) whilst developing expertise in international collaboration, digital innovation and audience experience.

WHAT SMG WILL DO: FOSTERING OUR RESEARCH CULTURE AND STRATEGIC ACTIVITY

Achieving this aim is a shared responsibility across SMG in which the Research Department takes a key role. The department will explicitly become a service department to the Group, supporting research of all kinds and levels with SMG professional groups. Through collaboration, we will enhance research in: digital, conservation science, learning and audiences as well as collections and history. Because research will function across the Group, it will contribute to the creation of a truly coherent and integrated group of museums, in the spirit of One Collection.

To ensure close integration with the Museums' programmes, SMG managers responsible for new cultural programming (including galleries and exhibitions) will hold early discussions with the SMG Research Department to ensure that, where appropriate, research funding applications can be developed in a timely fashion.

Across SMG, managers will support staff in the development of research skills and ambitions, including selective support for study for master's degrees and doctorates as forms of continuing professional development.

FOSTERING A RESEARCH CULTURE

SMG Research Department will work with colleagues to achieve goals that will collectively develop a strong research culture and meet strategic research objectives.

We will ensure that training and development opportunities are put in place for staff across the group and develop a ladder of research competencies for use by managers across SMG in staff CPD and job descriptions. Collaboration with managers will help them identify opportunities for research, allocate an appropriate proportion of time for research and implement these within job roles. We will also encourage increased participation in the *SMG Journal* across the group, supporting staff who are less experienced in scholarly research and writing.

The department will extend research networking activities, events and seminar programmes across all SMG museums and at the National Collections Centre at Wroughton, to engage with regional and national partners and enhance SMG's position as an important part of the UK research infrastructure. In parallel we will develop the audience for SMG research amongst university and heritage organisation colleagues and the interested public via effective marketing publicising SMG research, through the *Journal*, museum blogs, 'Lates', web pages, the *Annual Research Report* and staff update meetings.

Working with SMG Libraries and Digital teams we will archive research outputs and research data, so that they can be repurposed and made available for future use.

STRATEGIC RESEARCH ACTIVITY

The SMG Research Department will work with colleagues to align with the Group's strategic goals. We will, for example, ensure close alignment between the research programme and SMG's cultural programmes and seek increased funding for research activity across the Group (including applying for research projects, networks, fellowships and impact funding).

We will work with colleagues to develop research projects in new and existing areas by assisting in transformations of scale (for example, assisting Learning colleagues in the transition from project partners to project leaders). We will also explore the potential in new (for SMG) areas such as digital, international research and heritage science as well as reinforcing existing research strengths in historical and conservation study of collections.

Other research activity will include:

- Diversifying research funding
- Sustaining funding for postdoctoral training, including for doctorates, and engaging in Masters training as benefits individual museums, as well as exploring potential options for developing our own Master's provision.
- Establishing SMG-wide Fellowships, Associateships and Exchanges Scheme
- Developing a proposal for 'SMG Research partner' status for award to selected research organisations.
- Investigating the potential for establishing a centre for the study of a major area of concern, such as histories of use, or innovation.
- Continuing to work with the IROs' Consortium (IROC) to advocate to funding bodies for support for research in heritage organisations.

RESEARCH FUNDING

The department will continue to oversee the submission of applications to research funders via SMG's Research Approvals Group. Here, bids will have to show that they meet several criteria.

They must demonstrate a fit with SMG *Inspiring Futures* core priorities and SMG Research Priority Themes, including practical contribution to the museums' Master plans and programmes (see Appendix 1 in the full online strategy). Research bids must display intellectual strength appropriate to national museum status and to ensure competitiveness with other cultural offers. They should grow and extend the capabilities and areas of research expertise of the SMG Research Department and contribute to its ability to capture funds in a way which allows this growth to be ultimately self-financing. Internally, funding bids should deliver training and development opportunities in research practices for SMG staff and students, while in addition they should build relationships with external partners that contribute to SMG's research capabilities and enhance the reputation of SMG.

