Reflecting the Now: Project Management and Contemporary Collecting in a Multi-Disciplinary Museum

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Abstract:

Two million visitors a year pass through the new permanent galleries of the National Museum of Scotland in Edinburgh. This article reflects on the planning and collecting that presaged their redevelopment in the context of twenty-first century museum practice in the UK. We focus in particular on two elements: firstly, the fundamental project management work that underpins any development of this kind. Were established methodologies and practices conducive to open-ended activities like research? Secondly, we ask this question specifically of contemporary collecting in art, and in science. Can the known unknowns and the unknown unknowns of contemporary collecting be accommodated by project management workflows?

Key words: contemporary collecting, National Museum of Scotland, project management, reflective practice

Figure 1. Pipers on Chambers Street herald the opening of the new galleries in the National Museum of Scotland, 8 July 2016. Copyright Ruth Armstrong Photography. National Museums Scotland.

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Introduction

On the morning of 8 July 2016, a troupe of bagpipers marched down Chambers Street in Edinburgh and climbed the steps of the National Museum of Scotland to herald the opening of ten new galleries (Figure 1) – the third phase of a Masterplan that had begun over a decade earlier. 'Science and art, craftsmanship and technology, the wildly imaginative and the intensely rational meet', exclaimed *The Times*' reviewer: 'it makes for many a eureka moment' (Campbell-Johnston 2016, 12).

The National Museum of Scotland now attracts two million visits per year – the most visited UK museum outside London – of which a sizeable proportion will experience the new displays and the events and online activity associated with them. Far fewer will consider the four years of behind-the-scenes work involved of this £14.1M project. For those who might be interested in this process – museum professionals, museologists and other readers of *Museum & Society* – this article reflects on the project, its aims and its realization, in the context of twenty-first century UK museum practice.

We focus on two elements that were the subject of particular discussions throughout and have resonance across the sector and its associated scholarship. First, we reflect on the fundamental project management work that underpins any development of this kind and its challenges. Were established methodologies and practices that typically produce *outputs* (products, often tangible; Mills-Scofield 2012) conducive to open-ended *outcomes* (consequences, often processual) such as research? Secondly, we ask this question specifically in relation to the challenges of our expanding interdisciplinary. We focus on contemporary collecting as an area of especially open-ended practice, outlining how we updated collections and displays with contemporary material, in art, design and fashion; and in science, technology and medicine. How can the known unknowns and the unknown unknowns of contemporary collecting and its associated research be mainstreamed in project management workflows?

The authors' involvement in the project was varied – two were on board early on, two have the perspective of later arrivals – but we all had senior roles within the project structure. For this paper we have therefore also drawn on evaluation and testimony from others in the team.[1] Our methodology consequently has a historical element, with project records, policy and stakeholder responses as primary material, and museum staff, visitors and media as the actors. When combined with our own experience, this is in a way an exercise in group autobiography (cf. Chang, Ngunjiri and Hernandez 2013), and as such it is intended to be a contribution to the growing body of literature reflecting on museum practice.

Reflective practice – practitioners pausing and thinking hard about what they do – is widely accepted and employed in a range of fields, especially education and management (Bolton 2010; Cunliffe 2004; Lynch 2011; Moon 2004). This way of working draws upon and has parallels with research practice in the arts and ethnography (Davies 2008; Leavy 2015). Although the project itself involved considerable adaptation, our reflections here are retrospective rather than contemporary or anticipatory; we are considering the project after the fact, reflecting *on* practice rather than reflecting *in* practice. And we use 'practice' here neither in its broad socio-cultural sense (e.g. Bourdieu 1977) nor the narrow concept of curatorial practice as sometimes deployed within art history and criticism (as problematized in Rugg and Sedgwick 2007). Instead, like Conal McCarthy (2016), we consider professional museum practice to have an inclusive scope that encompasses project management, research, collecting, programming and more.

The question may be posed, by both readers and our own colleagues: *why*? Reflecting on our practice helps us to render explicit what had been tacit, to bring complex pressures to the surface and to examine the assumptions inherent in our processes and our accepted frameworks. 'Best practice' is not set in stone; it is constructed and dynamic. Reflective practice is a core part of project management, learning from our mistakes and improving processes and products in future projects. Disseminating these reflections then contributes to our qualitative evaluation, shares our experiences with colleagues who may find them pertinent (whether in practical or analytical terms), and leaves a legacy of what was after all a major capital project. Too often, we would contend, museological analyses focus on temporary exhibitions, rather than permanent galleries, which will be experienced by many orders of magnitude more visitors (e.g. Lynch and Alberti 2010; although see Macdonald 2002 on the development of

a long-term gallery and work by scholar-practitioners such as O'Neill 2007). What happens when we unpack the black box of a capital development project?

Masterplanning at National Museums Scotland

Such an analysis requires context. The National Museum of Scotland has a complex institutional and architectural pedigree (McKean 2000; Swinney 2013): occupying a site in central Edinburgh for over 150 years, its roots are in the University of Edinburgh natural history collections and the Industrial Museum of Scotland, which combined on Chambers Street as the Edinburgh Museum of Science and Art in 1866. In 1985, the collection of the Society of Antiquaries of Scotland was also included, and National Museums Scotland was formed as a non-departmental public body. The organization now also includes the National Museum of Rural Life near Glasgow, the National War Museum in Edinburgh Castle, the National Museum of Flight in East Lothian, and the National Museums Collection Centre in north Edinburgh.

Our central site comprises a 1998 building housing the Scottish history and archaeology galleries, and the former Royal Scottish Museum, a more traditional Victorian museum building. In 2008 the two buildings were conjoined in branding terms as the 'National Museum of Scotland', and began a major programme of capital development of the displays in the older building. The first phase addressed the infrastructure of the building, followed by the major 'Royal Museum Project', completed in 2011, which tackled the natural history galleries in the East Wing and much of the main building (Figure 2). The redevelopment we focus on in this paper was the third phase – titled 'Connections' but known informally as Masterplan Phase 3 or 'MP3' – which commenced planning in February 2011 and would tackle over a fifth of the display floor space of the National Museum (3,000m^2 of 14,600m^2).

