The Artist-designer: Situating Creative Interaction and Interpretation in the Museum

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Abstract

This research builds on my extensive experience in creating interactive artefacts. Designed to enrich interpretation in museums and galleries, many of these objects are intended to provide occasions for visitor participation and learning. This thesis interrogates the background to this work, examining its origins in crafts practice and how iterative development has led to more complex programmes. I construct and articulate my role and demonstrate the value of my distinct approach to animating collections, enabling innovative forms of user interaction and supporting creative action in public settings.

A review of literature highlights relevant work on theoretical and curatorial approaches to visitor studies, the cultures of display and theories of museology, museum history, materiality and authenticity. Of particular interest have been theories of visitor motivation and contextual models of learning. A review of creative responses in this arena also surveys my own practice, alongside resonant and significant projects by others.

The design and building of a new museum interactive - *The Enlightened Eye* – is the focus of my research. Here I analyse its design procedures and situated use. Focusing on its construction and deployment, I consider compositional, technical and material decisions that contribute to its design. In addition, I examine the collaborative negotiations and mediating influences that shape the production and installation of it as a live interactive in a particular situated 'ecology of action'. Critically I show how I adapt ethnographic procedures to evaluate the situated use of the main case study.

A critical framework has been structured using a flexible, naturalistic inquiry methodology. I have identified myself as an *artist-designer*, a role characterised by a complex set of preoccupations, concerned not only with designed use and design process, but also the aesthetic, sensory qualities of objects and structures, and the choreographed behaviour they afford. Real-world practice, combined with the subjective and the tacit, is examined reflexively to provide new insights and implications for artists, interaction designers, curators and the museum visitor.

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Introduction

This research investigates the distinctive role of the artist-designer in creating situated interactive artefacts in museums. The artist-designer is characterised as a practitioner who is not only actively engaged in the design and material composition of an object, but also with its aesthetic qualities, historical allusions and the situated choreography that reveals the intimate nature of its relationship with museum visitors. In order to discover how my practice has evolved, I have evaluated how my own work has shifted in its intention from a purely creative practice towards a more critical practice. Throughout this investigation I have considered the purpose and characteristics of this practice. I have specifically developed a project called *The Enlightened Eye* to measure the value of my practice. The value of this project has been assessed, and I can show that not only is this value recorded in the quality of actions and interactions demonstrated by those engaging with the main subject of this study but also with the unique assembly of personal and borrowed methods calibrated to substantiate the value of my approach. In addition, these new approaches to developing and assessing situated interactive artefacts have formed a basis for further refinements in enquiry and practice.

Research Questions

Throughout my practice I consider that I have successfully activated *interaction* in audiences. The work nearly always designed to function in a particular context is therefore *situational.* These designs have also considered creative experiences for groups and are *participatory*. This work is designed specifically to enable participants to make their own drawings as an inclusive process of *creative transformation* that affords *interpretation.*

. My work is also founded on my own creative interests as much as it is about responding to an external brief, so I am an *artist-designer.*

Throughout this PhD project, I reflect on the specific set of approaches and concerns of the artist-designer, and examine how this practice is orchestrated and manifested through the following key research questions.

1: *How can a critical analysis of historical and contemporary museum contexts inform a situated design?*

This involves a nuanced examination and critical review of spectacles, museums, museology, and exhibit interpretation in order to understand the ways in which this knowledge can be applied to an understanding of a new interpretive projects within the context of art and design research. This PhD project specifically interrogates the use and influence of a wide variety of sources and contexts that inform *The Enlightened Eye* project in order to assesses how significant that influence might be.

2: *How can social science be employed and integrated into an artist-designer's practice?*

This question is specifically concerned with the use of qualitative ethnographic data analysis as a tool for evaluating a design project that aims to significantly enliven a museum context. This research involves the development of distinctive techniques for analysis of the detailed choreography and the *contingent aesthetic* through the animation of both visitor and displayed object. Further, it asks if this evaluation and understanding of visitor activity helps to iteratively advance the quality of visitor experiences and interpretation, increasing value for both the visitor and the museum.

3: *How are art and design methods integrated in order to create a situated interactive piece in a museum?*

This question is concerned with the connection between the process and purposes of *design* and those of *art* in order to discern how the differences between these closely aligned fields interrelate and support each other to create a specific kind of practice. The nature of contemporary art and design research has been regarded as imprecise; as part of the ongoing enquiry this thesis examines how art and design procedures are brought to bear on a specific project. These art and design procedures include firstly, the development of an analytical and creative tool for *drawing,* committing visitors to close interactional transformative agency over museum objects

aimed to enhance their engagement. Secondly the design and development of a situated assembly that combines both sculptural and functional considerations.

This question attempts to show that the conflicts and commonalities between art and design are important factors in propelling forward my particular practice. Additionally, how the manifestation of this way of thinking and working can be analysed to identify an understanding of how the externally focussed nature of the designer and the self-absorbed nature of the artist are combined, therefore proposing a particular sensitivity to the creative problems that I undertook. By creating a figure, I have called an artist-designer I examine my approach to practice.

Aim and Objectives

The aim of this PhD project is to both articulate and evaluate the artist-designer's key role in the enrichment of creative interpretative interaction through the use of situated design methods. The scope of the project should be considered as a practice based enquiry: its methodology relies on a contextual review, explanation and examination of the design and production of an artefact, as well as its use in a particular context.

There are two main objectives: firstly, a contextual review that examines my own previous practice and that of others, allied to an analysis of relevant theoretical discourses. The critical evaluation includes an exploration and re-evaluation of key works of my own, together with an interrogation of selected significant examples of historical and contemporary interpretation. The contextual review also examines the emergence of the museum as a cultural phenomenon and as an arena for innovative curatorial design.

The second objective is the design and construction of a new interpretive museum resource, *The Enlightened Eye*, created to enhance visitor interaction and interpretation. *The Enlightened Eye* is a situated interactive artefact developed for Liskeard and District Museum, designed specifically to meet the educational and curatorial agenda set by the main project funder the Caradon Hill Area Heritage Project (Hill Area Heritage Project. 2014).

LARGE SCREEN   MICROSCOPE   TOUCH SCREEN

ORRERY HANDLE   MINERALS   FOCUS
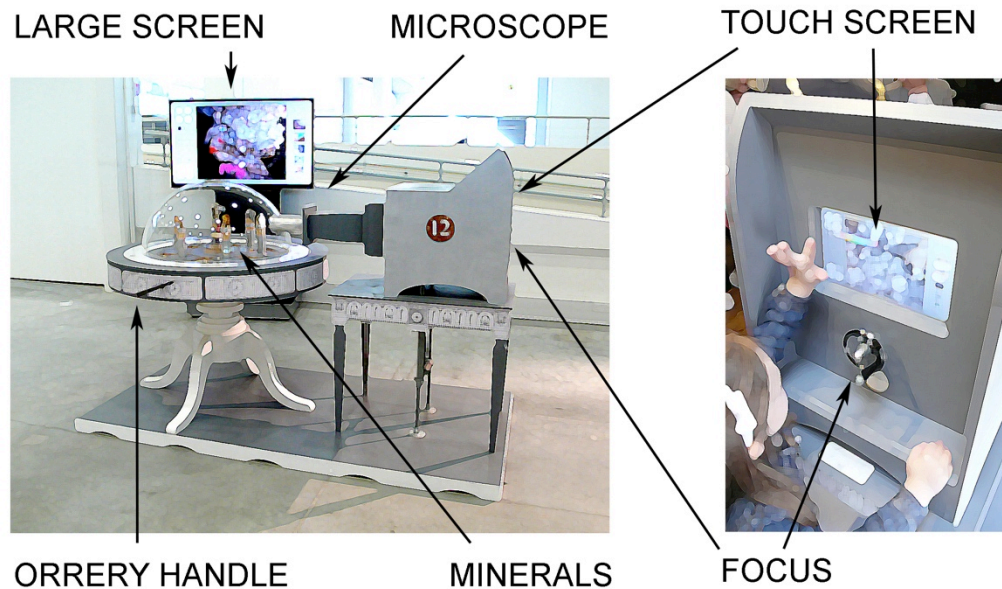
Figure 1: Jason Cleverly. 2014. The Enlightened Eye main components, image: J. Cleverly.

My concept for an interactive needed to take account of visitor exploration and participative creative engagement with mineral samples in the situated context of the mineral gallery of a museum. The structural composition of this interactive was also informed by practical and aesthetic visual cues or 'affordances'. The American psychologist James Gibson originally proposed the concept of affordance, his hypothesis dictated that: 'Values' and 'meanings' of things in an environment can be directly perceived. Moreover, it would explain the sense in which values and meanings are external to the perceiver' (Gibson 1979, 127). Affordances are mechanisms by which an audience might be directed to engage with an interactive. For this study, the idea of an evaluation of certain 'affordances' and an assessment of associated design tools has become an important feature.

The Enlightened Eye was built in order to configure an experience for museum visitors, and designing for an experience required planning for a series of possible outcomes. A museum interactive should be designed to encourage certain physical responses and this requires visual cues or affordances.

The final work (figs1&2) consisted of a table supporting a domed vitrine containing minerals that could be manipulated to appear via a microscope on a touch screen interface, affording creative engagement encouraging tracing and drawing in response to the selected image.
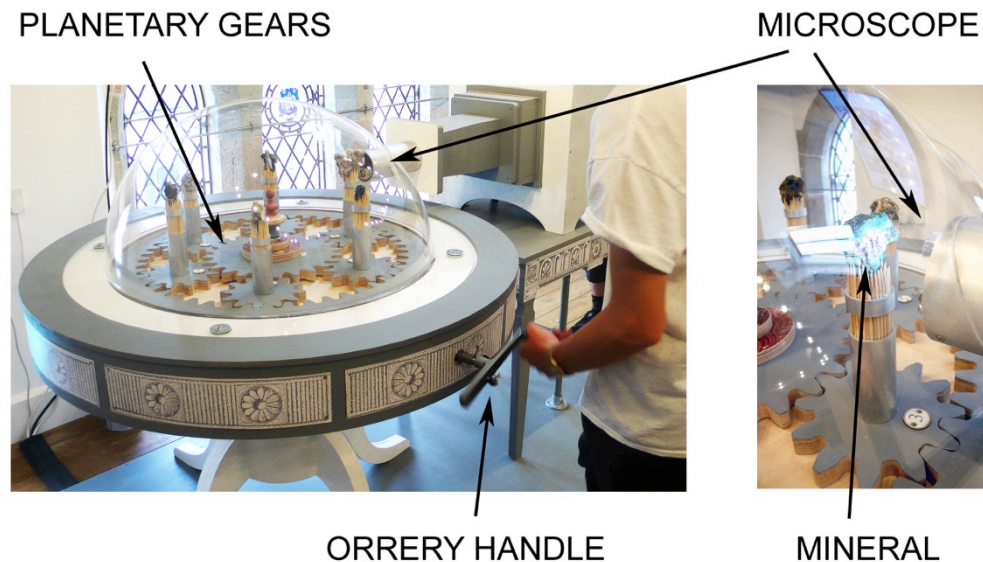
Figure 2: Jason Cleverly. 2014. The Enlightened Eye kinetic controls, image: J. Cleverly.

An evaluation of this work allows for a critical examination of the design process, as well as the way in which it is received or consumed by the museum visitor.

The fugitive figure of the artist-designer moves through this research, and is constructed to find the edges of a practice that does not fit readily into a specific category. This is not an uncommon position; many practitioners cross borders and utilise a range of skills and procedures to get a job done. The search for a definition of this particular approach is used here as a methodological device as much as it is a statement of individuality.

The opportunity to develop and build interpretive and interactive pieces for public use is a privilege. Not only have I been able to work with fascinating collections and buildings, I have also been able to engage with curatorial

staff. Throughout my recent practice I have developed, evaluated and made material design ideas in public spaces. Based on a personal understanding and personal appreciation of design and composition, I understand these idea-objects to be the product of an individual approach to specific contexts. As a consequence, there is a need to re-evaluate the detail of my role and its relationship to other fields, such as social science and museology, in order to make a clear account for both myself and for the benefit of other stakeholders in the production of successful, situated interactive design objects. This PhD project is a chance to reassess and clarify my role, to establish the currency and validity of the role of an artist-designer in context.

This research project has emerged from a long-standing commitment to the design development and construction of interactive sculptural craft works. These have taken the form of small-scale figurative automata, objects such as decorative cupboards and radios. These are objects that can be engaged with, toyed with, animated and brought to life by use. Increasingly this approach has become interwoven with an emerging research practice that reflects upon wider design implications, that considers more closely the interactive function of the work in regard to a range of more particular, site-specific and interpretive design projects.

These design projects have arisen from a number of sources, including commissions from museums and art galleries. However most significantly the projects have been undertaken in collaboration with a research team at King's College London. The Work Interaction and Technology Research Group (hereafter referred to as W.I.T.) specialise in video ethnographic field studies of social interaction in organisational settings and have a particular interest in the ways in which tools and technologies, objects and artefacts, feature in work, practice and organisational conduct ('King's College London - Work, Interaction and Technology'. 2013). This relationship has resulted in a series of projects or 'Naturalistic Experiments' (Heath et al. 2010, 141) that have allowed me to undertake projects that both engaged my artistic preoccupations and stimulated new forms of visitor engagement. A number of these projects have been the subject of book chapters, conference papers and journal articles (Hindmarsh et al. 2002, Heath et al. 2002).

I have undertaken an evaluation of these projects in regard to aspects of social science, ethnographic analysis and visitor studies. I have also evaluated them from the particular standpoint of the artist-designer; a figure that engages with both the construction and design of an aesthetic object and that creates and designs an experience for the visitor.

Defining the Artist-designer

My roots are in a craft practice, I grew up surrounded by ceramics and embroidery made by parents immersed their practice. However, my innovative undergraduate degree in Combined Studies Crafts at Crewe and Alsager College in the mid nineteen eighties focused not only the revival of the studio crafts tradition but also a rejection of this same traditionalism. Studio crafts as exemplified by the establishment of a pottery in the nineteen twenties in St Ives, Cornwall by Bernard Leach (Tyas 2015, 41) had begun to fall out of favour, to be replaced by an interest in hybridity in the use of materials and of questioning process and function (Hill 1997). I was happy to pursue my studies stimulated primarily by composition, materials, and surface pattern. It was from this stance of openness to my own interests and preoccupations that I set out to establish my own practice, making automata and small-scale furniture. My work was made and then exhibited for sale.

The success of an artefact can be measured by the willingness of an audience to show their appreciation for the skills and ideas inculcated into it. This does not mean that the sense of the work for either the audience or the artist is unimportant or casual but that the responsibility for the success of the work and its ideas lies, at very least in this relatively simple transaction: you like it, you buy it. For example, exhibiting at an applied art fair, I sold a decorative mirror to a client. Returning the next day, she protested that the small hand carved wren that the piece featured did not, on reflection, look enough like the bird in question and she wondered if she could return it. Had the client complained that the mirror was not reflective or that it could not be hung straight, then my response would have been different to the apologetic one I gave: 'sold as seen madam'. However, 'sold as seen' cannot be a

maxim for an artist-designer; the balance between aesthetic qualities and practical affordances needs to be addressed.

During the earlier period in my career, I thought of myself as a *designer-maker*, a term that was certainly around during my time studying for a mixed-material undergraduate crafts degree. Peter Dormer talking about the duality of a craft practice says 'In a practical sense you cannot divorce craft from design. The craftsman or craftswoman is as much a designer as is any product designer: to make something requires choices regarding the structure and the appearance of the object as well as a strategy for making it' (Dormer 1997, 12). This down to earth description can be applied equally to those objects that question function, that push definitions as much as to the derided 'brown pot' of my student days.

In their introduction to a wide ranging examination of the polemics surrounding crafts definitions and distinctions: *Dangerous Liaisons: Relationships between Design, Craft and Art,* craft theorists Grace Lees-Maffei and Linda Sandino report that: 'While the historiography of the disciplinary discourses of art and design presents an increasingly closer parallel in their concerns with the context, production and consumption of their objects of study, crafts have a nascent rather than mature historiography' (Lees Maffei and Sandino 2004, 6). Therefore the field of crafts are often playing catch up to secure a firm vantage point. This view is tempered with the apprehension that there is, and will be an increasing hybridity of craft, design and art. Isabel Risner a researcher examining the impact of the digital on contemporary crafts, finds the term designer-maker 'shorthand for the multiplicity of specialisms, as an imprecise and broad, and usefully 'gutless umbrella term' (Risner 2013, 21). Risner suggests that the term designer-maker has been coined to cover practitioners who did not want to be identified with craft, to 'redefine and reposition' (Risner 2013, 20). The term has been seen as useful by craft theorist in describing a post-disciplinary hybrid practice adopted by designers who wish to work with a variety of materials and approaches and not be bound to traditional conceptions of how and where they might work. For all its breaking down of barriers, the phrase designer-maker has also been seen as imprecise and

lacking in conviction, to the extent that it has become a meaningless portmanteau. For me the transformation of this epithet from designer-maker to artist-designer is not about shrugging off the past, as the designer-maker did to the craftsman but as part of my methodology to help explain the emergence of a new kind of practice.

As the opportunities expanded beyond the commercial craft arena, my work became more collaborative, and more often designed for public engagement. This increased the responsibility to make things that worked consistently and that fulfilled expectations. Additionally, I still wanted to make successfully functioning work that relied not only on these pragmatic responsibilities, but was successful in regard to my own aesthetic concerns and sensitive to my tacit and sometimes unconscious choices. This PhD project explores the connection and validity of the relationship between these two concerns; in attempting to account for a synergy between the artistic and the practical, I propose them both as indispensable to my approach. The construction and evaluation of a figure I call the artist-designer has been a critical tool in examining and finding the edges of my practice. If the artist-designer is a figure that makes, articulates and critiques situations, then a combination of personal artistic preoccupations are conflated with curatorial and visitor requirements. Situated design categorises this approach to creating interpretative assemblies for particular museum environments. By reviewing methods of thinking, making and designing and by developing a critical framework based on an uncovering of my own tacit understandings, I reveal an idiosyncratic approach to realising and explaining practice.

An evaluation of theoretical and practice based research has deepened my appreciation of my position as both an artist and a designer. This has been partially achieved through an assessment of museum history, museum interpretation, and social behaviour. Importantly, this process has been supported through the design, fabrication and evaluation of *The Enlightened Eye,* a functional interactive object. This interpretive assembly is designed to enhance visitor engagement and reveals the meeting-point at which an artist's choices elide that of a designer's.

To examine the work of others - those who have, through their own approaches, secured authority - and to be part of this ongoing epistemological dialogue and understanding is an important opportunity. Additionally, this thesis explores recognisable similarities, drawing upon the work of social scientists, cultural historians and the like who have developed specific methodologies in their own fields.

When making compositional judgements and design decisions, there are points at which the heuristic channelling of accumulated knowledge connects with primary research and practical considerations. The elusive and elastic nature of an artist-designer's decision-making process has been examined through the creation of *The Enlightened Eye,*

Additionally, there have been other procedures undertaken by me as an artist-designer that have shaped the central attention and focus of this study. These procedures include how collaboration and close engagement with key partners operate and how they are conducted to respond to their influences. Additionally, there is an assessment and consideration of the site-specific influence on the objects and people that are placed under attention within the ecology of action.

A Review of Previous Practice

introduction

This overview of my own work was constructed to demonstrate how my practice has developed from decorative automated objects through to more

complex installations. I discuss how these iterations were all developed to address an audience and to invite interaction, of how the work moved from interaction between individuals and the artwork, through to the way in which an audience might address a theme or a situation, and importantly how this work could be calibrated to encourage interactions between others in the same space.

Over the course of my practice, I have made many objects. Works from my commercial production, small scale and site-specific work number in the hundreds, there have been twelve of the more complex interactive commissions.

My work has evolved from a predominantly tacit practice; a way of thinking and working that has emerged naturally from my interests and materials manipulation skills. I have made a mixture of decorative and functional objects. Working with paint, pencils and hand-carved wood, I made things from found materials and found images. A feature of my work is that it often juxtaposes appropriated images with inappropriate forms; a pig with Botticelli's *Birth of Venus*, a fish with Raphael's *Marriage of the Virgin* or a pig with Hergés *Thompson Twins* painted on their surface (fig 3). I admire the richness produced by the Surrealist Magritte's 'deadpan technique' (Whitfield et al. 1992, 236) of collaging images, if I liked something I used it. The audience for these works had to work it out for themselves, to see things differently, borrowing from Marcel Duchamp: 'it's the beholder that makes the pictures' (Bourriaud 2002, 26). I recognise now that collaging in this way began the procedure for my method of visual research that I outline later in this thesis, as well an interest in the way an audience might respond to my work.

Figure 3: Jason Cleverly. 1987. Hergés Pig, image: J. Cleverly 1987.

Interactive, Immersive and Participatory

In this section I outline a brief history of automata and my original preoccupation with constructing figurative, interactive craftworks. I then discuss subsequent projects, firstly using embedded cameras to create affinities and then successive larger and more ambitious projects designed to afford situated creative action.

Automata

Automata are decorative playful machines, descriptions of which reach as far back as Alexandria in the third century B.C. where 'Ctesibius is generally considered the founder and first great figure of the Alexandrian school of ingeniously engineered contrivances' (Terpak 2002, 40). Popular during the eighteenth century, automata such as *Vaucanson's Duck* (fig 4) appeared to peck, digest and defecate; android figures would play flutes and harpsichords and even create handwritten letters, these '[m]echanical devices seem to offer limitless new technological possibilities' (Standage 2002, xiii). Indeed, Vaucanson is cited as the inventor of the automatic crank. This advance is one that 'revolutionised weaving at the turn of the nineteenth century' (Stafford 1994, 191). More recent examples by exponents such as the Pop Absurdist Bruce Lacey's mid-twentieth century 'kinetic sculptural versions of the uncanny' (Mellor et al. 2012, 46), and master automata maker Paul Spooner's 'wooden cartoons' (BBC News 2013) exemplify the continued curiosity that mechanical life evokes.
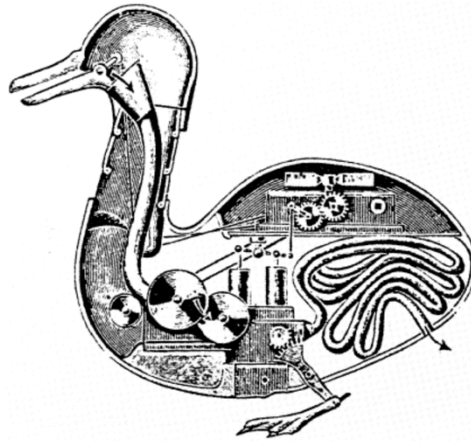
Figure 4: Anon.1739. A postulated interior of the Duck of Vaucanson (1738-1739) by an American observer.

Automata have by their very nature a built-in narrative; an audience is encouraged to interact with an analogue kinetic machine, very often representations of animals and people. For a number of years I developed a series of works utilising simple wheel driven cranks (Figs 5 and 6). The urge to embed movement was propelled by the obvious amusement that basic movement engendered in both the public and myself. The simplicity of the mechanisms was no barrier to the received impression of life-like movements. Indeed, my mechanisms were not hidden, as in the sophisticated automata of the eighteenth century but were visible and readable to the viewer.

This openness of engagement engendered a dialogue between the audience and myself, at trade shows and exhibitions I was able to engage in discussion with clients. This set the scene for continued design development of interactive and participatory project works.

Figure 6: Jason Cleverly. 1998. Electric Crab, image: J. Cleverly 1998.

Deus Oculi (1999)

The intent for this piece was to create an interactive artefact that allowed the audience to interact both with the work and collaboratively with others. The project proposed by Work Interaction and Technology Research Group at Kings College (King's College London 2014) (Hereafter W.I.T.) had an open-ended design brief that, while allowing for a continued personal exploration of particular visual and material qualities, asked for it to enhance and support social interaction. This proviso arose from studies by W.I.T. that concluded that whilst museum interpretive interactives were often well designed in terms of individual experience, they 'emphasise simultaneous independent use, rather than supporting or enhancing collaboration between visitors' (Heath et al. 2010, 140).

The project was subject to extended filming by the W.I.T. team and the resulting video footage provided data for analysis. Describing the power of this process in the definitive handbook *Video in Qualitative Research*, Heath et al state that 'the ability for video to reveal to others the complexity and character of the mundane, can prove highly insightful and persuasive for

practitioners, and help them to address a range of distinctive problems' (Heath et al. 2010, 78). To apply video analysis to design development was clearly applicable to my own research and practice, however it is only through this PhD project that I have been able to seize the opportunity to develop my own procedure for data capture and analysis. This will be discussed in chapter 5 in depth. The assessment of design specifications, including the potential for video analysis on a project-by-project basis, formed a key part of my working methodology. There was also great value in answering to a design brief that called for enhanced interaction and participation and this was the way in which my practice developed forward from this point.

Figure 7: Jason Cleverly. 1999. Deus Oculi, image: J. Cleverly 1999.

Deus Oculi was conceived to directly engage two visitors at a time; although a single individual or a number of viewers could also participate. The composition consisted of a large Renaissance style painting, positioned in the landscape format, featuring two figures in a plain interior (fig 9). These figures were appropriated copies of Petrus Christus's *Portrait of a Young Man* (1450-60) and his *Portrait of a Young Woman* (c. 1470).

Figure 8: (R) Petrus Christus. 1450-60. Portrait of a Man. (L) Petrus Christus. 1470. Portrait of a Young Woman.

These images were positioned so that the head and shoulder portraits inclined towards each other. This was a compositional conceit designed to mirror the intended positioning of the visitors.

Figure 9: Jason Cleverly. 1999. Deus Oculi (detail), image: J. Cleverly 1999.

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Two structures resembling hand-held mirrors were arranged on either side of the painting. In place of the mirror glass were circular paintings, the right and left eye from *Portrait of a Man* by Antonello de Messina (c. 1475-6),.

Figure 10: (R) Antonello de Messina. c.1475-76. (L) Portrait of a Man, Portrait of a Man (detail). Portrait of a Man (detail).

The design of the work allowed an engagement with simple embedded technology. Drawing on previous pieces containing radio mechanisms, I fixed monitors into the work in the form of small CCTV screens. The insertion of screens had the effect of drawing the eye and created a compositional and aesthetic problem. The design required the user to centre their attention on the screens, however the work needed a compositional balance. This was resolved by making the surrounding surface of the screens highly decorative, creating a tonal equilibrium.

Deus Oculi was designed for a particular context: Chelsea International Crafts Fair (fig 7). This show, by virtue of its commerciality and its accent on public engagement with craft makers and their products, allowed for close inspection and appraisal of artefacts. The work itself was displayed alongside other exhibits of mine, including mirrors, automata and small-scale furniture. This embedding of an experimental work within a commercial show, and its positioning along a corridor, meant that a steady stream of visitors throughout the six-day event came within range of the work. I also decorated the space to resemble a room or an art gallery, with wallpaper and a dado-rail, in effect creating a micro ecology within a larger ecosystem.

Qualitative field studies revealed many instances of active engagement and co-participation by visitors. In some cases, separate visitors as well as those who appeared to be together, directed and informed each other in the navigation of the work.

As the first in my series of works of this type, I gave some consideration to the necessity for written instructions. I decided against this believing that the work should be intuitive. I wanted the visitor to be able to interrogate and

navigate the work via its compositional affordances. The work continued to allow visitors to successfully shape experiences for themselves and others, 'in and through the installation' (Heath et al. 2002, 17). An example of these affordances included the exposed camera cables connecting the wall-mounted hand-mirror cameras to the main structure. Some in the research team saw this element of the composition as an oversight. However, I felt it made the work more intelligible. This intelligibility was captured in the video data; in a notable example, a subject was seen to follow the cables with her eyes and then initiate use of the piece with a fellow visitor. This was an interesting observation, as I had tacitly considered the cables as part of *Deus Oculi's* composition. Owing something to the compositional dynamic affordance of a hairdryer, where the cable feeds power to the handset, producing hot air, and something morphologically akin to the tail of an animal.

Ghost Ship (2001)

In 2000 I was approached, alongside colleagues in W.I.T., by the British Crafts Council, and asked to design and make a work that would fill the Special Exhibit space at the Sculpture Objects and Functional Arts (SOFA) Exposition in Chicago in 2001 (SOFA. 2016). This opportunity had a number of potential outcomes, not least of which was to develop a work that would afford and provoke multiple visitor engagement.

The space to be filled was a large open sided rectangle. At approximately four and a half metres by seven, the space allowed for a significant number of people to move around within it. Ideas were continuously discussed with the W.I.T. team, with whom I had by now built up a strong collaborative relationship. Video ethnographic studies that were to be conducted formed an important driving force for the design. This design continued, as with *Deus Oculi*, with an attempt to immerse visitors in the structure of the work and to provoke interaction between visitors.

Nautical imagery had been a recurring theme in my work and the concept of an ocean liner emerged in this instance at the development stage. I wanted to set the ship in an ocean so I decided to utilise the generous space I had

been given in the manner of a Panorama. Following visits to the Mesdag Panorama in The Hague (1881) (Panorama Mesdag 2014) and Lucerne's Bourbaki Panorama (1881) (Bourbaki Panorama 2014), I became preoccupied with the proto-cinema immersive spectacles popular in the eighteenth and nineteenth centuries. I consequently aimed to provide the visitor with some of the immersive qualities engendered by the panorama, which I discuss in greater detail below.

Figure 12: Edouard Castres.1881. The Bourbaki Panorama (detail), image: J. Cleverly 2010.

The resulting work took the form of two discrete zones: on one side a large ship resembling a scaled up tin toy, based on the designs of the late nineteenth and early twentieth century German company, Gebrüder Bing

Figure 13: Gebrüder Bing. 1902. Bing Tin toy: HMS Terrible. Image: D. Pressland 1979.