DEFINITIONS

'Research' here means the set of practices by which SMG undertakes 'the systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions' (OED, 2010). SMG undertakes differing kinds and levels of research, some of which are more academic, and some of which – our 'everyday research' – are close to the secondary OED definition of the verb 'to discover or verify information for use in a book, programme, etc'. At the more academic end of the spectrum, the AHRC definition is valuable. This proposes that coherent research should define a series of research questions, lay out a research context, and specify the research methods for addressing the research questions (AHRC Funding Guide).

SMG RESEARCH STRATEGY, 2018

LEFT:

The crest of the Ashworth family used on several carriages and cars bought from Cockshoot, from research by Joshua Butt

SMG staff are conducting research all the time: to develop the content for displays; to understand, preserve and build our collections; to gain insights into audiences; to develop new visitor experiences; and to build knowledge of our world and that of our predecessors as we consider the role of the museums in the future. Although much of this everyday research goes unrecognised as 'formal' research, it is essential to the work of the SMG museums; furthermore, it is the foundation for what we can do in terms of more formal and scholarly funded research. In other words, there is a connection and continuum between the more basic fact gathering and checking kind of activity and the more analytical and synthetic style demonstrated, for example, in our publications.

Research is at the heart of what SMG does, and to succeed we need to recognise, support and leverage our research to the greatest extent possible. Where there is research to be done, then there is also the scope to enhance its confidence, quality, efficiency and visibility. Growing research will enable SMG to grow as a whole, since it brings in extra capacity at the same time as it builds national and international networks, and enhances understanding of collections, displays and audiences.

SMG STRATEGIC CONTEXT: *INSPIRING FUTURES*

Research underpins the work of SMG, enabling us to deliver the group mission of inspiring futures through the creative exploration of science, with the aims of building scientific literacy and inspiring the next generation. Research is a key means by which the SMG values of thinking big, revealing wonder, sharing authentic stories, igniting curiosity and openness are expressed. Research is an essential instrument for addressing the core and supporting priorities described in *Inspiring Futures*: the idea of 'science capital' was born in a research collaboration; further research will enable SMG to investigate and develop its implications. Research enables SMG staff to grow our audiences and exceed their expectations because it enhances their professional practice across collections, visitors and policy, leading to a better cultural experience. The specific research audience is numerically small but disproportionately significant, as its members address otherwise unseen and unused collections and develop new narratives from them. Research sustains and helps grow our collection, uncovering forgotten relevance and revealing new stories. It can be foundational in securing international working, enabling new networks. Research into site histories can support the transformation of our estate; digital research is a priority area. Funded research brings in both in-kind value and income in support of SMG priorities, aiming to be cost-neutral to the organisation.

A reinvigorated research culture across the Group, that builds on One Collection and acknowledges expertise in all teams, will enable SMG to create a common culture of research, curation, display and learning. This is a major opportunity for SMG to gain influence by delivering a world-class and sector-leading research programme as a fully-integrated part of how the group works, expressing our international status, with an appropriate commitment to the highest intellectual standards.

EXTERNAL CONTEXT

SMG is one of 20 heritage Independent Research Organisations (IROs) of UK Research and Innovation (UKRI). This status recognises research activity and capacity and enables access to government-derived research funds, notably through the Arts and Humanities Research Council (AHRC), the council that most closely matches our activity.

Research funding is a partnership of values, from which funder and funded both benefit; part of our strategy is therefore to work to support our funders, even as they support us financially.

Research funding is in a state of flux. The establishment of UKRI and the availability of new hypothecated funding streams under the Industrial Strategy and the Global Challenges Research Fund are providing new opportunities at the same time as Brexit has introduced significant uncertainties. This strategy therefore includes measures to remain cognisant of the changing scene.