Figure 2. The central atrium of the National Museum of Scotland's Victorian building showing the 'Window on the World' display, redisplayed in 2011. Copyright Andrew Lee. National Museums Scotland.

Like similar capital projects in the UK at this time, early project activity focussed on an application to the Heritage Lottery Fund (HLF); round one was submitted in April 2012. This eventually secured a £4.85M grant, the nucleus of the £14.1M project cost. HLF requirements stipulated the audience-driven approach we were in any case taking: we identified target audiences, preparing a detailed activity plan laying out how we would engage and

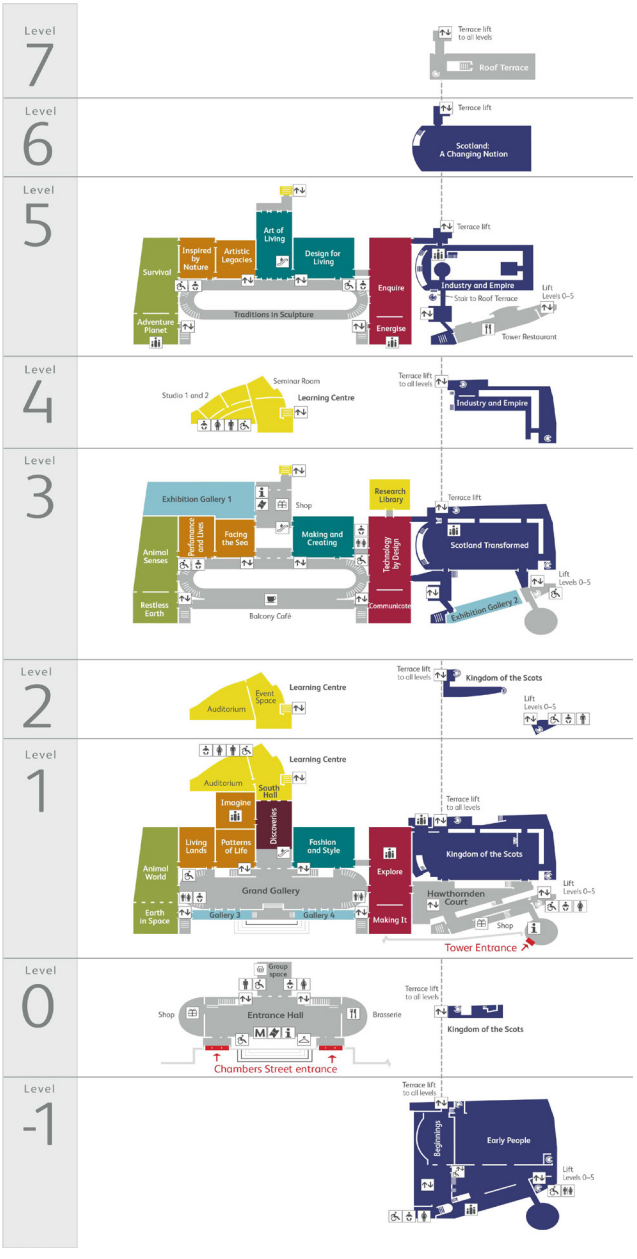

Figure 3. Floor plan of the National Museum of Scotland, 2016, showing the Art & Design and Science & Technology areas in the centre. National Museums Scotland.

sustain them through learning and digital programmes, activities and resources.[2] Other funders included the Scottish Government and private donors. For discipline-specific support we made an application concentrating on the astronomy and physics elements to the Science and Technology Facilities Council which did not progress, but in 2014 we secured £1.3M from Wellcome (then known as the Wellcome Trust) to realize planned biomedical elements within the science displays, which brought new staff and enhanced our programming capacity.

The ten galleries that were the major outputs of the project occupied two adjacent 'stacks' (Figure 3).[3] Art & Design comprises *Fashion and Style* (contemporary fashion); *Making and Creating* (design, glass and jewellery since the 1950s); *Design for Living* (the development of design as a global phenomenon, including for example the Arts and Crafts movement); and *Art of Living* (decorative arts, including material from Hamilton Palace).[4] Science & Technology includes an introductory gallery, *Explore* (dominated by interactives and featuring Dolly the sheep) next to *Making It* (engineering, especially manufacturing); upstairs is the mixed *Technology by Design* (innovation and invention, from bicycles to bridges); *Communicate* (networks of communication from semaphore to smartphones); *Enquire* (the process of science, especially physics); and *Energise* (energy generation and consumption, including nuclear and renewables).[5] Each gallery had its own brief, primary and secondary target audiences (Table 1 shows the original targets), with adjusted tone of voice, interpretative approaches and intended learning styles (using for example Generic Learning Outcomes: see Hooper-Greenhill 2004).

Gallery	Location	Primary target audiences	Secondary target audiences
Fashion and Style	Art & Design level 1	Adult informal	Young people (16–24)
Making and Creating	A&D 3	Adult informal	Adults with specific interests
Design for Living	A&D 5	Adult informal	Adults with specific interests
Art of Living	A&D 5	Adult informal	Adults with specific interests
Explore	Science & Technology level 1	Families with children 8+, cross-generational	Young people (16–24) and adult informal
Making It	S&T 1	Families with children 8+, cross-generational	Young people (16–24) and adult informal
Technology by Design	S&T 3	Non-expert adult informal learners with a general interest	Young people (16–24) informal and formal learners
Communicate	S&T 3	Families with children 8+, cross-generational	Young people (16–24) and adult informal
Enquire	S&T 5	Non-expert adult informal learners with a general interest	Families with children 12+; young people (16–24)
Energise	S&T 5	Families with children 8+, cross-generational	Young people (16–24) and adult informal

Table 1: National Museum of Scotland Masterplan Phase 3 galleries

Even so, the boundaries between these elements are not always evident to visitors (Muncie and Hutcheson 2016), and are as much legacies of the division of labour rather than the division of the space. To unpack these and the other structures inherent in the process and product of MP3, we turn first to the principles of project management in the museum context.

