

The Public History of Science, Technology, Engineering, and Medicine (PHoSTEM)

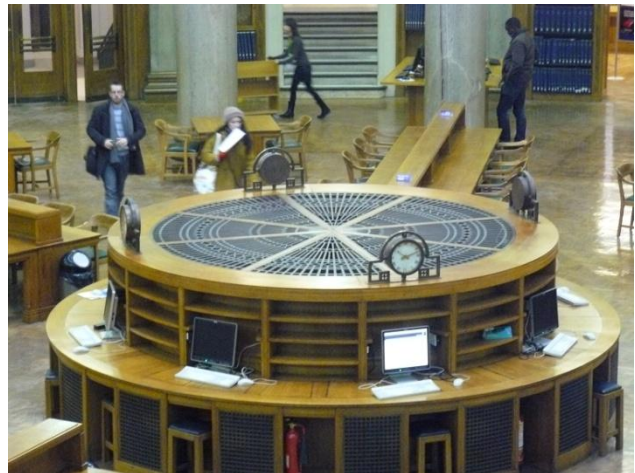
An AHRC-funded Research Network between
The Science Museum,
The Institute for the Public Understanding of the Past,
and The University of Leeds.

“PHoSTEM Workshop: University Engagement with Museums and Audiences”

Workshop organised and hosted by
The Centre for History and Philosophy of Science, University of Leeds

On Friday the 18th January 2013, the workshop entitled “University Engagement with Museums and Audiences” was held at the Brotherton Library, University of Leeds.

“The Public History of Science, Technology, Engineering and Medicine: Prospects and Issues” Research Network is funded by the AHRC. It aims to develop a community of interested practitioners and scholars concerned with effective communication between HEI practitioners of the history of science and lay people, with a special emphasis on museums. How might



academic researchers work with museum practitioners to broaden engagement in the History of STEM? The Leeds workshop was organized to focus on university research, and to explore in particular how university humanities scholars, especially in the history of

science, technology, engineering and medicine, can engage most effectively with museums, their collections and their visitors, and thereby gain impact for research. The meeting also discussed how the diversity of academic approaches to audiences and consumers might provide insights into the nature of impact and public engagement.

Dr Tim Boon, Head of Research & Public History, The Science Museum, London



Dr Tim Boon, Head of Research and Public History at the Science Museum, began the event by commenting on the high attendance despite the adverse weather conditions which had unfortunately prevented one of the speakers, Dr Iwan Morus of Aberystwyth University, from attending. After welcoming the delegates and speakers, Boon thanked the AHRC for funding the workshops, Professor Helen Weinstein for bringing in IPUP as a key collaborative partner, the Centre for History and Philosophy of Science at the University of Leeds for

hosting, and Dr Claire Jones, Director of the Museum of the History of Science, Technology and Medicine, University of Leeds, for organising the programme of speakers.

Boon then recapped some of the core concerns raised in his introduction to the first workshop in York on the 7th December 2012. These included;

- the growing sense that museums had lost confidence in the inherent interest of their collections;
- that there is an absence of social survey data on public attitudes to the history, specifically, of science and technology;
- that the emphasis on impact and knowledge exchange criteria within funding regimes can provide opportunities for developing more interesting work on and with the public.

Reflecting directly on the York workshop, Boon reminded those in attendance that the organisers wanted to promote discussion between speakers and delegates and that plenty of time had been built into the programme to facilitate discussion. He then returned to a point made by Professor Ludmilla Jordanova at the York workshop about terminology and the necessity to clearly understand the definitions of the terms used.



The two specific terms mentioned were ‘public history’ and ‘science’ and Boon elaborated on both of these. In addressing the question “What is public history?” He quoted a definition from the Wikipedia entry which he described as a ‘broadcast’ definition of public history, as the “broad range of activities undertaken by people with some training in the discipline of history who are generally working outside specialized academic settings.” This broadcast definition is insufficient, he stated, as it neglects the importance of reception. If we are to examine what public history is, we need to take account of how everyone consumes history, especially when we are talking about lay audiences who may also be experienced researchers. We must also consider the fact that there are more styles of history than may always be recognised in the Academy.

Moving on, Boon noted that we often use the term ‘science’, as a portmanteau term which needs to be deconstructed; that we need to remember that its elements are not homogenous. He proposed that we need to keep physical science distinct from technology, maths, medicine and the rest, recognising that their gathering together is historically contingent; in other words, that the contents of the portmanteau have changed over time. He stated that it was important to use these terms with care, especially in relation to ‘public history’, where the lay experience of the history of each – science, technology, engineering and medicine – may differ radically.

**Professor Helen Weinstein, Institute for the Public Understanding of the Past (IPUP),
University of York**

Professor Weinstein then continued the introduction by returning to Dr Boon's focus on the importance of active discussion and his suggestion that the workshops should continue to link together continuing themes across the three events. This also involved a recapitulation of some of the issues raised during the first workshop.



The first event, organized by Helen Weinstein at IPUP, had been entitled “Cultural Change, Material Culture and Public History - Understanding Involvement, Participation, and Widening Public Engagement” and it sought to examine how those who work professionally with history and archaeology in a PHoSTEM context can widen public access to collections in meaningful ways. The workshop in York took a series of thematic case studies from a range of industrial and technology museums, from the National Railway Museum, Beamish Museum, Tyne & Wear Archives and Museums, Ryedale Folk Museum, and the Science Museum. This provided an opportunity for exploring the motivations of those who actively participate with collections and archives. From those case studies some very useful primary material emerged with which to re-examine the role of expert volunteers and their involvement as co-researchers, co-curators, stakeholders, and enthusiasts. These individuals support heritage institutions by offering their specialist knowledge and commitment. Their relationship is changing as museums democratize access to collections and share their curatorial voice.

The key understanding that had arisen from that workshop, Weinstein reflected, was that it is possible to use these case studies of participatory practices of public history and identify that they are examples of public history in practice. Weinstein asked that we should also think about how we may collaborate and work better to create a participatory ethos and

scale up niche participatory projects so they may meet the needs of wider audiences to engage with the science, technology, engineering, and medicine collections. The interest of the Science Museum in developing and ‘scaling up’ the visceral and emotional experiences of a small group of volunteers to include wider audiences was noted.