(Bing Museum 2014) and occupying the other, a section of deck and a secondary vestibule featuring simple apertures (fig 14). The boat structure included a back-projected live feed from a camera focused upon the deck area, with the image appearing on the boat's main cabin, this created the opportunity for visitors to appear both on the real deck, as well as projected as if they were aboard the liner. Additionally, several portholes featured along the main hull of the boat, two of which contained hand painted faces of imagined passengers and a further three, which contained monitors displaying a live feed from three small cameras mounted on the side of the hull, allowing visitors to appear within the portholes. In addition, as the first and third portholes were fed by opposite cameras, this afforded a potential surprise for visitors. Thus, upon encountering the vessel, visitors could position themselves in a number of ways in order to allow the incorporation of multiple participants.

As described, the design of *Ghost Ship* offered a series of creative possibilities for the participants, providing 'progressive opportunities to create and develop novel forms of interaction and participation with and around it' (Hindmarsh et al. 2002, 4). These progressive opportunities ranged from simple play-acting, such as pretending to be stuck inside the ship and banging on the porthole glass, to more complex navigations of the structure, such as allowing individuals to hide behind the stage set version of the cabin and disappear from their companions' sight; their companions would then search for them, only to encounter their projected image, thereby creating opportunities for openly expressed amusement. These interactions between visitors reflect the success of *Ghost Ship*. Hindmarsh discusses the relational relevance of this thus: 'We routinely read into the current bodily actions of individuals to establish a sense of what they are doing next and how that might be relevant to our own conduct' (Hindmarsh et al. 2002, 5). The conduct of visitors in relation to each other is an important aspect of the design consideration for my continued practice.

Figure 14: Jason Cleverly. 2001. Ghost Ship, image, J. Cleverly 2001.

A failing of the piece was the apparent infrequency of occasions where visitors felt able to co-participate. This failure has been addressed in subsequent iterative experiments through the scalability and distribution of the components of the assemblies and an accent on thematic or didactic narratives, where the mise-en-scene or context is more firmly established. A success of *Deus Oculi* was the apparent willingness of visitors to consider themselves in relation not only to companions but also to others, including apparent strangers, within the local ecology of the work. It could also be seen that the smaller space of this work afforded the drawing in of other visitors 'by virtue of the actions of others' (Heath et al. 2002, 22), forming a chain reaction through chance.

Keepsake and Viewer (2001)

The Beatrice Royal Gallery in Eastleigh, Hampshire, commissioned a new project in 2001. The project arose from the gallery's desire to help visitors

navigate their rather large and complex internal space in a former church. This consisted of a series of interconnecting rooms housing small and large-scale crafts and sculptural objects, forming a mixture of semi-permanent displays of work for sale to the public.

After visiting the gallery, I again consulted with my collaborators from W.I.T., and submitted a range of proposals to the gallery. The design that emerged was intended to exploit the intercommunication of space and, once again would use the device of cameras and embedded screens. I also wished to affect a transposition, allowing the visitor to in some way project themselves between spaces and attract the attention of others around the building.

Having identified a number of suitable positions within the gallery, I developed two variants of this extended structure. The first, titled *Keepsake*, took the form of a massively enlarged Georgian eye miniature of the kind shown in fig 15.

Figure 15: Anon. c. 1800. Miniature Watercolour on Ivory, image: © Victoria and Albert Museum, London 2017.

Made of painted, carved wood, standing at over two metres high and positioned by the main reception area (fig16). It was connected to a large metal urn in close proximity but made remote by the layout of the gallery. The embedding of a small camera into both structures formed a connection between the vessel and *Keepsake* and each supported a television monitor relaying the signal from the other. A monitor lay at the bottom of the vessel structure.

Figure 16: Jason Cleverly. 2001. Keepsake, image: J. Cleverly 2001.

This positioning was chosen after the curator reported the frequency with which visitors looked into other large, mainly ceramic vessels on display. The *Keepsake* screen was situated in the iris and pupil part of the eye image, meaning that the head would become a visual stand-in for the pupil when another visitor looked into the pot.

The second structure, simply named *Viewer*, followed a similar configuration
to *Keepsake*, I made a copy of a painting by Cornelius Gijsbrechts (fig 19)
the visitor could put their face up to this image and housed in the box was a
monitor and a small camera. This meant that a visitor could see a live feed
showing the view from an adjacent gallery.
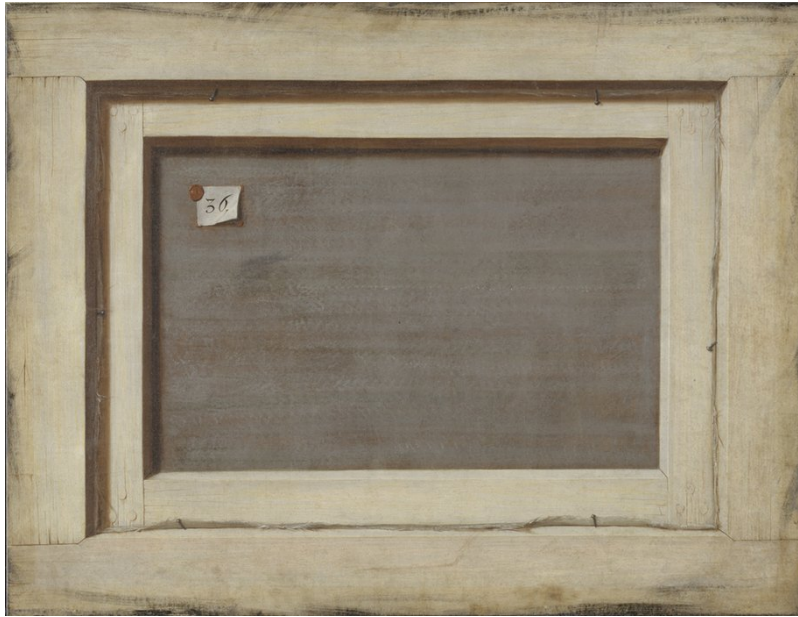
The secondary device primarily took the form of another appropriated painting; Lucas Cranach the *Elder's Portrait of a Man* (1522) (fig 20) that I copied onto wood.

This hand-painted copy had two circular holes in place of eyes framing the 'real' video relayed eyes of a visitor peering into the Gijsbrechts' device. The work mounted in the wall had the intention of giving a viewer the sensation that they were immersed in the portrait in the adjacent gallery (fig 21).

Figure 21: Jason Cleverly. 2001. Viewer (detail), showing eye movement image: J. Cleverly 2001.

The complexity of *Keepsake* and *Viewer* extended and explored an area of practice that enriched and reconfigured the toolkit that I had developed up to this point: an appropriation of Northern European Renaissance paintings; and the embedding of cameras and screens to promote collaboration and interaction. The attempt to disguise the interventions as if they were objects within the gallery established a provisional correlation with the practice of *aesthetic affordance* discussed in chapter 1. My early practice in small-scale interactive automata formed a productive platform for new immersive and participatory work. The collaboration with W.I.T. expanded opportunities for new ways of working, designing objects that created participation and interaction in the visitor.

Designs for Creative Transformation for Revealing Interpretation

In this section I discuss three iterative configurations of the same basic design. Building on previous work with embedded cameras, these designs were concerned with generating interpretive affinities with people and objects; the designs were organised to create opportunities for museum visitors to work together, although this was not essential for effective use.

The Universal Curator (2003)

The Universal Curator was funded by the European project Situating Hybrid Assemblies in Public Environments (S.H.A.P.E. 2014). The initiative supported a number of projects and the W.I.T. team asked me to produce a piece for the 2003 exhibition *Re-Tracing the Past,* held at The Hunt Museum, Limerick, Republic of Ireland (Hunt Museum 2014). The Hunt Museum houses an internationally important collection of works of art and antiquities collected by John and Gertrude Hunt. The eclectic collection includes diverse religious artefacts, ceramics, tools and toys.

The design for *The Universal Curator* was developed to allow the visitor a sense of ownership of key items from the collection, and to create their own selections for display. The design featured a large canon-like structure that contained a camera that could be trained on a lit stage-like area. Visitors were asked to place ersatz plastic versions of the selected objects on this stage, the selection appearing on a large screen that then became a personally curated cabinet (fig10).
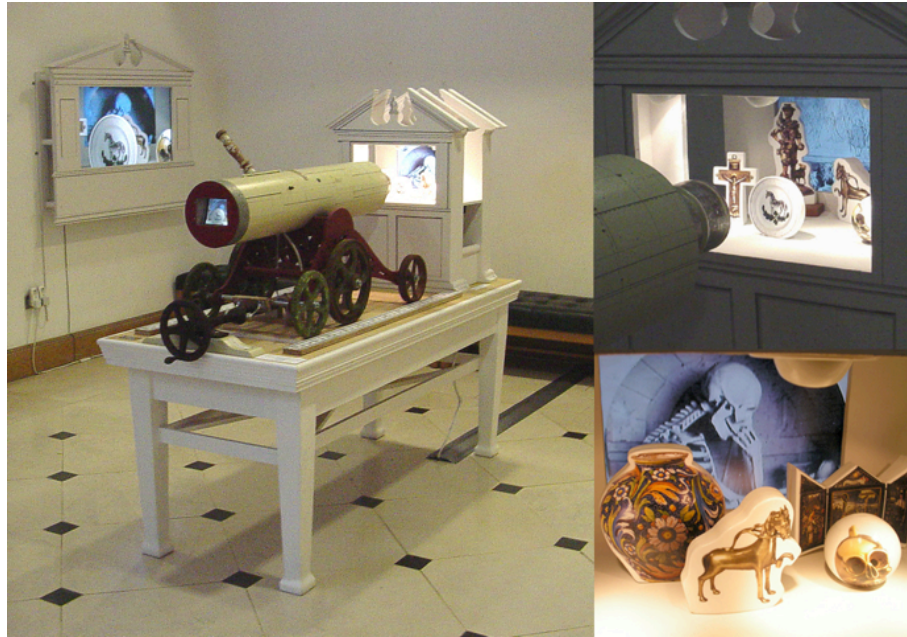
Figure 22: Jason Cleverly. 2003. The Universal Curator, image: J. Cleverly 2003.

The Universal Curator was used and understood, according the video data collected by the W.I.T team. However individuals, particularly school children, would place their faces near the camera in order to see themselves close up on the wall-mounted screen (fig 22), thus provoking a reaction from others (fig 23). This unintended action was part of the way in which this work preserved a relatively open agenda and continued the playful qualities of the piece. Following on from this example of the spectator becoming part of the spectacle, I developed a view that *open-endedness* is an important aspect of interpretive works that are participatory and contributory.

The Narrative Engine (2003)

For the exhibition *Tell-Tale Narratives in Contemporary Craft* at the Shipley
Art Gallery, Gateshead in 2003 (Shipley Art Gallery 2014) *The Universal
Curator* was reconfigured to become *The Narrative Engine.* To suit the
theme of the exhibition, the same premise was deployed: facsimile versions
of contemporary craft works that featured in the exhibition could be arranged
by the visitor to make a narrative scene. The stage for this arrangement also
featured a back mounted screen that could be changed to alter the context
that the objects inhabited. Selected results of the arrangements were
captured during workshops, which enabled participants to write a story to
augment their creations. The printed pictures and stories were then
displayed in the gallery. Again, as with *The Universal Curator*, unintended
forms of engagement emerged over the period of installation. Local schools
taking part in the model-making workshops that coincided with the exhibition
began to use *The Narrative Engine* to display their own cardboard and mixed
media creations. This chance activity prefigured and informed later designs,
encouraging greater input from visitors.

Figure 24: Jason Cleverly. 2003. The Narrative Engine Being used, image: D.V. Lehn 2003

Figure 25: Anon. 2003. Participant story sheet being creatively misused, image: J. Cleverly 2003.

The Perceptive Engine (2004)

Held at the Potteries Museum Stoke on Trent (Stoke Museums 2014) the exhibition *Ways of Looking* concentrated on a range of works by artists, including David Hockney, Francis Bacon, Patrick Caulfield and Dorothea Tanning. A third iteration of *The Universal Curator* allowed visitors to configure their own versions of paintings drawn from Tate Britain's collection. In the exhibition these pictures were thematically arranged into categories, such as 'Looking at People' and 'Looking at Oddities and Enigmas'. Real things, such as thermometers, as well as ersatz objects based on elements extracted from paintings, were again available for configuration by visitors.
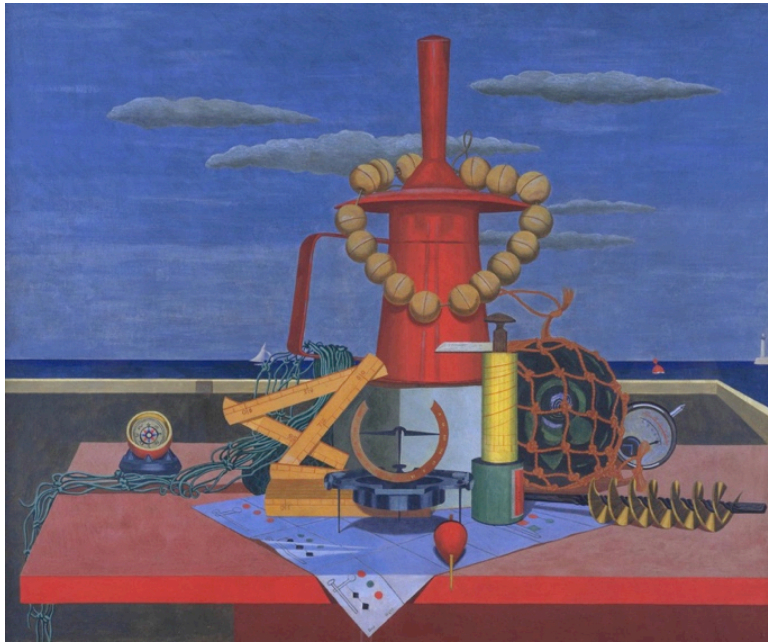
Figure 26: Edward Wadsworth. 1928. Regalia, image: © The estate of Edward Wadsworth.

Edward Wadsworth's *Regalia* (1928) (fig 26), and Paul Nash's *Equivalents for Megaliths* (1935) (fig 27) were two of the paintings from the exhibition that were drawn upon for this piece.

The resulting arrangements of objects were fed to a live screen in the gallery to accompany the exhibition paintings.

As with *The Narrative Engine,* the selected arrangements could be printed out. In this case, the visitors' work was placed in small frames in the gallery, so that the contributors' work was, in effect, part of the show. *The Perceptive Engine* was well used by visitors to create their own versions of a still life. Unlike the *Universal Curator* there were no clear incidence of participants using the piece in ways other than for what it was designed. This indicated to me that the design of this iteration supported a greater range of freedom for individual expression and creative transformation. That is to say, the *Perceptive Engine* was sufficiently diverse in the ways in which a visitor in this particular context could use it. Iterative use of the design had allowed for a range of distinctive, supported activities to be developed.
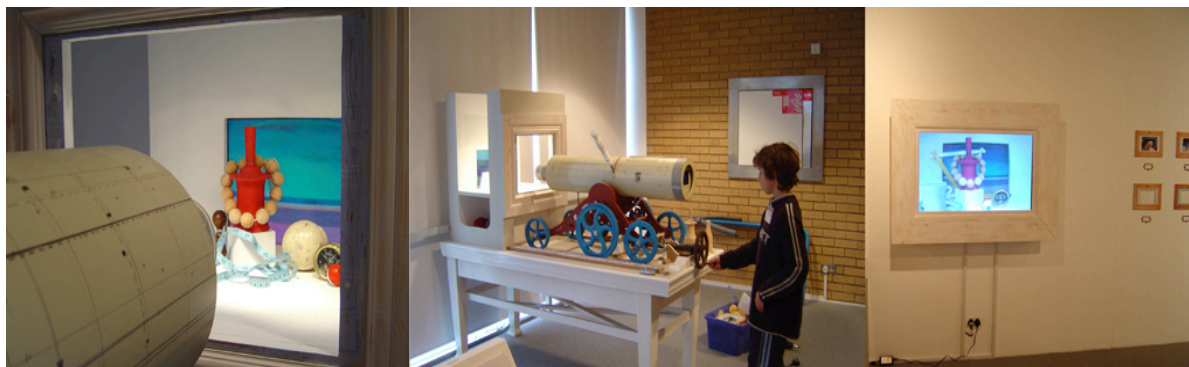
Figure 29: Jason Cleverly. 2004. The Perceptive Engine. Image: J. Cleverly 2004.

The playful misuse of two of the works reinforced my ambition to develop further opportunities for creative responses within new designs. When visitors had the opportunity to engage in structured, creative, transformational tasks, some still found new ways of using the interactives. The agency that these projects provided could be used again and could be widened in their scope, affording even greater and more sophisticated individual and group responses.

Towards Participatory Networked Objects

In this section I discuss two projects. Firstly, *Lineamentum* (2007) designed to create interpretive affinities with museum objects, through the use of drawing. Secondly, *Interactive Worktable and Escritoire* (2009), which allowed visitors to make up words and define the use of them in a particular situated context. This second project enabled visitor responses to be distributed and preserved via the Internet. These two iterative projects are critically linked to the main case study of this PhD project. Through live testing of visitor engagement through drawing and the operation of a networked object, they form an investigative basis for *The Enlightened Eye*.

Lineamentum (2007)

As part of the continuing collaboration with W.I.T., *Lineamentum* was developed for the Royal Cornwall Museum Truro (Royal Cornwall Museum 2016). It comprised a mobile drawing kiosk sited in front of a large vitrine, containing a variety of applied arts, including ceramics, metalwork and glass (fig 32).

Lineamentum allowed visitors to draw museum artefacts, to engage intimately with them and to engender a feeling of ownership and engagement through the close inspection that drawing requires. Building on my experience of *The Narrative Engine* and the contingent drawing that visitors created, I aimed to cultivate this kind of interaction, therefore the design was devised to make participants feel at ease about the drawing process. Drawing in museums is a relatively normal educational experience for art and design students. Indeed, many museums and art galleries actively encourage this process. The Victoria and Albert Museum, London, for example, has a whole section on its website devoted to this process, featuring advice for teachers (Victoria and Albert Museum 2014).

To make the process of drawing easier for the visitor, I utilised a system employed by Albrecht Dürer in the fourteenth century. Dürer's use of the perspective net and grid is a well-known device for perspectival rendering of 3D objects, as discussed and depicted in his *Four Books on Measurement* (*Underweysung der Messung*) (Dürer 1538).

The design of the *Lineamentum* allowed the visitor to use the net and grid to draw with board markers on an illuminated gridded white board. Drawings were projected in real time on to a large screen above the vitrine and to a secondary screen in the museum foyer.

Again, the work was well used. It was filmed in use by a researcher from W.I.T. who reported that his main observation was that the 'interaction between two participants, often a parent and child, was restricted to instructions'. He also reported on '[a] father instructing his son how to look through the grid, and then observing and commenting on the son's actions' (Vom Lehn 2013). Known as 'scaffolding', this kind of supportive behaviour and instructed action is a feature of group visits to museums, particularly in regard to adults and children. When designing interactive exhibits, scaffolding can be taken into account by designing multi-modal features to enhance collaboration between visitors, (I discuss this in depth in the 'Visitor Studies' section in chapter 3). The phenomenon of scaffolding to support creative transformation, although I did not understand the significance at the time, forms a significant underpinning to the way in which these works are animated and used.

Figure 32: Jason Cleverly. 2007. Lineamentum, image: J. Cleverly 2007.

Despite its functionality, the *Lineamentum* did not preserve any of the visitor's drawings, which meaning that visitors could not view previous examples, that might support and inform the next drawing was not possible. The guide for drawing afforded by Dürer's simple grid allowed for personal and collaborative connections with museum objects however these could have been made more permanent. I was determined now to apply a system for storage and review of creative action.

Interactive Worktable and Escritoire (2009)

The *House of Words* exhibition was held during summer of 2009 to celebrate the 300th anniversary of Dr Johnson's birthday. Dr Johnson is famous for compiling the most influential dictionary in the history of English language, published in 1755. Johnson's house, built in 1700 in Gough Square in the City of London, is one of the few residential houses of its type still surviving, containing panelled rooms, period furniture and paintings (Dr Johnson's House 2012).

I was invited to contribute to the exhibition and was determined to develop an interactive peice about language, words and definitions. For this installation, I built a playful, imagined recreation of Johnson's furniture to evoke a sense of purpose and context. My exhibit comprised a table, an escritoire, book and inkwell, to be positioned in the garret room where the dictionary had been originally compiled. This was a reference to the large high trestle tables on which Johnson had worked when he compiled the dictionary, covering them in paper notes, words and definitions. These definitions were brought to the garret by helpers called amanuensis; as Hitchings has said, 'the garret at Gough Square was not so much a counting house as an assembly line' (Hitchings 2006, 81). This image of a place that was at the centre of things, here the compiling and collation of words and definitions was suggestive of a search engine and its repository. I proposed a contributory online dictionary that could only be used in the garret room. Working with the support of a new collaborative partner, information technology specialist Tim Shear, I was able to devise an interface that could capture the visitor's words. This was an opportunity to create a participatory contributory and networked interactive that would solve the ephemerality of creative contributions seen in previous works.

Figure 33: Jason Cleverly. 2009. Interactive Worktable and Escritiore, image: J. Cleverly 2009.

For the visual characteristics and to further suggest the eighteenth century, I referenced Thomas Chippendale's catalogue of furniture styles, *The Gentleman and Cabinet Maker's Director* (Chippendale and Chippendale Society 1966). This publication contains clear black and white images with evocative crosshatchings and stylized perspective qualities. I was also granted permission to use hi-res images of Johnson's original correction notes from the Beinecke Rare Book & Manuscript Library at Yale University (Yale University 2013). Some of these notes were laser etched onto the table surface, forming a scattered trompe l'oeil pattern, implying an on-going dictionary making process.

Using a commercially available digital pen that could translate handwriting into text-based data (Anoto 2016), the visitor was encouraged, through written instructions, to add words of their own devising, or to write idiosyncratic definitions of existing words to add to a collaborative online dictionary. The response to this project can be seen at http://www.drjohnsonsgarret.net/ (Shear 2009), as an archive preserving a

record of the installation's life span in the 'ecology' of the garret and is some measure of the success of this novel approach to interpretation. In the catalogue to accompany the *House of Words* exhibition, one of the show's curators Tessa Peters wrote: 'Cleverly's interactive experience is an acknowledgement of how language evolves and expands, not least because of new and changing definitions which continue to emerge from 'the street', from the sphere of new technology and so forth. He also points to how authoritative print-based dictionaries and comparable works of reference now complete search engines and databases such as Wikipedia' (Peters 2009, 46).

Peters comprehended my intention to interrogate the theme of new and old ways of dictionary making. The initial core concept came to me very quickly, without my really comprehending what resources and planning it would take to realise the physical project. Not least were a number of technical and curatorial concerns with this work, a description of which can be found in the book chapter *Designing Collaboration: Evoking Dr Johnson through Craft and Interdisciplinarity* (Cleverly and Shear 2013). This examination of the collaborative process focussed on a shared ambition to create a novel functional piece within a particular environment. This central collaboration between Tim Shear and myself was also at the centre of a wider collaboration with the curator of Dr Johnson's House, the *House of Words* exhibition curators, commercial partners and ultimately the museum visitor. The evaluative analysis of this collaborative process revealed a number of key issues. Firstly, that the influence of collaboration shifts and flows as different responsibilities become important. Secondly, that the development and making a work of this complexity could only come about through collaboration. This sharing of practices was something I had not encountered to this degree before, having preferred to deal with all aspects of concept design and technology on my own. To accept a degree of trust and sharing of ownership was much easier than I had imagined and now marked a new phase one that resulted in *The Enlightened Eye.*

The interactive dictionary was also of interest to other visitors to the *House of Words Exhibition;* some of these visitors had things to say about the concept

and experience of using the work in context. Peter Ride, a researcher in digital media at the University of Westminster, discussed the playfulness of the concept:

> *The Interactive Dictionary* had a playful aspect to it: the project enabled a seamless transference from play to creative contribution, the definitions being frequently witty or whimsical, yet the actual interface had no particular characteristics, hardware or software, that could encourage play more than any other pen and writing ledger might. However, while the experience of writing down comments or making a textual contribution in a gallery is not unexpected, and might be thought to be obvious, when the means to do it comes through handwriting recognition it is unusual and stimulating. Although it is not a game in any conventional way, using an innovative technology can equate to playing and offer an incentive. This suggests that in considering if technology has a conditioning narrative we need to address the novelty of the experience and how this may condition the visitor or participant. (Ride 2012, 274)

Ride assesses the interactive as an experiment in user-centred design, considering the way it engaged with the possibilities shaped by the empowering nature of embedded technology, the curiosity it might provoke in the visitor and how it might be implanted subtly in an object for the designer. A detailed analysis of the way in which visitors approached the creative task appears in the paper '*Playing with Words: Creativity and interaction in Museums and Art Galleries*' (Patel et al. 2015). This paper considers the 'socially organised character of the entries' (ibid, 14) and how, despite the relative lack of interaction between visitors whilst using the work, the entries were carefully calibrated for wider reception. It also argues that the ways in which the content is produced merits serious evaluation. I have expanded on these points in the main case study of this PhD by examining the relationship between content produced by the visitor and the corresponding interaction with others. Creative open-ended contribution by those using *The Enlightened Eye* I contend is not only nuanced for personal amusement but is part of a flexible relational dialogue.

A particularly complimentary review of this project appears in Jørgen Riber Christensen's *Four Steps in the History of Museum Technologies and Visitors' Digital Participation*. Christensen, Associate Professor at Aalborg University, contended that:

The digital technology used here is exceptionally and exemplarily user-friendly, and it allows the visitor to become a co-author to such an extent that his or her part of the exhibited work is distributed and published to the whole world. With the help of digital exhibition technology, the museum audience is involved in the formation of the meaning of the exhibited object. This form of museum participation makes it possible for the exhibited object to be up-dated to the present, so that A Dictionary of the English Language and the museum, Dr. Johnson's House from the Age of Enlightenment, are made relevant to our time, so that the museum visit is both engaging and a source of experience and insight at the same time. (Christensen 2011)

This response was useful, particularly in its positive assessment of how technologies can be combined sensitively with a commitment to the physical, an affirmation of approach establishing the prospective for more works of this kind.

A more mixed review of the project by crafts practitioner and writer Helen Carnac in *Journal of Modern Craft* was approving of the concept as it dealt with the idea of language but criticised it for lacking a 'finer consideration of craft' (Carnac 2010, 256). This response revealed that the complexity of the *Interactive Worktable Table and Escritoire* project had meant that the making and finish was of a lesser consideration. My objective was to create a balance between my own making skills with the concept and function of an object of this nature.

Figure 34: Jason Cleverly. 2009. Interactive Worktable and Escritoire (detail), image: J. Cleverly 2009.

One of my own criticisms of the work rested on the resolution of the surface pattern. I had intended the piece look like a stage prop, a stylised version of eighteenth century furniture. This ambition had been changed by the

decision to use a brown stain on the wood, creating the impression that I was attempting to make a reproduction. Indeed, a review for *Crafts Magazine* by Maeve Hosea comments 'On first glance the beautiful hardwood table does not look out of place in the Georgian interior' (Hosea 2014). The visual harmonisation of the work within its context is then another important consideration: to what degree should a work blend in, or show more clearly that it stands a little outside of context? A calibration of this kind of aesthetic choice is also a design choice and will always differ in each project. In the case of the three iterations of *The Universal Curator, The Narrative Engine* and *The Perceptive Engine*, each work took on certain architectural details drawn from features within each museum. Site specificity in these designs was not deemed as critical as it was for the Dr Johnson's House project. In this case the context was the actual space where Johnson had worked, a stage for action that almost effortlessly allowed for playful re-enactment within its ecology.

Implications: My Practice

The process of organising my practice into these three key areas: Interactive. Immersive and Participatory; Designs for Transforming Objects; and Towards Participatory Networked Objects has enabled me to critically evaluate my practice as an artist-designer. Within this analysis I have identified key design elements and characteristics that form the basis of my research for my PhD. These are:

Aesthetics: I have considered the visual qualities of objects that I have constructed in my previous interactive interpretive works in regard to personal preoccupations with particular forms, styles and structures, the appropriation of functional wheeled objects and Renaissance era painting. A visual aesthetic may also arise from the subject and themes and context of interpretation, for example, neo-classical museum cabinets. In chapter 4 I also discuss the way in which particular paintings might inform my work to a subtler degree, influenced by theme as well as composition. The aesthetic qualities, I argue, are also to be seen in the behaviour and choreographed

positions of the museum visitors as they engage with my work and each other, creating a *contingent aesthetic.*

Kinetics: I have discussed my interest in the interactivity of automata. My impulse to build movement into objects that provoked engagement established the validity of particular mechanisms. A palette of kinetic affordances was built up from examples such as automated fish tails or the winding of handles that focus cameras, which, I argued, control or choreograph interactivity in audiences. This kinetic affordance became subtler as visitors were asked to engage in participatory procedures such as drawing or making up words. Nonetheless, this still relied on the affordances of pens, writing tables and perspective nets.

Situated Design: To design for a particular situated context means devising an approach that considers a range of conditioning circumstances. My own practice has focused on the museum context and takes into account the needs of the museum visitor, as well as curatorial agendas. The museum allows context for interactive design considerations, as well as the creation of an artistic statement. In chapter 1 I discuss the procedures and methods for approaching a situated design project. The chance to test designs that responded to public spaces, allowed for an iterative development of a design vocabulary that was combined with the continued development of a personal visual aesthetic.