Project is the New Ongoing

Over the years, the UK museum sector has become increasingly experienced in developing and implementing capital project work. To a large degree this skills-building has been a necessary response to the opportunities afforded by HLF. In the 23 years since HLF was established to distribute the portion of heritage funding raised by the state-licensed National Lottery, it has awarded a total of £7.1 billion to over 40,000 projects in the museum and heritage sector.[6] HLF funding applications demand that an organization has a robustly tested business case and programme; defined project scope; realistic project finances; thought-through risks; assessments of all the required processes and skills – in other words, all good staple project management practices, as can be found across the museum sector (for an overview of museum process generally, see Corsane 2005). Indeed, it is usual for HLF to assign trained project managers and quantity surveyors to help support and monitor the project, once they have given the green light to start implementation.

The governance and management structure of MP3, with its accompanying processes, was reasonably typical of a capital project of this size and scope, weaving together both project management practices and funders' requirements. It closely followed the Plan of Work set out by the Royal Institute of British Architects (RIBA) which takes the project team through eight stages, from *0 – Strategic Definition* through to *7 – In Use*. This process is the industry standard: first developed in 1963, the RIBA Plan of Work 'is the definitive UK model of building design

and construction processes' (RIBA 2013) endorsed by the Construction Industry Council, the Chartered Institute of Architectural Technologists and others. It is used for building railway stations and roads, hospitals and hotels. Due to its use in the development and implementation of projects in the museum sector for more than fifty years, the Plan of Work approach is fully established as the quintessential approach to project management, embedded in workforce skills, and endorsed by capital funds grant givers. HLF's two-stage bidding process works in parallel with the *Plan of Work*: HLF's first Development Phase comprises RIBA Stage 0 to Stage 3; the second Implementation Phase progresses from Stage 4 to the final Stage 7.

Our Masterplan's governance was designed from the onset, enshrined in a Project Execution Plan (PEP) with the Project Owner chairing the Project Executive Group (PEG), and the Project Director chairing the Project Implementation Group (PIG).[7] Design approvals and financial management decisions followed the project's structure: the PIG was responsible for preparing briefs and making design recommendations; the PEG agreed designs, cost plan changes and made recommendations for any changes to project scope, and the Board of Trustees agreed all scope and budgetary changes. In turn, the Project Manager coordinated the Change Control Process (CCPs) and contractor's Requests for Information; the Project Director agreed CCPs and budgetary spend, and the Project Owner agreed contingency usage above a set threshold and contractor's fees.

Although in principle project management is about 'tackling new ground, taking a group of people and trying to achieve some very clear objectives quickly and efficiently' (Reiss 2007, 2), there remains the risk of making the bureaucracy more complex than it needs to be, even for such a large project. While there are opportunities for debate and deviation in project management processes, these may run against the grain of the overall project's processes. Changes are given special focus as rogue elements that need attention and rapid fixing. A raft of specialist tools and terms are at the ready for these project 'weak areas' – defined as 'areas in the project where insufficient design work has been done, or for some other reason the nature of the works is uncertain' (Reiss 2007, 144). Inevitably, planned activities are driven towards definition; cost control; construction; contract management and implementation. The *Plan of Work* has a start, middle and end, so that objectives are developed in the same way: a linear, progressive approach where rough edges are smoothed as it pushes forward in its quest for project closure.

Project management practices rely on defining what is within and outwith the project. As project control cannot be exerted if the project's scope is not robust, so boundaries are important to realize and communicate amongst the wider project team. These include definitions about roles; where team members' responsibilities 'stop' and 'start'; which artefacts are 'in', and which are 'out', waiting in store for another day; which audiences are being targeted, and which therefore aren't; which pots of money will be spent and which will be held back as contingency; and, of course, the physical space of the project. Thresholds are drawn on paper, if not on the ground, between established and less valued spaces. Medieval cartographers signalled these zones on a map with a sea monster.

This, then, was the structure in which we worked; this article turns now to the workflows within and beyond this framework. What of museum professionals whose practice do not easily conform to project management processes – whose areas of work provide an awkward fit, or lie in the deep unchartered waters where 'there be dragons'? These might include research; interpretation planning; community engagement; stakeholder management; and sometimes digital content development. Project management practices have a term for such activities – those that are not deemed essential to achieving the key tasks and have no known duration – a 'hammock task' (Reiss 2007). These are slung between a scoped and structured tasks' start and end time, with no further programmed definition nor requirements, largely left to their own devices. A hammock task is suspended outside formal governance – as long as it does not extend past the associated task's end date of course – in its own context, shapeless, hanging off the main programme; an *outlier*, in every sense of the word (Gladwell 2008).

Activities and processes that struggle to find a place in the *Plan of Work* – especially research, as we shall show below – tend to get relegated to the status of a hammock task. The assignment of a hammock to 'difficult' practices – open-ended, intangible, consultative or improvised activities – has happened iteratively, not always explicitly, programme by programme;

project by project, over our long history of complex projects. In doing so, the complex and iterative nature of the work is not demonstrated, and therefore not fully credited (only in part due to historic lack of accountability).

