Object Lessons and Nature Tables: Abstracts and Bios

Untangling Ohm's Apparatus
Charlotte Connelly
History and Philosophy of Science, University of Cambridge
Science Museum, London

Georg Simon Ohm first published the famous electrical law, now known simply as Ohm's law, in 1826. Ohm described his apparatus which drew on recent developments in theories of electricity and magnetism. I have sought to become familiar with his apparatus, despite the fact that the original instrument is not believed to have survived. Instead I have interacted with replica instruments held at the Science Museum in London, the Deutsches Museum in Munich and the Europa-Universität in Flensburg. I will also describe my own fledgling experiments in reproducing parts of the apparatus. My motivations for performing reproductions are to aid my understanding of the challenges Ohm faced and gain a tactile understanding of working with electricity. This is particularly valuable when studying a period where the language to describe electrical phenomena had not yet been standardised. Through this work I have been able to untangle what at first appears to be a complicated piece of apparatus, and better understand the theoretical and practical challenges inherent in its use. Most importantly, however, different parts of the apparatus provide physical evidence for Ohm's position in debates taking place at the time. While his writing may have aimed to please all parties, the instrument had to take sides.

Charlotte Connelly is a PhD candidate studying the history of Ohm's Law and co-supervised by the Science Museum and the University of Cambridge. Objects and material culture heavily inform her research. In particular she is replicating experiments first carried out by Ohm and his contemporaries, often finding evidence in museum collections as well as text-based sources. Outside of her studies Charlotte is the Curator of the Polar Museum, part of the Scott Polar Research Institute in Cambridge. Before that she was one of the curators of the Science Museum's telecommunications gallery, Information Age.

Open (the) Architectures: A hands-on approach to media and computer theory with operative archaeology
Stefan Höltgen
Department of Musicology and Media Studies
Humboldt University, Berlin

The Department of Musicology and Media Studies of the Humboldt University of Berlin hosts two media archaeological collections: the Media Archaeological Fund and the Signal Laboratory. The first collects different analogue and digital media technology from the mid-19th century until today to show how media history is driven (and told) not only by historical discourses but by the technological artifacts themselves. For this the artifacts have to be functional. Put in operation, the artifacts deny their mere historicity as present operative objects. The Signal Laboratory concentrates on digital media from the 1960s to the

1990s - especially digital computers and video games. Here teaching and research concentrates on the connection and layers of hardware and software. In both collections the artifacts are not "preserved" in a sense museums preserve their artifacts: the method of media archaeology demands that we open, analyze, modify and even destroy them to "read" their hidden epistemologies. For my presentation I will bring two objects: a toy car named "Kybernet" (engl.: Cybernaut) from the Media Archaeological Fund and the computer game "E.T. - The Extra Terrestrial" with its video game platform "Atari VCS" from the collection of the Signal Laboratory. Both will be put in operation to show how our method is working and to give examples of the media epistemological knowledge those toys "contain" and how to "excavate" it.

Stefan Höltgen - PhD (1971) - studied Linguistics, Philosophy, Social Sciences and Media Studies from 1996 to 2000 in Jena (Germany). In 2009 he did a dissertation in German Literature Studies at the University of Bonn about ‘Discourses of Media and Violence in Authentic Serial Killer Movies’. In 2008 he moved to Berlin where he is working as publicist and scholar since then. In 2011 he began a post-doc research project on The Archaeology of Early Micro-Computers and their Programming at the Department for Musicology and Media Studies (Berlin Humboldt University) which is also a second dissertation at the Center for Computer Studies (Berlin Humboldt University). He publishes and edits books and publishes papers about the history of computing, computer games and the archaeology and epistemology of media as well as reviews for video games, movies, and books. In 2015 he started a book series on computer archaeology and joined the editorial staff of the magazine ‘Grundlagenstudien in Kybernetik and Geisteswissenschaft’ (Fundamentals in Cybernetics and Humanities). He curates the annual ‘Vintage Computing Festival Berlin’.