After summarising reflections and thoughts taken from the first workshop, Weinstein offered a framework through which we can better understand what good practice of public history is. Good public history has to be ‘history *with* the public’ and Weinstein defined this as what was happening at the first workshop. The communication and reflection based upon the case studies of participatory practice allowed for analysis of schemata that have developed positive and equitable relationships with the public.

Concluding her introduction, Professor Weinstein expressed a concern highlighted by her experience in the media sector. She felt that the university sector’s tendency to treat public engagement as a bolt-on to pre-determined research projects was worrying and hoped that institutions are now moving toward using methodologies in public history that integrate values of public engagement. Acknowledging the problematic nature of this route, Weinstein concluded by suggesting these developments will take time but the fact that university funding criteria now increasingly requires participatory methodologies would hopefully generate interesting discussions throughout the course of the workshop.

Professor Graeme Gooday and Dr Claire Jones, Centre for the History & Philosophy of Science, University of Leeds

Weinstein then handed over to Professor Graeme Gooday, Professor of History of Science and Technology at the University of Leeds, and Dr Claire Jones, Director of the Museum of the History of Science, Technology and Medicine, University of Leeds.

Gooday began by emphasizing the importance of hearing the delegates' views about how universities and museums can collaborate. Gooday cited PhD collaborations at the University of Leeds with museums such as the Thackray Medical Museum, Leeds City Museum, the National Maritime Museum, and the Porthcurno Telegraph Museum. Looking beyond the collaborative PhD model he added that he was keen to encourage discussion on the variety of ways in which universities could work in research-based partnerships with museums. He then outlined the schedule for the day and invited delegates to take time to view the display cabinets within the room, which included objects from their new Museum of the History of Science, Technology and Medicine.



Dr Claire Jones then provided more detailed information on these displayed collections.



After informing us about the larger holdings, including thirteen scientific collections, Jones described how the collections on view had been curated to engage with the themes of the workshop. Instead of focussing on inventors or heroisation, the selected items sought to reflect the interests of the audiences who engage with them. These included lesson books, patient and medical case books, public information posters and natural history artefacts. The museum works with twenty volunteers who are all Undergraduate, Masters-level, or PhD students who curated

the exhibition under the guidance of Jones and the museum's curator Dr Emily Winterburn.

Session One: Approaches to Audiences in the History of Science, Technology, Engineering and Medicine

The first session of the workshop was entitled 'Approaches to Audiences in the History of STEM' and was introduced by Dr Tim Boon. Boon spoke about his aim for this meeting as one that would enable an interdisciplinary discussion about different types of museum users and how they have been theorised, studied and written about in a PHoSTEM context. Following on from this, Boon introduced Professor Graeme Gooday, whose presentation was entitled 'The Ambivalent User and Visitor: Creatively Problematizing the Engagement with Technology'.

Professor Graeme Gooday (University of Leeds): The Ambivalent User and Visitor: Creatively Problematizing the Engagement with Technology

Gooday offered an account of an approach that he has found useful in collaborating with museums when thinking about how research perspectives can inform fresh approaches to displaying technologies in a way that better engages visitors. This focused on conceiving museum visitors not as passive admirers of technology but as users of technologies and often highly ambivalent in their relationship with them. This created the prospect of inducing a range of emotional responses from the audiences so that they spent longer in a more productive and thoughtful engagement with objects on display.

Gooday then gave examples from his own work, showing two pictorial examples that displayed past forms of emotional response to the installation of electricity: anxiety about risks to the body and enchantment at the magical powers it could bring. He then extended this discussion to the development of hearing aids. Gooday suggested that by tapping into these sorts of emotionally varied



experiences of technology, institutions might unlock pathways into successful visitor engagement. It is here that a dialogue between institutions can produce benefits and

universities can learn a lot from museums, not only in the terms of the skills of those working with the collections but the types of themes about emotional interactions with technology that a collection can open up. This is a two-way process and what academia – and historians in particular - can provide, are interesting reflections from recent research that busy practitioners may not have the time to read. He reiterated the need for seeking collaborative opportunities and that the reciprocity of the engagement between the museum and visitor is mutually beneficial. Although it may seem trite to some to make these observations, he stated, the need for reciprocity in such work could not be over-emphasized.

In the next part of his presentation, Gooday contrasted this configuring of visitors as users of technology with worst-case scenarios where collections become mausoleums of defunct hardware, either shrines to heroic inventors or even sometimes to the alleged power of progress itself to develop new technologies independent of human intervention. The emphasis of this criticism was the distance these scenarios created between visitor and collection. In cases where the admiring gaze is presumed, the audience feels deferential and uncreative, and unsurprisingly finds little scope for thoughtful engagement with the displays.

One inspiration for Gooday, in thinking about the range of user-centred responses to technology, was the history of technology for personal use, rather than the inventor- or



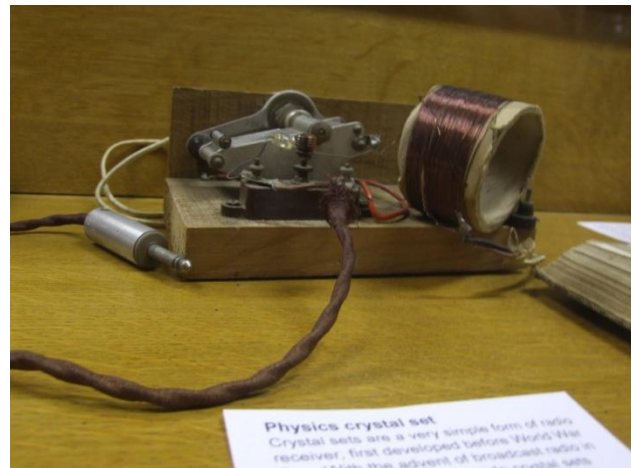
engineer-focussed exhibits which stop at the gestation or creation of technologies. One key text he cited was Nellie Oudshoorn and Trevor Pinch's *How Users Matter* (2003). Their examination of diverse reasons for and ways of using technology, as well as the modes of non-usage, informed Gooday's own research into the use and non-use of hearing aid devices. Exploring the motivations for use and non-use allows the researcher to evaluate a user's value systems and emotional responses to open up a more nuanced approach for audiences to understand the complex trajectory of a

technology throughout history. Gooday highlighted the Riverside Museum, Glasgow, as the

best example of this model because the museum exhibits their collections based upon user experiences, often with rather subversive and mischievous stories, and so present a much more appealing approach than traditional ways of presenting technology.