A powerful example of this can be found in section 5, below – the marine renewable energy section in MP3's *Energise* gallery. All the work leading up to the point of procuring a wave tank interactive was absent from the project programme. By not being explicit about these activities in a programme in instances such as this, the wider team's perception of the activity itself changes. Even though those involved in these workflows are as committed to outputs and deadlines as the rest of the team, little by little, hammock tasks become implicit. They are viewed as non-critical and overruled in discussions; they are chivvied when perceived to be slow; they are regarded as passive in their fondness for consultation; and they are weak in their plea for 'soft' things in life, like outcomes. Owners of these hammock tasks are also viewed as non-critical, therefore often finding themselves uninvited to key decision-making forums. Associated outcomes enter long-term, languid relationships with project management with the commensurate danger that parties 'snooze' through opportunities.

Of commonly hammocked tasks, rarely is *research* explicitly included in a project process and programme. At best, it may appear in its list of outputs, on a sub-programme, for instance a line in a detailed spreadsheet that says: 'write gallery captions'. Typically in a project, implicit assumptions are made by both colleagues that understand *and* misunderstand research practices on behalf of the researchers. Activities like archival and secondary source research, selecting acquisitions, collections management, conservation assessments, peer review and research dissemination are left in the margins of the project programme. Research activity immediately poses difficult questions for the *Plan of Work* to accommodate: how can an open-ended process be captured in the programme?

Contemporary collecting also poses its own set of particular difficulties. Sections 4 and 5 below discuss the intrinsic dilemma of best practice in contemporary collecting demanding speed and unattainable hindsight, whether in fashion or physics. In such circumstances, the curator's best hope is to retreat to a hammocked sub-project. It seems to us that curatorial research processes should be better integrated and planned from the outset, as we do with audience research.

We will address the specifics of contemporary collecting in the sections that follow, but first let us reassess the very project management framework within which we operated. It is important to acknowledge that alternatives to the unquestioned roll out of traditional project management processes are available (often from other sectors). We will not dwell upon them here, but suffice to mention that *Agile* challenges us to think about contract management and cash flow in different ways; *Human-Centred Design* helps us built time for creative discussion into our plans; and *Scratch* reminds us that the *Plan of Work*'s last stage (*7 – In Use*) is not necessarily the end of the story but only a new beginning. Equally, days are numbered for interpretative planning that positions itself outwith the broader project's processes (Veverka 2011).

These alternatives highlight what many of us have chosen to ignore – that project management is only one way to bring about change. It is, of course, our preferred and most practiced way, underpinned by an entire industry of skilled professionals, contracted relationships and set ways of working, but there *are* alternatives. Other approaches suggest ways of planning for seemingly awkward areas of a project, converting outlying areas of a project or hammock activities into essential contributors towards a creatively-grounded project. Not that we claim such methodologies and processes are necessarily new. Pliny the Younger could arguably be describing an ancient Roman version of Scratch in his letter to Caecilius Celer nearly 2,000 years ago:

> First of all, I go through my work myself; next, I read it to two or three friends and send it to others for comment. If I have any doubts about their criticisms, I go over them again with one or two people, and finally I read the work to a large audience; and that is the moment, believe me, when I make my severest corrections, for my anxiety makes me concentrate all the more carefully. (Radice 1969, 196–97)

His letter signs off after saying

> I can never forget the importance of putting anything into the hands of the public, and I am positive that any work must be revised more than once and read to a number of people if it is intended to give permanent and universal satisfaction (Radice 1969, 197).

Project managers are now not only required to ensure a project is 'on time and on budget' but also ensure that these multiple open-ended sub-projects are engaged; a wider variety of enabling critical processes are put in place; and a quality visitor experience results. (With this in mind, MP3's Project Manager attended the Project Implementation Group so that he could gain this deeper insight into the preoccupations of the team.) Quantity Surveyors are not only required to know the unit cost of tangibles like walls, flooring and cabling, but also make allowances for one-offs, and understand the cost of time required for open-ended processes. Project Directors, Project Owners and Boards of Trustees are required to adapt their processes too, to rethink their role in project control and perceptions of risk, in order to achieve this collective, inclusive, greater impact. And if more motivation were needed, HLF is now also asking the museum and heritage sector to rethink its heavy capital project habit, focussing on sustainability, skills development and inclusivity as integral project outcomes.[8]

Capital projects, and the external funds they attract, both follow and lead curatorial work. Our Art & Design department was established during the MP3 process, providing the new department with opportunities to showcase their work. And yet a capital project process is not necessarily the most hospitable framework for the new department's core activities – including contemporary collecting and the interpretation of topical content. Project management practices need to adapt to cater for the new focus our sector is placing on shared processes (co-creation, peer review, iterative design, consultation) and audience and organizational outcomes (intellectual, emotional, lifelong, sustainable, fundamental). National Museums Scotland is in the business of inspiration – our vision anchors us to this – and we are going to need to use every tool in the box to create these complex and creative encounters with our audiences. Inspiration does not dwell in hammocks, nor is it created by using the same methodologies over and over again. We know the perils of opening a can of paint with the conveniently-to-hand-but-wrong implement. 'Right tool, right job' is the mantra; for the rest of this paper we use our experience of the MP3 project to explore whether this worked in our case.

Contemporary Art

'Something could be modern or it could be in a museum', Gertrude Stein is said to have observed, 'but it could not be both' (Altshuler 2005, 1). The gallerist and the science curator face the same challenge:

> How are museums to collect the new and the unknown? … How are museum curators, steeped in a tradition of connoisseurship and *Kunstgeschichte*, expected to deal with the unruly hundred-and-three ring circus of contemporary art? … This idealized version of museums tends to cast the museum as a reliquary, a mausoleum, a shrine to the past and the supremacy of material culture. Conceiving the museum on such a model serves to discount the actual involvement that a museum might claim with the culture of the present, or even of the future. … Anticipation of the future, rather than a codification of the past, is a necessary attribute of the contemporary curator's function. … A healthy curiosity is in order. Contemporary curators, like scientists and contemporary artists, should not resist experimentation: it's part of the job. (Fox 2005, 15–27.)