Ecology of Action: these projects allowed me to experiment within the ecology of action, in order to see more clearly how multi-modal features contribute to an enhanced collaboration and might be configured so that supportive interaction was encouraged between visitors. The ecology of action that each project established was intended to be an immersive stage for the users and was always calibrated to be *participatory.* Taking into account the participatory means that not only is the design configured to support interaction between visitors who know each other but also through the creative task that elicits a broader participation between separate groups. This was seen quite clearly in the study of *Deus Oculi* (Heath et al. 2002, 22). Broader participation can also be observed in designs that leave traces

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of previous creative interaction. For example, *Interactive Worktable and Escritoire* was configured to allow a review of previous entries and creative interaction was often constructed in regard to past entries and composed with regard to a subsequent 'reader who is largely unknown' (Patel et al. 2015,6). Thus, social participation was extended beyond the immediate. The participatory effect on visitors to an extent relies on the social concept of the reception of *spectacle*, that is to say, how audiences allow themselves to be drawn into activities through the agency and affordances of a situated design. I discuss the concept of spectacle in chapter 2.

Enhancing Interpretation: The development of creative engagement procedures enhances interpretation, achieving this through designs that deliberately allow the transformation of objects by visitors. That is to say, the interactive devices allowed visitors to engage with and manipulate objects. Offering the visitor approaches to creative engagement through open-ended tasks permitting reconfiguration and transformation has been a significant tool used in the construction my designs. I tested and iteratively refined this series of transformative interactives. This practice has gradually moved towards increased creative participation by visitor groups and with the collaborative support of others, has become more sophisticated in ambition.
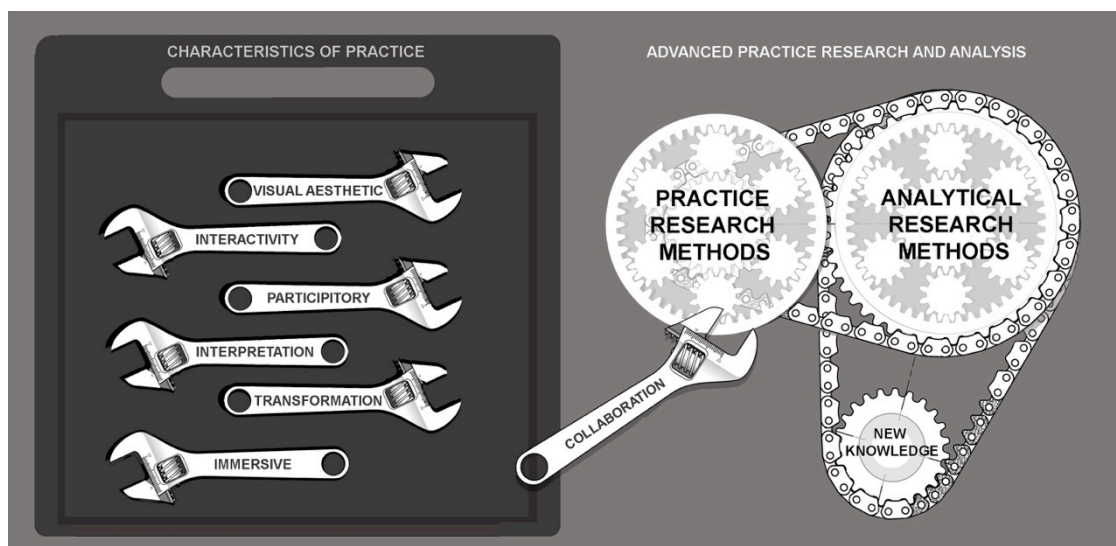
Figure 35: Characteristics of my practice (left) and research and analysis of The Enlightened Eye (right), Image: J Cleverly 2016.

Collaboration: My recognition of the value of collaboration has grown through these projects, both in terms of evaluating social interaction through ethnographic methods and in creating more complex, multi modal networked assemblies through working with technology experts. During the development of many of these projects I was able to participate with the analysis of the qualitative data that my W.I.T colleagues extracted from their ethnographic study. Although not as engaged to the same degree with the social science of their work, I have adapted some of their research methods to my own ends. This enabled analysis and description of the social interaction and creative participation that took place in the situated ecology of action of *The Enlightened Eye* (see fig1 and fig 2 page 30 and 31).
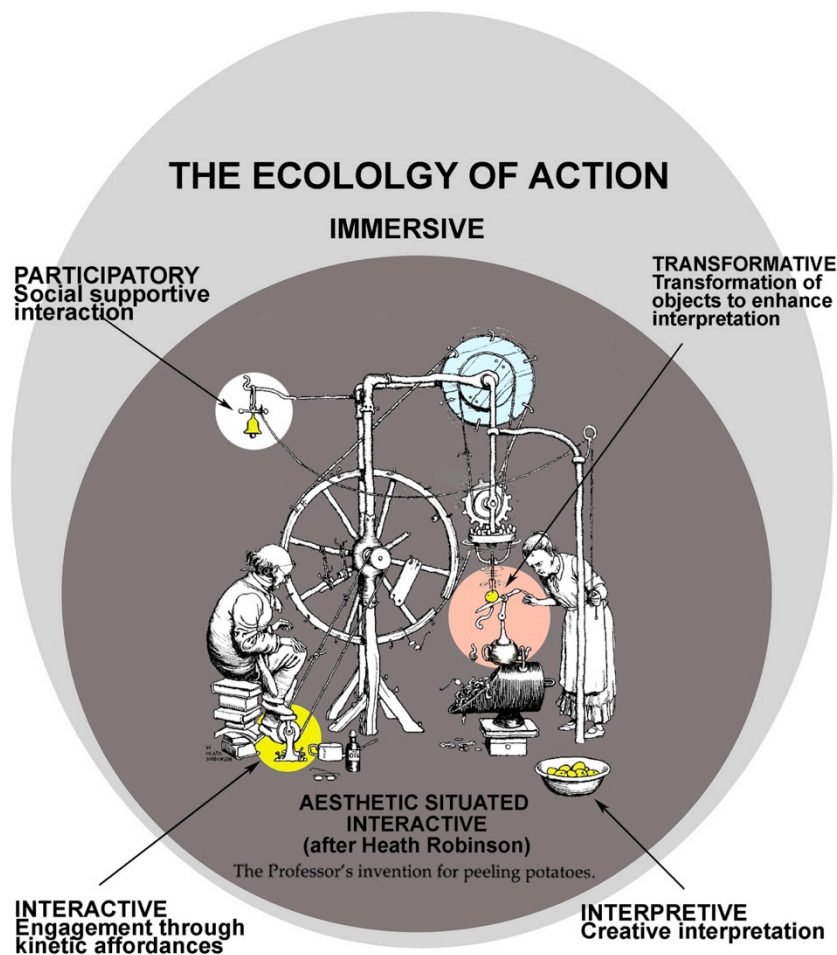
Figure 36: Jason Cleverly. 2017. Diagram of basic design vocabulary, after W.H. Robinson. W.H.Robinson. 1933. Much Better Inventing at home (The Professor's Invention for Peeling Potatoes).

Conclusion and Outline of Chapters

In this introduction, I have discussed my research questions, outlined the aims and objectives of this project and I began to unpick the figure of the artists-designer. I traced my own practice from its beginnings in studio craft practice, through to the completion of increasingly complex work. Drawing out the distinctions in a series of discrete concepts that iteratively and incrementally build in ambition and scope, leading towards a situated interactivity.

In chapter 1 I outline and detail the practice research methodology and theoretical approaches that have helped to inform the design, production and analysis of *The Enlightened Eye* project. In order to set this research project in the wider academic context of art and design research, the initial section of this chapter provides an overview of contemporary art and design research practices and theories. It discusses how art and design research is represented and evaluated and examines some of the conflicting arguments that surround this field. I also consider case study research and the way in which art and design research has been defined by practitioners and theorists to establish how to model and position practice and creativity within a research agenda. I then go on to discuss art and design's interrelationship, investigating aspects of each that align and distinguish them. I also briefly examine the social science methods and theories that have influenced this project, by helping to describe the way in which the Enlightened Eye is used and considered as an interactive object. I also take the opportunity in chapter 1 to consider aesthetic and design affordances, showing the way that designed objects might communicate their purpose, both visually and through their active use.

Central to the development of my practice is the concept of the 'museum' alongside historic forms of popular entertainment, such as 'spectacles' and 'sideshows'. This is explored in chapter 2, which introduces these concepts as closely related histories with a clear distinction: the spectacle and sideshow are considered as a populist, commercial entertainment, whereas

the museum is regarded principally as an educational, hegemonic cultural construct.

The history of spectacle, in particular is presented as an artful manipulation of technical processes, designed to communicate to audiences a shared sense of wonder. These processes draw upon both established and emerging technologies and often drive technical innovation in the interest of capturing the audience's attention. This overview has a particular resonance with my own practice.

In this chapter I continue by evaluating the concept of the museum as a social and political institution, from its early roots in private collections, through to its public educative ambition in the eighteenth and nineteenth century. The museum in its early history, I suggest is less about innovation through modes of communication than more about the way in which it invoked wonder through the auratic and exotic qualities of its collections.

I discuss the emergence of the contemporary museum and in particular, the impact of the Avant-Garde, of new technologies and new social agendas in chapter 2. I investigate the ultimate transformation of the museum shaped through the demands of its audiences into a venue for spectacle and innovation.

In chapter 3 I consider how the museum visitor has become a subject for anthropological and sociological studies, not only by way of in-house evaluation and assessment by exhibit designers and curators, but also as a reflection of the rich environment for study that the museum and art gallery affords. Additionally, in chapter 3, I identify and examine relevant and significant interpretive projects, exploring the practice of other artists in the field of interpretation.

The design and production of my research project, *The Enlightened Eye,* is the focus of chapter 4. Here, I introduce my working methods and discuss, through case study the background and details of this project. I introduce issues concerning tacit creativity, the value of aesthetics and the values and importance of design. I introduce some considerations of the dynamics of

form and the use of aesthetic affordances, using particular examples of structures and compositional elements that inform the design components of *The Enlightened Eye*.

I go on to examine the design development strategies and the particular testing procedures used, to inform the construction and use of the interactive. This is followed by a discussion of the fabrication and material assembly of *The Enlightened Eye,* leading to a review of the final design of the interactive artefact, now destined for its situated context. The role and significance of working within a collaborative agenda are discussed as core to the Design Production stage of making *The Enlightened Eye*. Finally, in chapter 4, I discuss the fabrication and material assembly, leading to a review of the final design of the interactive artefact.

An analysis of the operational qualities of *The Enlightened Eye* in its specific situation and visitor interaction is the focus of chapter 5. The evaluative methods I employ are based on a variety of data captured via visual, audio and verbal means. These methods involved practices familiar to me as an artist-designer working in a public context, including observing, sketching, photographing and talking to users and stakeholders. These are combined with my developing understanding of the conventions of qualitative video ethnographic analysis, as brought to bear on the situated ecology of action of the piece. The development of my knowledge of ethnographic research methods was undertaken specifically for the purposes of evaluating this research and is in part based on my experience of working with the Work Interaction and Technology Research Group at Kings College (King's College London 2014) and through a review of relevant research methods in the field of cultural ethnography.

Through an iterative process of reviewing and cross-referencing data collected through these methods, I construct and interrogate my own datasets. These enable me to examine visitors' responses and reactions and to demonstrate ways in which groups and individuals adhere to certain modes of conduct, and how choreographed action is played out. I reveal how *The Enlightened Eye* provides agency to visitors' and begin to describe their

behaviour and engagement, including my own interest in how these actions and interactions create a contingent aesthetic. The chapter concludes with an examination of the implications of my approach to this research.

Above I evaluated selected aspects of my own previous practice. By focussing on individual projects for review: Interactive, Immersive and Participatory; Designs for Transforming Objects; Towards Participatory and Networked Objects, these categories were used to explore concerns with practical and aesthetic choices; forming methods for designing and making. This process of categorisation allows for a comparative system of analysis. Also discussed were some of the assessments of audience responses within the 'relevant ecology of action' (Heath et al. 2002, 29) and the collaborative process of working with external partners.

The process of identifying and defining the artist-designer has inevitably involved a consideration of the similarities and differences between an artist and a designer, opening up a multitude of ways to align and separate them.

The act and process of design provides a service that fulfils a need or enhances human activity by adding value to people's lives in some way. This is also true of art; sculpture, painting, music and so on are typically constructed to evoke emotions to engage audiences and to add cultural value in society. An artist might also make work that does not take an audience into account: their work may purely be an outward expression of inner reflections and preoccupations.

The artist-designer is actively involved in developing opportunities for visitors to have an open-ended creative agency, enabling them to transform museum objects through their own preoccupations and intrinsic motivations. The concepts behind my work have often been subversive, purposefully not following straightforward paths or solutions and exploring the unknown to create new kinds of audiences and understandings. Latterly this subversion has integrated the imagined choreography of interaction around an interactive that will enable collaborative playfulness amongst groups of visitors allowing them to reconsider museum objects and themes. This

creative unconventionality is also evident in my approach to evaluation, adapting ethnographic methods in ways that only the artist-designer can.

This research project provides evidence of the artist-designer as a character who wants to do things differently. The idiosyncratic aesthetic affordances constructed by the artist-designer reveal embodied, dramaturgical and choreographed behaviour. The artful spectacle of the design creates around it an immersive ecology of action that visitors are drawn into, and that elicits rich examples of visitor conduct and generates conversations. The unconventional and performative design of this work also relies critically on close engagement and agency with real, objects and contexts.

In summary, my previous practice prepared me to design, produce and evaluate new work that relied on an understanding of how interactive multi modal designs might support social interaction in the immersive ecology of action, through participatory and creative transformation. The following chapters examine the context for this work, including how my own visual aesthetic informs and supports these interactive assemblies. In what follows I continue to survey the characteristics of these projects to develop a sense of my approach as well as describing the practical and conceptual nature of each.

Chapter 1: Methodology and Theoretical Approaches to Art and Design Research

Introduction

Art and design research has increasingly encompassed the theoretical evaluation of research practice. Though there is an on-going debate as to the categorisation and value of art and design research. A range of unique creative approaches to art and design research has exposed descriptions and assessment of tacit ingrained practice and the idiosyncratic process of creativity. The shape and purpose of creative activity can be exposed in a number of ways; methods can be combined as methodology, arrayed and focused to expose an art and design problem. Some of these methods are discussed in this chapter; a physical, practical correspondence with the material world can be described through the results of these interactions. Additionally, research practice can focus on particular case studies to explain the themes and subtleties of practice. Doctoral projects show how a combination of methods can help to address a research question covering a range of creative projects, developed as tools to dissect and explain.

This chapter discusses the conflations and differences between art and design by examining a range of opinions put forward by practitioners. This shows how different explanations are used to locate practitioners on the art and design spectrum. Additionally, theoretical descriptions and evaluations on art and design hybridity are discussed showing commonalities and distinctions. Art and design hybridity is an interrogatory method for this PhD.

This chapter also proposes the value and usefulness of social science research, in particular the method of video ethnography for revealing details of visitor interaction in the ecology of action. There is too a brief discussion of Actor Network Theory and its relationship with the social object and how this might be a way of examining the axis between object, public and curator. A consideration of the relational object within a system of actants will be discussed, as a way of describing *The Enlightened Eye*, its connections and validity within its context and of how it connects and animates museum objects with visitors.

Also introduced in this chapter is the idea of affordances; the visual and physical cues that help interaction with physical objects, and of how they might be applied. Affordances are described in a variety of forms, including an introduction to the concept of the aesthetic affordance; I also discuss how different types of affordances were applied to *The Enlightened Eye* and of how appropriations of composition and form are considered, selected and applied. I will discuss theories that concern the ways in which aspects of functional things appear and transmit information in regard to their use. Affordances, I argue, can be amplified by configuration and become not only functional but have an aesthetic semiotic that can be applied when creating sculptural structures.

I will evaluate the way in which a visitor might, through the agency of *The Enlightened Eye* exploit comparative morphology, in that when objects or aspects of objects appear to visually correspond with other similar objects, they can be used to support creative transformations. In the case of geological mineral samples, there are many shapes that can be discovered and isolated on close examination. These visual resonances can drive creative action through their natural resemblances to other things; this capacity to transpose and appropriate forms being a stimulus in the interactive task presented by *The Enlightened Eye*.

A discussion of appropriation in design and aesthetics shows how artists and designers re-use and adapt useful, mainly artificial structures and images in a number of ways, and for a number of reasons. This section includes an evaluation of my own preoccupation with particular types of machinery and functional artefacts that have intrinsic, dynamic compositions.

Finally, in this chapter I have considered approaches to the way a design project might be structured and undertaken. I have looked at how a design schema is broken down into specific essentials and can be viewed to focus on particular elements. This focus then has implications for the way in which an emphasis on a particular discrete element influences and impacts on a project's outcome.

Art and Design Research

In this section I review the contemporary landscape of art and design research. I cover a range of opinions in regard to what art and design research might be and find some conflict between those who are committed to analysis and evaluation of the process of creativity as an empirical quest and those who are more accepting of the fugitive qualities of the way in which ideas are conceived and developed tacitly. Some argue that the production and subsequent existence of a creative artefact is as valid as any exhaustive reflection upon the creative process that attends that process. I considered the methodologies that have been constructed to examine creative practice, the use of analytical diagrams and systems such as grounded theory that attempt to reveal where creativity lies. A discussion of recent studies by designers and theorists, as well as relevant practice based PhDs that examine the field, and attempt to articulate and assess practice.

The emergent field of design research attempts to examine and characterise procedures for research methods and methodologies appropriate to the development of new knowledge in this field. Design projects that venture into new territory and ask new questions, require clarity in their procedures. This in turn requires an awareness of pre-existing and on-going structures as described and debated in practical and theoretical methodologies relevant to specific projects. An awareness of methodological approaches can be used to refine, calibrate and inform a project.

A recent history of design research definitions might start with Christopher Frayling's 1993 definitions of art and design research categories. They are: *Research into art and design*, *research through art and design*, and *research for art and design* (Frayling and Royal College of Art 1993, 5). Clearly *Research into* art and design is the straightforward category, while the second, *research through art and design,* is reasonably clear and derives its content from practice and reflection with a stated outcome. The final category, *research for design* Frayling feels is less easily described, however he contends it is 'research where the end product is an artefact-where the thinking is, so to speak, *embodied* in the artefact, where the goal is not

primarily communicable knowledge in the sense of verbal communication, but in the sense of visual or iconic or imagistic communication' (ibid).

Recent debates into the validity of such proposed definitions have been attacked by figures such as Ken Friedman, in the journal article 'Research into, by and for Design' (Friedman 2008), Friedman argues that as design research attempts to develop a useful 'general theory of design' (Friedman 2008, 153), Friedman cannot support the notion that a contribution may be made by 'adapting the tacit knowledge of individual design experience' (Friedman 2008, 154), that a conceptualisation of design procedures cannot be made by anything other than an empirical approach, such as the grounded theory approach. Grounded theory, often used in social science, is a qualitative research approach that analyses primary data gathered by questionnaires, interviews and observational records, and looks for patterns and key words that are then reflected upon by the researcher, creating layers of linked meanings and comparisons with robust recurring concepts finding prominence. This qualitative interpretative procedure is meant to be, according to its authors, 'a dynamic free-flowing process' (Corbin and Strauss 2008, 1) that relies on the researcher's grounded understanding of what they are actually trying to achieve. In addition, the researcher is so closely engaged with the procedure that they must, to an extent, become very much a part of any result.

Friedman, as an advocate of grounded theory, takes a provocative stance when he claims that many researchers confuse the achievement of practice with theory, rather than develop theory out of practice, when surely, in order to build explicit knowledge, any account of practice needs to be comprised of a mix of tacit knowledge and structured data. The problem arises, Friedman reasons, with the concept that tacit knowledge could constitute research by practice. Tacit knowledge (Polanyi 2009), according to the originator of the term, scientist and philosopher Michael Polanyi, is ingrained, indescribable and supports a range of human actions: it is a kind of autopilot. Additionally, it might be unique to an individual, forming personal knowledge (Polanyi 1969) and might be communicated through skill and creativity such as through a dramatic performance or the making of a painting.

One definition of the tacit can be applied to making: it is the nuanced ingrained movement of the hand that guides tools or brushes, exemplified by an examination of wood-turners and blacksmiths and the like. Nicola Wood, a specialist in video recording and analysis of craft practices, observes that 'the expert practitioner makes the task look easy, tacitly responding to subtle cues that may be any combination of kinaesthetic, visual, auditory or the olfactory' (Wood 2012, 6). The purpose of Wood's work is an interest in the communication of craft skills between experts and novices, where the subtlety of tacit action requires multiple methods of interpretation to support this communication.

The tacit appears to be, on the one hand, something vital for human existence but also the source of inspirational illumination (Polanyi 2009). Although very hard to describe, there are those who are comfortable with accepting that tacit knowledge might be communicable and contribute to practice. Professor Chris Rust of Sheffield Hallam University, discussing the role of tacit knowledge in scientific enquiry, 'would like to suggest that the undervalued "creative" dimension of scientific enquiry needs to be emphasised, and that designers, through their practical contributions, can be instrumental in drawing attention to this' (Rust 2004, 78). Rust continues to stress that everyone involved has understandings that will support and help develop concepts. These are unique and remain tacit knowledge to the individual, and though they are rendered explicit in use, they cannot be expressed in their personal form. This movement from the tacit to the explicit confirms that an illumination has occurred and can show what it is in response to, but not how it happened exactly. Rust makes this clearer by explaining that within collaborative structures, designers show that the actual artefacts that move forward and shape a project is the proof of their contribution. Rather than having to describe the process of illumination, they should be convincing, subversive and endeavour find open-minded colleagues, such as museums curators that agree to take risks.

Tacit knowledge and its value for creativity, though elusive is revealed as Rust proposes by the evidence. I discuss this indexicality through an examination of my practice research process below in Chapter 4, where

examples of provisional drawings and my process of appropriation are discussed. Rust's other point, the pursuit of co-conspirators for creative activity, leads us to ask how and where collaboration might exist and be supported. Collaborations are essential in complex publicly situated design projects. I discuss this in *Designing Collaboration* (Cleverly and Shear 2013), where an account of the Dr Johnson project reveals the nature and shape of a particular situated partnership that foreshadows *The Enlightened Eye*.

Whilst psychologist Mihaly Csikszentmihalyi's theories of motivation and flow are discussed elsewhere, in his *Systems Model of Creativity* (Csikszentmihalyi 1999), Csikszentmihalyi proposes a connected structure for creativity. Defining three main arenas within a society where creativity is maintained and nurtured. Csikszentmihalyi suggests that throughout history novel ideas have emerged from a triadic interrelationship between the individual, their area of practice and a wider culture. A practitioner using individual skills and experiences takes structured knowledge from a wider culture - tools, education and the like - giving and receiving support from their own field of practice and building on this relationship to develop new concepts and things.
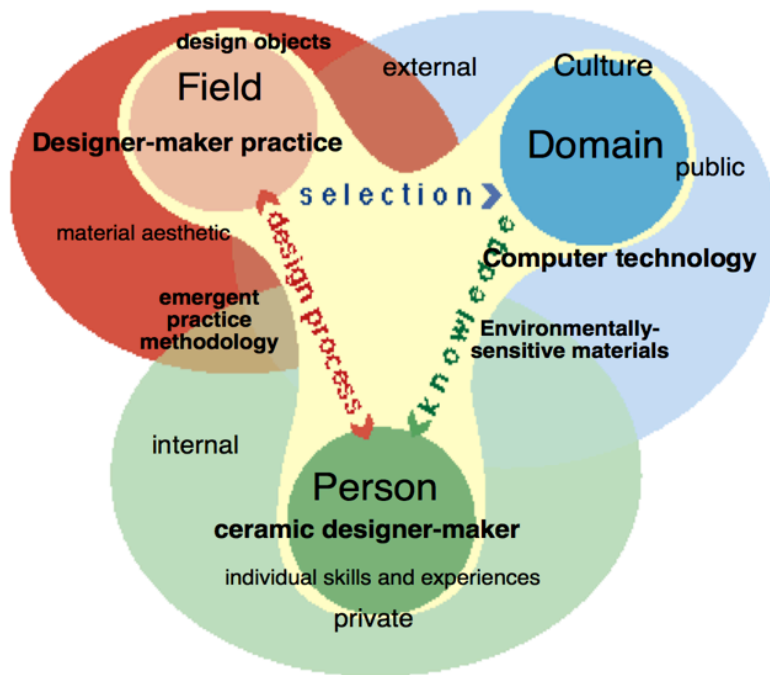
Adapted by Bunnell from **Csikszentmihalyi, 1988.**

Figure 37: Katie Bunnell. 1998. Adaptation of Csikszentmihalyi's systems model of creativity, image: K. Bunnell 1998.

Fig 37 shows a diagram that adapts Csikszentmihalyi's model, applying it to the shape of a practice undertaken by Katie Bunnell through her PhD (Bunnell 1998). The diagram pinpoints the locus of her digital ceramic practice against the wider field of influence. This shows how a practitioner might adapt the systems model to locate his or her own practice within a dynamic supporting structure, and reveal the edges of tacitness and the intersection with other significant factors, to show an emergent practice methodology.

Contrasting with Frayling and Csikszentmihalyi's diagnostics of territory where creativity is found, it may be worth considering the interlinked *meshwork* world as portrayed by anthropologist Tim Ingold. This is a domain within which objects people and things populate a world, which can be explored and described by lines of flow and lines of connection (Ingold 2010). Ingold invites us to look hard at the world as it is, at how we respond to it viscerally and personally, rather than to accept the acknowledged scientific hegemony. One of the ways in which Ingold proposes that this

might be done is through art. He suggests that art is a way of reawakening a close connection with objects and things, in that the process of creativity reveals itself as literally an 'entanglement with the 'fluxes and flows of materials' (Ingold 2010, 3). Ingold also contends that creativity should be 'read 'forwards', as an improvisatory joining in with formative processes, rather than 'backwards', as an abduction from a finished object to an intention in the mind of an agent (ibid). This approach seems very appropriate to the methods and construction of a reflexive record of a project that brings to bear many influences, structures and materiality upon its reasoning. There is also a sense that the creative process is not about the final conclusion, but about the process itself, which grows, forms and changes. Ingold also discusses an environment without objects, the idea of a blank space that can be populated with objects of affordance, or the mingling of enmeshed objects, which can be seen as a kind of sketchbook, where on the blank page pencil marks begin to connect, form and annotate. This is how the artist-designer operates.

Interrogating the idea of the human as a creature that apprehends the world and cognitively constructs affordances, the philosopher Lorenzo Maganani discusses the idea of abductive reasoning as a kind of heuristic postulation, based on an individual's understanding of what he calls cognitive niches (Magnani 2011): 'A cognitive niche emerges from a network of continuous interplays between individuals and the environment, in which people alter and modify the environment by mimetically externalising fleeting thoughts, private ideas, etc' (Magnani 2011, 172).

Magnani proposes that humans are sensitive to surroundings and constantly explore and seek chances and that, like animals, we adapt to an environment by altering and constructing new things. In this definition of affordance and mutual relationship with situation, Maganani includes not only the biological Darwinian idea of niche construction but also its application to cultural and ontological evolution. This way of considering relational structures can be applied to designed structures. Artificial constructions such as buildings can be configured and exploited to harness and broadly condition or choreograph human activity. I propose that the situated design

of *The Enlightened Eye* concerns the construction of activity in the ecology of the space, creating chances for the use of intellectual, sensory responses. This would include influencing types of social conduct, such as *scaffolding*, *situated interest*, as well as *epistemic* and *ludic behaviour,* each of which are discussed in Chapter 3, where I examine visitor studies and again in Chapter 5 where evidence of these characteristics are identified in the data.

Building on Frayling's definitions of theoretical art and design (Frayling and Royal College of Art 1993), research has come to be broadly defined as practice led, meaning concerned with the nature of practice or practice based meaning, achieved by practice and outcomes the of practice. These definitions according to some are contentious, the design researcher David Durling claims that the terms cannot be satisfactorily identified (Durling in Niedderer 2004, 28). For me the proposal that, whereas practice led-research acknowledges and interrogates the nature of practice through an on-going reflective process and may be entirely written, practice-based research is a methodological approach to that corresponds the creation of an artefact. This creative act forms the contribution to knowledge, complimented and interrogated by a written thesis (Candy 2006). The word *artefact* used here may describe an exhibition, film or digital media, but in the case of this project it is an object: *The Enlightened Eye*.

It should be recognised that these two convergent forms of practice-based and practice-led research must overlap in scope, and this is the position of this written thesis, which is directed at a designed material object, a complex artefact, expressly made to be the central tool and case study for this research project, the phrase *case study* here referring to a rigorous focus on a 'phenomenon in context' (Robson 2002, 178). *The Enlightened Eye* constitutes not only a considered visual aesthetic and constructed sculptural form, but is also designed to operate within a particular situation. The conflation, therefore, of the subjective and objective, steers and conditions the project in particular and unique ways. This requires sensitive, complimentary methods for critical analysis, which examine the project from a number of stances.

William Gaver and John Bowers of Goldsmiths University are researchers concerned with the production and analysis of innovative design projects. Their 'annotated portfolio' system (Gaver and Bowers 2012) has been developed to combat the way design projects do not conform easily to a shared theoretical understanding, as we have seen above. 'Design seems to offer the ability to reflect emotional, aesthetic, cultural and critical concerns, alongside those of functionality and usability' (Gaver and Bowers 2012, 42). The annotated portfolio system aims to take into account that as contemporary design research applies regulating methodologies and theories, it dilutes the unique approaches developed by some researchers and 'promises generality and guidance but seem inadequate to capture the situated, multidimensional and configurational nature of design' (ibid). Gaver and Bowers go on to describe their concept, a system that visually compares a number of their own design projects, annotating them to highlight commonalities and differences in the way they are used, styled or understood by users. Similarly, in the Review of Previous Practice section above, I have examined my own works, assessing their relationship to each other, in order to highlight valuable aspects of their design and aesthetic qualities.