Moving on, Gooday spoke about his own work, specifically the 'Domesticating Electricity' project which produced a published volume in 2008 and focussed on the anxieties and gendered user experiences of electricity between 1880 and 1914. One of the outcomes of this study was that early representations of electricity were anthropomorphised as faeries or sprites. This aspect of the study helped practitioners at the Bakken Museum, Minneapolis, understand why their collection of printed ephemera contained so many images of electricity depicted as sprite, fairy, angel, genie, imp, wizard or servant. It also aided museum engagement with the public as workshops involved participating children dressing up as wizards and fairies to explore past experiences of electricity.

The next project he spoke about was the AHRC-funded, Leeds-based project in collaboration with the University of Bristol: 'Owning and Disowning Invention'. Part of this project focussed on the patterns of patenting, and also non-patenting in electrical technologies of the pre-First World War period. It also examined the interesting questions that are raised around how patents were used to create legally-grounded histories of the devices' invention, and also robust identities for their inventors. The issues for museum display that arise from this study concern the ways in which audiences might be interested in



the diversity of reasons for patenting an invention, such as a desire to monopolise a whole industry or, at the other end of the spectrum, to protect the rights of an individual inventor from predatory companies. This will be further explored in an impact-centred AHRC-funded 'Follow-on' project 'Innovation in Combat' which will support museums and archives in examining how telecommunications devices were patented during the First World War. He gave an example of a patent for the 'Fullerphone' presented during 1916

which wasn't published until the war had finished, in 1919; this case of a 'secret' wartime patent raised a number of issues or audiences about how to connect to an object through the lens of the patent.

Continuing the subject of user perspectives, Gooday spoke about the collaboration with the Thackray Museum, Leeds, which is the largest medical museum in the UK and includes some of the British Audiology Society's collection of hearing aids. He showed some pictorial examples of patented and unpatented hearing aids, including an ear horn dating to 1916 that was owned by a family member whose hearing was damaged when his plane was gunned down during the First World War. This, along with other examples of hearing aids disguised to spare user embarrassment, or ostentatiously decorated to display the user's wealth, exhibited the range of aesthetic/emotional connections with which hearing aids might be displayed in a museum. In particular, Gooday suggested that by examining the themes of gender, power, guilt, and embarrassment in the advertising for hearing aids, study of the changing cultural attitudes and emotional response of their users could create narratives to enrich the visitor's experience of collections relating to less commonly celebrated devices.

To conclude his presentation, Gooday suggested that academic researchers can bring out approaches and narratives that have previously been unexplored in museum collections. At the same time, museum staff can help researchers reveal features of their story in little documented artefacts that are unavailable in traditional academic sources. To end the presentation, he returned to his earlier suggestion that through focussing on modalities of the usage and non-usage of technologies great strategic value can be found for combined museum and academic narratives to better engage the visitor.

Dr Jonathan Topham (University of Leeds): Readers of the Book

The second speaker of the session was Dr Jonathan Topham, Director of both the Centre for History and Philosophy of Science and The Centre for the Comparative History of Print at the University of Leeds.

A specialist in 19th century popularisation through print, Topham began his presentation, entitled 'Readers of the Book', by expressing his interest in the intersections between the history of science and the history of print. He asked the question, 'why are we talking about books in the context of a workshop which is primarily about museology?' Books, he said, are objects too, and we often have to remove the barrier that impedes us identifying them as visually stunning artefacts as well as objects that contain physical



evidence of the historical processes of their manufacture and distribution. His choice of slides illustrated this point as the delegates were shown an image of a 4ft hand-coloured geological section within a book and some printed ephemera. Linking with Gooday's emphasis on the relationships between users and technologies, Topham drew on the comparable relationships that are formed with printed works, viewing them as paper technologies that can reveal changing historical usages. He addressed the history of the use of scientific books by dividing it into two strands.

The first of these strands shows that the use of printed objects is a key part of the work of science and therefore it is crucial that we understand the users of these objects. Topham, quoting an extract from Jan Golinski's *The Theory of Practice and the Practice of Theory* (1990), acknowledged that there has been a growing awareness in recent years that the thinking that scientists do, rather than being entirely cerebral, is also a "practical activity, intimately bound up with other kinds of doing." One of these activities can be identified as the act of reading. This would involve not just examining what, when and to what effect scientists read but also examining how scientists read. He used Charles Darwin as an example of a scientist whose notebooks and marginalia had been subjected to intense

scrutiny to produce a picture that shows that practices of reading, writing and theorising are intimately linked.

Topham also stressed that Darwin's reading practices were learned: that social context informed his behaviours and thinking. Some of these aspects of Darwin's reading, Topham argued, receive little attention. Questions about how he read, made notes, stored and used book are neglected, as are the questions about where he learnt these practices, how and when they changed, to what extent where they shaped by peers, and in what way they shaped his scientific work. They are all crucial in defining and getting a better understanding of the way user experience is affected regarding paper technologies.



Topham stated that it is not just in theorisation that books impact on the work of a scientist. They figure prominently in the practical activities in relation to fieldwork such as the use of star catalogues, stratigraphic maps and the use of floras in botanical observation. Often the reading of books and the reading of nature are carried out in relation to each other. Quoting from Lorraine Daston and Peter Galison's *Objectivity* (2010), Topham argued that such processes are required to 'make the science'. The user of the printed work learns how to read nature through the stabilised descriptions and pictures found in the work. The observer therefore learns how to see nature as a competent member of the community of scientific observers and is able to see what is new or different in relation to the existing taxonomies.

Moving onto the second strand of his argument, Topham acknowledged that it wasn't only practising scientists that read scientific publications. For historians of science, an understanding of how knowledge claims come to be made as a result of the material practices of scientists working in laboratories, hospitals or the field must be combined with

an understanding of certain processes. These include a necessary understanding of how these claims depend on prior circulation of other such claims, how they are framed within the requirements of their communication, and the processes of production and reading by which they come to gain wider acceptance. The printed form had been a pivotal role in the development of these processes and the establishment of scientific claims. Topham listed the academic article in the modern period as the 'blue ribband technique' but emphasised the crucial role that monographs, treatises, textbooks, manuals, popularisations and a range of journalistic forms had in the dissemination of scientific claims.