Despite the common challenges and opportunities (Alberti and Gardner 2017), they constituted different MP3 workflows, so here we address them separately: first art (and design and fashion) then science (and technology and medicine).

The relation between art museums and contemporary creation has not been static. Art museums were originally linked to private, royal or aristocratic collections, but, though part of those collections were inherited, they were also developed by the addition of recent material.

Museums created during the great expansion of the nineteenth century were not only sites for connoisseurship, but also places of inspiration for both arts and industries. This was especially so for our predecessor institution, the Edinburgh Museum of Science and Art and its sister museum in South Kensington. Similar museums elsewhere in Europe include Lyon's *Musée des Tissus* and *Musée des Arts Décoratifs*, both created by the city's Chamber of Commerce, or, later, the *Museo Nacional de Artes Industriales*, now *Museo Nacional de Artes Decorativas*, in Madrid. The rupture of the Avant-Gardes led many museums to focus on the past, paving the way to the separation of museums specifically dedicated to Modern Art.

Figure 4. The catwalk-style display in Fashion and Style exhibiting contemporary fashion acquisitions. Copyright Andrew Lee. National Museums Scotland.

Though National Museums Scotland did continue to collect crucial elements of contemporary design, the focus shifted to a more ethnographical, anthropological or historical approach. In the case of dress, for instance, the museum had previously taken as social history approach to costume rather than focusing on aesthetic aspects of fashion. The same dichotomy can be seen in the furniture collection, although with an earlier cut-off date, where pieces from the Georgian era were collected for their aesthetic value, while post-Victorian pieces were acquired mostly for their historic or ethnographic value.

For the National Museum of Scotland, two factors changed this approach. First, curator-led actions allowed the acquisition of major contemporary donations. These included the Dan Klein and Alan J. Poole collection for glass and the Jean Muir and Bernat Klein archives for fashion and textiles. Secondly, there was an institutional momentum: the department of Art & Design itself separated from that of Scotland & Europe during MP3 planning, and the initial *raison d'être* of the department was to collect, study and display works of European decorative art and design from the medieval to the contemporary. It became clear again that contemporary creation was, *per se*, a part of the remit of the Museum, and that art (and design) history was more than a subset of history.

The new department brought together seasoned curators from the museum as well as new recruits. Among the challenges they faced was *how* to collect the contemporary; a question that needed to be addressed quickly, as two of the new MP3 galleries (*Making and Creating* and *Fashion and Style*) were intended to extend to the here and now (Figure 4). As we indicated earlier, in this respect the art curator faces challenges similar to those in other disciplines – how to assess and value without the supposed intellectual objectivity brought by time and/or distance? And how to fit this amorphous activity within project management structures? Because a museum is not a *Kunsthalle*, contemporary galleries must be conceived both to reflect the now, and to bear witness to it for future generations, not only as a testimony of the history of taste, but also by trying to identify what will then be seen as aesthetically defining the age in which we live. Cutting-edge clothing, which was placed centre stage in the fashion gallery, welcoming the visitor to the whole of the Art & Design stack, is probably the best example of this difficulty. Fashion, 'a form of ugliness so intolerable that we have to alter it every six months' (Wilde 1885, 9), is characterized by spurts of rupture and rejection without any long-term rationale, and so fits poorly within long-term project processes. To complicate the problem, because fashion is omnipresent in the contemporary world, it is a subject in which everybody, inside and outside the museum (including project stakeholders), tends to think they have expertise. For the most part, however, this so-called expertise reflects the crest of the wave and not the underlying deep currents that the gallery aimed to explore, modern fashion being 'the outcome of a precarious marriage between the processes of creative authorship, technological production, and cultural dissemination' (Breward 2003, 15).

Contemporary design and fashion acquisitions thereby challenge the museum: they must address a contemporary audience; they must document the present for the future; and they must also seek to anticipate future trends. This can only be by a process of trial and error to which the historical museum and its practices, and the *Plan of Work*, are usually averse, however well-planned collecting is (Gardner and Merritt 2002): objects enter the collection far more easily than they are deaccessioned. One of the challenges faced by Georgina Ripley, curator of contemporary fashion, was the extent to which she could be certain of the long-term value of the objects she seeks to acquire. The dilemma is not, as with more ancient works of creation, between authentic or not so authentic, but between significant or not significant in the long term, something which can only be very roughly estimated. And because we have been collecting contemporary pieces since our inception, it is also a lesson in humility when we look back at what has (and has *not*) been collected over a century and a half.

Turning to the particularities of MP3: as the museum was transitioning from a costume collection to a fashion collection, some gaps in the collections had to be filled. Ripley was able to make some iconic acquisitions, including a Paco Rabanne chainmail tunic (K.2015.1).[9] Others explored the same processes as colleagues in Science & Technology, for example the development of 3D printing, used both in cutting-edge creations (like the *Mojito* shoes by Julian Hakes, K.2015.168) and in more mainstream clothes (Pringle jumper, K.2016.55). Other ventures into collecting *terra incognita* had unintended consequences, and sometimes

required tweaking after the opening of the gallery. Two examples of these were faced by Stephen Jackson, curator of Furniture. The Dilly Dally vanity chair (K.2015.27) proved itself unsuitable for public display (without a case it proved haptically irresistible), but this could only be understood after it had been effectively displayed, prompting the museum to purchase another piece to replace it (the 4801 chair by Joe Colombo, K. 2016.142). As for the loaned prototype Full Grown chair by Gavin Munro – shaped from a living tree – at the date of this writing, it continues to grow (IL.2015.54).