WHAT THE SMG RESEARCH DEPARTMENT IS DOING

Over five years, the SMG Research Department has developed a set of research practices that provide the experience and skills to enable greater research activity across all SMG sites:

Research Culture: At the Science Museum Dana Research Centre and Library, we have established a model for how research spaces can be run to enable and embody our research culture, cementing our academic reputation and public profile. This includes resources and workspaces for students, fellows, associates, researchers and staff; an in-demand venue for academic conferences, workshops and book launches; and a seminar programme. SMG has a good track record of funded research projects, housing 13 projects (11 AHRC, two Leverhulme) since 2012.

Postgraduate training: SMG benefits from involvement in training at both master's and doctoral levels (two AHRC Collaborative Doctoral Partnerships – 42 students – since 2013). Doctoral students do valuable work, each devoting three-plus years to our collections and concerns. Postgraduate training enables substantial research to occur, can help train potential recruits for roles in SMG, and creates a wider alumni community that brings vibrancy, inspiration and networks to SMG.

Academic publishing: Academic publication is a key means for SMG to be properly outward looking. To support this, SMG will continue to publish and develop the *Science Museum Group Journal*, also investigating options to extend our online academic publishing. We will also continue to encourage staff to publish papers in other academic journals, and books with a variety of publishers (working with the publications team and licensing department).

The full Research Strategy is available online at:

https://group.sciencemuseum.org.uk/our-work/research-public-history/research-strategy-2018/.

OPPORTUNITIES TO STUDY AND RESEARCH WITH US

TIM BOON
Head of Research and Public History

OPPORTUNITIES TO STUDY AND RESEARCH WITH US

LEFT:
SIM Archivist Ceri Edwards reviews shippers' tickets relating to the global business activities of Manchester textiles trading firms in preparation for the Textiles Gallery Refresh (photo Science Museum Group/Drew Forsyth)

The Science Museum Group's research ethos is intrinsically collaborative: we want to work with colleagues in the universities and other heritage organisations who share our passionate interest in museum collections and the public culture of science – including museum audiences and museum possibilities – more widely. This will be evident throughout the pages of this report.

Our doctoral programme is one example; each student has a supervisory team that brings together university-based researchers with museum-based professional staff. The conversations around the development of the students' projects enact the dialogue between museums and universities. Would you like to supervise a student or be a doctoral student at the Science Museum Group? Most of our students are supported by our collaborative doctoral partnership funded by the Arts and Humanities Research Council. Our consortium – which includes all the museums of the Science Museum Group alongside the Royal Society, Royal Geographical Society and BT Archives – currently awards six studentships per annum.

Early each summer we publish a document outlining the subject areas in which we are most interested, and arrange meetings where potential supervisory teams can discuss potential projects. This reflects the SMG's priority research areas, which are recorded as Appendix A of the SMG Research Strategy (available online), and will be regularly reviewed so that they align with the museums' forward programmes. We invite colleagues in the museums and universities to work together to propose projects that address those areas for a first-round closing date in September, and the shortlisted projects must be submitted by late November. A panel selects the best projects in January, after which the universities advertise the studentships to start in the following October. It is worth mentioning that prospective students are often closely involved in writing these proposals, and that this approach provides an alternative route to self-determined study for those who have particular interests in material culture or museums. Increasingly, we also welcome students funded under other schemes, and indeed by other funders, to work in our Research Centre and on our collections.

The Dana Research Centre and Library is the venue for a rich variety of seminars, workshops and conferences. The majority of these are also the fruit of collaborations with universities, and notably of joint research projects, whether the Group is Co-Investigator or Project Partner. We like to be involved in projects that shed light on our collections and the contexts in which they arose and were used. If you are an investigator in a planned or active project that you think is relevant to SMG's concerns, please get in touch.

The *Science Museum Group Journal* is another example of how we like to work with colleagues in the universities, and with other museums too. We see this publication as a key home for discussion on the issues and subjects that unite everyone who loves science and technology museums, including those who work in them. We are proud of the *Journal*'s mixed authorship, which unites senior faculty and early career researchers, many of whom are publishing their first article.