In order to understand the development of science the modern historian of science should be sensitive to the wide range of printed works in circulation and the reactions of their users. Topham strengthened his argument by using the assertion made by Polish microbiologist Ludwig Fleck in his study *The Genesis and Development of a Scientific Fact* (1935) that scientific facts come into being through the process of simplification and the routinisation that occurs when converting content to textbooks and handbooks.

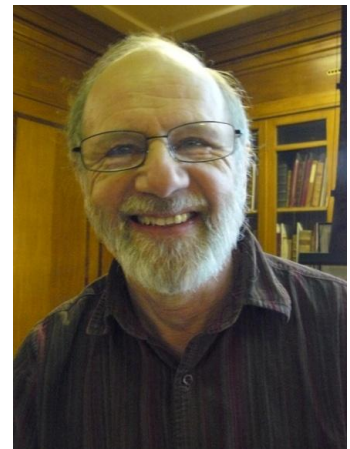
Expanding on this Topham said that textbooks and formal pedagogy have a key role in shaping scientific disciplines, yet many historians have neglected the study of textbooks and their readership. In order for scientific, medical, or mathematical knowledge to become centrally embedded in human culture it has to become embodied in the practice of everyday life. It is in regard to that statement that Topham posited that historians learn to think of printed culture as more than a tangible product of cognitive processes. They should take into account the variety of handbooks, manuals and trade journals that were read by practitioners as a way of understanding how they became embedded in our cultural, scientific, and practical progressions through history. Topham concluded his presentation by talking about the implications of this for the museum. He returned to an earlier point of his to foreground the importance of viewing books in relation to processes of scientific research and to not think of them purely as products.

Session 2: Broader Approaches to Audiences

The second session of the workshop, entitled 'Broader Approaches to Audiences', was introduced by Professor Graeme Gooday. He introduced the first speaker, Professor John Corner who is Visiting Professor in Communication Studies at Leeds University, whose presentation was called 'Studying audiences in media.'

Professor John Corner (University of Leeds): Studying Media Audiences

Corner began the presentation by arguing that there can be at times a suggestive parallel between work on museum culture and work on media audiences. He also acknowledged that the two sectors work towards different agendas at times. Museums focus on aspects of audience research that aren't central to the media agenda, and similarly, the media sector conducts audience research with a focus that is not specifically relevant to the agenda of museums. He then spoke about his own work into audience research as being sporadic as he has carried out a range



of audience research over a period of thirty-five years. He gave three examples of periods of intensive research that he was involved with. The first examined the public perception of nuclear power with TV audiences post-Chernobyl. The second example was a detailed survey of economic reporting and people's perceptions of economic news on the BBC and ITV. The third focussed on non-news political material, specifically political comedy on TV, web, and print formats.

Several different phases and strands have developed throughout the history of media audience research, the origins of which can be dated to the 1930s. Each of these strands, Corner said, has its own working methods and concepts that attempt to explore different aspects of audience behaviour. He acknowledged that there are connections between methods but largely there are disjunctions between strands which include a degree of

mutual indifference. He drew on examples of academia where this can be found, stating that it is often the case between continuities in academic work where there are various disciplines yet they rarely pay much attention to one another due to the energy needed to focus on one's own field.



Corner then listed and addressed key strands that have developed within media and academic audience studies and how they relate to museum studies. The first of these strands explored the influences of research which focuses on the public impact of programming. This type of research, he stated, dated quite far back and would seem remarkably general for a contemporary researcher but aspects of it still remain. It was driven by the pathology of the media and broadly concerned about the political and social influence of the media. The second of these, the uses and gratifications strand, looked at what audiences were doing with the media. This was a more positive shift in audience research regarding its motivations for investigation as it sought to examine what satisfaction media audiences take from the media they engage with.

The criticism that Corner gave of this strand was that it can be too psychologically focussed and as a result it is less socially and culturally aware. The next strand, one that Corner identified himself with, examines how media audiences understand media output and how they relate to it from the perspective of their own lives. The emphasis, he stated, is on audience comprehension and evaluation informed by the two disciplines of sociology and humanities. Corner gave examples of this strand of study such as Ien Ang's *Watching Dallas: Soap Opera and the Melodramatic Imagination* (1982) and Janice Radway's *Reading the Romance: Women, Patriarchy, and Popular Literature* (1984). The fourth and last of the strands Corner listed is what he referred to as being more sociologically ambitious. This strand, like the third, is still very present in research but has a much more ethnographic

focus as it centres on the domestic spaces, settings and technologies that media is experienced through.

He then moved on to discuss the partial convergence between academia and the media industry's own audience research which is extensive in its study into demographic ranges, perceived problems, quality output and levels of satisfaction of specific audiences. The academic agenda and the industry agenda often struggle to run in tandem.



There is some overlap suggests Corner but the industry wants to acquire intelligence that will inform its own programming whereas the academic agenda is driven by a range of sociological questions.

Linking back to themes that had come up in Dr Jonathan Topham's presentation, Corner spoke about the centrality and awkwardness of the form and content division. Defining content as the substantive aspect of media output, and form as the use of language and image involved to frame the content, Corner suggested that depending on which aspect is given precedence, studies reveal very different outcomes. He cited research into violence as an example of the form/content difference, where representation of murders (several each evening on most television channels) can have little impact on the viewer at all given a strongly stylised portrayal but lesser violent acts can have high impact due to their 'realist' organisation as images and sounds.

Corner then spoke about how his approach to audience research has differed from a more sociologically-focussed method because he wanted to explore how form, narrative structure, and the use of symbolism are employed. Principal methods of audience research included forms of experimental design which draw on the social-psychological tradition. This involves showing extracts and interviewing audiences in controlled settings, raising questions about how 'natural' the responses might be. Other approaches include forms of

survey research, focus group discussions, viewing diaries, and web-based collections of data and comment, including from existing media discussion sites. There is an increasing view that both quantitative and qualitative research have equal value, especially in combination, but issues of scale in relation to data still causes problems. For example, discussions about how large a study has to be before specific claims about audience behaviour can justly be made still continue.