The latter is also a good example of one prevalent way of collecting the contemporary: by commission. This brings its own challenges, as senior curator and assistant curator of Modern and Contemporary Design Rose Watban and Sarah Rothwell found. Institutions and project governance are often unwilling to commit to investment before knowing what the work of art will look like; and artists can balk at precise demands. Michael Eden's *Portals* (K.2016.53), however, is a good example of collaboration. Eden visited the galleries during the redevelopment and designed a sculpture in response to the exposed architecture and the 1998 Museum of Scotland building.

Despite, or maybe because of, these challenges, the galleries have been popular with both visitors and critics. *Fashion and Style*, in particular, was hailed by the *Burlington Magazine* as 'a dramatic and innovative installation' (Gere 2016). For National Museums Scotland, contemporary design and fashion were a brave new world, and has attracted those interested in this area who had not previously visited National Museum of Scotland (Muncie and Hutcheson 2016). Curators have been working hand in hand with the Learning and Programmes team and external stakeholders like Creative Scotland or the Edinburgh College of Art to create events engaging our audiences in new ways. The sinister-sounding 'Meet your Maker', for example, was an exchange between our visitors and contemporary craftsmen alongside conferences and workshops lead by the visitor engagement team and the curators. These and other programmes aim to keep the new displays fresh. So too the science galleries next door.

Contemporary Science

Like art galleries, science and technology museums have collected contemporary material since their inception. The Victorian chemist George Wilson, founder–director of the Industrial Museum of Scotland, set out to collect the latest technologies and materials of manufacture as part of the effort to inspire greater innovation and productivity in the industrial arts we mentioned earlier. His successors have wrestled ever since with the tension between collecting antiques and representing recent science.

When seeking to collect the contemporary today, science and technology collections share some of the challenges and opportunities as other disciplines, but face others for good measure. In common with their peers, science curators wrestle with new materials behaving erratically and thorny intellectual property issues; besides which, scientific objects are now often very large or very small, immaterial and indecipherable (Boyle and Hagmann 2017). But contemporary material brings added benefit: a wealth of choice, and living donors and designers to explain and testify (Pantalony 2015).

In tackling these challenges as part of MP3, we operated against the backdrop of two intersecting movements in the science museum sector. First, renewed attention to *recent* scientific heritage as evidenced by projects at the University of Cambridge, the European UNIVERSEUM network, and the French *Patrimoine Scientifique & Technique Contemporain* (see for example Jardine 2013; Ballé *et al*. 2016); and since the 1990s a widespread interest in representing contemporary scientific issues (Chittenden *et al*. 2004).

Scotland has an especially rich scientific and technical heritage, and we set out to exploit this for the redevelopment. The overall aim of the interpretation plan was to 'encourage debate on contemporary issues and subjects relating to the collections e.g. sustainable and renewable energies'; formative evaluation convinced the team not only to use 'objects to explore history and change over time, but also contemporary science and technology, including issues that provoke thought, debate and discussion'.[10] The science curators' challenge, shared with their art colleagues, was to capture Scottish achievements through the displays while still reflecting the international breadth of collections and themes, especially in increasingly delocalized

contemporary science. We wanted to avoid tying a token conceptual 'tartan ribbon' around key objects.

As the gallery themes crystalized, each included up-to-date elements, including for example renewable energy technology in *Energise.* The biomedical areas would be especially contemporary, which proved challenging for Wellcome-funded staff who were appointed mid-project. The project management structure did not necessarily reflect the below-the-water iceberg of contacts and earlier research that existing colleagues can draw upon. Whereas in other areas curators were able to exploit long-established networks, in a relatively underexploited area like biomedicine, Assistant Curator Sophie Goggins had to work fast from her arrival in November 2014. Within the biomedical sphere alone, science curators made 74 acquisitions, most of them contemporary. They range from the humble (disposable syringes, health protection posters) to the complex (an artificial heart, genome sequencers). Other curators had also hit their stride; over 2015, new acquisitions arrived thick and fast across the board (especially in the lead-up to the September content deadline) including Vert rotors, Smart Car material and a KUKA robot (see for example, T.2015.12; T.2016.44.1; T.2016.18).

One new object illustrates the way of working that brought this material to the Museum. Elsa Cox, lead curator on *Energise*, wanted to bring in recent material to enhance the already strong energy collections, to realize the contemporary objectives of the project and to play on a politically relevant issue. The department had an existing relationship with the University of Edinburgh, where engineer Stephen Salter and colleagues had pioneered marine renewable energy since the 1970s (Salter 1974). The famous wave energy converter 'Salter's Duck' was already on display in the existing gallery next door, *Scotland: A Changing Nation*, and this was transferred to *Energise*. This introduced the time-consuming problem of back-filling an existing display, a workflow that is not always accounted for in project planning, and in this case, was a lesson learned.