The Research Centre is also host to a wide range of researchers and students, all contributing to the Museum's programmes at the same time as they pursue research that will be submitted, published or performed under their own names. It is here that we undertake most of the teaching for our 'curating science and technology' ten-week option within UCL's Science and Technology Studies MSc programme. This option provides students, who may come from science or humanities first degrees, with insights into the ways in which the 'history of science' – as broadly conceived – is done in museums. The option has a particular stress on objects, the material record of the practice of science, technology and medicine in the past – including the recent past. Students learn from a wide range of case studies taught by a dozen curators, looking into the 95% of the Museum's collections not on display, and the 5% that is; and exhibitions that have been completed and remain on display, as well as those in development. We consider key technologies from astrolabes to rockets and stretchers to phonographs; students learn how the Museum goes about tackling the large-scale and unwieldy material culture associated with infrastructure or sound, for example. Some students stay on to write their dissertations with us; there is a near infinity of Museum objects that can be the focus of a long essay informed by the readings and debate across the whole MSc.

For individuals with doctorates, at whatever career stage they have reached, we have fellowship and associateship schemes that are designed to support long-term relationships and targeted research projects. Our small number of associates are fellow travellers on particular research journeys. These individuals may be spending a research sabbatical with us, or may become fellows when funding becomes available. Our fellows are supported by a variety of agencies, including United Kingdom Research and Innovation (UKRI) and European funding bodies, trusts and foundations.

People at all the different stages of academic experience described here have the opportunity to interact in the Research Centre, where the reading room and some limited 'hot desk' provision enables people to join our research culture, just as they do when they attend our seminars, workshops and conferences.

If you would like to study or research with us, please take a look at our web pages, https://group.sciencemuseum.org.uk/our-work/research-public-history, or e-mail us at research@sciencemuseum.ac.uk.

OUR TEAM

TIM BOON

Head of Research & Public History

Tim is Head of Research & Public History and a historian of the public culture of science. He is responsible for overseeing and developing the Science Museum Group's Research & Public History programmes. His exhibitions include *Health Matters* (1994) and *Making the Modern World* (2000). His first book, *Films of Fact,* was published in 2008, and he is co-editor (with Frode Weium) of *Artefacts: Material Culture and Electronic Sound* (2013). He is currently President of the British Society for the History of Science, and a member of the AHRC Advisory Board.

ALISON HESS

Research & Public History Manager

Alison supports a variety of activities in the department, including applying for grant funding and assisting others to do so, working with other research organisations to develop grant applications within the heritage sector. She also manages the Collaborative Doctoral Partnership scheme and the Science Museum's relationships with Doctoral Training Partnerships. As well as her work to support the department, Alison also runs her own research projects.

ROBERT BUD

Research Keeper

Robert is Research Keeper and an Arts and Humanities Research Council Leadership Fellow. He is carrying out a major project on the history of the concept of applied science from the fall of the Bastille to the raising of the Iron Curtain. Having previously published books on the histories of antibiotics and of biotechnology, he is now developing understanding of applied science in the post-Second World War era through a research project on the history of Britain's civil nuclear power industry. His latest book, *Being Modern: The Cultural Impact of Science in the Early Twentieth Century* (co-edited with Paul Greenhalgh, Frank James and Morag Shiach) was published by UCL Press in October 2018.

MEGAN BRADBURY

Research & Public History Coordinator

Megan joined the team in September 2018 where she is responsible for coordinating the wide-ranging activities of the Research & Public History team, including organising the programme of events, conferences and seminars, and providing support to the Collaborative Doctoral Award students, research fellows and other associates.

KATE STEINER

Editor, *Science Museum Group Journal*

Kate is the Editor of the *SMG Journal,* an open-access online publication presenting peer-reviewed articles relevant to the Science Museum and other museums within the Group. Previously Kate was Head of Audience Research at the Science Museum and has worked in Exhibitions and Learning.

RICHARD NICHOLLS

Assistant Editor, *Science Museum Group Journal*

Richard is the Assistant Editor of the *SMG Journal,* an online publication which presents the global research community with peer-reviewed papers relevant to the wide-ranging work of the Group.

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