To conclude his presentation Corner spoke about the current profile of media-audience studies. He felt that there is now a richer and more complex sense of how the media work. This is exemplified in the studies that look into fan culture, forums and blog sites as a way of identifying a greater understanding of meanings generated by the media. Returning to his earlier point, Corner said that there is a wide range of discipline-based or media-based enquiries that aren't connecting as often as they might. He felt that there could be more events like the PHoSTEM workshops which seek to promote discussion and collaboration between disciplines in relation to audience research.

Kate Steiner (The Science Museum Group): Studying Science Museum Audiences

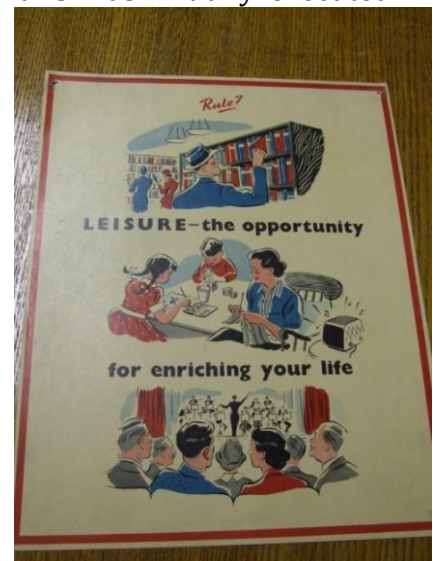


The next speaker was Kate Steiner, Head of Audience Research and Advocacy at the Science Museum Group. The title of her presentation was 'Museum Audience Response' and aimed to inform the workshop of the type of audience research undertaken by the Science Museum and create a discussion about where that is relevant to practitioners in other disciplines.

As an introduction Steiner explained that the Science Museum Group consists of The Science Museum, (London); The Museum of Science and Industry, (Manchester); The National Media Museum, (Bradford); The National Railway Museum, (York); and The National Railway Museum (Shildon).

The Science Museum Group's audience research unit is one of the oldest and largest in the UK and is exemplary of the importance placed on the centrality of audience experience by the Science Museum Group. Steiner then outlined three types of audience research that they carry out and the ways in which the findings are put to use. She emphasised that although they employ academic methods they are museum-based and therefore practical application and adaptation of their findings is crucial to their discipline. Audiences are our business, she said, and as of the 1983 Heritage Act museums are legally obliged to engage the public and their enjoyment of collections. It is also part of their mission to have a dialogue with people and to remember that they are publicly funded to a very high percentage. Their aims, as Steiner outlined them, are to develop exhibitions, web-resources and events that are engaging, inspiring and memorable for the intended audience.

One of the ways this can be better achieved is through using high quality research to better understand audiences. The first of the methods she outlined was profiling. This seeks to gather data on who the audience is and who is coming to the museums. It is a large quantitative exit-survey that profiles 100-people a month and is carefully sampled due to varying patterns of attendance. Steiner spoke about how this was initially executed in coordination with the marketing department and worked with volunteer staff but is now commissioned to an external company due to the scale of the survey, a practice that many museums use. The findings have revealed that visitor numbers are nearing 3 million annually, 57% of those are families, the audience is 73% British, audiences are equally gendered, average dwell time within the Museum is 2 hours, 34 minutes, and gallery dwell time is roughly 10 to 11 minutes per gallery. Steiner then spoke about what can be done with this data. This included developing a plan focussed on which audiences you want to grow and which you want to 'cherish' or maintain.



The second method of better understanding audiences that Steiner spoke about was researching engagement of audiences. This seeks to examine what happens to people when they encounter exhibitions. She spoke about the difficulties of this research as it involves people's lives and experience, not just their behaviours, yet she felt there is a lot museums can do to think about, and therefore influence the kind of engagements that happen in an exhibition. What can be done, Steiner said, is to think about what we don't want an audience to experience. This includes creating an oppressive and authoritative voice which isn't conducive to audience learning and enjoyment. It can't be boring or too similar to other kinds of experience that are didactic and don't engage the audience.

Theory, Steiner advocated, can be really beneficial as it can aid in the understanding of how people learn and respond to different types of knowledge. To emphasize this point she made reference to Lev Vygotsky's *Social Development Theory* (1962) which identified learning as a social endeavour and that is particularly significant in relation to museums where 80% of people attend in groups. Theory suggests that they learn better and engage more when they can create dialogues within a group where individuals have varying levels of knowledge and can assist and inspire each other in learning. Knowing this can help you construct exhibitions and displays that encourage social learning.



Continuing the subject of research engagement, Steiner spoke about the ways of growing the discourse around successful practices. This includes creating a library of understanding about what engages different audiences so that mistakes aren't repeated and positive actions can be continued. Speaking directly to the theme of the next workshop, Steiner talked about their current work that involves building up an understanding of how audiences engage with science objects. She mentioned that there is ongoing research about this which reveals that audiences can find functional and mechanised scientific objects that aren't functioning in the museum setting harder to engage with.

All this information can be used to inform future exhibitions. The key agent for that is an Audience Advocate who has knowledge of past data and who works from the start of a project to inform and shape it. It also allows for exhibition teams to be trained in audience awareness, the development of learning outcomes, co-curation, and public engagement activity, as well as specific testing that can be put into place before an exhibition opens to the public.

Concluding her presentation, Steiner spoke about their aims for the future. They want to be involved in more academic collaborations as it has worked well in the past, specifically when the subject is of mutual interest. There is a desire to publish more findings as a way of sharing information with colleagues. She finished by stating that visitors need to be studied because they understand and engage and participate in different ways from one another and crucially, from practitioners, and this offers very different approaches to topics and collections.

Tour of the University's Museum of the History of Science, Technology, and Medicine



After the lunch break the delegates and speakers were given the opportunity to be taken on a tour of one of the museum's collection stores by Dr Claire Jones. Her remit is to care for and organise the four collections that are held in the selected store. She informed the tour party that a further nine collections are held in various on-site locations.



The specific store that delegates were shown holds artefacts pertaining to the medical school, mechanical engineering, science education and a recently acquired biology collection. Jones spoke about the process by which they came to store this new collection. It had been used for teaching in the early 20th century but due to changes in teaching methods and content, it was perceived to be defunct and the Museum of the History of Science, Technology and Medicine salvaged it. Jones then spoke about its current use in primary and secondary education as a way of teaching natural selection through

workshops and programmes in schools.