Wax on wax off: A Matter of Method

Jenny Bulstrode
History and Philosophy of Science, University of Cambridge
Greenwich National Maritime Museum

University collections are amazingly diverse, but this in itself can make engaging with them a daunting task. The researcher is faced with an array of objects, from fine art to engine parts; and tasked with making these objects eloquent. Indeed, students like myself are not only required to engage hands-on with these collections, but also asked, again and again, to articulate exactly what it was about the experience that was useful - to justify the experience of hands in words. Wax is famous in the history of philosophy and of technology as the material through which such experience is analysed, as such it makes an apt focus for my own reflexive study. Taking a cue from the historical actors of my thesis - engineers, mathematicians, and naval officers of the early nineteenth century who dismantled clocks and compasses in an attempt to control their properties - this talk disassembles the collection by following the wax. In doing so the closed commodity form of the object is broken open and the history of production and use brought to the fore. Following the wax reveals unanticipated connexions.

Jenny Bulstrode is a Doctoral Student on an AHRC-funded Collaborative Award between the University of Cambridge Department of History and Philosophy of Science, and Greenwich National Maritime Museum. She researches the industrial context of a nineteenth century, global campaign to survey the earth's magnetism, dubbed The Magnetic Crusade. She has edited a major survey of the networks that brought optical glass making to early modern London; and published work on the importance of paper-making to the development of experimental archaeology in mid-nineteenth century debates over the antiquity of man, which was jointly awarded the BSHS Singer Prize in 2014.

You Can Only See What You Know?
Wax Moulages – Epistemic objects in research and education now and then

Victoria Asschenfeldt
History and Ethics of Medicine
University of Hamburg

Medical wax moulages materialize and transform concepts and signs of diseases on the skin in three-dimensional form. The peak of their usage in science and education has been from approximately 1880 to 1950. For medical training and research they had the advantage of not only showing the signs of diseases in life-like colours but as well in three-dimensional form. Therefore they dominated all other forms of medical imaging in dermatology till the invention of colour photography, especially since dermatology is to date mainly based on a purely visual form of diagnosis ("Blickdiagnose"). In our project we predominantly see wax moulages as epistemic objects in teaching and research as well as public education. They are not "lifelike images", as argued to date, but their production and perception are subject to technical, artistic and mental processes and influences. Seen as working-objects in the process of scientific teaching and research they open up vast opportunities to discover new insights in the history of dermatology, of certain diseases, working processes, teaching methods or role models in science. On top of that we want to find out, why moulages had and have to date the reputation of "lifelike images". We want to find out about their esthetic surplus and the ways in which they affect their viewers. We want to find out if you really only can see what you know. In my object animation I will draw up the outline of our project followed by a focus on the esthetic aspects, while combining the close look on the object with some hands on activity for some of you…

Victoria Asschenfeldt studied History, German language and literature studies and Art History in Frankfurt/Main, Lyons/France and Hamburg; 2003 M. A. and 2006 PhD at the University of Hamburg; 2006-2008 trainee in the Museum for the History of Hamburg; since 2009 freelance curator, author and adviser for public institutions and foundations; research focuses: cultural and science history, history of Hamburg/Northern Germany, museology and museum didactics; since 2014 researcher at the Institute of the History and Ethics of Medicine Hamburg.

Where There is No Vet – Management of Animal Health in their Own Hands

Alexander Bowmer
King's College London Centre for the History of Science, Technology and Medicine
Museum of English Rural Life

In an attempt to understand how a farmer would have coped with the presence of disease in the twentieth century, this object animation will examine a farmer's options when managing the health of their livestock. Providing examples of the types of medicines used, why they were used, as well as what effect these medicines would have had on their animals, on farmers themselves, and on researchers today, I will introduce the complex relationship between livestock, disease and medicines. In this presentation I will examine the dangers of handling medical object collections in the museum setting. The purpose of this animation is to demonstrate why a researcher or museum member should approach medical collections with caution. Using my own experiences, I will begin to explain the difficulties of identifying and examining potentially dangerous medicines. This demonstration will introduce you to some dangerous drugs, in a controlled environment, to emphasise how future researchers can apply the simple yet systematic approach that I have created to the handling and identifying of these materials and objects.