To convey clearly the series of tacit, subtle and often highly subjective constituent actions that contribute to practice is the challenging responsibility of the researcher. In many cases he or she has developed a practice over many years of working to personal agendas, of understanding of how certain materials or processes may behave, how particular forms or colour might combine, and how users might respond. Alongside these practicalities there is a synthesis of visual research and accumulated data. Information is selected subjectively and distilled in personal ways that make each approach uniquely sensitive to the requirements of the creative process and to the design problem.

PhD Case Study Research

Practice based doctoral studies in design in the UK have doubled in the last ten years (Yee 2010, 1), enabling a body of research based in and for the

benefit of, creative practice to be more widely disseminated and built upon by future researchers. This can be seen as due in part to a flexibility of approach within design PhD methodology. PhD level study provides a valuable opportunity to critically survey practice, to understand it more deeply and to extend its relevance and activities beyond established boundaries. This project has been a revelation in the understanding of my own practice, in analysing that practice, in attempting to set down what it is that I actually do and to cross-reference my practice with historical and other contextual sources.

The relationship between my research aim and the rationale for confecting a methodology has emerged specifically to test my own assumptions about the effectiveness of my design and to help articulate and approximate, as a practitioner, the way things work in the real ecology of action as far as possible to detail the process and the results of a naturalistic enquiry to an extent that there is value for others in similar position and to strengthen any new approach I might take in the future.

Recent doctoral projects reveal a convergence of the creative and the systematic, requiring the construction of bespoke methodological tools to interrogate and discuss individual cases. One example of this is crafts-maker Andreas Fabian's doctoral thesis *Spoons & Spooness- A Philosophical Inquiry Through Creative Practice* (Fabian 2011), which constructs a question requiring a deep analysis of 'spooness'. A solution was provided through Gray and Malins' structurally simple and adaptable triangulation system (Gray and Malins 2004, 31). Based on geographical evaluation procedures, triangulation allows for the application of multiple methods in order to assess a central issue. Fabian used triangulation in this way: three distinct areas contained analytical tools that were brought to bear upon his central theme; these tools were diverse and included events, a dinner party and an exhibition. Records of these were in turn examined for patterns and issues that could be measured against each other to advance the research.
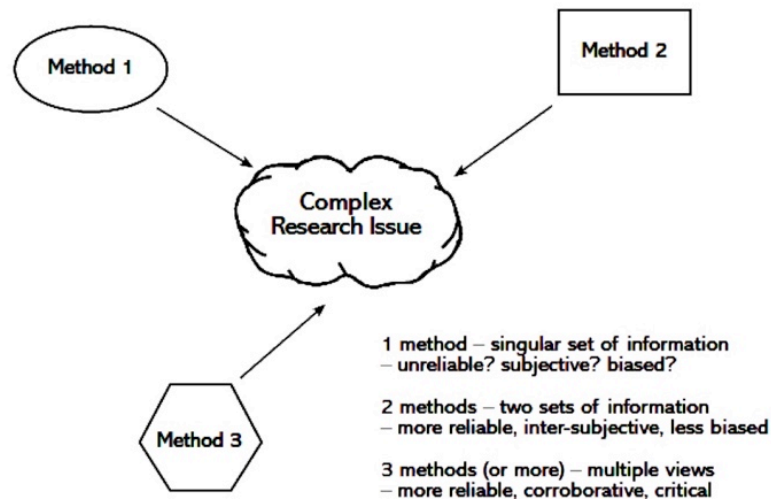
Figure 38: Gray and Malins. 2004. Triangulation Diagram, image: Gray and Malins. 2004.

Isol Onol's doctoral project, *Haptic Interaction with Visual Information: Tactile Exhibition as Inclusive Interface Between Museum Visitors in the Bronze Bust of Sophocles* (Onol 2011), also drew upon Gray and Malins' triangulation approach. Like Fabian, Onol deployed material, cultural and conceptual tools. She included empirical objective data from video and still photography, alongside perceptions from users, theorists and her own perspective. This allowed for substantive objective information to be measured against personal preoccupations and visitor responses to the experimental project under review. This project was an exhibition that formed the main case-study research for new, inclusive ways of exploring and understanding exhibited artworks. Onol used methods such as photo-elicitation, a useful way of using visual data on which to base participant interviews. Onol also used tactual exploration, whereby photographs were used as a tool for supporting discussion during a research interview. The theory allied to this data generating method is that images have a way of eliciting deeper, qualitative information from a participant in a study than, say a questionnaire, text having a lesser symbolic reach than images. When text and images are combined together, the physiological response is increased. Douglas Harper, Professor of Sociology describes the phenomenon: 'This has a physical basis: the parts of the brain that process visual information

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are evolutionarily older than the parts that process verbal information. Thus images evoke deeper elements of human consciousness than do words; exchanges based on words alone utilise less of the brain's capacity than do exchanges in which the brain is processing images as well as words' (Harper 2002, 13). This description of a physical-visual process, where the power and resonance of image, and the deeper broader discussions that it occasions, bears upon and has a close relevance to my own attitude and reflection on data collection.

Ceramicist Paul Scott's practice based work: *Ceramic and Landscape, Remediation and Confection - A theory of Surface* (Scott 2010) was a project that included subtle interventions with antique ceramics and new ceramic works, anachronistically echoing the future/present. Scott favours a 'broad and dynamic approach' (Scott 2010, 33) to his methodology. He argues that a project focussed on a very close engagement with a specific kind of historical pottery needs a bespoke, detailed examination of the production techniques involved in both original and contemporary ceramic artefacts. The project revealed a dialogue between his use of old and new techniques and an analytical procedure that highlighted and illuminated the properties of each. Scott details the ways in which glaze transfers, used in the ceramic manufacturing industry were produced by increasing multifaceted methods. Ultimately, digital methods were adapted to help convey a traditional surface quality and at the same time this was itself the nuanced driver of a new material body of work, a continuation of a practice preoccupied with ceramic surface and the advance of technological determinism.

A complex PhD project undertaken by Isabelle Risner in 2012 called *The Integration of Digital Technologies into Designer-Maker Practice: A Study of Access, Attitudes and Implications* (Risner 2013), considers the effect and implications of the increased use of digital technologies by designer-makers in their craft practice. Risner uses a multi-method hybrid approach to examine her question, including a practice based case study project, which considers her own engagement with digital process, as well as case studies of the craft practice of others, including both evaluations of structured workshops and a questionnaire response. Risner's methodology utilises a

personalised grounded theory approach to tackle the manifold data sources her project required. Conforming to an open, diverse programme of information gathering, she quotes Gray and Malins: 'So a characteristic of artistic methodology is a pluralist approach using a multi-method technique, tailored to the individual project. Increasingly, this has involved the use of multiple media to integrate visual, tactile, kinaesthetic experiential data into rich information' (Gray and Malins 2004, 24). This kind of 'open channel' for information, processed through a bespoke analytic filter, is only possible to if there is the development of an: 'analytical, 'conceptual scheme' (Risner 2013, 130-131). This then became a framework for discussion. For Risner, this framework surrounded both an unpacking and surveying of the emerging data, built on structured discourse with selected crafts-makers and was combined with her 'narrative account of the dynamics of practice' (ibid). This parallel investigation of a personal enquiry and qualitative research into the response of others meant that multiple data sources could be processed by a non-linear iterative loop. This reflexive structure appropriately allowed Risner to become part of the 'enactment of a situation' (Risner 2013, 132).

Luigina Ciolfi's 1994 case study PhD research *Situating Place in Interaction Design: Enhancing the User Experience in Interactive Environments* (Ciolfi 2004) was concerned with an exhibition called *Re-Tracing the Past*, held at the Hunt Museum in Limerick, Republic of Ireland. Ciolfi constructed her research question around visitor experiences of the augmented space of an interpretive exhibition. Her methodological approach consisted of fieldwork, a careful comprehensive study of the space that both the exhibition and the wider museum occupied. Additionally, video records of visitor behaviour in the conventional museum collection and visitor encounters with the interactive exhibits were made. Experimental handling sessions were also documented, as were the processes involved in the exhibition design and production. Ciolfi then systematically interrogated each method in order to draw her conclusions. The central case study project for Ciolfi was a complex multi-modal piece that relied on collaboration and specialist embedded technologies; her main interest however was an examination of the nature of space, or in this case 'place'. Her analysis of visitor behaviour and

experience helped to reveal the dynamics and structure of place, including its impact on the design of interactive experiences and the possibilities for further work of this kind in different settings.

Each of these case study projects utilised flexible, multi-method approaches that I too adopted throughout the critical analysis of my project. Clearly the concept of triangulation creates a rigor to the evidence gathering and analysis in case study research. Often these analytics are built on the adaptation of existing methods to explore their research and tailored to suit the idiosyncrasy of their particular study. Practice based procedures of video, still photography and photo-elicitation, acknowledge the growing sensitivity to the visual and the ethnographic. A researcher's individual entanglement with data is particularly obvious in models of multi sensory evidence and evaluation. In my own critical analysis I have also developed my own methods in proposing a hybrid figure called the artist-designer equipped with bespoke methods that also emerge through a process of adaptation. The discourse below veers more towards design research than research into art practice. This is partly because the main case study operates as a functional situated interactive and because the bespoke, aesthetic research considerations emerge from the evaluation of the construction and deployment of the main focus of this study.

Defining and Exploring the Art / Design Hybrid

In this section I will explore and attempt to define practice that conflates aspects of both art and design by offering examples of where these categories appear less distinct. I discuss the movement known as *designart* and adapt analytical tools in an attempt to distinguish the commonalities and differences in the perception of design and art and in order to approach a defined hybrid.

As I am proposing that the main case study project is a conflation of both design practicalities and aesthetic considerations I will now examine design and art hybrids as a method of appraising the elusive territory that I occupy.

The interdisciplinary artist Martha Fleming, working across art, science and the humanities says that she feels like a 'double *double* agent of sorts' (Fleming 2013, 155). Whilst Fleming is describing her own affinities, this notion of being undercover, or a stranger in an unknown land, is appealing. An artist-designer in a science environment might approach a project with perhaps very little real understanding of say, geology but equipped with a healthy regard, not only for the visual qualities and trappings of the natural sciences and how these might be reflected upon.

The design curator Gareth Williams in the introduction to his book *21 Designers for Twenty-First Century Britain* proposes that the contemporary designers that he surveys: 'Lead critical debate and regard design as a cultural activity; they are innovators and explorers of new materials and processes, and of different ways of working even of new definitions of design itself' (Williams 2012, 8). Many of the designers Williams examines are resistant to categorisation. Emerging from various backgrounds they are artists, filmmakers, furniture and industrial designers, and they make interactive installations, performances and films, as well as more recognisable design objects. Like the design company Committee who report that they feel like 'outsiders in the design industry' (Williams 2012, 180), Committee assemble functional lamps and furniture from found materials and have tended towards the 'aesthetic and communicative potential of products' (ibid). Others, such as the design studio Fredrikson Stallard reveal that: 'We have a constant love affair with the freedom of the fine art world but as we always tend to pull this inspiration into functional objects, we must at the end of the day call ourselves designers' (Williams 2012, 162).

Fredrikson Stallard admit to crossing conventions with their sculptural designs and are allowed a creative freedom by their clients in order to make work with 'a sensorial impact, which is essentially an objective of fine art' (ibid). Williams argues that the success of industrialised product design has allowed 'some designers to step back from the imperative of defining their design practice in these terms. Instead they explore the outer margins of making and using objects' (Williams 2012, 148). There is a space for this

kind of hybrid art and design practice that draws upon whatever it wishes and eschews definition whilst at the same time name checking it's influences.

The influential graphic designer Milton Glaser asserts that design and art are different and should never be confused (Quartz 2016). Design for Glaser being a transformational, problem solving process that when aligned with art, as it often is, turns the designer into a mere visual stylist. This declaration that the 'art' in any process is about simple visual coherence undermines the intentions that might go into the construction of an altarpiece in a church for example. By necessity this example is a conflation of art and design; it clearly acknowledges the viewer and the viewer's position in space and is designed to exert an emotional influence an audience in context (Shearman 1992).

A clearer view of the distinctions between art and design comes from Gareth Williams in his 2015 book *Design an Essential Introduction* (Williams 2015, 10), Williams says 'design looks forward and also outward: It is seldom undertaken solely for the benefit of the designer. Unlike fine art, which tends towards a personal quest for meaning and expression on behalf of the artist, design is outward looking and not introspective'. I feel that my position on this is of duality; I create this work for myself, and it is conditioned by my own aesthetic choices, and is also heavily conditioned by design sensibilities. That is to say the way in which my work is influenced by the creative possibilities an artefact such as the *Enlightened Eye* offers both to an audience and my own creative exploration.

Jette Lykke Jenson, in her 2015 PhD *Contemporary Hybrids Between Design and Art* (Jensen 2015), explores designed objects 'created as a result of interchanges or confluences between design and art' (Jensen 2015, 1). Acknowledging the historical and inevitable overlapping occurring between design and art, Jensen is keen to discuss a contemporary tendency towards hybrid forms. Sometimes known as *Design art,* this hybridity relates particularly to furniture, such as those pieces exemplified by the Dutch design studio Droog (Droog 2016). This is furniture that pushes the definition of design towards the sculptural and conceptual, seen in works free from

their functional intentions. Jensen, as part of her interrogation of this art/design conflation, has made a diagram that sets out to indicate what distinctive headings might fall under Art and Design (fig 39). I use and adapt this diagram in my own analysis of *The Enlightened Eye*.

Diagram of parameters or characteristic elements related to design and art

Design	Art
Function	Non-function
Practical usability	Contemplation
Using	Seeing
Utilitarian purposefulness	Disinterested, artistic perception
Meaning related to function	Meaning/content
	Aboutness
Requires understanding of use	Requires interpretation
	'Enigmatic' character
	Symbolic and expressive qualities
Problem solving activity	Problem raising activity
Solutions	Critique
Impact on people's lives/ social relevance	Reflects on human and social conditions
Part of consumer society and everyday life	Commenting on / critique of everyday life
Heteronomy	Autonomy
Close relations to technology, economy and commercial forces	Indirect relation to surrounding society
Constrained creativity	Self-initiated and free experimentation

Structural frameworks related to design and art

	Design	Art
Production/creation	Industrial mass production Repeatable items Everyday objects	Unique production Singular objects Artworks
Distribution/Circulation	Potential for wide distribution on consumer market ➔ potential massive impact	Circulated in galleries, museums and exhibition spaces
Consumption/Reception	Consumption in concrete usage Reception or evaluation relates to function and form	Contemplation Reception relates to form and meaning/content

Figure 39: Jette Lykke Jenson. 2015. Diagram of parameters or characteristic elements related to art and design, image: Jensen 2015.

Jensen considers art and design as constituting 'different milieus' (Jensen 2015, 70). She acknowledges the overarching circumstances of each to be

different, but nevertheless in examining the interrelationship she acknowledges that moves by designers into the gallery and museum context, relieves them of the heteronomy dictated by conventional design. If the objects and practices Jensen is scrutinising are then repositioned into the everyday world, they remain connected to the art world and are not often subject to the manufacturing process and commerciality of orthodox design. This, she argues, creates a new kind of market structure, of one-offs, commissions and limited editions.

The world of design-art is a close relative of high design. Design theorist Guy Julier describes high design as 'where conscious designer intervention in authorship, along with the price tag, play a large role in establishing the cultural aesthetic credentials of an artefact' (Julier. 2014, 77). Philippe Starck's iconic lemon squeezer, the *Juicy Salif* (Alessi 2016) is an object imbued with Julier's credentials: it is a functional object that famously does not function particularly well.

Figure 40: Phillippe Starck. 1990. Juicy Salif, image: Alessi 2017

Julier confers the *Juicy Salif* with the status of 'anomalous object' (ibid), one that does not fit into classical notions of anonymous design production and is created by those who are not from conventional design backgrounds. This unconventional approach to design resonates with my own definitions of practice, not with notions of quality and exclusivity in design production but in doing things differently, not least in contemplating the augmentation of objects by aesthetic affordance and design.

Social Science Research

According to the Non-Departmental Public body, the Economic and Social Research Council: 'Social science is, in its broadest sense, the study of society and the manner in which people behave and influence the world around us' (ESRC 2015). Social science has many constituent groups that conduct both qualitative and quantative research into many aspects of social life and social policy.

The social science that is of particular interest to this study is that of *social action*, that is to say the small intricate acts of behaviour exhibited by groups of people who interacted with each other through the agency of *The Enlightened Eye.* The concept of Social action is structured around what in 1895 the French sociologist and father of modern social science Emile Durkhiem called *social facts* (Durkheim 1982) These social facts were considered as the building blocks of society affecting routine actions, constructing and moderating how people behave with one other. Whilst social facts were associated with broad societal institutions, *ethnomethodology* as proposed by the American sociologist Howard Garfinkel, focuses on the construction of social behaviour through the commonplace actions of everyday life (Garfinkel 1967.). These are the social conventions that organise and regulate social interchanges. One of Garfinkel's ethnomethodological tools was known as 'breaching' (Maynard and Kardash 2007, 1484). Garfinkel's breaching technique included asking participants to play noughts and crosses, a game that relies on those taking part having a consensual agreement on its rules. Garfinkel instructed some players to disrupt play by deliberately cheating, breaching the conventions of the game. The ensuing disruption of play helped indexically to confirm the importance of the underlying rules that communities of people adhere to (Vom Lehn 2014, 73). The concept embodied in Garfinkel's rule breaking is of interest to this study; groups of visitors encounter a new interpretive interactive, they use tacit social conventions to engage with each other and when they don't, the experience is disrupted. Evidence of these protocols for social interaction are established in the data analysis sections of Chapter 5. These social conventions appear to naturally arise from the situation that is,

in part planned for by the artist-designer, supported by social cohesion where creativity is sustained.

My collaborators in W.I.T. (King's College London 2014), are sociologists, who conduct research into the behavioural structures of groups and the way they relate to each other. As outlined in my Review of Previous Practice*,* my work has been in part influenced by research projects and objectives set by W.I.T. Projects such as *Deus Oculi* and *Ghost Ship* were supported and funded by W.I.T., and were developed in order to explore how groups of individuals in museums and art galleries responded to my situated design concepts. The main method for evaluating these responses was video ethnography.

Video Ethnography

The main case study of this PhD project utilised video ethnography, it is a versatile method for data capture, suitable for the detailed examination of visitor interaction and conduct. The video ethnographic process involves the positioning of a video camera upon the subject of study. The camera should be fixed and accommodate as much of the ecology of action as possible. The sound should be clearly audible. There are then methods of reviewing the video recording and extracting information from this procedure, including a preliminary review, through to more detailed transcriptions. The collection of data in this way should not be considered as a purely dry recording process, rather as an opportunity for exploration, one that can usefully and purposefully interrogate information from a number of perspectives, as one of my previous collaborators and social scientist, Christian Heath has it: 'One of the advantages of video recordings over other forms of social science data is that the same material can be considered with a range of very different interests and analytic commitments' (Heath et al. 2010 62.). This flexible nature of video data certainly became evident as I started to explore my own data, as will become clear in chapter 5.

Despite creating several interactive pieces that form the subject of video studies (Heath et al. 2002, Hindmarsh et al. 2002), my contribution in these cases has so far been concerned with the development of the assemblies

that form the focus of these studies. This has been at the expense of properly understanding the various analytical procedures involved in video ethnography. However, video ethnography has now become woven into my on-going critique of practice and has been an influence on the design development and evaluation of my practice. It has helped to establish the validity of this approach these methods of ethnographic data collection and analysis are described in depth in chapter 5. To understand the social behaviour that *The Enlightened Eye* might occasion within its ecology of action, I applied video ethnography to its analysis. Here I adapted the method to suit my own *entanglement* with the project. Video ethnography has been used in this instance to reveal through the social action of those involved in the ecology of action, the 'shape' of *The Enlightened Eye.*

Visual Ethnography and Design Ethnography

For this research project, I have identified myself as an artist-designer and have described the particular integration of art and design methods that characterise this role. My methods for analysis in particular as a practitioner researcher are informed by both visual and design ethnography.

Visual Ethnography relies on visual representations of data gathered in response to and as a result of ethnographic study. These take the form of photography, video and online materials (Pink. 2013, 1). Strictly speaking ethnography is only concerned with reporting on things that have already happened and does not have a view on how these findings might influence the future.

The way in which ethnographic data is collected varies, field studies include interviews, observations and video, and the researcher is often directly involved in the target group's activities (Mackley et al. 2013). In the context of contemporary art, ethnography has been developed in new and subjective ways, as for example in the work of Jeremy Deller who, immersed in a particular community makes documentary films that are understood and presented as a form of visual ethnography (Tate 2018). The close engagement of the researcher with the research resonates with my interests

as an artist-designer in qualitative assessments and the desire to reveal underlying concerns, motivations and relationships between participants.

The work of Social anthropologist Sarah Pink is particularly relevant to my study. Pink has developed a blended approach, pioneering a methodology that brings together visual and design ethnography in order to present intrinsic knowledge of how real people deal with daily activities and technologies. Pink clearly states that what distinguishes design ethnography from traditional ethnography is a specific interest in developing understanding of situations and behaviours that facilitate the design of improved future situations (Laundry Lives 2015). The flexibility of Pink's approach and its specific interest in design problem solving resonate with my own practice. In chapter 5, I show how the artist-designer also exerts a nuanced multidisciplinary perspective on primary data.

Objects and Actor Network Theory

A useful way of considering the connections between objects, situated design and museum visitors is Actor Network Theory. A simplifying of the relationship between the important elements of situated design allowed me to consider these connections in a number of ways and gives equal consideration and agency to the key components situated within the ecology of action. A project that asks people to connect with an object like *The Enlightened Eye* should consider Actor Network Theory. Conceived by the sociologist Bruno Latour, Actor Network Theory or A.N.T. describes social organisational structures as a framework which collapses the distinction between people and objects: 'Open fields of enactment mean new alliances arise between author, work, and observer, in which new actants such as machines, programs, multiple users, and visitors operate on the same level (Weibel and Latour 2007, 106). If A.N.T. maintains that objects have agency, then this may be one way of defining the connections within *The Enlightened Eye*'s compositional design and its systems of performative connectivity. However, in outlining the principles and rules of method associated with A.N.T. design historian Kjetil Fallan says: 'these principles and rules of method may make it easier to bring the A.N.T. perspective into empirical studies. A.N.T. should not, however, be thought of as a

methodological toolkit, but rather as a theoretical framework of facilitating new and dynamic ways of thinking about design' (Fallan 2010, 48).

Reviewing visitor behaviour and conduct against *The Enlightened Eye* through A.N.T. then, becomes problematic. However, if *The Enlightened Eye* is considered both as an artwork and a design object, then Latour's own simplification of an interactive museum exhibit he was involved in reflects the concept of an 'object-oriented democracy' (Weibel and Latour 2007, 107) and may support one kind of method or critical filter being brought to bear, adding to the methodological framework utilised in the analysis of *The Enlightened Eye* project. If museum objects can be thought of as social objects, then this fits into an A.N.T. structure. The museum expert Nina Simon defines social objects as quite simply discrete objects that provoke and engage people into exchanging discourse. These can be physical objects, like those in museums but they are also objects in the digital realm like the images, events and products shared on social media platforms (Simon 2010). Social objects are a conduit for discussion and engagement; they are 'transactional, facilitating exchanges amongst those encountering them' (Simon 2010, 54). Nina Simon sees social objects as a great opportunity for museums, both in the online collections and within the physical space of the museum itself (Simon 2010). A relational object Simon argues is an example of a social object that calls for several people to engage with it: this possibility for multi-engagement has been an important factor in the consideration of the structure and design of my own work.

It is often the case, according to museum specialist and social anthropologist Sandra Dudley, that museum artefacts are considered as useless things, having been removed from their original setting, they have become de-contextualised (Dudley 2012). This opinion is wrong she continues, rather they have become 're-contextualised' as they undergo encounters and new dialogues with different visitors and as new meanings and relationships arise from their new context in the museum. This re-contextualisation is surely a feature of the social object and methods for re-contextualisation include social learning against engagement with interpretive devices, like *The Enlightened Eye.*

Practice based research into art and design is a relatively new area, which defines its research territory by those taking part in its development. Borrowing theoretical approaches from other more established methods, such as the social sciences, is clearly a useful and appropriate strategy. However, there are concerns from some, including Durling and Freidman, who propose that methodologies for an examination of the tacit are impossible. Yet any evaluation of practice that includes an individual mapping out of what has been achieved and by what means, as well as an inclusion of empirical qualitative methods, such as video ethnography and photo-elicitation as part of a triangulation process, will find at least some of the edges of what is actual and can therefore be considered as valid.

Interaction Aesthetics and Interactive Affordances

My concept for the *Enlightened Eye* relied on a design composition that attracted and sustained interaction with those individuals and groups that entered its ecology of action. Features of my design were composed and arranged with the intention of communicating their operative purpose or *affordance*. The idea of affordance is essentially how people might be described as interacting with things, by virtue of visual cues (Gibson 1979, 127). Building on James Gibson's work, his colleague Donald Norman in the book *The Design of Everyday Things* (Norman 1988) extended the discussion to explore how individuals relate to designed objects with features such as knobs, dials and switches: 'Affordances provide strong clues to the operations of things […]. When affordances are taken advantage of, the user knows what to do just by looking: no picture, label, or instruction is required. Complex things may require explanation. But simple thing should not. When simple things need pictures labels, or instructions the design has failed' (Norman 1988, 9).

Norman goes on to discuss the principles of visibility: 'make relevant parts visible', and feedback: 'give each action an immediate and obvious effect'. 'When we use a novel object, a number of questions guide our actions. These questions include which parts move and what kind of movement is

possible (Norman 1988, 99). To consider the composition and configuration of an interactive object such as *The Enlightened Eye,* the design needs to take into account these visual and physical feedback systems.

Other considerations of the way that physical interaction with designed objects might provide the users with certain responses can be seen in the work of Patrick Jordan, an expert on the link between design and pleasure. Jordan's expertise is directed towards designers of commercial products. He has identified four kinds of pleasure: 'Physio-pleasure' deals with the senses; 'Socio-pleasure' focuses around interaction with others; 'Psycho-pleasure' deals with the psychological and 'Ideo-pleasure' corresponds to reflective appreciation of the aesthetics and quality of a product (Jordan 2000, 13-14). The design of a museum interactive may concern itself with all of these definitions of pleasure. However, in the case of *The Enlightened Eye,* whilst it's not easy to clearly ascribe all of these pleasures*,* It is possible to detect Socio-pleasure, clearly seen in my data analysis in chapter 5, where within the ecology of action there are displays of participatory engagement engendered by *The Enlightened Eye.*

Interaction aesthetics and interaction affordance are terms that express how a designer might choose to communicate function to the intended user and how the user might draw on experiences similar to the designer's intention for interaction, so that: 'A user trusting his aesthetic experience (recommendations) reduces his personal design-uncertainty by assigning aesthetic values to the current presuppositions of interaction, thus enhancing the ability to detect the interactive affordances' (Xenakis and Arnellos 2013, 13).

Anthropologist Anne Lorimer has identified a threat for the more unconventional museum interactives, such as *The Enlightened Eye.* In '*Raising Specters: Welcoming Hybrid Phantoms',* she reports that a common fear amongst museum exhibit designers is: 'That aesthetic forms, instead of acting as a transparent conduit or facilitating vehicle for underlying concepts, will steal the show: that exhibit creators, exhibit forms or exhibit receivers will fail to act in a semiotically disciplined manner' (Lorimer 2007, 214).

Continuing, Lorimer contends that 'the exhibit becomes *about* exhibit technology and its aesthetic qualities'. However, she is explicitly *not* against new forms of exhibit but argues that 'exhibits should be evaluated as experiments' (Lorimer 2007, 215). I conclude from this that my experiments should be about producing new knowledge, rather than simply communicating the old.

The furniture designer David Pye in his book *The Nature and Aesthetics of Design* first published in1964 proclaims that: 'A designer designing a tool may give it a profile which derives from something he saw in a mussel shell, or in a turbine blade' (Pye 1983, 144). Perhaps this kind of visual appropriation, conducted to various levels of explicitness, offers a simple explanation in support of aesthetic design and affordance. In considering the use of visual appropriation I will discuss the visual dynamics of mechanical objects that drive my own aesthetic compositional interests below.

New Kinds of Aesthetic and Interactive Affordance

The design of *The Enlightened Eye* interactive has discrete controls besides the embedded touchscreen graphic drawing interface. These controls are handles of a basic design and not positioned for ease or smoothness of use. There are a number of reasons for these particular placements, the first being that having two separate positions for controls forces visitors to cooperate and work together, in order to engender collaboration and enhance participation in the visitor, thus forming and feeding visitor interest and creating opportunities for shared supportive social action. Secondly, the use of archaic technology conforms to a programme of kinetic machine styling. This kind of dynamic composition is appropriate and in keeping with the evocation of the camera obscura and the orrery that I myself draw upon. I would also suggest that this evocation could be enhanced by a comparison of antique and contemporary ergonomics, as exemplified by the scenario described in design historian Kurt Rowland's 1965 book *The Shapes We Need*: 'During the early industrial revolution, engineers concentrated on the mechanical aspect of their machines and human beings, had on the whole, to fit in with the conditions imposed by the machines' (Rowland 1965, 33).
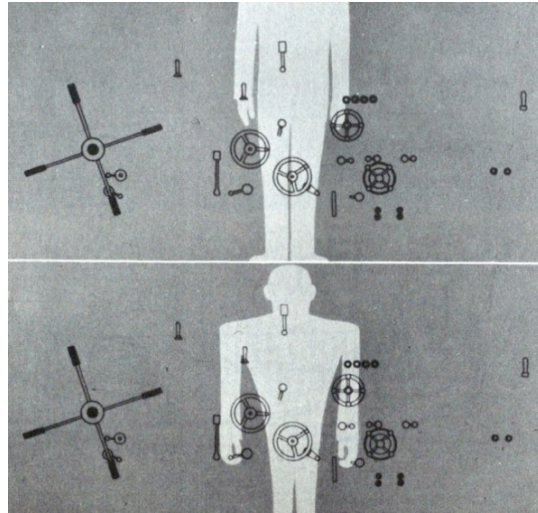
Figure 41: Kurt Rowland. 1965. The controls of a lathe, image: K. Rowland.

