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Festschrift: of mice and myths: challenges and opportunities of capturing contemporary science in museums

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Festschrift: of mice and myths: challenges and opportunities of capturing contemporary science in museums

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Introduction

> The Science Museum collects artifacts, not organisms. This rule has applied in the Museum ever since its foundation; but in 1989 the rule was apparently broken by our Department of Physical Sciences, which acquired two mice for its permanent collections (Durant, 1991).[1]

The mice in question were freeze-dried transgenic mice, direct descendants of the first mammals to be granted a US patent. The Department of Physical Sciences curator who had committed this transgression was Robert Bud. The addition of the 'oncomice' to the Science Museum's collections nicely sums up aspects of Robert's career: active contemporary science collecting, notably in biomedicine; exploring the role of artefacts as storytellers; and, of course, the (often gleeful) stretching of institutional conventions to explore new avenues in museum research and display.

In this essay I will consider some challenges of collecting contemporary artefacts, and question whether such artefacts actually offer any greater challenges for museum storytelling than those from earlier periods.[2] I will also discuss some opportunities of contemporary collecting, many of which have yet to be fully harnessed by science and technology museums.

Figure 1

Two freeze-dried genetically engineered mice, United States, 1988

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Contemporary science: in search of charismatic artefacts

The oncomice (1988) were the most recent entry in 1992's *Making of the Modern World: Milestones of Science and Technology*, a volume showcasing the collections of the National Museum of Science and Industry (forerunner to the Science Museum Group). Here they were the last in a line of the Museum's self-consciously created treasures of rare survivals, 'firsts' or items associated with famous names, including an Islamic glass alembic, Stephenson's *Rocket,* a sample of Parkesine plastic and the Crick-Watson DNA model. In the *Making the Modern World* gallery (opened in 2000) they sit along a central aisle of big hitters, making use of both the 'peaks of the great achievements of fundamental science' and the 'massive materiality' of large-scale technology (Russell, 2006; Bud, 2017).

Massive materiality (practicalities of transport and storage notwithstanding) remains a key part of the curator's repertoire of tactics for making contemporary science appeal to visitors. Alvin Weinberg famously predicted that 'when history looks at the 20th century…she will find in the monuments of Big Science – the huge rockets, the high-energy accelerators, the high-flux research reactors – symbols of our time just as surely as she finds in Notre Dame a symbol of the Middle Ages' (Weinberg, 1961). Space technology displays certainly tend towards the monumental, with the Smithsonian's National Air and Space Museum a notable example: at its opening in 1977 a nationalistic, hero-centric narrative was discernible in the exhibits, and it remains to be seen what tone will be taken by major refurbishments underway from 2018 (McMahon, 1981; Meltzer, 1981). The (up to now) largely national-interest domination of space exploration is also seen in recent displays in China, where science museums rarely display original artefacts but the national science and technology museum makes much of the *Shenzen* programme (Schäfer and Song, 2017). Big tech has also dominated space technology displays at the Science Museum, with British and American narratives prevalent in the (ageing) permanent gallery, although the recent approach of the *Cosmonauts* exhibition signals a drive towards broader coverage of social and cultural motivators for space exploration (Millard, 2016).

Meanwhile in particle physics, copper accelerating cavities from CERN's Large Electron Positron collider (LEP) have been a gift to several museums worldwide; literally as a donation from CERN, but also to curatorial interpretation. These cavities hit a 'sweet spot' in terms of size – large enough to be impressive and attract visitors, but just small enough to fit into a museum gallery and be installed without vast expense. They also have a delightful Jules Verne quality. When one was displayed in the Science Museum's *Collider* exhibition (2013–14), the *London Review of Books* likened it to 'the bust of a copper robot from the golden age of sci-fi, with a bulbous round head, ribbed skin, red cyclopean eye and silver claws which project, raptor-style, from what would be its breast'; meanwhile, at National Museums Scotland, Keeper Sam Alberti hopes that the striking cavity, prominent in the atrium, might tempt visitors towards the science and technology galleries (opened in 2016) much as Picasso's *Capra* or the Lewis Chessmen might attract people to the adjacent art and design galleries (Richardson, 2014; Alberti, 2017; Desborough, 2017).

However, big is not necessarily beautiful. The Science Museum has an object on display that combines massive materiality with being a great achievement of fundamental science: the prototype beam-splitter for Advanced LIGO, the twin experiments which in 2016 detected the gravitational waves long predicted by Einstein's general theory of relativity. However, despite its size it is a challenging object aesthetically, and its function in the LIGO setup (at the intersection of two 4km-long interferometer arms) is not immediately apparent, requiring additional animation interpretation beyond the object label.