Alex Bowmer is a Collaborative Doctoral Award PhD candidate at King's College London and the Museum of English Rural Life. His PhD focuses upon grass-root conceptualisations of livestock diseases in twentieth-century Britain, to establish how livestock owners responded to and understood disease behaviors. My primary interest is in the use and efficacy of medicines administered to treat these diseases, and how drug capabilities have affected contemporary concerns such as Anti-Microbial Resistance. I am also a qualified Intervention Healthcare Consultant, working for over six years in pharmaceutical, emergency, and sports medicine. Over the past three years I have managed my time balancing historical research with my medical responsibilities, now currently working in the National Football League.

Discovering Ellis's barnacle

E Geoffrey Hancock
Hunterian Honorary Research Fellow
University of Glasgow

A Mediterranean barnacle described by John Ellis in 1758 was recently "re-discovered" in William Hunter's collection in Glasgow. The barnacle is where it should be, part of Dr John Fothergill's bequest to Hunter, but why was it not recovered before now? New and old attributions can be made through a mixture of serendipity and targeted research. An external force, such as a request to examine the original specimen from a revising taxonomist, could have produced the same result. In this case it was due to internal procedures including a rising interest by experienced curators investigating Hunter's place in the Enlightenment as seen through his museum collection, concerted cataloguing programmes and exhibition research. Without this the external secretions of this marine animal may have lain unrecognised and unloved for another few centuries. Interesting offshoots include an

unusual question regarding rules on Linnaean binomial nomenclature. The extent and nature of Fothergill's zoological material is a long-standing mystery, unlike his botanical collections. No catalogue, list or deed has been found. Reconstruction from individual specimens such as this presents some idea of its former glory. A small but significant number of insects have been identified recently also as ex Fothergill.

The career of **E Geoffrey Hancock** has been in curating natural history collections. Entomological research interests are mainly in Scottish island faunas and European and Neotropical forest ecosystems. One item in relation to the history of collections is a study of William Hunter's eighteenth century insect collection initiated by a 2004-5 research grant from The Leverhulme Trust. This has resulted in and continues to produce publications. The contents of Hunter's museum bequeathed to the University of Glasgow are a key resource for investigating the Enlightenment. Hancock recently co-edited and contributed to *William Hunter's World: the Art and Science of Eighteenth Century Collecting* (Ashgate, 2015).

EXPERT PANEL

Simon **Schaffer** teaches history of science at the University of Cambridge. He contributed to the exhibitions 'Empires of physics' (Whipple Museum, 1993); 'The new age' (Whipple Museum, 1994); 'N01SE: a multisite exhibition about information and transformation' (Cambridge & London, 2000); 'Anish Kapoor' (Royal Academy, 2009). He is a member of the advisory board of the Science Museum and Caird medallist of the National Maritime Museum.

David Gaimster is the Director of The Hunterian at the University of Glasgow, the largest university museum service in Scotland and the nation's oldest museum. Previously David worked in senior roles at the Society of Antiquaries of London, the Department for Culture, Media & Sport, and at the British Museum. He has published widely on European historical archaeology, material culture studies and on cultural property matters. Funding from the Heritage Lottery Fund has been secured to help create centralised access to The Hunterian's extensive collections of 1.5 m objects and specimens in a purpose-designed Collections Study Centre at Kelvin Hall, central Glasgow. The Hunterian Study Centre is the largest cross-disciplinary collections centre in the HE sector, designed to support object-based research, teaching and training. The decant of 1.5 m objects and specimens from multiple suboptimal storage pods to a modern consolidated store and study centre has highlighted a range of conservation and collections management issues in the University of Glasgow's History of Science collections. The project is enabling a collection review and rationalisation programme, involving consultation with faculty and external expertise. Other initiatives 'activating' the HoS collections include Masters curatorial teaching and PhD research projects. A new Science Showcase intervention in the main gallery suite has transformed the level of faculty and public engagement in the HoS collections and brought them into dialogue with current HE science research.
http://www.gla.ac.uk/hunterian/about/thehunterianatkelvinhall/