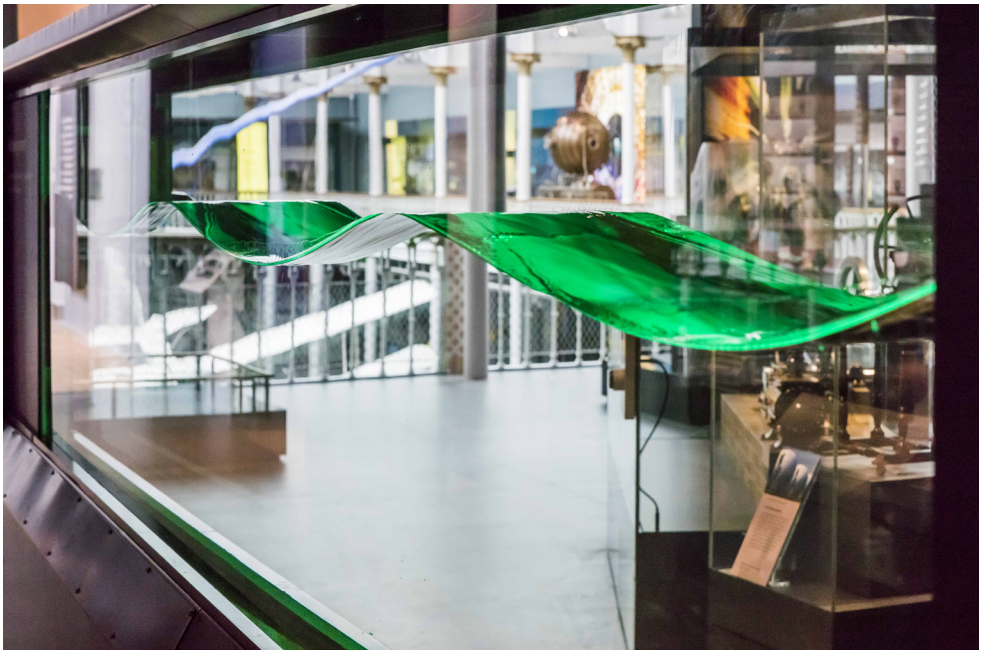

Figure 5. The bespoke commissioned interactive wave tank in the Energise gallery. National Museums Scotland.

After considerable research and conversation, we came to the conclusion that alongside Salter's Duck and other devices on the gallery the best way to engage visitors would not be through acquisition, but rather by commissioning a bespoke wave tank (Figure 5), as touched

upon in section 3 above. Such a commission was only possible within a collaborative network that involved curators spending time with their industrial partners: Cox travelled to relevant sites and attended specialist conferences. She was able to manage expectations and to spot areas of common objectives between the Museum and potential partners – often a shared interest in promoting science, technology, engineering and mathematics (STEM) as a career choice for visitors.

The wave tank was one of a number of elements of the overall narrative for which we decided that interactivity rather than new acquisitions was the most appropriate way of delivering a contemporary message. Clinical trials, for example, may not lend themselves to physical kit, but we felt they were topically relevant and intellectually engaging. We therefore designed a digital interactive that stood apart from the material displays, briefing the interactive supplier to ensure that Cox's work was embedded into the product. The result is an interesting example of a flagship of the project's success that did not involve objects. *Museums Journal* found 'not only has the interactive impressed staff at the museum, but the medics they worked with now use it to explain the process to people about to undergo their trials'.[11]

Whether interactives or objects – the clinical trial, the wave tank, and new acquisitions – the few museums have the capacity outside capital projects to devote this much staff time to these contemporary elements. 'Working directly with industry on an interactive display has its challenges', reflected Cox:

> There was a fine balance of priorities for the company between the museum project and their international major capital projects running at the same time, this required careful management. There are also considerations associated with how an industrial product can be adapted for museum use, with its complexities clearly explained for a museum audience, and how it can be future proofed to cope with intensive visitor use over several years.[12]

Impactful as it may have been, we do not wish not to exaggerate the statistical significance of contemporary collecting here. Not all the objects collected for MP3 were contemporary; neither were they all eventually displayed. The effort expended in new acquisitions and in some cases the profile of these objects should not obscure the many historical and existing works put on display, and considerable effort in both internal and external communication was around bringing stored collections onto display. In the end, 170 of the 1,000 objects in the science stack were less than a decade old. This is unusual, but still a small minority – and they will, of course, age.

Nonetheless, the contemporary issues and objects caught public and media attention: *The Scotsman*, for example, encouraged its readers to 'Join the museum's high-tech revolution' (Harkness 2016, 34). The highest profile scientific objects during the launch, Dolly the Sheep (in the centre of *Explore*) and the Large Electron-Positron collider from CERN (Figure 6), are both interesting in this context. Although neither is very recent – Dolly died in 2003, the collider was decommissioned in 1995 – both are considered contemporary, precisely because they are so obviously *not* antiques. We deployed recently-obsolete icons rather than hyper-recent material to tackle current issues: the LEP is a hook to provide information about the Higgs Boson, which relied on the Large Hadron Collider that replaced it at CERN; and we display much more recent genetic equipment next to Dolly. We can exploit the slipperiness of 'contemporary' to our advantage when engaging visitors with science. It transpires that historical and modern, like and science, are hazy distinctions.

Conclusion: Accommodating the Mess

'Life moves pretty fast', observed Ferris Bueller during his *Day Off*: 'If you don't stop and look around once in a while, you could miss it' (Hughes 1986). Our intention here has been to pause to reflect on the practices involved in a large-scale capital redevelopment, as a contribution to the museological literature that tends to focus on temporary exhibitions. Like McCarthy, we have taken 'current practice seriously as an object of analysis in its own right and produce[d] work that reflects the inside view of practitioners' (McCarthy 2015, xliii); in our case, aiming to provide a critical glimpse of project management and contemporary collecting in particular.

Figure 6. The Large Electron-Positron Collider accelerating cavity from CERN in Enquire (T.2014.34). National Museums Scotland.

By way of conclusion, we offer some lessons learned about three particular relationships that contemporary collecting runs through: between science and art; between structure and flexibility; and between project management and (other) museum managements.

Samuel Beckett argued that art accommodates the mess of life (Driver 1961), and perhaps the same could be said of museums in our quest to collect and organize – to accommodate – the world around us. In our museological practices we create structures, taxonomies and definitions in an attempt to tame and order 'the mess' of life; we divide science and art. Despite the multidisciplinary nature of National Museums Scotland, the combination of workflows within the process and the potential for interdisciplinary work, MP3 was in the end a science product next to an art product, rather than an overall science-and-art product. Throughout, art and science for the most part remained separate, except for a handful of unusual individual pieces such as 'Cybraphon'.[13] Visitors, however, happily transgress these boundaries, weaving in and out of the stacks (Muncie and Hutcheson 2016; see Figure 3); they explore horizontally, as afforded by the architecture. We knew this from previous gallery redevelopments; we could have exploited this to our advantage (and that of our audiences).