Student volunteers assist Jones and Dr Emily Winterburn, Curator at the Museum of History of Science, Technology and Medicine, in monitoring the store and cataloguing the contents. She spoke about the mutual benefit of this collaboration as a way to give students practical experience and research skills which can be put on their CVs. It also helps Jones and Winterburn maintain and utilise the collection.



Session 3: How Can University Humanities' Scholars, Especially in the History of STEM, Engage Most Effectively With Museums and Their Collections, and Thereby Gain Impact for Research?

After the tour the delegates and speakers regrouped for the third session of the workshop which included six speakers addressing the title of the session, 'How can university humanities scholars, especially in the history of STEM, engage most effectively with museums and their collections, and thereby gain impact for research?'.

Erica Ramsay, Impact and Innovation Officer at Leeds University, co-chaired this session with Helen Graham, Research Fellow in Tangible and Intangible Heritage at Leeds University. The first panel of this session included Joanne Bartholomew, Director of Collections and Interpretation at Thackray Medical Museum, and Dr Jamie Stark, Research Fellow on the Arts Engage project at Leeds University.



Joanne Bartholomew (Thackray Museum) and Jamie Stark (University of Leeds): Knowledge Exchange Between Leeds and The Thackray Museum on Historical Patents

Joanne Bartholomew began the presentation by providing context for the Knowledge Transfer Fellowship (KTF). She spoke about collaboration as an evolving process and in regard to this case study, one that has been developing over the past ten years. This slow-burn relationship doesn't have to be the model for development, Bartholomew noted, especially now that recent impact agendas have sped up these processes. Students had long been using the museum for study days, dissertation projects, and other academic collaborations. One example of this, notable as a contrast to the Knowledge Transfer Fellowship, was the 2003 collaboration with the Biotechnology & Biological Sciences Research Council to produce an exhibition based on anthrax. Although historically and culturally relevant to contemporary issues it was tangential to the museum's collection and

the academic output was minimal. Bartholomew also made reference to a second project from 2005 that collaborated with the Engineering and Physical Sciences Research Council, Leeds Teaching Hospitals NHS Trust, Institute of Medical and Biological Engineering and De Puy International to produce the Body Parts exhibition that had a stronger link to the museum's collections and was more successful regarding participation and public engagement.



Bartholomew then spoke about their first CDA (Collaborative Doctoral Award) from 2006 and funded by AHRC, and how this was the beginning of a new methodology. Unlike the earlier projects this was grounded in the collections and from the outset there was a public output that had been anticipated and planned for. Based on the long - standing relationship with the university, and with the culmination of the jointly supervised PhD, the museum began to think about how they could continue to cultivate collaborative work.

It was from here that they felt that looking at Knowledge Transfer funding, built upon Professor Graeme Gooday's research into patents, was a worthwhile direction. The current Knowledge Transfer Fellowship is the result of this. Bartholomew asserted that this is a much more sustained partnership than what had preceded it. By exploring the needs of the institutions involved and acknowledging the strengths of each collaborator the reciprocal process of knowledge transfer can be achieved. Having discussed ideas more fully, with regard to the audiences, they were able to structure the project in such a way that would integrate the museum processes into the schedule of the academic post-holder. This was mutually beneficial: the academic was gaining new experiences by being involved in museum practices and the museum collection was supporting and generating new research.

Bartholomew then handed over to Dr Jamie Stark who outlined the project goals. These included two staff training sessions designed to make accessible to the staff at the Thackray Museum the recent research in the history of patents, with a particular focus on medical technologies. This would also allow for staff to bring their own knowledge and experience to bear on the subject.



The second goal was to carry out two public consultation sessions, one aimed at the general public and one at the medical industry. During this stage they identified that the museum spoke to a number of different audiences and realised that a consultation for the general public would not necessarily represent how the range of audiences would respond to this material. A third consultation was arranged for the attendees of a Saturday morning lecture series whom Stark acknowledged as having a wealth of specialist knowledge and a long-standing interest in the history of medicine.

In order to facilitate the staff training and consultation sessions, the museum used some of the recent research carried out around patents and applied it to three objects in the collection. The next step was to produce ten object biographies from the collection based upon knowledge about patents and issues of ownership. Stark then spoke about how this culminated in a one-day meeting of the UK Medical Collections Group at the museum. This involved academics and practitioners discussing how best to collaborate on displaying objects of a STEM nature and to lay the groundwork for the future exhibits and events.

Stark also spoke about how initially unplanned outputs including collaborations with other institutions developed from the project. Articles were published in the *British Medical Journal* and *New Scientist* highlighting the Thackray and its collections. A new relationship with a National Trust property in Devon was established and a lecture titled *Healed by Inventions* that will be held at the Thackray Museum in March 2013. Reflecting on the outputs of the project, Stark identified that they brought the collections to a wider audience as well as opening up new avenues of academic research. The experience had been

wonderful, he said, as it had allowed him to engage with new audiences as well as creating strategies for future research projects.

Stark handed over to Bartholomew who concluded their presentation by returning to a point she had made earlier. She said that by working together under a common area of interest, universities and museums can work to their own strengths in order to produce better exhibitions for the public. Collaboration also generates a greater understanding of the methods and systems of working across disciplines and institutions that can benefit all involved. Responding to what Weinstein and Gooday had said in the introduction to the workshop, Bartholomew agreed that once these relationships have been established they can be mutually beneficial. The higher education institution can act as a 'semi-detached' research and development department for the museum and the museum can assist in delivering the public impact agenda for research. This can only happen successfully, she added, if the research is guided by public interest from the start.

Catriona Smellie (Project Manager and Curator for the HLF funded project at the University of Worcester): A University Museum: Experiences from Worcester

The next speaker was Catriona Smellie, Project Manager and Curator at The Infirmary, Worcester. Her presentation focussed on the collaborative work between the museum and the University of Worcester.



Smellie started by providing some contextual information about Worcester, highlighting the former Worcester Royal Infirmary which is now the University of Worcester's city campus, therefore a significant site within medical history. Founded in 1770, it is the birthplace of the British Medical Association, and also where Smellie is based.