The Forum Wissen: Goettingen University's project to (re-)activate its academic collections

Marie Luisa Allemeyer
Zentrale Kustodie
University of Goettingen

The Zentrale Kustodie - centre for collection management - is a vital node at Göttingen University, coordinating and interconnecting its more than thirty academic collections. A key goal is to re-establish and further develop the collections as central infrastructures for object- and collection-based research and education. The Zentrale Kustodie actively encourages and supports object-based research, as well as digitisation and conservation measures. By raising and focussing on interdisciplinary issues, the Zentrale Kustodie aims at promoting an awareness among students and researchers for the epistemic potential of university collections in general, considering their objects as yielding sources for historical as well as current interdisciplinary scientific research. The Zentrale Kustodie is currently planning the installation of an object laboratory, physically combining object-exposition and object-exploration. The laboratory will be designed to activate the academic collections for interdisciplinary object-based research and education, as well as to stimulate an academic and non-academic public to investigate the social, political, or cultural dimensions of science in the making. The Göttingen Object Laboratory will serve as nucleus for the university museum Forum Wissen, which is currently in the design phase and will open in 2019.

Marie Luisa Allemeyer is director of the "Zentrale Kustodie" (Centre for Collection Development) at the University of Göttingen, and has been Managing Director of Göttingen's Graduate School of Humanities. She was Academic Coordinator of the International Max Planck Research School "History and Transformation of Cultural and Political Values in Medieval and Modern Europe" at the Max-Planck-Institute for History (2005-2008). Trained in history, hispanics and cultural anthropology, her PhD (University of Kiel, 2006) was a study on the mentalities of coastal societies in the Early Modern. She has also published on mental and technical strategies for coping with urban fire in the 17th century. The focus of her current interest lies in the broad field of academic collections, their history, multi-faceted and multi-layered meanings and their employment for research, teaching and outreach activities of universities.

Experimenting with new paths for a social and cultural mediation of science at the Jardin des Sciences

Sébastien Soubiran and Delphine Issenman
Jardin des sciences
University of Strasbourg

The Jardin des sciences of the University of Strasbourg is currently involved in a most challenging project of renovation of the zoological museum. Managed both by the University and the city of Strasbourg, this museum was built within the University at the end of the 19th century at a time when Alsace was German. The challenge for us is not to build a new science museum or natural history museum, but rather a new type of museum, in which

natural science can be put in context of its production and uses: in the production of knowledge and in education, but also in constructing, challenging or reinforcing social and political order. For this project, we are convinced that the main assets of university museum rely on their ability to construct strong relationship with current human and social science research - and especially science studies- with their will to challenge the traditional division of disciplinary organisation of museums and to offer an alternative discourse in public debates. In this paper, I would like to share and discuss the methodology and project tactics that have been developed so far in order to create a new generation of natural science museum.

Sébastien Soubiran is deputy-director of the Jardin des sciences, a cultural department of the University of Strasbourg in charge of science outreach. He trained as a physicist and an historian of science in Paris (Centre Alexandre Koyré) and Oxford (Museum of the History of Science and Faculty of History). His research combines the social history of twentieth century physics and earth science, the relationship between the scientific community and their heritage, as well as the management of university heritage in France. He teaches history of science, history of museums and scientific heritage management in master classes in Strasbourg. He is currently secretary of Universeum Executive Committee.