Moving from product to process; we have appreciated throughout the need for project management structures, and the team we worked with met deadlines and budgets admirably. There are good reasons for structure: to minimize risk, to reinforce accountability, and to ensure delivery. But there is also the need for greater flexibility – or at least, a different sort of flexibility. Colleagues in Glasgow have paid critical attention to flexibility in museum projects in terms of unsettling the distinction between temporary and permanent galleries (O'Neill 2007; Morgan 2013). In this article, however, we have been concerned with the very process of gallery making.

We reflected here on our experience of organizational structures and the unilineal timeline of a capital redevelopment project that were not sensitive to the known unknowns of unseen commissions or new technology in development. Just because projects are large, however, does not mean they cannot allow for exploratory work; just because scope is fixed does not mean that PEGs and PIGs cannot have a more dynamic and changing culture as the project evolves. Those embarking on capital projects may think about combining them

at times, having 'floating' members, or at least ensuring clear channels of communication. Furthermore, the activities we have reflected upon here – collecting and research – should not be left as hammock tasks, but rather woven into these structures with as much flexibility as possible. They could be more visible in planning processes, awarded dedicated workflows rather than hammocked. The dynamics of museum research could be strengthened if project processes include associated research activities on the programme, or if – for instance – a collections-related research plans are integral outputs (as audience research already is). Or else the project management structures themselves can be re-thought. We hope that this article may prompt consideration of (at least elements of) Human-Centred Design; or the Lean canvasses and Agile scrums of the IT sector. There is potential to weave in other approaches without discarding tried-and tested methods entirely.

Finally, for collecting as for other processes, reflective practice for us rendered explicit that project management (one-off, task-and-finish) and museum management (ongoing, background) could be more closely enmeshed to mutual benefit. For example, if new staff were joining a museum not in the throes of a major project, they may not have been dropped into the workflows so abruptly as MP3 staff were. We can and should plan for sustained activity relating to the product of a capital development once the attention, staff and resource of the funded element of the project has concluded. And, of particular concern here, the planning around a (medium term) re-display project can be explicitly linked and exploit the (long-term) collection development strategy of a museum (Gardner and Merritt 2002; Knell 2004; Merriman 2007).[14] As a sector we know that contemporary collecting is challenging (Rhys and Baveystock 2014), but we still plan and undertake this; we have the opportunity of building this more effectively into our project management processes. We can and should continue to reflect, and to reflect the now.

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Notes

1 Where colleagues are named or quoted, their contribution and/or testimony are on public record.

2 National Museums Scotland, 'Connections: Science and Art', round 2 application to the Heritage Lottery Fund, volume 3, part 6, 'Activity Plan', 29 January 2014, National Museums Scotland Masterplan Phase III Project Files.

3 The galleries won the 'Best Permanent Exhibition' award in May 2017 at the Museums+Heritage Awards, and the Society for the History of Technology Dibner Award for Excellence in Museum Exhibits in October 2017.

4 A large part of the extensive contents of the opulent seat of the Dukes of Hamilton, in Lanarkshire, were auctioned in 1882 and 1919. Either by buying directly in those sales or by subsequent acquisitions, many of these collections entered National Museums Scotland, including the panelling from the drawing room, of which the fireplace wall towers over the *Art of Living gallery* (A.1992.107). http://www.nms.ac.uk/explore-our-collections/stories/art-and-design/the-rise-and-fall-of-hamilton-palace, accessed 26 September 2017.

5 Arguably the highest-profile object in the museum is the mounted skin of the sheep 'Dolly' (1996–2003), the first mammal cloned from an adult cell, from the Roslin Institute near Edinburgh; Z.2003.40. http://www.nms.ac.uk/explore-our-collections/stories/natural-world/dolly-the-sheep, accessed 26 September 2017.

6 Heritage Lottery Fund 'Projects'. http://www.hlf.org.uk/our-projects, 2017, accessed 27 April 2017.

7 National Museums Scotland, 'New National Museum of Scotland Galleries Project Executive Group Start-up Meeting Agenda', 2 February 2011; National Museums Scotland and Sweett Group, 'Phase 3 of The National Museum of Scotland Project Execution Plan', 5 November 2013, National Museums Scotland Masterplan Phase III Project Files.

8 Heritage Lottery Fund, 'Resilient Heritage: Grants from £3,000 to £250,000', 2016. http://www.hlf.org.uk/looking-funding/our-grant-programmes/resilient-heritage, accessed 19 April 2017.

9 Museum reference numbers are included for key objects to allow readers to find more information and images in the online catalogue, https://www.nms.ac.uk/explore-our-collections/search-our-collections/, accessed 27 April 2017.

10 National Museums Scotland, 'Masterplan 3: Interpretation Plan', 27 March 2013; National Museums Scotland, Application for a Medical Humanities & Engagement Capital Award submitted 8 October 2013, 197pp, on page 18, National Museums Scotland Masterplan Phase III Project Files.

11 E. Mills, 'Leading by Example', *Museums Journal* blog, 6 July. http://www.museumsassociation.org/museums-journal/museums-journal-blog/06072016-leading-by-example, accessed 30 January 2017.

12 Elsa Cox, MP3 Reflections: Wave Tank, 22 November 2016, on page 2, National Museums Scotland Science & Technology Departmental Records.

13 Cybraphon (T.2013.6; Taubman 2014), the Autonomous Emotional Robot Band, is an experimental cupboard that plays analogue music and is connected to social media. At the time of writing, Cybraphon was feeling 'dismay': https://twitter.com/cybraphon, accessed 6 October 2017.

14 National Museums Scotland, 'Collections Development Strategy 2017–2022', 15 June 2017, http://www.nms.ac.uk/media/1154769/collections-development-strategy-2017-2022-pdf-version.pdf, accessed 6 October 2017.

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