She then spoke about the two museums that have been established in Worcester. The George Marshall Medical Museum, for whom Smellie previously worked, consists of a collection acquired and collated by George Marshall from the 1930s onwards. Whilst working there the University of Worcester bought the Royal Infirmary and this prompted a dialogue which led to the planning of a second museum. In 2007 fund-raising began and just over £500,000 was awarded by the Heritage Lottery Fund in 2011.

The presentation then moved onto the subject of how the museum has devised collaborative course material that has been developed with a range of departments within the university. Most of these collaborations to date had focussed on supporting modules and student experience. Some of the departments and courses that the museum have worked with were listed, these included Archaeology and Heritage Studies, Illustration BA Hons, Drama, Digital Media, Centre for Leadership, PGCE Secondary History and Science, PGCE Secondary STEM Network and a range of others that exhibited how broad an influence the museum has within the university. Smellie noted that although this hasn't been research-based what it has accomplished is the professional development of students who are also a key target audience regarding the HLF project. She also said that the steps towards developing research collaboratively are planned for the future.

She then expanded on the history undergraduate module with which the museum assisted. Dr Claire Jones was also involved in this project and had three sessions with the students, which Smellie identified as having an immediate effect. It gave the students access to sources that had been gathered by museum staff over a number of years as well the specialist expertise of the researcher. They had an opportunity to engage with artefacts directly and within the building that they were originally used in. There was also a reciprocal benefit to the project's outcomes as it demonstrated a future model for course leaders and helped to secure the museum's future within the university.

Most recently the museum has been moving into the field of gaming and digital arts through the department at the university. Their interest in augmented reality (the

augmentation of a real-world environment by computer-generated sounds, images or videos) has resulted in a relationship with the museum. The museum worked with students in their second and third years of their undergraduate degree to develop ideas and plan user experiences around historical settings and narratives. The gaming department were particularly enthused by the material that the museum has and they have produced a 3D version of the infirmary.

In September 2012 the museum hosted a public knowledge sharing day where academics from around the country shared research on the theme of local health. Responses from this suggested that the public noticed an intellectual barrier but it went some way to showing to the university that the museum can nurture relationships with academics and research, as well as being a vehicle for sharing this with the public.

Other public engagement events that were run by the museum include various access and inclusion activities aimed at young people to discuss with them sexual health through engagement with art. The benefit of these outreach projects is that the museum could support the university's strand of access and inclusion in a way that many other departments couldn't. Smellie sees this as the main way that the museum will be successful in maintaining a relationship with the university.

The presentation was concluded with some of Smellie's reflections on the issues raised during the workshop. She listed the benefits to the museum from the collaboration, one of which was the city centre location that now increases the visibility and accessibility of the museum. It has provided access to researchers who are becoming increasingly interested in working with the museum. The main benefit to the collection has been the increase in visitors due to the location and the opportunity for public engagement. The infirmary closed in 2002 so the history of building still resonates with many people who have connections to it. It is conducive to creating effective and affective connections between visitors and the objects within the collection. She then ended with a suggestion that the university could provide assistance in marketing and research into audience development which would symbiotically benefit both parties.

Claire Jones (Leeds University) and Sue Davies (Leeds Museum): Domesticating Electricity: A Learning Project for Schools

The next presentation was delivered by Dr Claire Jones, Director of the Museum of the History of Science, Technology and Medicine at the University of Leeds, and Sue Davies, Head of Learning and Audience Development at the University of Leeds.

Jones began the presentation by talking about the 'Lights on! at Lotherton Hall' project in relation to the Research Excellence Framework (REF) agenda. It was a joint venture with the Centre for History and Philosophy of Science at the University of Leeds and Leeds Museums and Galleries, and was developed directly from the Centre for History and Philosophy of Science to form part of the case study that constitutes part of the REF. They wanted to enhance their department's impact case study with a project that engaged with schools and the local history of science in Leeds whilst



utilising the academic research from within the university. The project was based on Professor Graeme Gooday's aforementioned book *Domesticating Electricity* and took as its focus the gender and domestic anxieties over the incorporation of electricity into the British home in the late 19th century and early 20th century. The project was centred at Lotherton Hall, Leeds, which was one of the earliest houses in the area to have electric lighting installed.

The outcomes of this first stage of the project, Jones explained, involved a workshop with year five pupils and the development of an educational pack that went into primary schools. The workshop activities included a household trail so students could see how electricity had featured in the house. The students also took part in an arranged debate where they took on the opinions of characters and incorporated historical perspectives to develop an argument for or against the inclusion of electricity.

Jones then spoke about the ways in which the project achieved its impact aims. Firstly, the impact it had on the partners was identifiable in the way that Leeds Galleries and Museums now view Lotherton Hall as a space. It has improved its approach to science and now offers a more balanced approach to programming science and art. Secondly, the school audience were unfamiliar with what Leeds Museums and Galleries could offer before the project, but the hands-on and non-abstract approach to learning engaged the children. It also benefitted the teaching staff who wanted a different approach to teaching electricity and they found that employing historical context was a useful method. The project has also resulted in the school programming a yearly visit to Lotherton Hall as well as the incorporation of some of the workshop activities into the classroom. Some of the future plans for the project involve more educational packs for schools and the translation of the research for an adult and family audience.

Jones concluded her presentation with lessons for impact that these case studies are based on. She broke these lessons down into two criteria, significance and reach. Due to the depth of the engagement Jones felt that their work had been significant for the groups that they targeted although reach was an area they could develop. She noted that evaluation has to be built into the project from the beginning so that when you have to demonstrate your impact you can do so. A similar forward planning is necessary when working with schools as they are usually timetabled tightly and aren't particularly flexible. Jones also suggested that one of the reasons this project was successful may be due to its relatively small scale which meant that the partners were working closely within a tight-knit group.

Sue Davies then spoke briefly from the perspective of the museum practitioner about the question that the session took as its title, 'How can university humanities scholars, especially in the history of STEM, engage most effectively with museums and their collections, and thereby gain impact for research?' She



stated that it can be achieved by keying into the educational mission of the two organisations to create a balance that can enhance the relationship between different organisations. This will encourage mutual learning and understanding of abilities and methodologies across those organisations. It will also provide confidence amongst staff members to engage with, and in some cases teach, subjects that they may not have felt competent in prior to the collaboration.