Working with history at Manchester Museum: past, present, future

Henry McGhie
Manchester Museum
University of Manchester

As a Head of Collections, I work with zoologists, historians, environmentalists and more. I will be speaking about what historians in particular bring to this mix, and my experience of collaborating on two research-based exhibition projects at Manchester Museum: *Turing* (2012) and *Breed: The British and Their Dogs* (2013). In zoology, there are a range of different curatorial approaches to research, and to understanding collections: I will draw on my research into 19th Century ornithologists and in particular Henry Dresser, to give some examples. Finally, how can history influence the future for the better? I will outline some of the climate change engagement activities we have spearheaded at Manchester Museum.

Henry McGhie is Head of Collections and Curator of Zoology at the Manchester Museum of the University of Manchester. He has worked extensively in museums and has effected field work on upland birds as a zoologist. He says: “When I was about 20 I discovered that behind-the-scenes collections had great potential for illuminating historical ecology. I have worked in museums as they have undergone radical change. I embrace new challenges and opportunities, and am more passionate about nature, museums and personal choice than I ever was. I have high standards and work to get the best from people, having managed and led teams of people for a number of years. I aim to make a positive difference through my work, helping people and collections fulfil their potential of a better future.”

Putting the Museum back into Natural History Museums

Mark Carnall
Natural History Museum
University of Oxford

University natural history museums are new ground for social science and humanities research on the collections, histories and cultures. Natural history museums are a core part of the early modern history of material culture but as the sciences become disciplines in their own right, natural history museums and science museums become scientific institutions first and museum spaces second. Their history diverges from art museums and archaeological museums and only now with a remit for broader audiences and users as well as with newer generations of collections managers are they opening up/actively soliciting use, knowledge and skills needed from outside of scientific departments. Traditionally staffed by researching scientists, interest in specimens has primarily been as points of data or props for display. To varying degrees the objects and institutional histories and research into specimens like models, casts, lantern slides, replicas and interpretation are largely poorly recorded or explored. Because the significance of the collections, with rare exceptions, is unrecognised, these collections remain hidden and unstudied. This paper looks at categories of science collections which have literally dodged the skip but now are useful collections for research, teaching and study outside of science. At the Grant Museum of Zoology and at the Oxford University Museum of Natural History, Mark Carnall has been working with academics, students and practicing artists outside of the sciences in using the 'unusable collections' which starts with highlighting these specimens in exhibitions, displays and online.

Mark Carnall is the Collections Manager (Life Collections) with responsibilities for the vertebrate and invertebrate (non entomological collections) material at the Natural History Museum of the University of Oxford. In addition to managing collections he lectures on biology, palaeobiology and museological topics. His research interests are digitisation in museums, public engagement and natural history, sector wide advocacy for collections, models, casts and replicas as well as the implications of 3D printing on museum collections. In addition to collections management, Mark contributes to public engagement for all age groups -- from stand-up comedy about natural history museums through to lectures, informal talks and workshops.

Is it the International Year of the Frog? How a well-used teaching model can be a catalyst for new research

Rosanna Evans, Henry Schmidt and Liba Taub
Whipple Museum of the History of Science
University of Cambridge

A member of the Department of History and Philosophy of Science recently asked, 'Is it the International Year of the Frog?'. In 2015-16, a large anatomical model of a frog, made in England in the mid-twentieth century was transferred from the University Museum of Zoology at the University of Cambridge to another University museum, the Whipple Museum of the History of Science, and installed in a brand-new case. Having done decades of diligent work

as a teaching model, now that space was tight at Zoology, it was deemed fitting to retire the frog model to the Whipple, to be enjoyed by visitors, and studied by students in HPS. The Whipple has around 30 models of frogs. The display of Wh. 6599 suggested that frogs in history of science might be an interesting addition to our *Explore* website. Our 'Frogs in History of Science' project provides opportunities to reflect on questions posed by the conference organisers: How do we approach material culture of science? How do collaborations between curators and historians of science function in university contexts? Are there examples of innovative research conjoining university collections and historians of science? When do teaching and research come together in collections contexts?