Therefore, the use of what might be considered un-ergonomic design may help to support an evocation of the past; an image from Rowland's book shows the problem, illustrating the poor positioning of the controls of a lathe positioned to support the machine rather than the operator: 'only a freak human being could handle this machine easily' (Rowland 1965, 33). Another potential of this un-ergonomic design was that forcing exaggerated or uncomfortable movements might stimulate memorable kinaesthetic learning experiences.

Comparative Morphology for Creative Transformation

The drawing task that the visitor is invited to undertake whilst using *The Enlightened Eye,* is supported by the visual associations that are made with the selected mineral samples. As a driver for visitor creativity and in the same way as Dürer's net system was deployed in the *Lineamenteum* project I discussed earlier, the tracing of images on *The Enlightened Eye's* digital tablet, supported the visitor in the choices they made and formed a reassuring template for making a drawing. The comparative morphologies created by chance natural formations can be seen as an essential driver of human creativity since early times. The arrangement of stars, cloud structures and very aptly, rock formations, have inspired image making. Palaeolithic cave paintings and carvings representing animals, human figures and birds often conform to the rock structure. Archaeologist Genevieve Pincon discusses a study of Cresswell Crags, which house Britain's only known Ice Age cave drawings and compares them with European cave art of the same era: 'we can observe a perfect adaptation of the organisation of the figures relative to the wall's morphology' (Pincon 2007, 236). This deep-seated urge to construct recognisable shapes from other visually similar forms is creative, transformational task allowed by *The Enlightened Eye.*
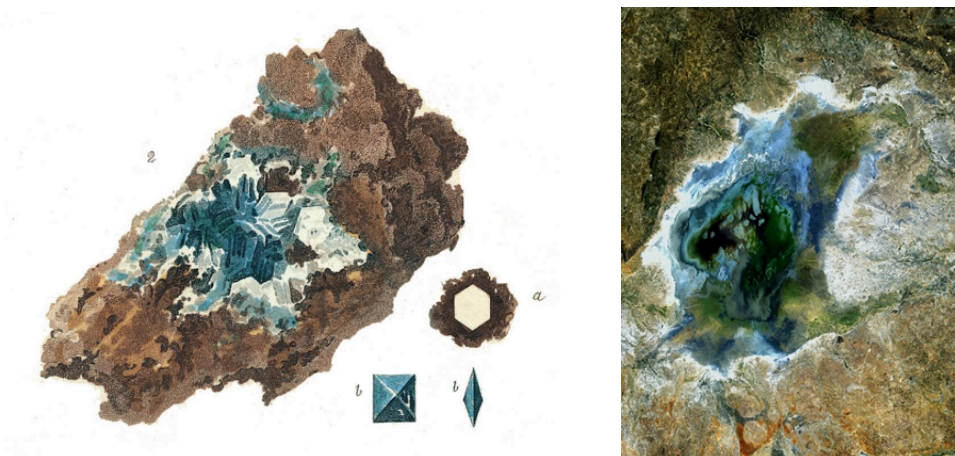
Figure 42: (L) Thomas Underwood.1802. Liroconite from Huel Gorland, Cornwall, Minerals Rashleigh Collection Licronite Hand coloured engraving painted by Thomas Underwood and engraved by Thomas Medland. (R) European Space Agency.2011. Satellite image lake Tanzania.

David Pye addresses the artist's role in drawing upon morphologies: 'The artist's ability to make his discoveries is perhaps not remarkable. What is remarkable is his ability to isolate them and make them explicit in a transmuted form. It is in that ability, I suggest, and not always in the range and sensitivity of his experience that the artist is remarkable: for if other people were incapable of responding to the particular relations and qualities of shapes, colours and surfaces which have stirred up the artist then they would fail to respond to the artist's expression of them' (Pye 1983, 144-145). This is a useful description of the way in which many people identify satisfying forms. For example, the deep-seated innate appreciation of beauty held by, say, a museum visitor, may enable a latent artistic response, given the right circumstances. The art historian Dario Gamboni, in his book *Potential Images,* talks about visual 'triggers' 'integrated into the creative process', for example he mentions 'stains on walls recommended by Leonardo (da Vinci)' as a stimulus for creativity (Gamboni 2002, 16). Other artists have used the random as a route to creativity. For example, in *A New Method of Assisting the Invention in Drawing Original Compositions of Landscape* (Oppe 1952), Alexander Cozens (1717–1786) describes the process of finding value in the production of quickly produced images upon which to build his landscapes. Cozens 'in fact proposed to give up copying the work of others or even nature itself to use the artificial blot' (ibid). Albrecht Dürer is well known for concealing faces in his studies of rock formations. Of particular note is his *View of the Arco Valley* (Louvre Museum Paris 2014). This watercolour contains several examples of anthropomorphism. Geologist Gary Rosenberg describes Dürer's painting: 'clearly is an applied study of variations in the form of the human head […]. Structural geology, was at one time coupled with an understanding of the perspective distortions of the human form […] and established landscape as an object capable of geometric transformation (Rosenberg 2009, 29).
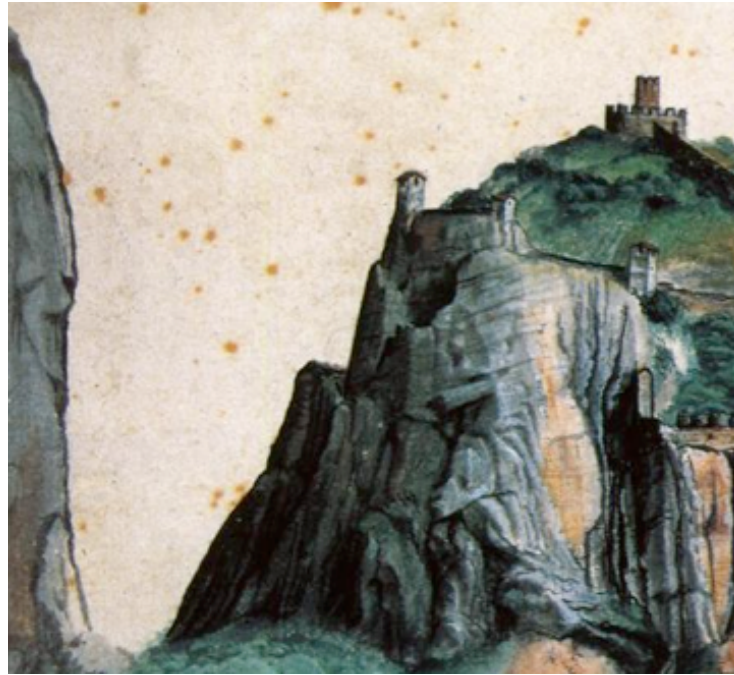
Figure 43: Albrecht Dürer.1495. View of the Arco Valley (detail), image: © Musée du Louvre.

What appears to be a playful augmentation of landscape therefore, actually goes hand in hand with the development of the science of geology, exposing the strong relationship between artistic and scientific study, an idea which contributes to the argument for the aesthetic design affordance, structure and intention of *The Enlightened Eye* and the task of drawn response to minerals. The pervasiveness and creativity engendered by visual associations is a tool for supporting the open-ended creative transformations afforded by *The Enlightened Eye's* design.

The Importance of Appropriation

The term *appropriation* covers a number of actions within art and design; it generally implies the creative repurposing or reuse of an object, image or theme. The conceptual motive for appropriation is an active and considered re-contextualisation that, through its addition, adapts and enhances a new context. Historical and contemporary examples of creative appropriation can be seen within music, graphics and architecture. It pervades many, if not all creative practices. It may be embedded in traditions of cultural colonial styling, as seen in much eighteenth and nineteenth century Western applied

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arts: the form and nature of fashion design for example, rests heavily on material and thematic re-contextualisation.

An act of appropriation may be explicit and identifiable when subject to interrogation. Or it can be less obvious; translation from one context to another will have had many possible reasons or conceits: it may be an expedient practicality, it may also form a subtle code to be unpicked, or be 'writ large', to provoke different responses from an audience.

Types of Appropriation

A widely recognised form of appropriation is not concerned with any visual aesthetic culture, rather a practical process of reuse and recycling where physical objects are made to perform new, everyday tasks. A typical example might be a broken radio aerial replaced with a coat hanger. Design theorists and practitioners have reflected upon improvised 'make do and mend' practice produced by necessity in materially impoverished cultures. Exploring the rationale and process of appropriation during the collapse of the Soviet Union, *Home Made: Contemporary Russian Folk Artefacts* (Arkhipov et al. 2006), is a book that considers in detail many makeshift objects. Through maker interviews and photographic records, these objects are elevated and catalogued, informing a further design aesthetic that is separated from the political landscape that fostered them. Contemporary craft and sculptural objects often explore the aesthetics of this kind object appropriation. This kind of material appropriation and reuse is embedded in my own work; found materials were a prominent feature of my own automata work. The mechanisms that operate aspects of *The Enlightened Eye* are also re-appropriated from reclaimed equipment, having mechanical properties that I could not have easily engineered myself. In some cases, I thought to use found objects and then discovered them not fit for purpose but was still captivated by the quality of form and subsequently remade them for use in the design.

Appropriation cannot be discussed without a reference to Marcel Duchamp and the Dadaist tradition of ready-mades and the modification and re-contextualisation of *objet trouve*. Found objects as sculpture might be seen

as a political, revolutionary act, intended to make an audience rethink the value and meaning of things. Talking about the now iconic early twentieth century ready-made urinal *Fountain* (Tate 2016)*, and perhaps to a lesser extent his 1919 amended moustachioed version of the Mona Lisa *L.H.O.O.Q.* (Norton Simon Museum 2016)*, the filmmaker and cultural historian Robert Short explains: 'The ready-made is exemplary of the tension within all Dada art on account of Duchamp was evidently claiming that the most humble manufactured objects-a bottle-dryer, hat-rack or snow-shovel-could be elevated into a work of art; on the other hand he was equally evidently breaking down the hierarchy of art in order to debase its masterpieces to the level of mundane objects' (Short 1994, 25). For me Duchamp's legacy and enduring influence, is that his recontextualisation of objects disrupts visual apprehension, revealing the underlying structures and conventions in understanding, a sculptural equivalent to Garfinkel's social science method of 'breaching' (Garfinkel 1967).

Figure 44: (L) Marcel Duchamp. 1964. Fountain, 1964 replica of 1917 original, Image: © Succession Marcel Duchamp/ADAGP, Paris and DACS, London 2017. (R) Marcel Duchamp. 1964. L.H.O.O.Q. 1964 replica of 1919 original, image: © Succession Marcel Duchamp / ADAGP, Paris.

Design theorist Damon Taylor suggests Duchamp's rationale for appropriation is positioned differently from contemporary, outwardly similar

works. In *After a Broken Leg: Jurgen Bay's Do Add Chair and the Everyday Life of Performative Things* (Taylor 2013), Taylor discusses the difference, positing that a chair with a deliberately shortened leg and a title that clearly refers to Duchamp (Studio Makkink & Bey 2016) is testing the boundaries of function in design, rather than challenging the calcified hegemony of an early twentieth century art world. Jurgen Bey's use of appropriation is different Taylor continues, as the object is about practical use in the 'economy of design' (Taylor 2013, 360), a chair recalibrated, rendered difficult but still useable and engaging, interactive. It is within this economy of design that the artist-designer also experiments with what might be considered sensible and appropriate for design interaction and interpretation in the museum context.

Appropriation is also a term increasingly recognised within Human-Computer Interaction studies and used to describe a way of accounting for flexible user adaptations of software and hardware. According to computer science expert Antti Solavaara, the way in which users may appropriate and use systems in ways different to that which they were designed for, forms a rich area for the study of cognitive procedures. Software designers are making and harnessing this 'repurposive appropriation' (Salovaara 2012). Solavaara suggests that this adapted use is a creative process that takes place in socially distributed situations. If appropriation can mean allowing and affording creativity in others, then this also relates to designing for situated creativity in non-linear interactive objects, such as the *Interactive Work-Table and Escritoire* and *The Enlightened Eye*, both of which appropriate and repurpose the use of digital technologies in new ways.

To understand the use of appropriation in my own work, I detail some of the procedures within the research, below.

Aesthetic Appropriation and Design Appropriation

In order to design an interactive piece devised to allow for creative action, the designer needs to understand the action they are predicting. Professor of Interaction Design and musician, Lars Hallnäs, in discussing design, aesthetics and function, states: 'In all design, aesthetics has a dual nature, spanning the expressiveness of the things and systems we design and the

expressiveness of their use' (Hallnäs 2011, 74). When creative flexibility is required in an interactive, designing something foregrounding, and therefore expressing, one's own sensibilities and visual preoccupations, is manifest in many objects. Expression Hallnäs argues is about the choices a designer makes through and beyond mere functionality. Expression is the manifest phenomenological fact and form of an artefact. Is this the point where design can tip into appearing more like art? Where do those decisions about colour, texture and form come from? It depends, of course, on the individual designer and the intention of the design. On product design, Hallnäs continues 'in the process of designing a product, we define the product' (Hallnäs 2011, 73). Discussing the design aesthetics of interaction design, he makes the useful observation that 'playing the piano is implicit in the process of designing a piano as a thing' (Hallnäs 2011, 76). This commentary has a great relevance to this project: I wanted to afford situated creativity and the object I designed and built whilst not as complex as a piano was confected of a number of functional forms and structures. In my own world of art and design, the use of image capturing equipment, such as cameras, set up in order to trace and look for stimulating shapes is not unusual. I sought to share this way of thinking and working freely in a museum, using collections as a resource to stimulate the imagination. I felt this required a design that permitted and afforded this action through a combination of familiarity and novelty. In the case of *The Enlightened Eye* I was very interested in conjoining visual qualities with a design that afforded creative action. These design choices emerge from the tacit imagination; the individual, latently stored memories and experiences that are appropriable sources and potentialities.

The geometry of form revealed within man-made objects has been long recognised. The proportional geometry most associated with 'human cognitive preference' (Elam 2001, 6) in visual structures, is the 'golden mean' - the ratio 1:1.618. This golden mean or 'golden ratio' can be detected in early structures, such a Stonehenge (ibid) and has been deliberately deployed in classical buildings ever since. Underlying structural variations on the golden ratio appear in many objects, including architecture, painting

and design. When subject to harmonic analysis, a visual breakdown shows division and a repetition of those divine proportions in objects, such as chairs, cars, lamps and so on. The design theorist Kimberly Elam, discussing this theme in design, says: 'Geometric organisation in and of itself does not yield the dynamic concept or inspiration. What it does offer to the creative is a process of composition, a means of interrelationship of form, and a method for achieving visual balance' (Elam 2001, 137). Built to these fundamental proportional compositions, I suggest that the iconic qualities of many man-made objects create both an aesthetic and a functional affordance.

One specific theme of *The Enlightened Eye* project is the appropriation of mechanical structures for aesthetic affordance, informing a visually dynamic structure. The artist-designer often identifies useful forms tacitly. In order to identify this process, I will now describe the visual nuances of some relevant dynamic forms through their function and visual qualities. On a basic level, the mechanical visual dynamics of these functional objects include a 'business end', where subjects are captured and drawn in towards the 'action end' where controls are configured. These dynamic structures are often compositionally tapered like telescopes and microscopes or have a directional flow of information, as with cannon and epidiascopes. The diagram below shows some of these related structures and details the direction of information via an interrelated, compositional dynamic.

1. Telescope

2. Camera Obscura

3. Epidascope Projector

4. Cannon

5. Magic Lantern

Direction of information
Control configuration
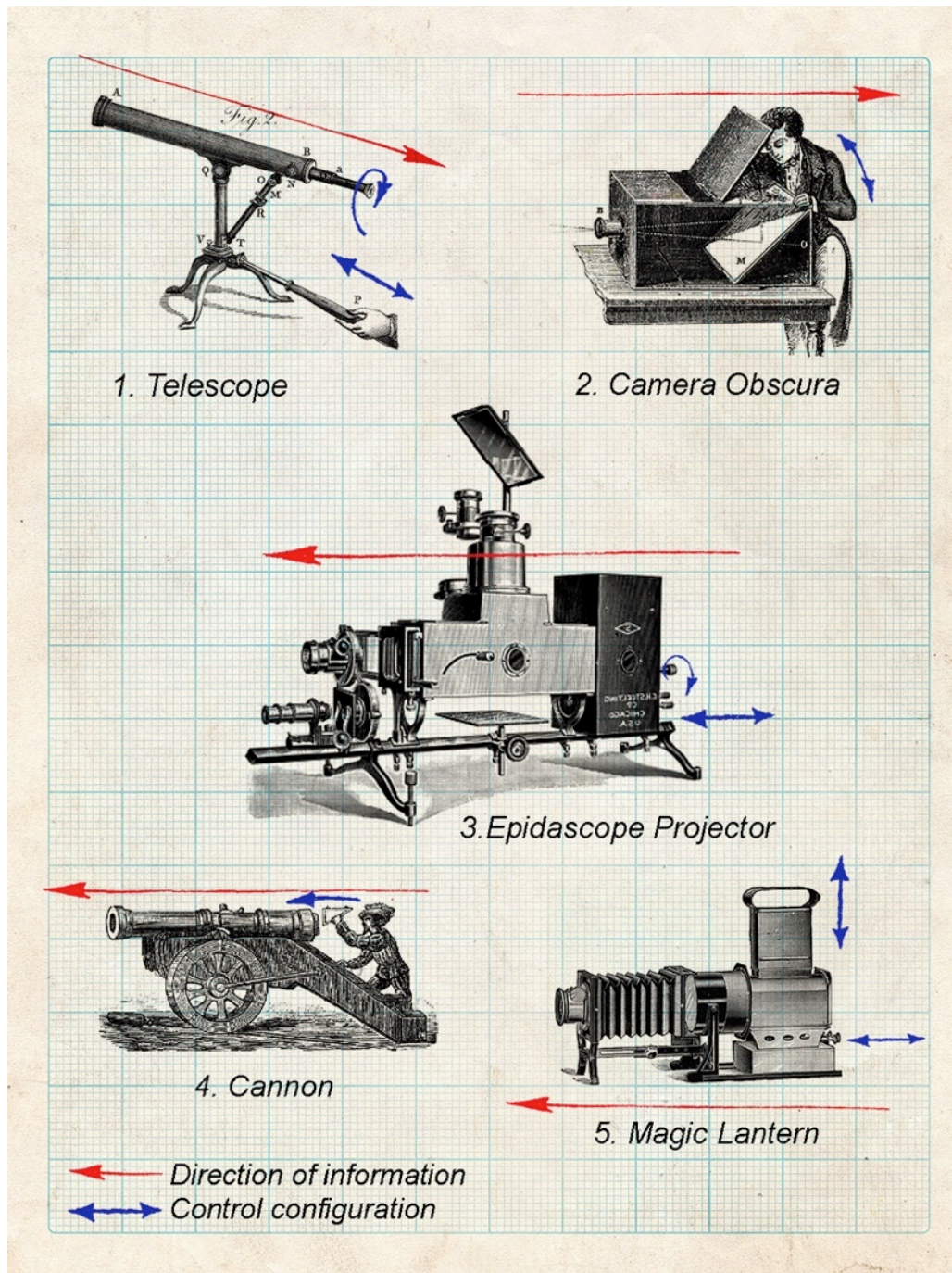
Figure 45: Jason Cleverly. 2016. Mechanical dynamic structures, image: J. Cleverly 2016.

1. The telescope, devised in the seventeenth century, is an optical device often composed of a series of tubes that step down sequentially in size towards the eyepiece. There are adjustable controls that focus and alter the attitude.

2. The camera obscura has a box form that collects light through a front mounted lens which projects this light to a glass panel, over which paper can be placed to trace the image formed. This area for drawing often has a hood to help render the image more visible in ambient light. Its shape is often chunky, not elegant but is subtly and pleasingly directional in form. The hood too is visually directional, aerodynamically, recalling a car windscreen.

3. The epidiascope projector, or opaque projector, was a common presentation tool in the late nineteenth and early to mid-twentieth century. There are many variations but essentially these devices project images of brightly lit documents via a configuration of lenses and mirrors. The compositional form has a strong attraction for me, as it often includes a multitude of satisfyingly adjustable controls, as well as the forward facing lens.

4. An historic and unfortunately ubiquitous device, the cannon is a strongly dynamic form. It is highly directional, both visually and practically. The carriage and wheels, used for positioning, contribute to the form and the user naturally stands at the back end, out of the way of the cannonball's trajectory.

5. The magic lantern is perhaps the most well known of the devices. A highly recognisable dynamic it is closely related to other optical forms. Again, the majority of controls are at the rear of the structure, in counterpoint to the projecting lens.

I have shown specific examples here, although there are many more configurations and versions that I could have drawn upon and discussed. Sometimes these devices can be seen decorated with opulent detailing and ornamentation, others are Modernist and utilitarian in style. Notwithstanding this variety, the essential dynamism of form is preserved. Most of these devices are used to interrogate a subject, or to reveal something; these are

strong, readable dynamic shapes. A provisional design sketch for *The Enlightened Eye* from my sketchbook below, shows a variety of forms: a microscope, an endoscope, a kind of robot arm probing a lump of something, as well as a telescope shaped form, eyeing up a lump. This is a nascent conceptualisation of *The Enlightened Eye,* where the essence of the idea is already evident, intuitively and tacitly grappled from memory. Visual appropriation of form and structure from earlier periods I contend arises from the effect of material and scientific improvement in objects leading to objects that are less explicit and increasingly anodyne in their latent functionalities and affordances.
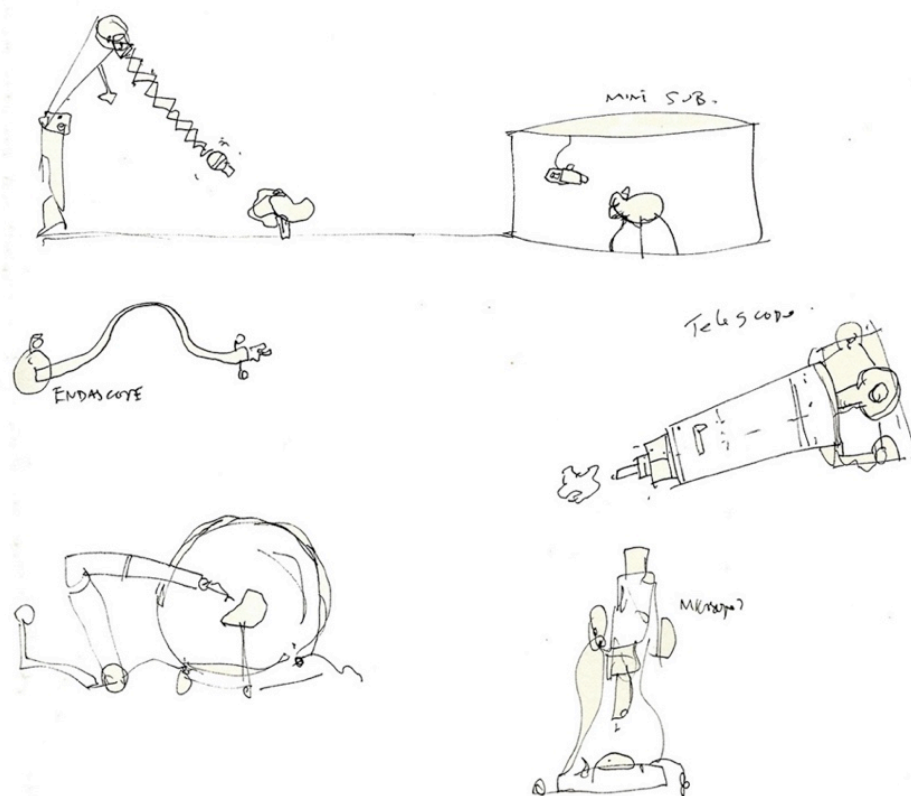
Figure 46: Jason Cleverly. 2013. Provisional sketch showing initial dynamics, image: J. Cleverly 2013.

For a museum audience, it is necessary to have some sense of how these appropriated forms in a design might influence them. If they are able to read consciously or unconsciously the semiotics and dynamism of shape, this

then is part of a communication between the artist-designer and an audience, an invitation to engage.

Approaching the Design Process

A versatile model for design projects devised by Morten Hertzum, Professor of Information Science at the University of Copenhagen (Hertzum 2014). Hertzum's model was created as a flexible teaching aid designed to allow design students to assess the direction and emphasis of their approach. To construct a plan is useful when considering approach, a basic model can also form an interrogation of approach. To consider Inglold's more subtle evaluation of the design and construction process, that is to say the tension between the hylomorphic, the Aristotelian bringing together of form and matter (Ingold 2010, 2) and the morphogenetic shaping and growing of things (Ingold. 2011, 372).

The infographic (Hertzum 2014, 10) below, shows how an existing situation, combined with technological possibilities and processed through a design procedure, creates a new situation.
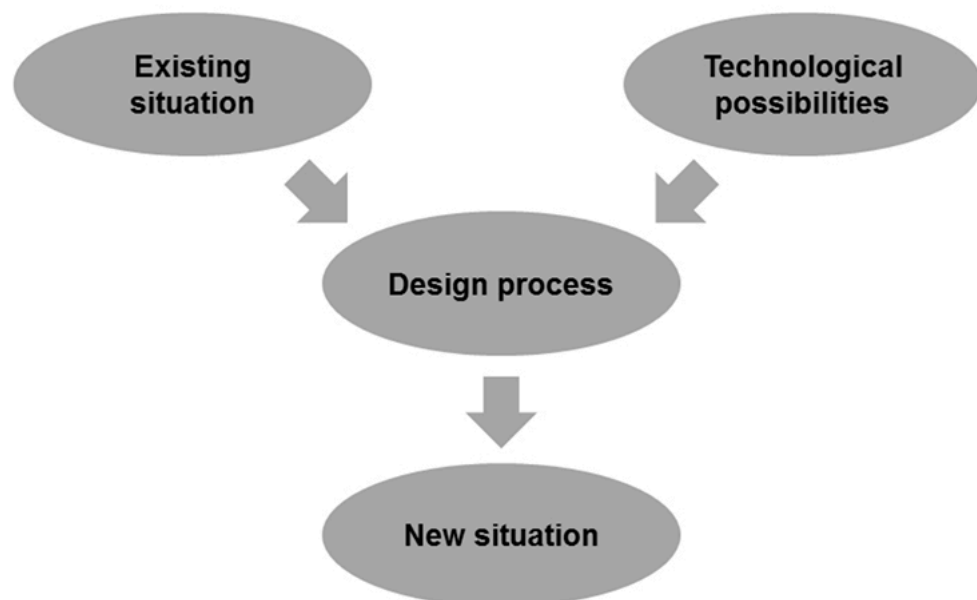
Figure 47: Morten Hurtzum.2014. A simplified model of design projects, image: M. Hertzum 2014.

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Hertzum continues, showing how a focused emphasis on each aspect of the diagram can show how a designer might navigate a project.

A focus on the existing situation is called the 'analysis project' (ibid). This requires an assessment of a situation as it stands and evaluates its strengths and weaknesses. An understanding of the prevailing situation takes into account inadequacies and problems that affect a stakeholder. The positive aspects of an analysis of the current situation also need to be taken into account. This leads to a deeper understanding of what kind of design approach the existing situation requires.

Hertzum's second kind of design project is the 'construction project' (ibid). This focuses on the technological possibilities, meaning that the designer examines the physical properties of a design. The designer considers 'affordances, their look and feel [and] the construction project calls for investigating the technological possibilities by actually constructing designs' (Hertzum 2014, 30). This particular focus is a reflexive, iterative dialogue that requires an appreciation of the existing situation, in order to properly respond to the design problem it sets out to address.

The 'process project' (ibid) examines the design process and asks: 'how is change accomplished […] how is it brought about, documented and transformed into designs?' (Hertzum 2014, 32). The kind of activities ascribed to this process can be live tests of procedures, where procedures are influenced by situated-ness and need to adapt to context. This part of the design model seems to be the most problematic and flexible in description, but has useful implications for developing strategies for assessing the performance of design concepts.

The 'vision project' (ibid) focuses on the new situation and describes and accounts for the end result of a project, looking at how it will form a suitable solution to a problem, and how it 'supports prospective users and other stakeholders in experiencing use, which adds context, meaning and emotion to the technology' (Hertzum 2014, 34). To undertake a vision project without taking account of the preceding components, is risky; it means that the design solution may not be informed properly by any firm evidence and

testing and may therefore be unpersuasive as a concept. If a vision project is not linked appropriately to its projected use and purpose, then Hertzum contends it may be a 'solution in search of a problem' (Hertzum 2014, 35), whilst if it is linked persuasively, then it may appear to 'lack vision' (ibid) and be an uninspiring and a rather pedestrian idea. I feel that a 'solution in search of a problem' aligns with the artist part of the artist-designers psyche, in the making of work purely for the personal challenge of it.