Davies also spoke about the model of engaging audiences, presenting the argument that a good model is the hands-on approach through active learning, keying into experiences to interest audiences in the specialist information researchers have. Researchers can also help education staff in museums in improving their practice so they can then disseminate to a wider public to provide greater knowledge and learning. Another area where the two institutions can work together, Davies said, is in long-term evaluation where traditionally the arts and museums can fall behind due to time and financial constraints.

Alison Fell (University of Leeds): Experiences of Community Engagement: Legacies of War Project



The final speaker of the session was Professor Alison Fell, Project Leader of the Legacies of War 1914-18/2014-18 project at the University of Leeds.

Fell began by outlining the project and breaking it down into two components. The first of these components was the interdisciplinary research project which brought together a team of researchers from across the university to focus on different aspects of the First World War. The second component was the public engagement and collaboration aspect which worked with a number of partners throughout Yorkshire in commemoration projects.

Fell made reference to Dr Claire Jones' discussion about impact to elaborate on the motivations for academics involved in public engagement. Besides being driven by the funder's requirements, the academics involved in the commemoration project are motivated by a desire to have some impact on the discourses that surround the war. Fell cited a particular desire to take perspectives of war out of the trenches and away from the figures, (for example, the war poets), that people associate with the First World War, to include a broader range of legacies.

Fell then spoke more specifically about the project funded by the 'Research for Community Heritage Scheme', that has just come to the end of its first phase. The scheme was co-funded by the AHRC and the HLF and aimed to fund universities working with partners such as museums to support community-led heritage projects. The 'Legacies of War' project was funded to run two open days, in collaboration with Leeds Museums and Galleries, and hosted at the university and the Discovery Centre, Leeds, to promote the HLF funding opportunities available.

A broad section of the public was invited and as a result the open days received a mix of enthusiastic, interested and interesting audiences. One of the purposes of these events was to open up the Liddle Collection, based at the university, and other Leeds archives, to the public. The organisers knew that differing community groups were attending the open days and so they divided them broadly into two groups, a local history audience and an arts and culture audience. What they found, Fell said, was that local history groups wanted to share and exchange information whereas the arts and culture audience wanted to take inspiration from the collections. In the following days the organisers maintained contact with attendees and six HLF bids that developed from this were successful.

The scheme is nearing the beginning of Phase 2, and there are currently two bids to the AHRC scheme that have been submitted by the Legacies of War team. The first bid focuses on working with the successful HLF funded community groups and the second bid is to work with harder to reach community groups. It was at this point that Fell spoke about the necessity of funding being utilized to hire brokers who can develop long-lasting relationships between community groups and institutions.

Moving onto her experiences of working with museums, collections and community groups, Fell said that she found those experiences enormously enjoyable because of the opportunities they presented to engage with an audience beyond the academic audiences she was used to. Fell closed her presentation by talking about the ways that academics, who are often looking for new methodologies and perspectives on research, can aid the museums by providing new approaches and new thinking about objects and collections.

Scott Anthony (University of Cambridge): Summative Thoughts and Commentary

The final session and the workshop were brought to a close with a summative presentation by Dr Scott Anthony, Research Fellow in HPS at the University of Cambridge.



Anthony spoke about his previous career in the media as a way of approaching what Boon and Weinstein had discussed in their introduction about public history and public engagement in relation to scholarly research and museum collections. Having worked as a journalist and in public relations he differentiated between the disparate ways in which the public can influence the approach of academic and museological research in comparison with the decisive impact public tastes make in other areas of national life.

Commenting on the difficulties that academia can have when responding to engagement and feedback, Anthony referred to Professor Alison Fell's assertion that brokers are required to facilitate a way for academics to bridge the gaps and correct the misperceptions that currently exist between history professionals and the public. Simply monitoring and reacting to audiences is not building a relationship with them.

This led him onto reflection about Professor Graeme Gooday's approach to objects and collections as one that posits the user at the centre. In advocating the history of usage Gooday displaces the static and distancing effect of what he called the 'admiring gaze', of the teleological history often employed in technological museums. The benefit of



this approach encourages and stimulates emotional responses to STEM collections. This type of superimposition of histories on top of each other (technological and emotional), Anthony reflected, can lead to a rich relationship between scholarly work, museum objects and public engagement. He then moved on to speak about Dr Jon Topham's presentation as an example of how scientific ideas could be brought to life. Through looking at how and where ideas are consumed and understood by a reading public we can see how they shape understandings of STEM concepts.

Anthony then moved on to reference Professor John Corner's sensitive illustration of the divisions between the way commercial practitioners and academic institutions and museums monitor and implement methodologies in audience research. The next presentation Anthony spoke about was Kate Steiner's. He reflected that her findings on the attention span of audiences (ten to eleven minutes per gallery), and the limited number of galleries visitors looked at, bore out other research findings. Similarly, although online resources might be 'unlimited', he said, audience attention is not. Public History programmes have to take into account these factors, and additionally, the fact that visitors are not blank canvases. Individual knowledge as well as the influence of the national curriculum and commercial media shape audience expectations and knowledge, making it difficult for museums or academics to set the frame of reference of audience's interests or understanding.

Anthony stated that the final session brilliantly illustrated how the process of gently opening up scholarly and museological methods to the public leads to lots of unintended and beneficial consequences, by making organisations work creatively with a more unpredictable range of external and internal groups. He also asserted that if the only reason for 'Public History' work is to gain funding then it becomes just another bureaucratic hoop to jump through, when the potential is there to develop new and more informed ways of researching, curating and relating to a wider public. To sum up and conclude the workshop he spoke about the ways that STEM practitioners, academics and the public can work together to raise numerous layers of interpretative and emotional responses to STEM collections. He suggested that although this may have many unique complications it also has the opportunity for unique results. As the workshop illustrated, doing Public History is not a case of anything goes, but understanding, accepting and embracing that many things go.

PHoSTEM reports authored by the Institute for the Public Understanding of the Past, by IPUP's Sam Johnson and Helen Weinstein.

For further information about IPUP, please go to www.york.ac.uk/ipup/

The third PHoSTEM event will be organised by The Science Museum, and is entitled "Is Science a Special Case in Museology?" This AHRC-funded workshop will be held on Saturday 13th April, 10am to 5.30pm, at the Dana Centre, The Science Museum, Queen's Gate, London, SW7 5HD. To sign-up to participate, please email us at: publichistory@sciencemuseum.ac.uk