Figure 2

Prototype beam-splitter for the Advanced Laser Interferometer Gravitational Wave Observatory (aLIGO)

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LIGO also encapsulates a challenge for contemporary collecting: with thousands of people working on many of today's projects, the overall effect can be de-personalising. Even where individuals have been singled out, for example with the award of Nobel Prizes, they will rarely become 'famous names' beyond their own professional spheres. Those who have achieved widespread name recognition have often done this due to their efforts in popularising science. Stephen Hawking was surely the most famous scientist of recent times, but the first to be honoured with a burial at Westminster Abbey for almost eighty years (Westminster Abbey, 2020). But most visitors to the Abbey will know him for his popular books and media appearances, rather than have really engaged with the work on radiation from black holes depicted on his memorial. Similarly, *Science's* list of top Twitter stars includes several people who these days spend more of their time on mass media outputs than on academic publications (and if you are going to engage people with the daily realities of your practice, it helps to be an astronaut) (Travis and *Science*, 2014).

Figure 3

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Dr Stephen Hawking, *Simpsons World of Springfield* interactive figure

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Generally, for curators trawling the material culture of science of recent science, it can be difficult to spot what Simon Schaffer has termed ‘charismatic megafauna’ – compelling, important objects, often associated with celebrated people or events, which can provide a hook upon which to tell the stories of a wide range of practitioners, as with the *Board of Longitude* research and exhibition projects run by the University of Cambridge and National Maritime Museum (2010–15) (Schaffer, 2014). *Making the Modern World* adopts a similar tactic: away from the central aisle of ‘icons’ can be found a wider range of objects which speak more to professional practice and everyday use. For contemporary science, these types of object may on first glance occupy the ‘low lands’ of objects that are less inherently interesting, or are simply too complex to explain (Bud, 2017). Ad Maas, curator at the Dutch Rijksmuseum Boerhaave, envies his counterparts working on earlier periods. Unlike his colleagues who look after the Museum's collections of artfully-made (and usually shiny) objects from the Dutch Golden Age, he rarely comes across an object that is unique or attractive in his trawls of sheds, storerooms, basements and attics, commenting that he and his ilk 'taking care of modern artefacts are the scrap dealers' (Maas, 2013).

However, we ought to remember that the shiny or charismatic objects in museums are the survivors, and are not representative of all types of objects in circulation and use in the past. And while there may be some pragmatic concerns to preserving the material culture of recent science and technology (for example size, and short-lived materials such as plastics), several curators of science and technology museums have argued that such artefacts do not necessary pose radically greater intellectual challenges than those from a more distant past.[3]

Aesthetically, a mass-produced grey metal and plastic PCR machine may indeed lack the instant eye-catching appeal and 'material charisma' of a shiny brass astrolabe (Alberti et al, 2018). But while the astrolabe's form reveals its function, it only does this to the initiated viewer. Whether to the curator seeking to preserve information for the future, or to the visitor encountering a display on gallery, technical artefacts from many periods are complex and do not speak clearly. Other reasons frequently cited for the complexity of contemporary collecting are the distributed and de-localised nature of science, and the rapid turnover of equipment (de Chadarevian, 2018; Boyle and Hagmann, 2017). But while the scales of production and pace of change of equipment may have increased, historians of science can point to many examples of geographically-distributed work, and equipment becoming obsolete or repurposed.[4] This may not always be apparent from museum collections initially built around national narratives or seeded from institutional or business collections, with a tendency to favour objects in good physical condition. As for current science being a somewhat faceless activity, surveys of visitor knowledge and attitudes repeatedly show that (aside from a few big names such as Newton, Einstein and Curie) the majority of past practitioners of science, technology and medicine are no better known to most museum-goers than today's are. And, of course, even those names that have come down to us from the past are a subset.