For me the vision project is a major influence on my creative ambition. This is both a problem and an advantage for the artist-designer. Because these 'back of an envelope' vision ideas, in order to take shape in a real environment, in what sociologist Pierre Bourdieu called the 'Habitus' (Bourdieu 1984 6), they have to take account of technologies, users and situations. This 'taking account' that informs the solution, is another influence and inspiration that can help overcome design problems. The advantage of the vision project is that it creates new approaches to design, to growing things out of the tacit imagination, conditioned by the morphogenetic (Ingold. 2011, 372).

Considering these subdivisions of a project are useful flexible methods for unpicking the basic modus operandi of an artist-designer. I would suggest that this model, as applied to the procedures when designing and making *The Enlightened Eye*, has to implicitly and explicitly include the iterative progress that my wider practice has undertaken. And in addition, consider the key characteristics of my practice as described earlier, such as the aesthetic and kinetic affordances that support participatory and transformative interaction, to enhance interpretation in the ecology of action. In chapter 4 I will examine *The Enlightened Eye* project through Hertzum's three headings, I will also draw upon the key characteristics of my practice and this will help to outline the project in general.

Implications: Methodology in Practice Based Art and Design Research

There has been debate as to what research into art and design constitutes. An inclination to consider that the designed object is the embodiment of

practice, that indexical evidence is revealed by the individual and collaborative actions of those concerned, (Rust 2004), has been question by those who seek empirical evidence (Friedman 2008). Models that locate creativity (Csikszentmihalyi 1999) are useful. Additionally, detailed, delicate deliberations of the way in which creative ideas and objects are grown, nurtured and shaped by considerations of the environment (Ingold 2010, Magnani 2011), are also persuasive. Those researchers who have conducted practice-led and practice-based design projects have developed multi-method approaches to interrogating their themes, and this to a certain degree helps to create empirical evidence for what design research is. There are methods of interrogation used by researchers, such as diagrams that effectively tease apart different aspects of their subjects of attention (Jensen 2015). Methods such as photo-elicitation, interviews and questionnaires are directed at design research questions and processed through grounded theory procedures to arrive at conclusions. Data collection and analysis afforded by social science video ethnographic procedures are appealing, as they offer fine-grained analysis of conversation and interaction.

Case study research requires detailed and interrogative focus on a particular event or design; close enquiry into aspects of a design concept, using multiple methods to elicit useful data is a particularly useful model for art and design research.

The application of these methods, or indeed bespoke adaptations to case study research of specific situations and projects can effectively reveal to some degree something of what the poet T.S. Eliot considers in his 1925 poem: 'Between the idea and the reality Between the motion and the act Falls the Shadow' (Eliot 1969, 85). That is to say the detail, the murky *what, how and why* of a project, as it is realised.

To summarise, the contemporary field of art and design research methodology consists of an understanding of the ways in which art and design problems and their thematic subject can be interrogated from a number of perspectives to arrive at a conclusion and identifies a cultural and societal location.

Conclusion

This chapter highlighted particular contemporary research practices and the debates that surround them and positioned my practice within the landscape of art and design research. As I have argued in this chapter, the establishment of art and design methodologies for the evaluation of interpretive resources in the museum is not without problems. Audiences do not always respond in predictable ways and the endless variation in context, size and shape of spaces, as well as their contents, have implications that are not always possible to judge in advance (Heath and Davies 2014). This situatedness means that each project starts from a position of relative ignorance and that one can only make design decisions as educated assumptions, based on previous iterations.

Closely associated with the methodologies for analysis of situated design are the art and design production practice methods. Here James Gibson's concept of affordance (Gibson 1979), casts an important light, as does David Pye's solid reflections on form, function and aesthetics (Pye 1983). Art and design research draws on discussions of the validity of approaches (Frayling and Royal College of Art 1993) that chose to allow Polanyi's concept of the tacit to be taken as a serious method within practice (Polanyi 2009). Despite cautions against the tacit by design theorists Durling and Friedman (Friedman 2008), for my part I chose to resist these cautions and used this thesis as an opportunity to examine aspects of the tacit, through descriptions of the way in which my practice articulates examples of both aesthetic and design affordances. I take inspiration from Chris Rust's assertion that the design and fabrication of an object should be enough to convince audiences of its validity (Rust 2004). Additionally, there is some interrogation of the complex ideas around making and the environment by Tom Ingold and Lorenzo Magnani (Ingold. 2011, Magnani 2011), as well as the issues emerging from practice based PhD's by Onol, Scott and Fabian (Onol 2011, Scott 2009, Fabian 2011).

The contextual review is also concerned with the concept of art and design hybrids. Of particular use for outlining the territory that an artist-designer

might inhabit, is the work of Jette Lykke Jensen, who through her PhD (Jensen 2015) interrogated the differences and similarities between art and design. Significantly Jensen concludes that contemporary hybrids are now prevalent and practitioners often move freely across definitions. Gareth Williams' survey of contemporary British designers (Williams, 2012), reveals many instances of hybridity, of practitioners who appear to approach their work like artists but who describe themselves as designers. The design process, as defined by Morten Hertzum's sequence of procedures (Hertzum 2014), proves a valuable description of an approach to situated design. Grey and Malins' describes critical evaluation of practice (Gray and Malins 2004) and their multi-method approach allows for flexibility and supports an evaluation of practice through a number of different approaches. If each discrete method is focussed on the same problem, then this allows the form of the distinctive practice to emerge. Lars Hallnäs usefully describes the way in which a design emerges to visually describe itself through its function, so that the validity of both function and aesthetics are portrayed in the overall composition (Hallnäs 2011).

The purpose of undertaking an examination of art and design research is to survey the landscape in order to help understand my own particular stance and approach; this is a methodological prism designed to expose where my own practice is located. Art and design research including PhD practice research is in its relative infancy when compared to other practical and theoretical fields of research. Any approach to locating and defining practice has to, by necessity explore that which articulates similar methods and analysis, as well as inventing individual and unique approaches to achieve understanding.

Chapter 2: Historical Contexts: Spectacles, Sideshows and Museums

Introduction

In this chapter I discuss, through examples, the importance of an historical context to this study. Firstly, the spectacle is considered, a form of entertainment that relied on emergent technologies, devices that could immerse and engage a viewer in a number of out-of-the-ordinary ways. The relevance of this review relies not only on the use of technology to create new situations and possibilities but also on the way in which these individual devices form an aesthetic and thematic connection to my own work.

This examination of the history and the development of the museum is a particularly useful exercise in regard to this PhD project. The ebb and flow of personal preoccupations by curators and the growing challenge to disseminate knowledge amongst populations is set against the breaking down of calcified notions of what a museum could be. An examination of historical display supplies an important assessment of the visual aesthetic and design of my interpretive practice. This critical review of secondary influences is directly and meaningfully connected to my primary research. The history of the museum holds not only a romantic fascination for me as an artist-designer in its visual qualities, but is an endless arena for reflection and the testing of new forms of interpretation and engagement.

A broad history of the museum is also considered, including its emergence firstly as the private wunderkammer and then a chaotic taxonomy of contents based on what now appears to be highly unscientific categories. This uncertainty of taxonomic provenance engendered curiosity and wonder, until the later emergence of the public museum introduced a hegemonic, didactic culture. I also discuss the museum as a place where the unusual might happen, as an exotic backdrop for drama in the public imagination. I also consider the emergence of new ways of curating the museum, as artists and designers critique its calcified colonial agenda in new and unconventional ways. Ultimately the museum becomes an arena for experience and entertainment in establishing new ways of thinking about its contents.

Firstly, I discuss the *spectacle* as both a catalyst for artistic expression and scientific progress. In addition, I discuss examples of technologies that make visual experiences for an audience. Various forms of the panorama created an immersive experience on a large scale. For example, the panorama's curious cousin, the Kaiser-Panorama, allowed a mechanical, stereoscopic view of a broader world. In contrast, the microscope supported an exotic apprehension of the very small. All were capable of communicating extraordinary new concepts and vistas to recipients through their structures. My own projects have drawn upon aspects of both these technologies to help create a novel understanding in an audience, to translate and transform content into something new.

Secondly, I will introduce the museum as a structure for translating and interpreting knowledge, as a private repository that became a hegemonic and educational instrument and latterly a place for experience and play. The museum is where I have had, through my own practice, the opportunity to make interpretive structures and to develop ecologies of situated creative action.

Spectacles

My previous work created an experience for the audience. Although contemporary audiences are used to complex technologies, the use of simple configurations of cameras and screens seen in *Deus Oculi* and *Ghost Ship* had surprisingly influential effects on visitors who used the embedded technology to interact with each other through the installations. This evidence implies that, given the right context, a spectacle could be devised to affect an entertaining cultural experience. Additionally this kind of playful experience could support interpretation when aligned with museum objects or themes.

The artist and theorist Guy Debord says in his 1967 work, *The Society of the Spectacle* (Debord 1987), that the spectacle is 'a social relation among people, mediated by images' (Debord 1987, 4). Debord declares that these images of spectacle are true as well as false, in that images are a constructed, shared and agreed reality. I concur with Debord's analysis, his evaluation of the spectacle as shared experience, frames the way in which *The Enlightened Eye* encourages dialogue through creative transformations. A spectacle is an illusory performance or demonstration of something that is, or appears to be, extraordinary, often utilising contemporary or emergent technology. A spectacle is commonly a shared experience constructed to reinforce belief and wonder through its agency. The medieval cathedral is a good example of this, a space where complex structures were designed to impress and engage. In considering the soaring columns of such building, the ceremony, and the golden, decorative ritual artefacts. When accompanied by ethereal choral music, how incredible the rich colours of the stained-glass windows must have appeared to the ordinary churchgoer. It is easy to compare this experience to the secular spectacle of modern cinema. Alison Griffiths, Professor of Communication Studies at Baruch College, New York and an expert in proto cinema comments: 'what the mediaeval icon, panoramic painting, planetarium space show, motion picture, and dioramas share on a phenomenological level at least, is their power to transform abstract ideas and representation to the world into decipherable visual language that can be decoded by the spectator within an enclosed space (Church, rotunda, dome, auditorium, or museum)' (Griffiths 2008, 21). Since

to devise a structure that is capable of holding the attention of groups of individuals, a structure that communicates through its own composition and technological agency is at the core of my practice then it is important to assess certain significant antecedence.

The Lantern of Fear

The use of spectacle as a form of entertainment and education has a long and popular history. For example, in 1659 Christiaan Huygens developed the projection technology called the *Lantern of Fear,* or magic lantern (fig 48) as a device 'which allowed for the magnified projection of images painted on glass. These views could be static or in motion' (Mannoni 2004, 42). The possibilities for creating drama and narrative were self-evident.
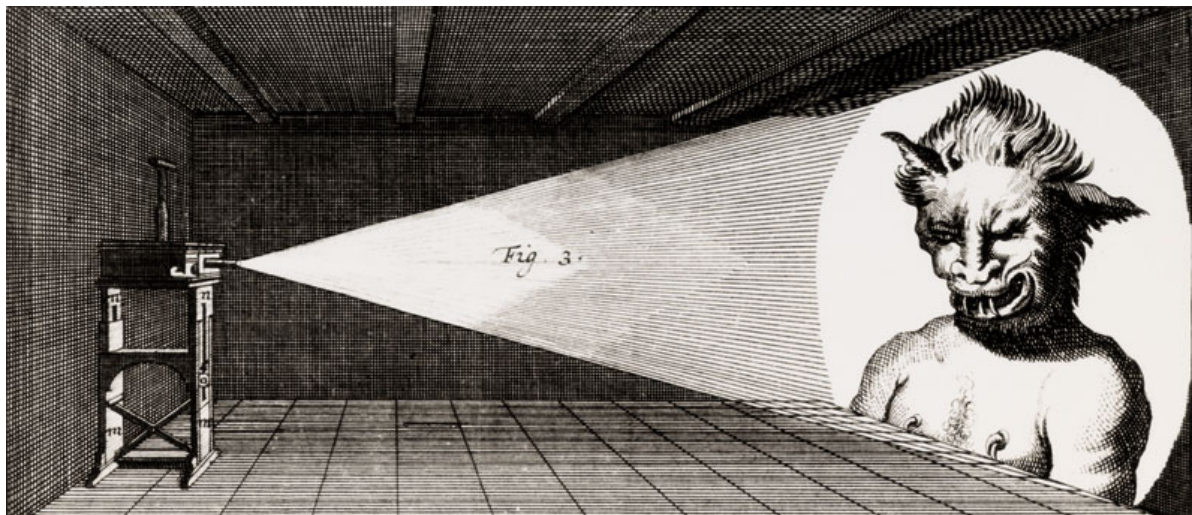
Figure 48: Guillermo Jacobo s'Gravesande. 1748. The Lantern of Fear in Physices Elementa Mathematica.

In the late eighteenth and early nineteenth century, physicist Étienne-Gaspard Robertson gave public demonstrations of optics, galvanism and phantasmagoria (The Magic Lantern Society 2014). Projected images using contemporary magic lantern technology devices, such as the wheeled fantascope (fig 50), allowed for amazing effects: 'Projections on smoke; animated and multiple images, growing or shrinking as the lantern was moved on rails like a film camera on a tracking shot. Illuminated figures moved across the screen in all directions, looming up from the end of the

room at terrifying speed, coming right up to the spectators, only to disappear abruptly' (Mannoni et al. 2004, 45).
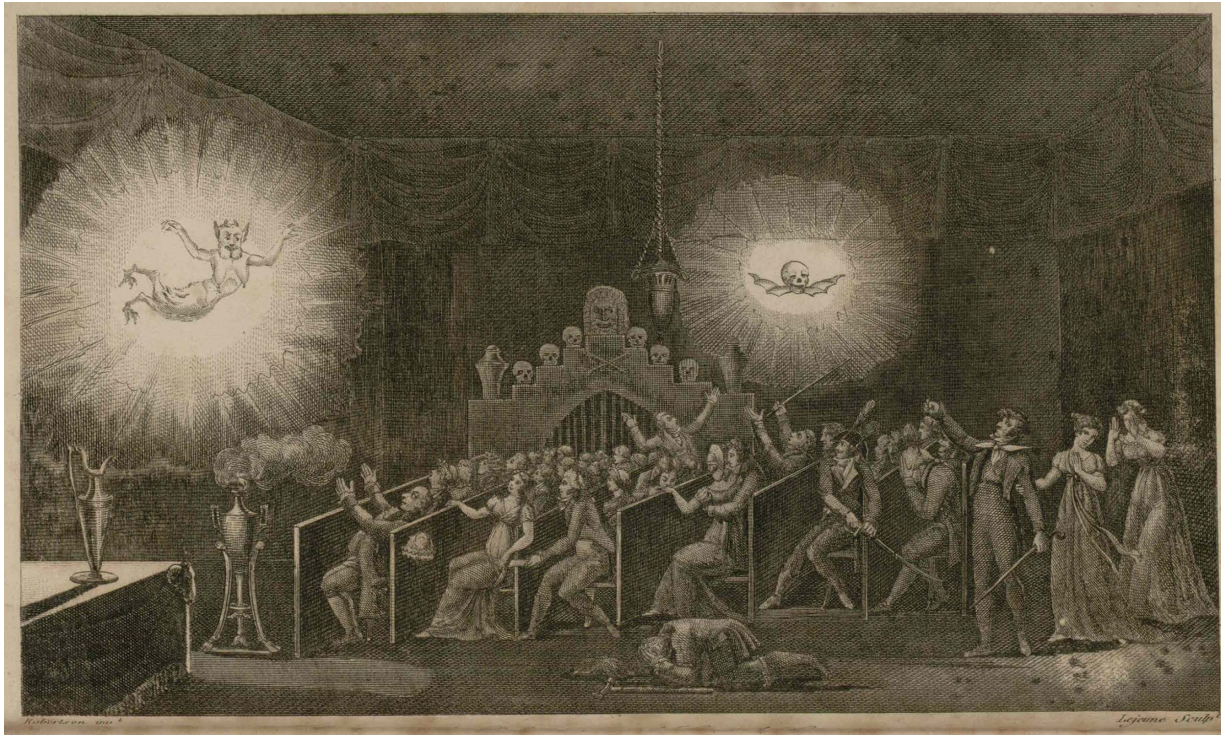
Figure 49: Étienne-Gaspard Robertson. 1831. Phantasmagoria lantern projection, image: Lejeune 1831.

The frontispiece to Étienne-Gaspard Robertson's 1831 biography *Mémoires Récréatifs, Scientifiques et Anecdotiques du Physicien-aéronaute* (Stafford and Terpak 2001, 302) (fig 49), shows how audiences reacted to these illusions by drawing swords, cowering on the floor and responding with 'fright and delight' (Stafford and Terpak 2001, 301). Robertson used his own understanding of science to hoodwink the audience and to prove that ignorance of scientific principles could allow a belief in the supernatural. Robertson manipulated the audience to heighten the involvement and choreography of experience, and of course the audience colluded in this, by suspending their disbelief.
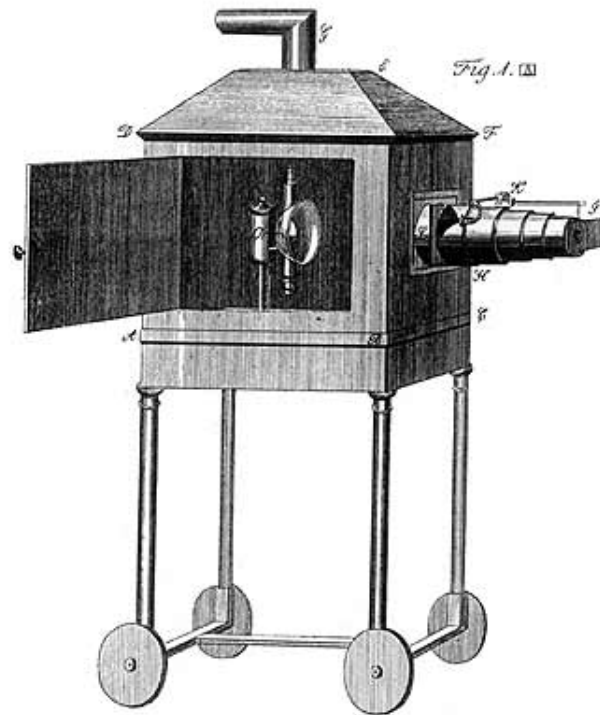
Figure 50: Anon. c. 1800. Fantograph.

In the early years of the nineteenth century, photography was gradually perfected when the camera obscura, was combined with chemical processes (Prodger 2003, 25). This seismic technological leap allowed not only the capture of the real, but spawned important variants. Stereoscopic images were accessible and very popular, enlivening daguerreotypes by harnessing the brain's ability to stitch two slightly different images together to create an impression of depth.
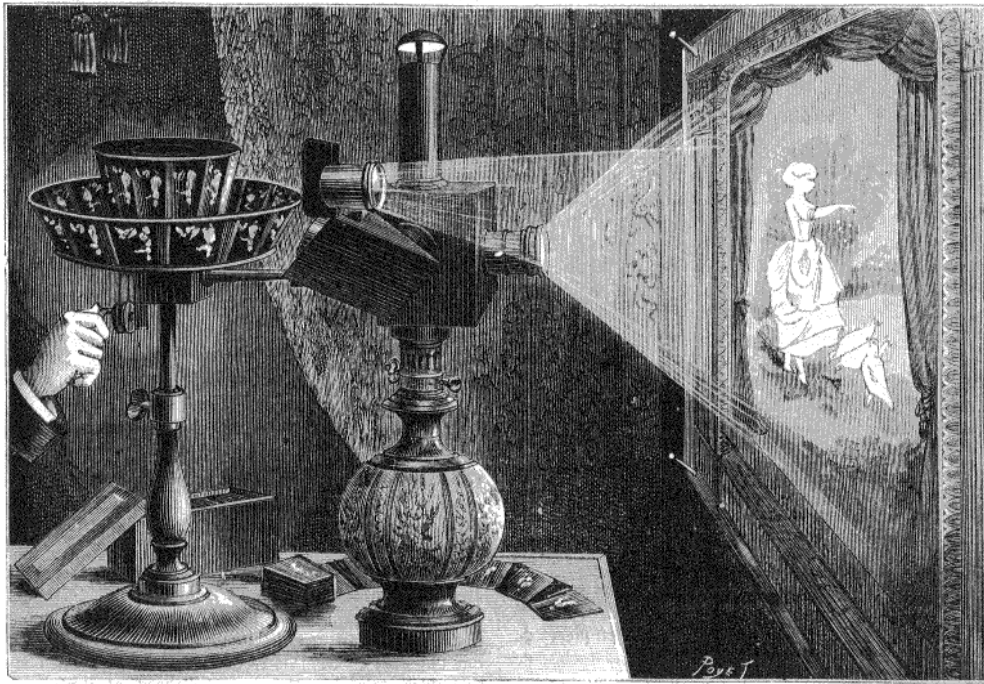
Nouveau praxinoscope à projection de M. Reynaud.

Figure 51: Louis Poyet.1882. Emile Reynaud's projecting praxinoscope.

In the nineteenth century, the development and refinement of optical toys such as the praxinoscope and the zoetrope, like stereoscopy relied on the brain's ability to be tricked. The effect known as persistence of vision allowed strobing printed images to appear as fluid motion. When these principles were united with the pioneering work of photographers such as Etienne-Jules Marey and Eadweard Muybridge, their work on instantaneous photography was at the heart of the development of cinema (Prodger 2003). Indeed 'the quest to record movement' was, in a number of ways, to lead to the development not only of cinematography but also provided the basis for scientific enquiry and the development of many new techniques and technologies (Mannoni et al. 2004, 47). In addition to this the development and commodification of an illusory, moving image spectacle, created opportunities and responses from artists. Specialist in cinema history, Laurent Mannoni considers the inspirational effect of the 'deceptive art' of animated projection and new forms of photographic reproduction (ibid) on significant works by early twentieth century Surrealists and Futurists. Marcel Duchamp's fractured painting, *Nude descending a Staircase (No. 2)*

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(Philadelphia Museum of Art 2016) being a clear example, draws heavily on Etienne-Jules Marey's multiple exposures of movement (fig 52). The technology devised for creating spectacles was to become an impressive, multivalent cultural agency, emerging from the legacy that can be traced back to scientific endeavour as well as playful theatrics, showmanship and trickery.
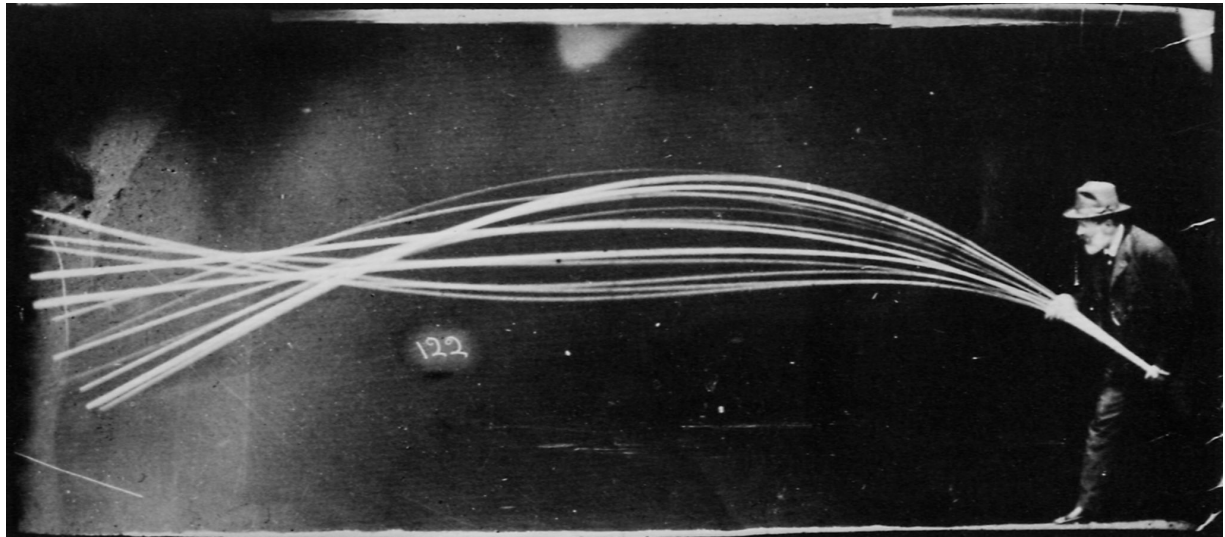
Figure 52: Etienne-Jules Marey. 1884. Chronographic image of movement phases of flexible reed, Image: Etienne-Jules Marey 1884.

When examples from science and art elide to create experience, combined with the hybrid nature of early technologies in which communication relies on wonder, have both informed and resonated with my practice. It is difficult to compete with the strength of experience that these original sideshows and spectacles must have provided; they would have been very new to the spectator. The the modern world is fraught with spectacle delivered by the latest technology, however it is a sense of this original, analogue charm that I hope is wrought from my own experiences and interests.

Panoramas: The Immersive Experience

The Victorian painter John Martin's vast immersive apocalyptic canvases made him famous (fig 53). Drawing great crowds seeking novel absorption in a variety of scenes, Martin's blockbuster paintings were hugely popular. They worked in a similar way to nineteenth century painted panoramas. However,

the panorama was much more about constructing an experience for the visitor than the celebrity of the painter.

Figure 53: John Martin. 1851-53. The Day of His Wrath, image: Creative Commons.

The visits I have made to well-preserved European panoramas revealed to me the reality of what the cultural historian Alison Griffiths calls, a 'peculiarly embodied, and highly immersive form of spectatorship' (Griffiths 2008, 38). Bernard Comment's comprehensive historical survey of the panorama discusses the history, design and installation of these enormous late eighteenth and early twentieth century structures. The title of his first chapter, 'The Pursuit of Maximum Illusion' (Comment 1999, 21), encapsulates the immersive ambition of panoramas, which were extraordinarily popular until the advent of cinema. Comment explains that 'a panorama is a continuous circular representation hung on the walls of a rotunda specifically constructed to accommodate it' (Comment 1999, 7). Realistically painted and often depicting historical scenes, battles and accurate cityscapes, the paintings were lit from a concealed lantern skylight, creating a heightened realism as the natural weather conditions were thrown against the painted surface. If I have ever been subject to *Stendhal's Syndrome* that is say 'an emotional response to art' (Heath et al. 2002, 15), it has been inside an immense 360º painted panorama. An extraordinary feeling of being transported is achieved by a very simple technology.

The Mesdag Panorama (1881) shows a fishing village about a mile away from the site of the panorama (fig 54). It transports the viewer in time as well as space and unlike the cinema or the Kaiser-Panorama (fig 57), visitors can move freely about and talk with others in the space.

Figure 54: Hendrik Willem Mesdag. 1881.The Mesdag Panorama Den Haag.

This sense of space, light and otherworldliness, particularly in the expanding cities of the time, was an escape, an entertainment and attraction that often revealed where citizens actually lived. It offered viewers a quiet, unobstructed vantage point above the urban bustle, 'an enclosed area open to representation free of all worldly restrictions' (Comment 1999, 8). Creating a fabricated version of a space, a kind of stage set, the panorama is a mechanism that conceivably enhances an audience's understanding of the real or received experience of something that no longer exists.
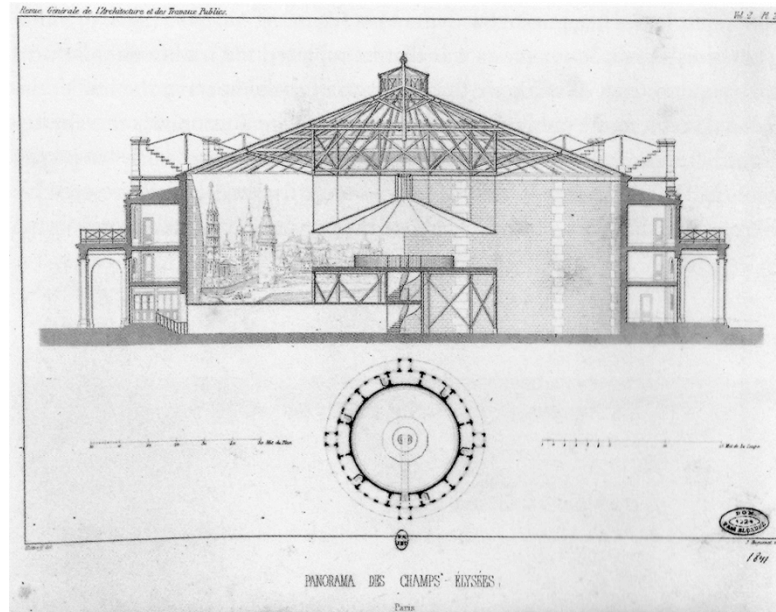
Figure 55: Johann Ignaz Hittorff. 1840. Elevation and cross section of the panorama in the Champs-Elysees.

In their representation of far off lands, and the fixing in time and distance of infamous battle scenes, the panorama allows a visitor to enter the *mise-en-scéne,* to travel elsewhere.