Rosanna Evans, Learning Coordinator at the Whipple Museum of the History of Science, completed her undergraduate degree in English and History at Leeds University, and is nearing the end of the Museum Studies MA at the University of Leicester. She began her museum career as a work experience student at the Whipple. Henry **Schmidt**, with an undergraduate degree in Art History from Williams College (USA), shared the Jennifer Redhead Prize for the best MPhil essays in HPS in 2015-16. He is the Frogs in History of Science Intern. Liba **Taub** has been Director and Curator of the Whipple Museum since 1995. She is co-author (with Joshua Nall) of 'Three Dimensional Models', *A Companion to the History of Science*, ed. Bernard Lightman (Wiley-Blackwell, 2016): 572-86.

Retracing historical practices at sea: navigating between instruments and archival materials

Emily Akkermans
University of Edinburgh
National Maritime Museum

How chronometry was practiced at sea and how these practices developed within the early nineteenth century is the main theme of this CDP project. After initially developing in the eighteenth century, the chronometer came into widespread use within the nineteenth century. Horological research has focused on its technical invention and development, side-lining the development of on-board practices. This project hopes to address this gap by retracing links between instruments and archival material held within the collections of the National Maritime Museum and other repositories including The National Archives, The Hydrographic Office Archive and the Cambridge University Archives. Nine surviving instruments and the archival material relating to their deployment on specific exploration voyages will form the empirical evidence for the research. A vast amount of these documents are a direct result of the voyage and consist of published journals, officers logbooks, correspondence, charts, signal books and ship muster books. Additional materials include contemporary instruction manuals, navigational manuals and workbooks and publications concerning chronometry.

Emily Akkermans is currently a second year Collaborative Doctoral Partnership student working under the supervision of Charles Withers at the University of Edinburgh and Richard Dunn at the National Maritime Museum. The thesis will focus on nineteenth-century navigational methods at sea, entitled 'Chronometry and Chronometers on British Voyages of

Exploration, c.1815-c.1872'. Her research interests include maritime history, horology, scientific instruments, history of exploration, and history of science and technology. She holds a MA and BA in Conservation/Restoration and has previous vocational training as a clock restorer. Prior to the PhD program, she held an internship within the conservation department at the National Maritime Museum.

Instruments of Science and of Music: The tradition of teaching acoustics at the University of Edinburgh and the collection of Professor John Donaldson

Jenny Nex (co-authors: Dr Michael Newton, Professor Arnold Myers, Dr Christopher Field)
Curator, Musical Instruments Collection, Reid School of Music
University of Edinburgh

The Reid School of Music at the University of Edinburgh was established in the 19th century. John Donaldson was the fourth Professor but the first to spend any length of time in post (1845-65). He oversaw the building of the Music Class Room as well as a Museum populated with instruments and acoustical apparatus. Archives survive concerning Donaldson's acquisitions due to the court cases he brought against the University to make them fulfil the requirements of General Reid's original bequest. The current fertile environment in musical instrument scholarship has developed since the 1960s with the formalisation of the musical instrument collections (now MIMEd) and a revived interest in acoustics within the Physics Department which has expanded to become a productive focus for research on the physics of instruments and related topics. Some of Donaldson's collection remains in the University and in the Scientific Collection of the National Museums of Scotland. Of note is Donaldson's apparatus for demonstrating standing waves, named after August Kundt, but commissioned 10 years before Kundt's results were published. This presentation will examine Donaldson's work and discuss how this informs us about acoustics teaching in mid-nineteenth century Scotland, as well as the work of his modern counterparts.

Jenny Nex studied music at the University of Edinburgh and voice at the Guildhall School of Music and Drama. She gained her MA in Museum and Gallery Management from City University and her PhD entitled 'The Business of Musical-Instrument Making in Early Industrial London' from Goldsmiths College. In 2005, Jenny took over as Curator of the Museum at the Royal College of Music and in 2013 moved to a similar role at the University of Edinburgh. Jenny's research centres on the business and economic activities of musical instrument makers working in London in the 18th and 19th centuries.