Collecting the contemporary has long been a fundamental activity of science and technology museums – indeed, the historic collections have often become so purely by dint of time spent in the museum – but many such collections were originally amassed with pedagogical or commemorative intent and there are many gaps in the stories they can tell (Bennett, 2005). They are likely to represent more attractive than mundane objects, more successes than failures, more finished products than works-in-progress or tools for making and repair, more scientists than instrument-makers, more inventors than users. They often reflect in the material record the power dynamics of different periods, with people excluded on the basis of gender, ethnicity, sexuality, disability or socio-economic background. Even as the broader approach of social history collecting was gaining traction in many museums, the rise of the science centre approach – itself intended as anti-establishment and democratising – meant that many organisations called 'science museum' were moving towards interactive exhibits which focused on phenomena rather than people, and in many museums collecting steeply declined.[5] But informed by questions of interest to historians, when collecting in the present we can endeavour to collect a wider cross-section of artefacts and stories than may have come down to museums from the past. The issue then might be not so much what are the difficulties of collecting contemporary science, as what are the opportunities of collecting 'in the moment'?

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Collecting in the now: opportunities

Collecting the contemporary gives us access to its actors – not only the people directly involved in making or using artefacts, but also the potential audiences for these artefacts in museums. This gives us opportunities to capture a range of stories around each artefact. The majority of the Science Museum's contemporary collecting is driven by gallery and exhibition displays, as collecting has generally always been (Bud, 2010). Today when hunting for 'charismatic megafauna' we have the advantage of knowing what types of creature will inherently appeal to visitors; from the end decades of the twentieth century the field of audience research has provided us with a rich seam of evidence about visitor attitudes to science and exhibitions (Alberti, 2005). The oncomice, recognisable rodents, provide a visual jolt amongst a run of less familiar technologies in *Making the Modern World*. They also speak to the enduring *Frankenstein* theme of science meddling with life itself (Bud, 1995). Robert has argued that myths, stories about key aspects of society which hold meaning across time, can be evoked by objects in museums, going beyond a purely scientific or technical interpretation of these objects (Bud, 1995). Visitors bring their own memories and experiences to objects, and can use these to form imaginary connections with people in the past (Silverstone, 1992; Downes et al, 2018).

For many specialised scientific objects it can be difficult to find direct experiences or connections for most visitors. But universal human experiences such as hope, fear, competition and friendship can be powerful ways in: the Museum Boerhaave re-interpreted its artefacts relating to Heike Kammerlingh Onnes and absolute zero as a story of international rivalry, while in a recent collecting example the Science and Industry Museum explored the role of play and creativity in Andre Geim and Kostya Novosolev's work on graphene (van Delft, 2017; Baines, 2018). Of course, public interpretation plans tend not to last beyond the generation or so lifetime of a 'permanent' gallery, and we cannot know for certain that visitors of the future will have the same concerns as those of today. But by articulating the reasons for acquiring an artefact in terms of its projected 'museum life' as well as its 'regular use' life, we can give future curators and historians a rounder picture of the different groups who interact with artefacts (Lourenço and Gessner, 2014; Alberti, 2005).

An opportunity for collecting interactions between different groups could be the 'first image of a black hole' released by the Event Horizon Telescope consortium to widespread fanfare in 2019 (Doeleman, 2020). This is a great story but a challenging one for museums, as the image never existed as a single artefact. While a traditional museum collection might comprise a segment from one of the large radio telescopes which gathers data for the EHT (it combines data from telescopes in Arizona, Hawaii, Mexico, Chile, Antarctica and Spain) and a print of the final digital image released to the world's press, there is an opportunity to take a more ethnographically-informed approach capturing social relations and processes. For example, the EHT's data distribution network is surprisingly 'old school': there is so much data from the participating telescopes that the fastest way to send it is not electronically, but by shipping hard drives from the telescope sites to processing centres in the US and Germany. We might collect not only a hard drive, but also one of the FedEx crates used to ship them (packing crates are another aspect of science's material culture that rarely survives for the long term). We have the chance to capture the publicity consciously and unconsciously generated by the EHT team: the viral image depicting MIT's Katie Bouman as architect of the image-processing algorithm, and the ensuing (often unpleasantly misogynistic) backlash, give us an opportunity to explore questions of how credit is shared in collaborations, and the enduring media need for mythical heroes (Koren, 2019). Hundreds of social media memes captured the popular reaction to the news release, whether likening the black hole to the Eye of Sauron, or being disappointed that the image seemed rather blurry.