Perhaps what the panorama lacked was an extended narrative. The moving panorama, introduced in the mid nineteenth century, was an attempt to introduce action. It consisted of a long roll of painted canvas, often depicting journeys, rolled slowly in front of a seated audience (fig 56). One example portrayed a trip along the Mississippi, Missouri and Ohio rivers. Designed and built by American John Banvard in the 1840s, it was hugely profitable and drew large audiences: '400,000 customers in nine months, enriching Banvard by $200,00' (Altick 1978, 204). Clearly these successes anticipate mass entertainment and the moving image's power to entertain educate and exact payment for the privilege.
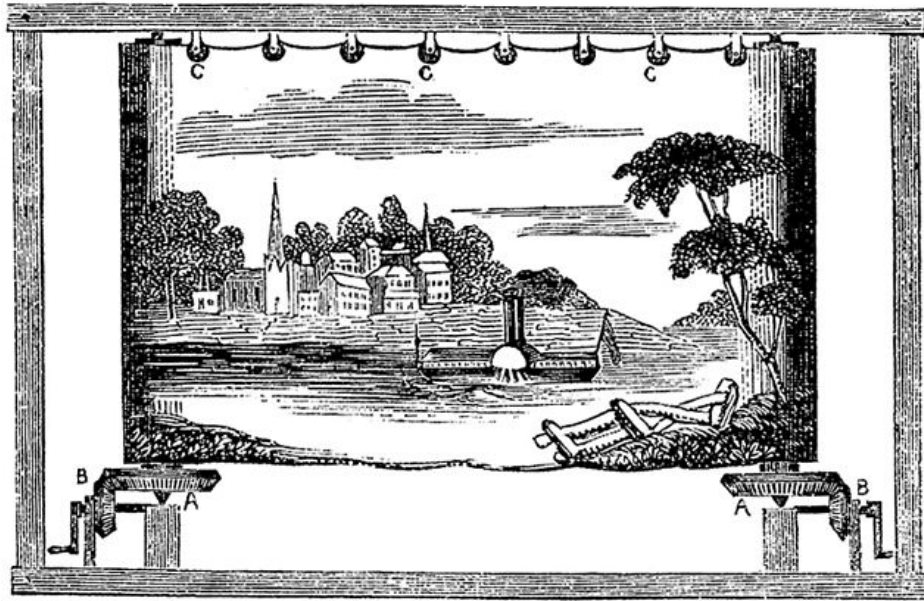
Figure 56: Anon. c.1848. Illustration of Moving panorama designed by John Banvard, Scientific American, Vol. 4, 1848.

The use of the technically impressive, the harnessing of scientific process and equipment in museums and visitor attractions as portals to a revealed world or experience has given rise to discussion of the synergies between spectacle and the didactic agenda of the museum. Alison Griffiths comments on this: 'Discursive oppositions between science and spectacle information and entertainment immersion and distance, and passive and interactive spectators […] have repeatedly resurfaced in contemporary debates over multimedia exhibits in public museums' (Griffiths 2008, 6). It is this debate that is rendered material in my own work, dealing as it does with many of these competing themes and which reflects on how contemporary technologies may engage audiences through anachronistic compositions.

Writing about the effect that panorama, dioramas and other spectacles had on the public consciousness of mid-Victorian Britain, the historian Thomas Richards, in his seminal exploration *The Commodity Culture of Victorian England* contends that there was 'universal public craving for monster displays of special effects' (Richards 1990, 57), that 'elevated technology into form of culture' (ibid). Richards discusses the Victorians' interest in the spectacular, arguing that in 'the technology of representation, the means for producing the world became the means of representation' (ibid). He argues

that the commodification of technology climaxed in displays of machines and their products in the Great Exhibition of 1851, which 'established a new boundary for representation' (Richards 1990, 58). This conferring of cultural value on the mechanical and industrial through the means of the exhibition, acknowledges the value of public consumption and resonates with *The Enlightened Eye* and my choice of technological iconography.

The Kaiser-Panorama: The Structuring of Experience

Some years ago I came across a Kaiser-Panorama in the Museum of German History in Berlin. This machine captivated me, with its peepshow viewing system and the drama and scale of its faceted, castle-like exterior. It held my attention for quite some time, I was transported; it reminded me of the plastic View-Master toys of childhood, with their bright views of other places. Additionally, there was a sense of being transported in time too, back to the heyday of the machine.

Popular in Europe, and originating from Germany in the late nineteenth and early twentieth century, the coin-operated Kaiser-Panorama was a large wooden structure that allowed seated visitors to view a cycle of stereoscopic photographs. Images of landscapes, military scenes and even contemporary news items were moved mechanically and sequentially.
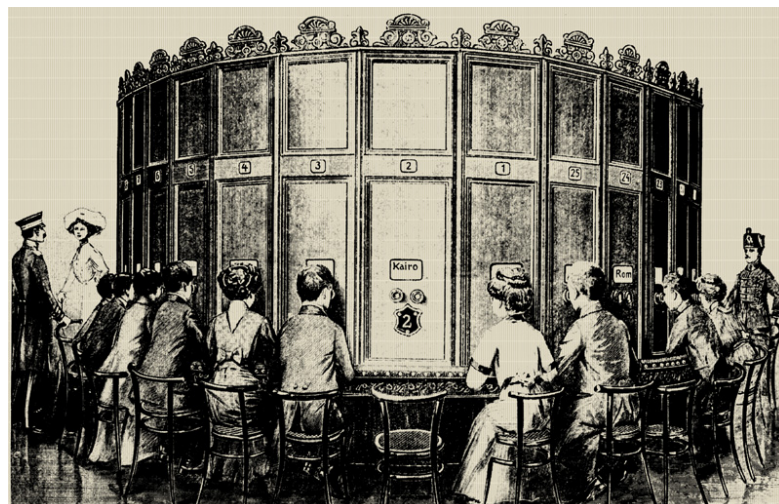
Figure 57: Anon.1880. The Kaiser-Panorama with 25 viewing stations: Print Landesbildstelle, Berlin, 1880.

Despite its name however, the Kaiser-Panorama was unlike the established 360º panorama where immersive experience could be shared. Here the design, which featured separate viewing stations, depended on an individual encounter with content. This begins to seem much more like a contemporary web page or television documentary. The inventor August Fuhrmann, in his foreword to *The Golden Book of the Central Institute for Kaiser-Panorama* (1900) was positively evangelical about the spread of educational value that his empire of machines could provide:

> My mission in life, the goal that I have set myself, is to record stereoscopically things of value on this Earth and to show them in an orderly way to school children and the majority of the population at the lowest possible admission price, with free admission for all children of impecunious parents and orphans. My idea was further to make available to inhabitants of other cities and countries images of Berlin through beneficial performances of the Berlin Kaiser-Panorama. Therefore with the opening of outlets in more than 250 cities it is natural that my Central Institute should continue to grow due to the success of the Kaiser Panorama in the education of the population. (Fuhrmann in Gaa and Krueger 1984)

The Kaiser-Panorama was an experience that combined an educational agenda with the latest developments in photography and was very popular, attracting queues for a chance to take a '15 minute, 50 picture "trip"' (Witkowski 2015).

Just as the popularity of the Kaiser-Panorama was waning, Walter Benjamin's memoir of a Berlin childhood describes evocatively his time spent repeatedly visiting a Kaiser-Panorama or, as he calls it, the 'Imperial Panorama'. Contrasting the experience with that of the cinema, a medium then gathering momentum, and one of the causes of the Kaiser-Panorama's decline, Benjamin finds himself absorbed in the brightly lit travel scenes. His absorption is intense, as revealed by this passage:

> There was no music in the Imperial Panorama-in contrast to films, where music makes travelling so soporific. But there was a small, genuinely disturbing effect that seem to me superior. This was the ringing of a little bell sounded a few seconds before each picture moved off with a jolt, in order to make way for an empty space and then for the next image. And every time it rang, the mountains with their humble foothills, the cities within mirror-bright windows, the railroad stations with the clouds of dirty yellow smoke, the vineyards

down to the smallest leaf, were suffused with the ache of departure.
(Benjamin 2006, 43)

A machine providing vivid reproductions, one that itself was reproducible and delivered a simulated travel experience to many, was clearly appealing to Benjamin, and contributed to nascent deliberations within perhaps his most famous essay, *'The Work of Art in the Age of Mechanical Reproduction'* (Benjamin 1999). In this essay, Benjamin returns to the Kaiser-Panorama, here considering the resonances between the cinema, the painting salon and the Kaiser-Panorama, concluding that the shared experience of the cinema rests intriguingly between an individual experience of viewing a painting and the shared but individual experience of the Kaiser-Panorama. This interactive semi-immersive structure, although conceptually resonant with my work, is, as I suggested earlier, more to do with a recontextualising of experience that casts the contemporary visitor as *fin de siecle* patron, excited and engaged by the latest thing.

Jonathan Crary, Professor of Modern Art and Theory at Columbia University, describes this mechanised conveyer of information as a device that provided 'a structuring of experience common to many pre-cinematic devices in the 1880s' and as 'one of the many places in which an *automation* of perception occurs, in which synthesis is mandatory' (Crary 1999, 138). By synthesis, Crary means that individual perceptual attention must be regulated to accommodate the synchronised flow of artificial images, thus holding attention in the viewer, something that Benjamin describes (Benjamin 2006), this feels very familiar to today's swiping smartphone users.

The Microscope: Science and Spectacle

For many people, their first experience of the microscope is at home. When I was a child I had a small microscope. I remember that onion skin and fly wings were hard to wrangle into position, I had to fiddle with the reflecting mirror to catch the light but when the image finally came into focus a remarkable hidden vista was revealed.

To consider the microscope, that most quintessential of scientific instruments it is worth contemplating its purpose and origins. The history of scientific

taxonomy is described as beginning with Aristotle (Slaughter 1982, 15). The classification of natural history includes written descriptions and drawings of natural specimens. The production of taxonomic images and records of natural specimens arose in part from the demand for accurate representations of medicinal herbs. However Albrecht Dürer's watercolour, *Large Plot of Grass* (1513), depicts a closely observed portrait of a group of meadow-grasses and flowers (fig 58). Indeed, Gary Rosenberg pronounces that 'they are rendered so carefully that they are taxonomically identifiable' and that 'the drawing qualifies as an early scientific study of sod, arguably, the first in history' (Rosenberg 2009, 26). It is interesting to consider how, by choosing to engage closely with this disregarded portion of the natural environment, Dürer alerts the viewer to its complexity and detail.

Figure 58: Albrecht Dürer. 1513. Large plot of Grass.

Artists like Dürer are significant to this study because of their attention to small-scale subjects in their natural setting and were forerunners of the practice of scientific drawing. It was not until the improvement of the microscope by Antonie van Leeuwenhoek (1632-1723) that even more intimate structural examination of objects became possible. It is worth noting

that Leeuwenhoek was a contemporary of the painter Johannes Vermeer (1632-1675) and is the 'prime candidate for the role of Vermeer's optical consultant' (Steadman 2001, 44). Vermeer is now acknowledged as using a camera obscura to create his paintings. The architect and Vermeer specialist Phillip Steadman argues that 'the camera allowed the artist into a newly revealed world of optical phenomena and to explore how these might be recorded in paint' (Steadman 2001, 1). The dynamic format of the camera obscura is of importance to this study as the compositional structure of the camera obscura forms a major component of *The Enlightened Eye*.
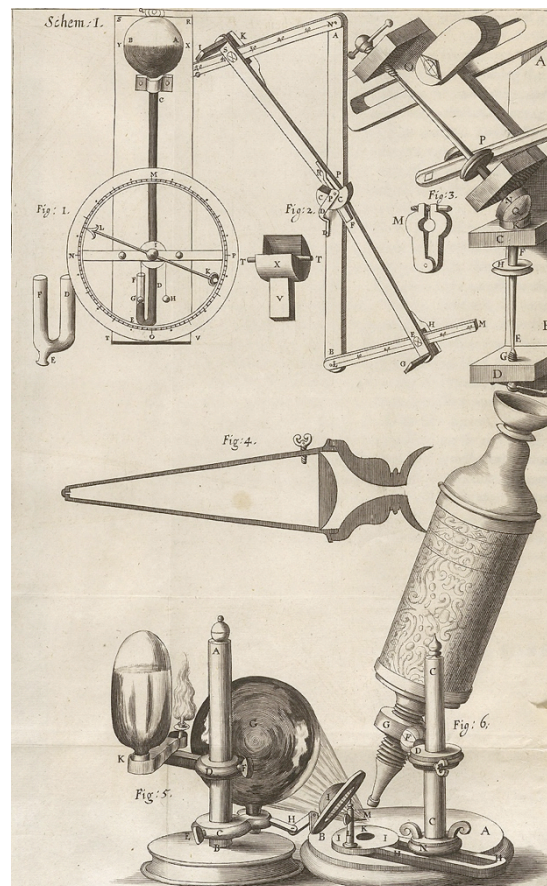
Figure 59: Robert Hooke.1665. Microscope diagram, image: R. Hooke 1665.

Leeuwenhoek's work with the microscope included the first recorded illustrated observations of plant cells and microorganisms and was to heavily inform and influence the work of a fellow member of London's Royal Society, Robert Hooke (1635-1703). Hooke's masterwork the 1665 illustrated book

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Micrographia or, Some Physiological Descriptions of Minute Bodies Made by Magnifying Glasses (Hooke. 2008), was created by using a microscope of his own design (fig 60). *Micrographia* showed highly detailed drawings of, amongst other things, a flea, bird feathers and plant structures. Professor of Ceramic Art and Design at Central St Martins College of Art and Design, Rob Kesseler, is an artist known for his work on images produced by scanning electron microscopes. In his book *Up Close* Kessler cites Hooke as having: 'Transformed the commonplace in raising philosophical and aesthetic questions on the nature of representation and our relationship with the world beyond our normal vision' (Kesseler 2010, 123). Conducting public demonstration of science for the Royal Society, Hooke, 'keenly understood the impact of powerful visual representation' (Terpak 2002, 205), so that the effect on the public of these astounding images in *Micrographia* was immeasurably influential, making the microscope a ubiquitous device for both the amateur and professional hoping to explore the exotic, previously hidden world of the microscopic. This world was populated with curious monsters in unfamiliar micro-landscapes. In his introduction to *Curiosity and Wonder from the Renaissance to the Enlightenment*, Alexander Marr, quoting in part from Hooke in *Micrographia*, makes an important point about the comparison that is made between the micro and macro: 'We find the marvelling engendered by the 'new visible world discovered to the understanding' by the microscope was at least in part, excited by the remembrance of regularly observing 'little objects […] a Flea, a Mite a Gnat' without the aid of instruments' (Evans et al. 2006, 5).

Figure 60: (R) Robert Hooke.1665. Of Blue Mould from Micrographia image: R. Hooke 1665. (Hooke. 2008, 124). (L) Jason Cleverly.2016. Dandelion head, Image: J. Cleverly 2016.

Enlarged images are exotic; by the comparisons that are made with the visible world they can resonate with similar objects on different scales (fig 60). This observation is of importance to this study and to my work: the transformation and manipulation of objects through technologies allow audiences to play with and be creative with morphology, with scale and representation as is demonstrated by the actions of visitors seen in Chapter 6.

The appetite for looking at this new realm of the microscopic is evident in the use of the solar microscope. Developed in 1736, the solar microscope (fig 61) directed the sun's rays through the material samples to be observed. This innovation could be adapted to project images on a screen. Frances Terpak, Curator and Head of the Department of Photographs and Optical Devices at the Getty Research Institute explains: 'The darkened space features comfortable upholstered chairs, a solar microscope installed in the window shutter, an unadorned wall on which project the specimen's image, and even a portable paper screen in which an artist could trace the projected image' (Terpak 2002, 215).
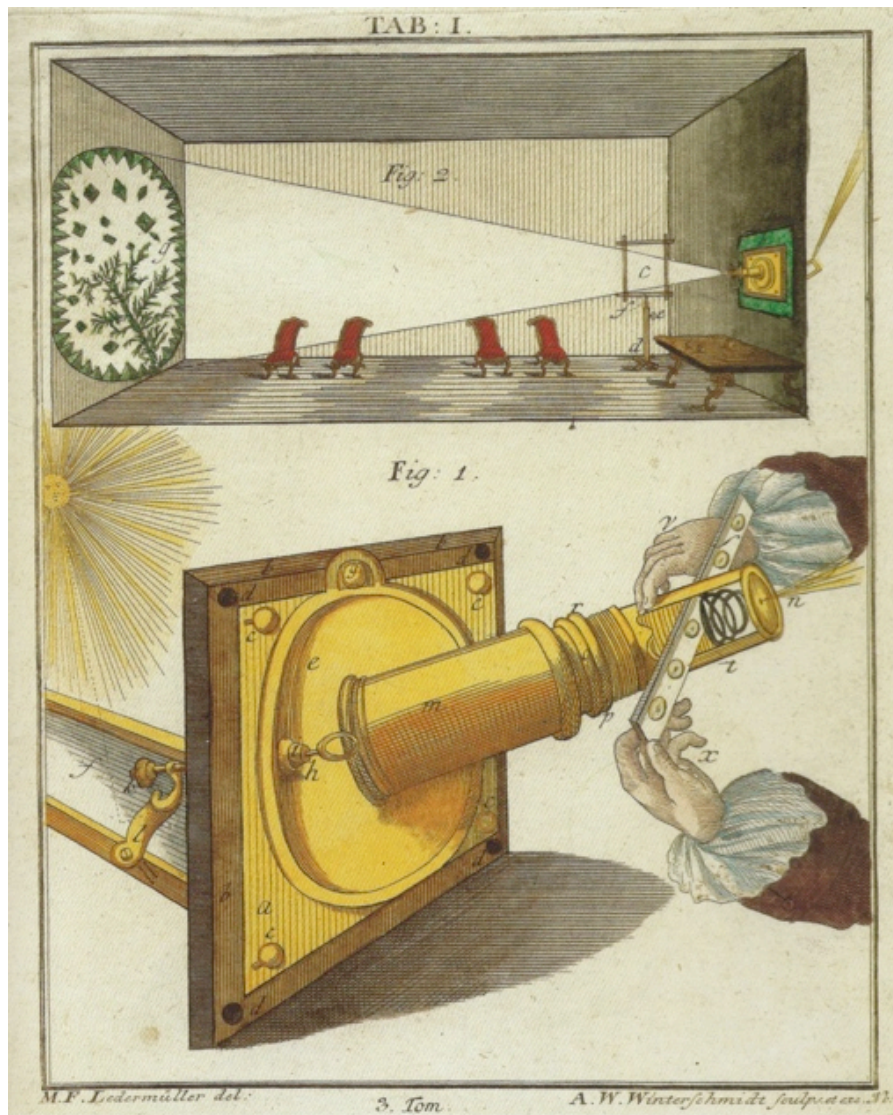
Thus, scientific advancements propelled and funded by public demand become artful entertainment.

The solar microscope however, was ineffective at night or on a dull day. Consequently, by the 1820's the self-illuminated 'oxyhydrodgen' microscope was developed. Its production was fuelled by a public appetite for more sophisticated diversions of the imagination. According to Richard Altick, the power of the new microscope created competition in the development of screen size; six-foot screens were superseded by fourteen-footers. Rival advertisements claimed that 'the sting of the bee was a monstrous barbed

weapon, four feet long' and 'an operation at 106 New Bond Street claimed that its instrument could make a flea look as "large as the late elephant Chunie"' (Altick 1978, 370). The experience of attending a display of projected microscopic images that *moved* in diverting theatrical conditions begins to read like those of a modern cinema. Regarded alongside the histories of similar technologies of the camera obscura, they contribute to the history of cinema development and its growing popularity and again, as with displays of phantasmagoria, we see science in the service of entertainment.

Alongside these diversions appeared the so-called museum microscope (fig 62). Handsomely made of brass, ivory and glass, these devices had pre-set sample holders and 'displayed in an upper class drawing room, it would tastefully symbolise the educated and cultured character of its owners' (Terpak 2002, 210). To own a device of such intrinsic sophistication represented a commodification of science and technology. For me however, the visual qualities of this device are important its functional design and dynamic composition is both sophisticated and unpretentious; it is also a cabinet of curiosity in miniature, like *The Enlightened Eye* it has specimens embedded in its frame.

Figure 62: Thomas Winter. 1794. Museum Microscope. brass ivory glass London Science Museum Collection, image: © Science Museum / Science & Society Picture Library.

Despite the evident curiosity and natural strangeness of this revealed microscopic world, many respectable figures, such as Louis Joblot (1645-1723), a neglected figure in the history of microscopy, reported 'the sensational discovery of tiny animals with exotic human features' (Stafford 1994, 144). The power of the microscope to reveal visions of the bizarre began to be effectively exploited by show business for mass entertainment. A number of figures such as Louis Joblot, confecting fantastic claims, helped inspire a popular interest in science. Indeed, Barbara Maria Stafford sees this as a major Influence on 'the cult of public science' in the eighteenth century. She describes how the undermining of science by the sensational was regarded as an opportunity to reflect and improve on the empirical quality of the knowledge produced (Stafford 1994, 140).

The multi-faceted nature of the microscope is one that still holds a fascination for an audience and is an ideal platform to build an interactive

piece around. As part of my fieldwork I conducted basic qualitative evaluations of microscope based interactives sited in museums and visitor centres. While these often have an initial appeal, visitors can soon lose interest, as certain limitations are perceived. For example, they are often poorly configured and not clearly labelled, so that images and samples are difficult to manipulate. This is often because they are off-the-shelf solutions designed for specialist use rather than uninvigilated in the museum. There are, however, many well designed examples. For example, in the Heartlands Centre (Pool, Cornwall), a robust microscope utilises raking directional light to highlight the crystalline structures in a granite sample, affording the visitor a feeling of real, effective control over the mineral sample (fig 63). When my companions and I used this interactive we were engaged for some time despite, or perhaps because of, its relative simplicity.

Figure 63: Jason Cleverly. 2012. Emile using microscope to view granite slice at Heartlands visitor centre Cornwall: Image J. Cleverly 2012.

Implications: Spectacles

Panoramas are able to transport and reframe experience, communicating wonder through scale, artifice and the science of perspective. The immersive panorama and the kinetic machine-human interface of the Kaiser-Panoroama have a particular influence on my work. For example, *Keepsake and Viewer* had some of the immersive qualities of the Kaiser-Panorama, as visitors were invited to peer into a representation of a different space. *Ghost Ship* was an attempt at immersive experience allowing multiple users to entangle themselves in its structure and required a suspension of disbelief in the user, thus allowing them to be transported to a different era and place. This piece was very much influenced by the panorama.

The microscope holds a dual role in art and science because it is able to both transport viewers to and allow them exploration of unseen new worlds. The compositional, physical structure of the magic lantern and the camera obscura, combined with the transformational power of the microscope, are explored through the main case study of *The Enlightened Eye.*

From antiquity, audiences have been impressed by artfully configured technologies. Those who control and advance the technology can also become showmen and fakirs. As technology progresses, public understanding of the nature and the workings of commonplace devices becomes slighter. Most people have no clue of the science that supports their mobile phones, computers and televisions. The philosopher Bruno Latour calls this effect 'black-boxed' (Latour 2005, 202), a phrase that nicely frames the impenetrable nature of technology. Robertson's illusory phantasmagoria also relied on a kind of black boxing, not just because it was new technology but also because to explain and reveal would have collapsed the deception. I have constructed works informed by the compositional qualities of early optical technologies but they also disguise black box equipment. Contemporary devices may produce wonders, but they are often visually anodyne and oblique in their visual dynamics. I feel that some of my projects, including *The Enlightened Eye,* attempt to investigate

the parameters of form and function through new kinds of compositional affordances.

The Enlightened Eye project harnesses older visual dynamics so that the audience may feel more engaged in its use and are inspired to be creative, rather than be recipients of creativity. Drawing on both arcane and contemporary technologies, *The Enlightened Eye* is a work destined for a museum situation. And like previous work it is the latest iteration of projects that always seek interaction. The concept is aligned with that of the *Universal Curator*, the *Narrative Engine* and the *Perceptive Engine* and a refinement of the *Lineamentum.* These works deployed technologies, allowing for creative transformations of real objects into representations by museum visitors. The creative transformation process owes something to Debord's concept of the societal mediation of images (Debord 1987). Debord contends that consumption and ownership of images, as with the showmanship of Étienne-Gaspard Robertson's relies on the collusion of an audience. Therefore, the construction of interactive machines that allow an audience mediation of images within the context of the museum, seems wholly appropriate and plays into the multiple agendas of the artist-designer, the visitor and the museum curator. There is a danger that this process trivialises the authenticity of the museum collection, yet it allies appropriately to the concept of informal learning discussed in the visitor studies of chapter 3.

Museums and Museum History

The museum is a very important arena for my practice and here I discuss the emergence of the museum. Museum history establishes that early museums were seeking order from chaos and were seeking to display, reveal and confer importance in the presentation of objects. From that beginning, each epoch of museum makers have striven to create order - forgetting sometimes the power and wonder that objects can have for the visitor - by successively overturning preceding concepts of curation in an inexorable drive for didactic communication.

The Wunderkammer

In early private museums, curious objects of all kinds were exhibited at the expense of empirical fact. These early museums were divided into five parts as follows: exotica, objects from distant lands; artifcialia: artworks; naturalia: rare natural phenomena; scientifca: scientifc instruments, and mirabilia: inexplicable artifacts (Where Magazin Oktober 2014, 46). These romantic pseudo-scientific categories gave way to more complex and accurate systems of taxonomy and the museum eventually emerged as a public resource to become an embodiment of establishment order. The contemporary post-modern museum has attempted to restore the wonder that the early museums must have evoked, through new interpretative agendas that support more a more open and imaginative, visitor sensitive approach.

According to Richard Altick in his extensive survey of exhibitions and spectacles *The Shows of London*, amongst the earliest forms of museum were medieval collections of holy relics and natural curiosities, collections of 'souvenirs brought back from distant lands by pilgrims and crusaders' (Altick 1978, 6). Subsequently, private museums known as 'cabinets of curiosity' or *Wunderkammer* emerged. The first of these ever recorded, erected in Naples in 1599 is the museum of Ferrante Imperato (fig 64). The collector and author Patrick Mauriès describes how in Ferrantes' museum 'books, botanical and zoological specimens in jars are crowded together in carefully arranged profusion' (Mauriès 2002, 10).

Figure 64: Niccolò Antonio Stelliola.1599. Museo Ferrante Imperato.

Mauriès, in his richly illustrated account *Cabinets of Curiosities,* describes these early museums as 'resembling a monument in miniature' (Mauriès 2002, 35), discusses the way in which how their entire interior structures were 'pressed into service in the pursuit of the single all-embracing scheme of interpretation and aesthetics' (ibid).

Objects in early cabinets of curiosity privileged close engagement, offering a sensory window on a previously unimagined wider world. Artist and curator Janis Jefferies and computing specialist Robert Zimmer both of Goldsmiths University in discussing the wunderkammer say: 'Objects were meant to be handled, smelled, even tasted, as well as seen' (Zimmer and Jefferies 2007, 4). This contrasts with the modern museum's temperature-controlled hermetic preservation that separates visitor from object.

Proto-scientific taxonomical arrangements often treated the objects, shells and mineral samples as components to be positioned for visually pleasing effect. In discussing later eighteenth century taxonomical shell illustrations, E.C. Spary, Reader of Modern European History, Corpus Christi College

Cambridge, tells us 'by placing shells in patterns: that, in fact, they were "intending" to entertain and not to instruct' (Spary 2004, 1). This impulse to compose and configure collections of artifcialia and naturalia, to see patterns and affinities, is an aspect of this study that resonates with *The Enlightened Eye* in both its function and design. For example, collections were often housed in complex pieces of furniture, their symmetrical detailed construction contained in many drawers. These cabinets were themselves inlaid with intricate veneers, ivory and mother of pearl. An excellent example of this type is the 1652 cabinet made for the diarist and botanist John Evelyn, now in the Geffrye Museum London (Geffrye 2016) (fig 65). A fascination with structures like these has fed into my own work with museum objects. The design of cabinets of curiosities emphasised and elevated the preciousness of their contents, combining aesthetic considerations with the function of protection and organisation, resulting in a physical structure that articulated functionality through the creative expression of its designers.

Figure 65: Unknown.1652. Cabinet on Stand, Image: © Geffrye Museum, London 2016

The museum in Britain continued to evolve, and figures like John Evelyn in the seventeenth century continued to source and collect anatomical

specimens, ancient artefacts and books. These objects were for private use, although the concept of sharing this knowledge more widely was taking shape. Richard Altick describes the situation: 'Conditions now were favourable for the planting of the museum idea. The increase of wealth and leisure amongst the educated encouraged them to take up collecting as a worthy avocation' (Altick 1978, 10).

The first recorded public museum in England was Tradescant's Ark, founded in 1629, (Ashmolean Museum 2016), this museum in Lambeth, south London, was the first open to all for a small entrance fee (ibid). Tradescant's Ark was full of curiosities: exotic birds including a dodo, reptiles, shells as well as man-made objects; a piece of the true cross, a peepshow box, weapons and clothing from foreign lands. After several decades Elias Ashmole secured the collection under dubious circumstances. This was to become the core of the first purpose built museum and in 1683 the Ashmolean Museum in Oxford opened to the public. Matilda Pye, researcher and education programme manager at the Victoria and Albert Museum, London, discusses the fascination of the *Wunderkammer* for the artist: 'The attraction to the *Wunderkammer* and cabinets of curiosity for artists resides perhaps in the stark contrast between pre- and post-enlightenment strategies for collecting and collating material. 'The cabinet of curiosity appeals to artist's magpie-like consumption of objects, ideas and things' (Pye 2013, 146).

In evocative contemporary images such as those seen in Ferrante Imperato's museum, the visual qualities of the early museum appeal to me not only for their cultural significance but also for the arcane variety of objects visible within the organised chaos, that exert an aesthetic charm and mystery.

The Development of the Modern Museum

In 1793 in revolutionary France, the private museum collection of the King, *The Cabinet du Roi* was declared the property of the French nation (Young Lee 1997), effectively transferring cultural capital to the masses. In the United Kingdon, the British Museum, founded a little earlier in 1753 and the

Natural History Museum founded in 1881, were philanthropic, educational resources, as were the Victoria and Albert Museum (founded in 1852), displaying applied art, the Pitt Rivers Museum Oxford, covering anthropology (founded in 1884), and the National Gallery (founded 1824), focusing on fine art.