The Science Museum has adopted a similar 'people and processes' approach to CERN and the Large Hadron Collider (LHC) (Boyle and Cliff, 2014). Building up relationships with CERN staff over several years enabled the curators to identify ordinary artefacts that might have otherwise been overlooked or discarded: a bicycle used to get around the collider ring during its construction, and a champagne bottle emptied by Peter Higgs and friends the night before the discovery of the eponymous boson was announced to the world. While in some ways the bottle is mythmaking in the style of 'relic' associated with a famous name, it is also illustrative of an aspect of CERN's working style: around the site, particularly in the LHC Control Room, the curators noticed arrays of empty bottles, souvenirs from celebrations of events including LHC startup, first physics collisions, major publications and other milestones. The CERN team had not originally considered that bicycles and bottles would be of interest to the Science Museum; curators and archivists interested in social history will often alight on items considered ephemeral or insignificant by practitioners who see them as just part of everyday routines tangential to their actual work (Baines, 2018). Meanwhile, STM practitioners and users are able to identify important equipment and working practices which tend to be completely opaque to anyone outside their specialised fields. By working together, we can 'collect at the intersection of what they and we consider important and feasible' (Alberti et al, 2018).

Figure 4

Champagne bottle emptied by Professor Peter Higgs, Professor John Ellis and Sir Chris Llewellyn-Smith (former Director-General of CERN) on the evening of 3 July 2012, in a celebration prior to CERN's announcement the next day regarding the discovery of a particle consistent with the Higgs boson

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Judgement calls about what is important and feasible inevitably involve selection. We simply cannot be comprehensive about collecting all aspects of the practices and public representations of current science and technology. But again, this is not unique to the present; historians charting science's recent past have always had to contend with large volumes of information no matter what period they were concerned with (Hughes, 1997). Contemporary actors can help us to navigate what material might be available, but we must be conscious that they have their own narratives, coloured by memory or concerns about public representation (Hughes, 1997; Lewenstein, 2006). Curators and archivists also have their own narratives. Careful representation of actors' perspectives becomes particularly pressing for current science topics with obvious social and political implications. New insights about the Higgs boson or black holes will not affect many people, but climate change will; in 2020 museum curators worldwide are attempting to chart a pandemic with an immediate and profound impact on everyday experiences, including their own.[6] We cannot know what the 'right' decisions are from a future point of view, but we can ensure that our reflections on what decisions were made, and why, are documented (Lewenstein, 2020).

Capturing these reflections will be particularly useful for future historians; while this discussion has focused mainly on the use of artefacts in public displays, we should also consider how the act of collecting could itself act as a driver for research. Given the large volume of documentation which exists for recent science and technology, could systematic preservation of the artefacts have anything to offer? Historian and curator of computing Doron Swade ruefully commented that 'one of the best definitions I have heard of a "high tech" object is one for which the documentation occupies more space than the object', while aerospace curator David DeVorkin has reflected on whether twentieth-century artefacts (particularly the very large ones of the Space Age) merit the effort of collection and preservation, given the existence of a 'mountain of documentation readily accessible that can tell us everything we might want to know or can answer every question we can imagine to ask' (Swade, 1988). DeVorkin has found that close study of a physical object can enable 'attention to the fine structure of nuts-and-bolts history', acting as a stimulus to research and writing that enhances scholarship on broader themes (DeVorkin, 2006). The very act of collecting an object prompts efforts to learn about it, and might ensure that archival material or oral history is preserved that would not be otherwise.

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Collecting in the now: missed opportunities?

However, despite the opportunities of collecting in the moment, habitual museum practice means that opportunities can be missed. Most science and technology museum collections are still geared towards traditional categories of 'artefact': 3D material or paper-based archives, with collection management systems slow to keep pace. Software is of course the biggest challenge, and remains the aspect that makes contemporary collecting particularly challenging in comparison with earlier periods (Lowood, 2017). Oral histories, many originally gathered for particular projects according to individual interviewers' styles and to a variety of recording standards, are gradually becoming more findable, and training is making the type of content recorded more systematic; for example, the British Library's oral histories of science and technology resources capture a variety of projects beyond the BL's own major recordings (The British Library, 2020). Despite an increasing interest in capturing video histories of practitioners with their equipment to record tacit skills – a great opportunity to collect 'around the artefact' – such resources remain very hard to come by (Boon et al, 2017).

Issues around preservation of software and intangible heritage are known, and museums are gradually addressing these. But museum mindsets themselves can also be an issue: many aspects of recent science are captured by museum staff for research or display purposes, but without creating systematic change in collecting practice. Despite creating a wealth of material for interpreting contemporary artefacts in displays, museums rarely attend to the systematic preservation of such material. Short interviews created for exhibitions could still be valuable to future historians even if they lack the depth and nuance of professionally-conducted oral histories, but they are rarely retained for the long term after the exhibition's lifetime. Much AV material which features in displays is considered to be supporting material of lower status than the material objects, but often involves considerable input from practitioners to ensure an accurate reflection of their work. Publicity material created by practitioners often reflects how scientists themselves view their work and the stories they want to tell about it, which is itself an important aspect of the historical record (Wittje, 2013).

As we have noted, the attitudes of museum visitors are also central to the future historical record. Visitors are increasingly shaping contemporary collecting: participatory projects incorporating visitors' expert knowledge and experiences have brought broader perspectives to interpretation and collecting plans.[7] However, these projects are often funded and managed through particular gallery, intervention or collecting projects, enhancing collections and stories in areas already identified as important by the curators. Could such practice be possible across all areas of the collection, particularly in highly-specialised areas of contemporary science where there may not be very obvious links to everyday lived experiences? More fundamentally, what might a contemporary collecting policy developed in collaboration with visitors look like? Collecting policies can tend towards museum-speak, reflecting the concerns of curators, conservators and academics working in the museum's fields of interest: should they be more inflected by myth?[8]

While it will take time to develop feasible approaches to addressing these missed opportunities, contemporary collecting offers much fruitful discussion around broadening the traditional museological conceptions of what counts as an 'artefact' of science, technology and medicine, and widening the groups of people involved in conversations about which artefacts merit a place in collections. And, as Robert's career has shown, sometimes it's good to bend the rules.

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Tags

- History of science
- History of technology
- Museum collections
- Material culture
- Curating
- Scientific instruments
- History of chemistry
- Contemporary science

Footnotes

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2. The time period covered by ‘contemporary’ varies between institutions according to the nature of their collections. Current literature on recent material heritage of science and technology tends to cover the broad period post-Second World War, as equipment may remain in use for decades before becoming available for collections. See, for example, Marta C Lourenço and Lydia Wilson, 'Scientific Heritage: Reflections on Its Nature and New Approaches to Preservation, Study and Access', *Studies in History and Philosophy of Science* Part A 44, no. 4 (1 December 2013): 744–53; Alison Boyle and Johannes-Geert Hagmann (eds), *Challenging Collections: Approaches to the Heritage of Recent Science and Technology*, *Artefacts: Studies in the History of Science and Technology*, Volume 11 (Washington, DC: Smithsonian Institution Scholarly Press, 2017); Samuel J M M Alberti et al, 'Collecting Contemporary Science, Technology and Medicine', *Museum Management and Curatorship* 33, no. 5 (July 22, 2018): 1–26. For targeted contemporary collecting projects the Science Museum is currently adopting a practical working definition of ‘made or become noteworthy in the last ten years’, but also continues to collect material from the last decades of the twentieth century.
3. See for example Alison Boyle and Johannes-Geert Hagmann (eds), 'Introduction', in *Challenging Collections: Approaches to the Heritage of Recent Science and Technology*, Artefacts: *Studies in the History of Science and Technology*, Volume 11 (Washington, DC: Smithsonian Institution Scholarly Press, 2017), vi–xi; essays and discussions in Science Museum, *Museum Collecting Policies in Modern Science and Technology: Proceedings of a Seminar Held at the Science Museum, London, 3 November 1988* (London: Science Museum, 1991).
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5. For overviews of the growth of social history collecting and the science centre approach from around the 1960s, see respectively Owain Rhys, *Contemporary Collecting: Theory and Practice* (Edinburgh: MuseumsEtc, 2014) and Karen A Rader, 'Hands-On Science Centers as Anti-Collections? The Origins and Implications Of the Exploratorium Exhibits Model', in *Challenging Collections: Approaches to Recent Scientific and Technological Heritage*, editors Alison Boyle and Johannes-Geert Hagmann (Smithsonian Institution Scholarly Press, 2017), 198–215. For more on the Science Museum's mixed economy of social-historically-informed curatorship and science communication approaches, see Timothy Boon, 'Parallax Error? A Participant’s Account of the Science Museum, c.1980-2000', in *Science for the Nation: Perspectives on the History of the Science Museum*, editor Peter J T Morris (Basingstoke: Palgrave Macmillan, 2010), 111–35.
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8. Here, for example, is ours: Science Museum Group, 'Collecting Policy Statements October 2016', 2016, https://group.sciencemuseum.org.uk/wp-content/uploads/2018/09/smg-collecting-policy-updated-0918.pdf

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