Henry Cole, one of the founders of the Victoria and Albert Museum and a proponent of the museum as place for public rather than privileged learning, proclaimed that 'unless museums and galleries are made subservient to the purpose of education, they dwindle into very sleepy affairs' (MacDonald 1970,177). Thus, the museum becomes a tool for the advancement of a nation. The museum as a space for both learning and spectacle had developed through a dynamic history of conflicting agendas. Private collections became public collections, organisations that required visitors to respond to a powerful imperial curatorial narrative.

Thomas Richards discusses the appetite for the Great Exhibition of 1851 (Richards 1990), a colossal event that exemplified a shared inclination for national self-examination. Through museum-like displays of engineering, trade, science and colonialism, the Great Exhibition was not only to influence the curatorial agenda in London's major museums, it also provided artefacts for its collections, and traditions of curating education and experience that continue widely today.

The museum expert and cultural historian Tony Bennett describes the scorn directed at the calcified methods evident in the provincial museum of the nineteenth century: 'For the process of fashioning a new space of representation for the modern public museum was, at the same time, one of constructing and defending that space of representation as a rational and scientific one, fully capable of bearing the didactic burden placed upon it, by differentiating it from the disorder that was imputed to competing exhibitionary institutions' (Bennett 1995, 1).

Bennett is also interested in the idea of the nineteenth century museum as a construct of social control, comparing it to the concept of a panopticon, an architectural idea for a prison in which the inmates are constantly under

surveillance, and even children might come to observe the prisoners' punishment as a deterrent. This is an idea formulated in the late eighteenth century by the philosopher Jeremy Bentham, and taken up by Michel Foucault in the 1970's in his analysis of the penal system *Discipline and Punish; The Birth of The Prison* (Foucault and Sheridan 1979.). Bennett applies the idea of a panoptican to the museum so that:

> The institutions comprising the 'exhibitionary complex', by contrast where involved in the transfer of objects and bodies from the enclosed and private domains in which they had previously been displayed (but to a restricted public) into progressively more open in public arenas where, through the representations to which they were subjected, they formed vehicles for inscribing and broadcasting the messages of power (but of a different type) throughout society. (Bennett 1995, 60-61)

Figure 66: Anon.1845, Easter Monday crowd in the great Zoological Gallery, The British Museum, Image: The illustrated London News page 201, March 1845.

The cultural capital generated by investment in the museum became a social project. One that did indeed have a resemblance to other emerging structured institutions like schools, factories, and prisons. The museum was

a place for order and scholarly attention, a kind of medicine to remedy ignorance.

But the museum was also an exciting place. For example, natural history museums featured soaring displays of dinosaur bones, whilst zebras and lions patrolled vast dioramas. Art galleries not only resembled imposing classical buildings but were also laden with the treasures of the past that informed their design. Museums of science and industry throbbed with beam-engines and airships. The modern idea of a museum and the municipal art gallery could be seen not only as manifestations of the power relations between the establishment and the public, but also a cultural motif; the museum became a dramaturgical stage for films and books.

Figure 67: Howard Hawks.1938. Bringing up Baby 1938, image: ©2016 British Film Institute.

The museum in the popular imagination was constructed by fictionalisations. Howard Hawks' 1938 film *Bringing up Baby* (British Film Institute 2016)

followed Cary Grant as a scholarly zoologist struggling with comedic distractions against gallery scenes of reconstructed dinosaur skeletons. In an early Tintin comic strip adventure, *The Broken Ear* (Hergé 1937), the plot revolves around the theft of a South American wooden fetish from an ethnographic museum. The author and illustrator Hergé drew on real objects and features of the Royal Museums of Art and History in Brussels (Farr 2001, 67). Hergé builds the archetypal museum noire *mise-en-scène*: here the museum is established as an accessible but also quite catalytic, mysterious place, a colonial space where unusual things are, and unusual things could happen.
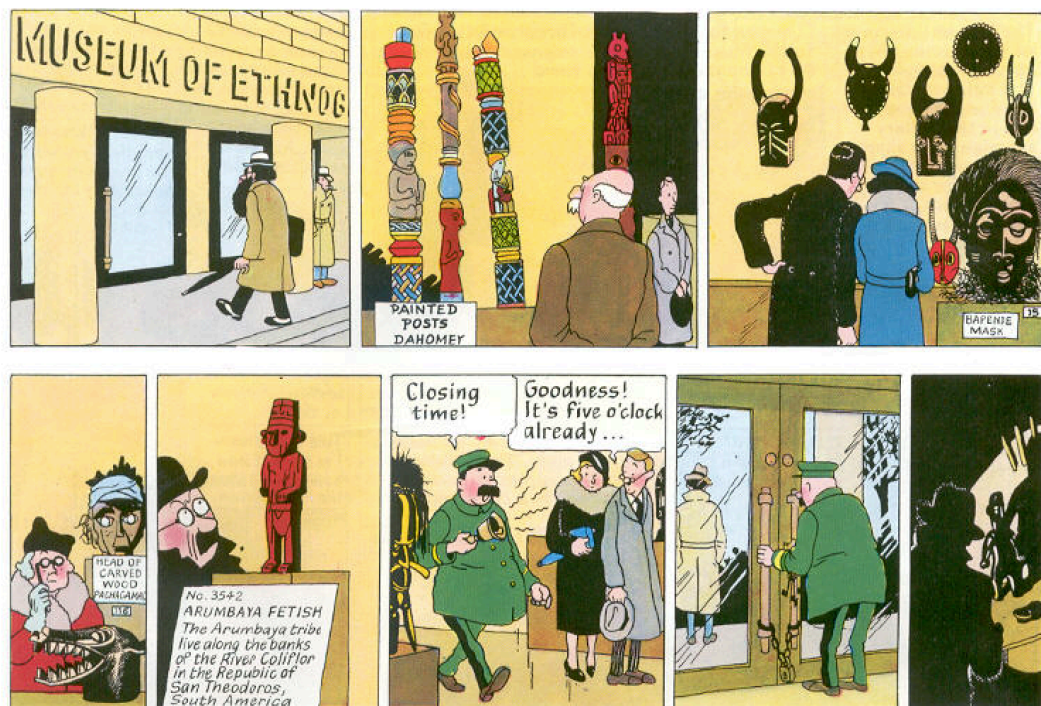
Figure 68: Hergé.1937. Panels from The Broken Ear.

Penelope Fitzgerald's 1977 novel *The Golden Child* (Fitzgerald 2004) is set in a fictional major London museum during the opening of a blockbuster exhibition, a response to her disappointing visits to the British Museum's Tutankhamen exhibition of 1972 (Lee 2013, 240). Fitzgerald satirizes the endless heroic and anticipatory queuing of the vast crowds. I was taken to the same Tutankhamen show myself as a child, and only really remember

the impatient museum guards chivvying my family through, barely allowing us an ephemeral glimpse of the golden mask of the boy king.

The original motivation for the construction of the modern museum was to preserve knowledge and to educate to be accessible and authoritative about its contents. However, a tension emerges as the museum becomes an iconic backdrop for entertainment and a space for experimentation and is challenged to allow for multiple viewpoints.

Modernist Museums, the Avant-garde and the Roots of the Post-Museum

As I have shown, the museum as a concept was flexible in fact and fiction. Its representation as a universal place for learning, and the notion that 'the modernist museum purported to offer the public direct experiences of material culture' (McTavish 2003, 97) held sway with the liberal elite. However French sociologist Pierre Bourdieu's visitor surveys of European art galleries conducted in the 1960's, led him to conclude: 'The museum presents to all, as a public heritage, the monuments of a past splendour, instruments for the extravagant glorification of the great people of previous times: false generosity, since free entry is also optional entry, reserved for those who, equipped with the ability to appropriate the works of art, have the privilege of making use of this freedom' (Bourdieu 1990, 113).

If the museum had failed to live up to its ideals of educating the masses by presenting interminable and daunting displays of ordered specimens, there were those that began to be curatorially creative with their content and design. Michelle Henning, Associate Professor in Photography & Cultural History at the University of West London says of this shift: 'Museums did epitomize, for the avant-garde, both the over accumulation and imperialist universalism of the Victorian era, and the institutional "death" of art' (Henning 2007, 34)., Henning continues her theme, discussing exotic avant-garde concepts formulated to challenge the Victorian panoptican. She considers André Malraux's 1947 *Musee Imaginaire* (fig 69) and Moholy Nagy's 1925

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Domestic Pinacoteca, a private museum, to be flexible museums without walls. New print technologies were deployed to bring the museum under the control of the ordinary citizen; the museum could 'extend beyond the walls of the public institution and broadcast itself into the domestic space' (Henning 2007, 35). To access content in this way allowed for new kind of a *Wunderkammer*, universal, distributed and personalised.

Figure 69: André Malraux. 1947. André Malraux in the process of selecting images for the book Le musée imaginaire de la sculpture mondiale, image: Maurice Jarnoux 1952.

In proposing the early origins of the modern virtual museum as having its roots in the early twentieth century, media archaeologist Erikki Huhtamo discusses the way in which the challenge of the exciting new media of film and sound recording set the Avant-garde agenda. He says that a 'rethinking of the relationship between exhibition spaces, exhibits and spectators/visitors was needed' (Huhtamo 2009, 123). *The Cabinet of Abstraction,* designed and built by the Russian supremacist El Lissitzki, was developed for the Landesmuseum in Hannover between 1927 and 1928 (fig 70). This new kind of gallery space afforded the opportunity to slide and rotate displayed paintings, thereby continuously changing its interior configuration. Three-

dimensional surface styling of the interior was devised, changing the appearance of the wall as visitors moved about the space (Henning 2007, 30). Lissitzky's design demanded direct physical engagement, overcoming the normal passivity that a conventional exhibition shaped in the visitor (Huhtamo 2009, 125). This was an art gallery that was itself an artwork, an experiment in engaging the audience; the work was as much about how its design promoted action as it was to do with interpretation of its content.
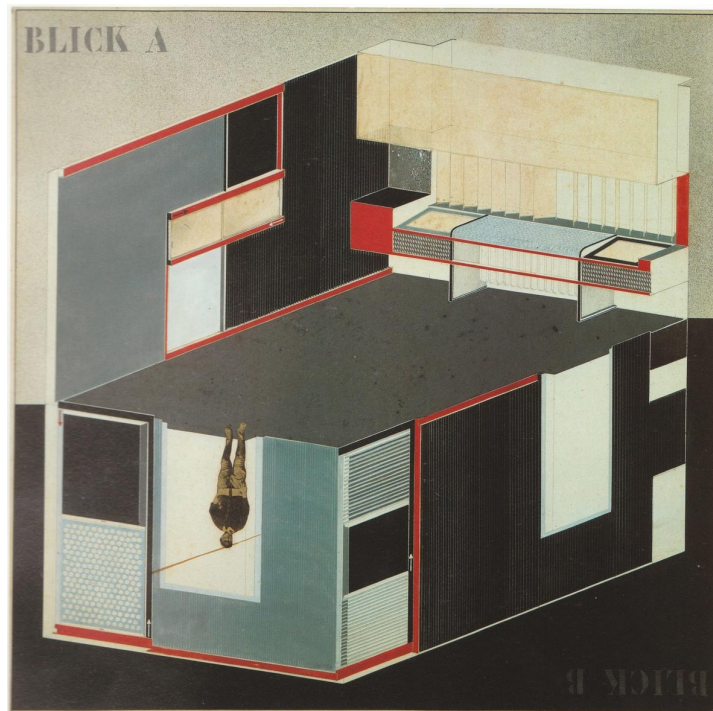
Figure 70: El Lissitsky. 1927-28. Design for Abstract cabinet.

El Lissitzki's concept of a flexible exhibition space was advanced by others and began to include actual physical manipulation. De Stijl artist Frederick Kiesler, interested in proto-cinema interactive devices, created exhibitions and objects to be manipulated by an audience. Peggy Guggenheim's *Art of the Century Gallery* was designed by Kiesler and opened in New York in 1942 (fig 71). The Surrealist gallery showed paintings that were supported on struts, allowing visitors to rotate and slide the work around, accompanied by changing lighting and sounds. This was, claims Erikki Huhtamo, part of an attempt to restore life back to an inert art exhibit through tactility (Huhtamo

2009, 126-127), which clearly prefigures the manipulation of artworks in virtual space that is commonplace today.

Figure 71: Solomon R. Guggenheim Foundation 1942 The Abstract Gallery of Art of This Century

Museum based exhibition experiments of the 1920s and 30s also began to draw on fairground style machines with push button rewards. Interactivity was becoming a feature of science exhibits affording participation and agency in the museum (Henning 2007, 35) and in the 1920s and 1930s interactive devices made use of electrical connections to activate bells, lights and sounds to reveal scientific principles. Henning argues that this user orientation of interwar avant-garde exhibition experiments depended on the notion of the '"active visitor" which was tied to a socialist vision' (Henning 2007, 36). This was a vision that at the time had real meaning for the idealists and their ambitions to transfer control to the visitor, as compared to the contemporary museum where the same kinds of controls are regarded as a 'consumer choice' (Henning 2007, 36). Henning also describes a new kind of control: modern descendants of push-button slot machines. These early interactives became a system for continued public conditioning towards new

media technologies. He says: 'For 1920s avant-garde exhibition designers and artists, button switches and dials, modular standardised exhibition components, and modern materials stood synecdochally for a whole range of possibilities through which audience/ citizens could realise their own social agency' (Henning 2007, 38).
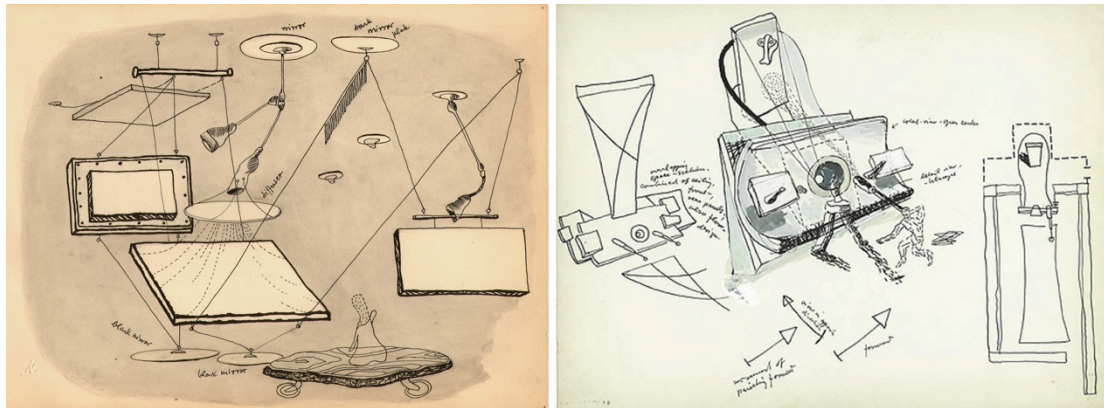
Figure 72: Frederick Kiesler.1942. Study for the lighting system and study for the viewing apparatus for the Art of the Century Exhibition, image: ©2006 Austrian Frederick and Lillian Kiesler Private Foundation.

The idea of an audience being given interactive agency is key to my own work, Frederick Kiesler's design drawings for the *Art of the Century* exhibition (fig 72) resonate powerfully with my own practice in the way they contemplate visitor interaction with display. Kiesler's experience in developing avant-garde set designs took intimate account of human movement. According to the artist and researcher Chris Salter, Kiesler wanted to: 'understand how an aesthetic practice could be harnessed to create conditions for a new kind of socialised human in constant contact within an environment increasingly embedded technology' (Salter 2010, 32), a rather prescient view that emphasises the importance of the aesthetic in affordances.

The appetite within science education for new aesthetics and new technologies reveals a continuing close relationship between science and art in the production of interpretive experiences. As a child, I often went to the Science Museum in London. A distinct memory of these visits was of a large round table in the middle of which nestled a golden ball. If you tried to reach

for this tempting ball, it dropped away, demonstrating some kind of motion sensing technology. This seemed extraordinary to me at the time, not only for the marvel of the technology but for the excitement it engendered in the children gathered around it. This exhibit was part of the children's gallery, formed in 1931 under the auspices of Science Museum Director Colonel Sir Henry Lyons, who 'argued in 1922 that in the technical museum the needs of the "ordinary visitor" should be placed ahead of those of specialists' (Science Museum 2016). Though I was young, this memory is vivid, and revealing something of the *kinaesthetic learning* discussed in chapter 3. This example additionally shows how this visitor experience was being constructed through the *social* as much as by the technology.

Figure 73:Unknown.1963. The Science Museum Children's gallery, image: Science & Society Picture Library 2016.

In considering new ways of connecting visitors with their collections, museums of science have often led the way. The Palais de la Découverte (Palais De La Découverte 2014) founded in Paris in 1937 by Nobel Prize winner Jean Baptiste Perrin (Kyle 1979), was the venue for live experiments carried out in front of the general public. These were usually visually impressive experiments, many of which are still presented at the Discovery Palace and were created to take science out of the laboratory, in order to highlight science in progress.

Influenced by the achievements of Perrin, another scientist curator, physicist Frank Oppenheimer founded San Francisco's Exploratorium (Exploratorium 2014) in 1969. Brigitte Zana, a director at the Palais de la Découverte, in discussing the history of the Exploratorium and its relationship with the Palais de la Découverte makes this observation: 'The demonstrations at the Palais de la Découverte were thus followed by 'interactive manipulations' that rely on the interaction between the visitor and the object on display. The latter, be it natural or artificially fashioned to answer human needs is no longer authentic, but becomes an artefact especially conceived to deliver a message to its user, the visitor' (Zana 2005, 2).

This remark about authenticity is relevant to the interrogation and perception of my own practice. Many of my projects have developed as part a creative process and are designed to engage the visitor with artefacts and the ecology of the space, as well as other visitors. I have thought of my projects as a kind of stage set, enabling visitors to imagine themselves as writers or artist or scientists, informed by this constructed context rather than directly by the subject of scrutiny. This may be seen as one of the distinguishing features of my practice in museums.

Currently the director of the Pinacoteca di Brera Milan, James Bradburne worked as a researcher at the Palais de la Découverte in the early 1990s and reported: 'Oppenheimer believed that in traditional museums of science and technology, the visitor was often denied the possibility of seeing real natural phenomena, instead was given the end products of a scientific process without having any tools with which to understand the phenomena, and therefore the scientific principles involved' (Bradburne 2000, 12). Bradburne goes on to state that many museums were drawn to Oppenheimer's approach of developing stand-alone exhibits. These were exhibits that supported visitor exploration through the creation of particular phenomena. Bradburne informs us that, based on his own video ethnographic data, visitors were often frustrated with these kinds of displays and, finding them too linear, too resistant to more than one kind of manipulation, they would move on to the next display. The failings of the

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single outcome format, insists Bradburne, gave rise to the 'open-ended' museum interactive experience, that is to say one that allows direct investigation of phenomena. According to Bradburne, through the description of an open-ended exhibit that involved the playful manipulation of large soap bubbles, the experience of the open-ended is shown as paradoxically limited, as it deals with an exploration of materiality with no fixed end point or reward. Bradburne is very complimentary of an initiative that allowed visitors to explore the Centre National des Arts et Métiers, a museum of technological heritage in Paris. Visitors arrived after dusk and were given small electric torches: 'Objects in glass vitrines, mute and ignored in daylight, were the object of close examination by visitors armed with means seeking out and examining what was of personal interest to them' (Bradburne 2000, 14).

Bradburne identifies the nocturnal museum visit as having the most success with the least resources: just a torch allowed the visitor to navigate, select and discover objects of individual interest at their own pace. An open-ended interpretive exhibit can be configured to allow collections and objects to be indirectly interfered with, affording a situated creative agency for the visitor and drawing on their curiosity and personal interests. I will show later that an open-ended interactive might mean more than playful interaction for the visitor, but how open-endedness can support creativity, allowing distinctive responses to objects.

Implications: Museums and Museum History

Now that the museum has become increasingly an arena for visitor-focussed involvement, the wunderkammer's affordance of sensory immediacy and the kind of experience offered by a nocturnal, torch-lit, open-ended engagement, as discussed by Bradburne (Bradburne 2000) might be revisited. This closer physical connection between museum objects and visitors is something that the design of *The Enlightened Eye* hopes to approximate.

Like Moholy Nagy's *Domestic Pinacoteca*, and the *Interactive Worktable and Escritiore,* I intended *The Enlightened Eye* to create an extension beyond the gallery walls by reaching outside the museum space via its online gallery, to afford a greater agency for the creative interaction of the active visitor. This

kind of initiative supports the contemporary agenda of museums that seek to use informal learning to expand audiences and for the visitor to engage in creative experiences with museum collections and for the artist-designer to develop new forms of sculptural interactive.

Conclusion

This chapter discussed ways in which showmen, scientists and curators have arranged and confected information for the public through spectacles, sideshows and museums. I focussed on how material realities and visual phenomena have been displayed and processed to impress an audience within a structured context. In some cases, the information is positioned as empirical fact, in others as an emphasis on evoking a sense of wonder; sometimes these are one and the same. In these cases, interpretation is the purpose. Interpretation, put simply is an act of translation and here the translation is a communication of a particular understanding of a particular thing to others. In the contemporary context, this process can be seen as a commodification of knowledge, a contribution to the acquisition of cultural capital (Bourdieu 2008 82). In any case it is a transaction available to those who are able and interested in committing to an engagement with displays of science, culture and art.

The *Enlightened Eye* project owes a great deal to this critique and survey of the history of museums and sideshows. An understanding of the broad context   reveals how the creation of mysterious, staged effects and the curation of exotic, and even anodyne objects have a common sway over an audience. Thus, this survey shows how the presence of an audience is indispensable to any consideration of these histories.

The exhaustive history of early museums and sideshows in Richard Altick's book *The Shows of London* (Altick 1978) is an important review of the significance of museums and spectacles. I am also supported in this study by Thomas Richards' *Commodity Culture of Victorian England* (Richards 1990)*, which* allows a deeper understanding of the connection between the communication of ideas and the role that the audience plays. This is also true of the work of Barbara Maria Stafford. Her discussion of the emergence

of the 'cult of science' in the public imagination, proposes an interesting debate around the conflicting and complementary dialogues between art and science (Stafford 1994). Frances Terpak's appraisal of the mechanisms that support emergent audiences for science as entertainment was useful to this study (Terpak 2002), to create a balance between learning and interest has been a concern for *The Enlightened Eye* project. Alison Griffith's observation that the use of science and spectacle continue to foster debate amongst museum curators (Griffiths 2008) confirmed that this is still a relevant arena for study. I was very attached to Walter Benjamin's description of the immersive qualities of the Kaiser-Panorama (Benjamin. 2006.) and Jonathan Crary's argument about the ease with which the use of structured, mechanised information delivery systems, such as the Kaiser-Panorama, were absorbed into society (Crary 1999).

If spectacles used scientific principles and equipment without the need for any real explanation, in order to entertain, Latour's concept of the 'black boxing' of technology (Latour 2005, 202), reinforces the perception that audiences do not need to know how things work, indeed that this easy collusion between the audience and the performer suspends disbelief and reinforces wonder.

This chapter has exposes tensions between scientific empiricism and spectacle and looks at how these have intermingled through the museum agenda over the last centuries. Tony Bennett's discourse *The Birth of the Museum* (Bennett 1995) shows how the museum has moved from an arcane stage, where entertainment and curiosity eclipse scientific rigour, a change that occurred when museums became formal institutions, manifest representations of state, intent on establishing an audience and following a didactic curatorial agenda. Pierre Bourdieu's quantative evaluations of museum visitor demographics in the nineteen sixties (Bourdieu 1990), exposes the museum as less of an egalitarian destination than might be desired. Bourdieu's research was, however, in counterpoint to the earlier experimental exhibitions by Dadaists, introduced by Michelle Henning (Henning 2007), a reconfiguring of the museum that attempted, in part, to overthrow elitism, had at least given more agency to the visitor; what the

audience wants to say and do about exhibits became key to exhibition design, defined by a return to the sensory attractions of the cabinet of curiosity, and most definitely begins to draw upon the participatory and relational. A discussion of visitor agency offered by James Bradburne, discusses how science museums are at the forefront of allowing visitors direct engagement with natural phenomena and of how these might have limitations and reveal the useful concept of linear and non-linear interpretive interaction in museums (Bradburne 2000).

These histories are an intrinsic part of own practice, as I have discussed in this chapter. For example, there is strong link with the aesthetic qualities of the microscope the wunderkammer and the Kaiser-Panorama on my work. Additionally, it is in the possibilities for structuring experience in order to create an ecology of action, where my interests lie.

Chapter 3: Contemporary Contexts

Introduction

In this chapter I begin by discussing post-modernity in the museum, how a movement emerged that contested the authority of the museum curator and that considered the ways in which artists might take on the role of curator.

I discuss the way in which theorists and museum experts have considered the power of museum objects, and the manner in which curators choose to display and describe objects to support their interpretation. I also describe how interpretation might confer authenticity on the materiality of museum collections and how a museum visitor might receive this in a number of ways.

The museum visitor is also subject to discussion in terms of their levels of interaction with objects, the ability to affect the object in some way either through touch or by making photos that feature themselves and significant museum pieces and how advances in technology influence the ways in which certain objects may be appropriated, shared and remediated in new ways that extends their conventional reach. I also discuss the relational experience that museum exhibits confer on the visitor, and how this social experience has been explicitly discussed and exploited by artists and designers. Here I also debate the harnessing of the relational and social, constructs that choreograph experience with and around collections and spaces.

This chapter then continues with a consideration of the different ways in which artists and designers work with museums to interpret collections. I begin by discussing the work of artists who create artefacts in response to collections – an activity described as *artistic interpretation*. I then move on to types of interpretation that rely on the work of designers who create interpretive resources, that help the visitor understand a particular theme of an exhibition through the production of interactive assemblies. These resources, though sophisticated, are concerned with linear non-contributory interaction: these I called *didactic interpretation*. A third form of interpretive resource I describe as *situated interpretation* and that has two distinct

incarnations: firstly, those that employ artists who lead workshops where museum visitors engage with collections and secondly, interactive assemblies that have open-ended, contributory outcomes for visitor participants.

I next survey the field of visitor studies. Here I describe ways in which visitors may be modelled and characterised through distinguishing types of behaviour within the informal learning context of the museum. A key method for understanding the visitor is revealed by Falk and Dierking's contextual model of learning (Falk and Dierking 2000). This model concerns the way in which visitors should not be regarded as *blank pages* but bring to bear on museum collections their own individual motivation and expectations, prior knowledge, interest and beliefs, with which to make meaning in the museum. The visitor often also brings with them another context in the form of the (family) group, within which certain structural interactions and group relationships help support situated learning - a particular example of group support being the use of scaffolding: the way in which those more experienced can guide the interactions of others who are less so.

In relation to the contextual model of learning, I also introduce examples of individual and situated types of interest that can be demonstrated in visitors. I discuss here the effects of interest exhibited when individuals are intrinsically motivated enough to enter an immersive flow state. Finally, I examine the way in which people, particularly young people might display distinct forms of play when interacting with museum displays, firstly ludic play, which is a disruptive and experimental style of interaction and secondly epistemic, that displays as a concentrated and absorbing approach to engagement.

Postmodernism and the Museum

The golden ball interactive of my childhood might be considered an example of a modernist exhibit. It was a simple demonstration of a scientific principle, and it had a reward, though this was, in fact, no reward but a failure to touch the ball: the linear sequence of the interactive could only ever repeat itself. If

an interactive can be considered to be open-ended, participatory and creative, then perhaps this is a post-modern type of design. The term *post-modernism* has been used to refer to a current school of thought where reality is viewed as subjective and the learner as an active participant in constructing knowledge. This view of reality is in contrast to the previous modernist view of reality as objective and the learner as a passive recipient of fixed knowledge (Morrissey 2002, 288).

Morrissey goes on to argue that the corpus of analysis and theory applied to museum visitor learning, can be seen as aligned to a postmodern perspective, in particular, that the visitor makes mutable knowledge and meaning by engaging with exhibits, objects and co-visitors. This notion clearly identifies with the ideas behind *The Enlightened Eye*, particularly the way in which it allows fluctuating levels of learning through participation and collaboration confirmed in the data analysis in chapter 5.

Eileen Hooper Greenhill, a significant voice in museum studies and in particular, museum learning, argues caution against accepting that the museum has undergone a full postmodern paradigm shift. She believes that, despite the suggestion that the contemporary can only be understood through an examination of how the past shapes the present, the museum has held on to aspects of the modernist museum. She says: 'education in museums was expected to be achieved through exhibition and display, where to look was to learn' (Hooper-Greenhill 2007 368). Greenhill argues that, contrary to this hierarchical 'top down' approach (my commas), as the visitor examines and constructs the formally curated content of an exhibit, they also bring with them their own interests and subjective preoccupations. She says that this personal perspective can be exploited in the museum, along with multiple meanings emerging from museum objects: 'Pathways to learning that include embodied approaches-opportunities to handle artefacts, to act out ideas and to design and produce creative products as a response to museum collections, are effective in engaging learners of all ages and abilities' (Hooper-Greenhill 2007, 374). Hooper Greenhill believes that there are still 'ghosts' of modernism; voices that need to be exorcised. She quotes from a relatively recent official museum training manual: 'Imagination must

be stirred, but tiresome rhetoric, fussy comparisons in gimmicky flourishes are to be avoided at all costs. Good taste and restraint are vital. It is the objects that are important: they must speak for themselves' (Wilson in Hooper-Greenhill 2007, 376). If the museum then, is often still preoccupied with the primacy of the object and the conventional truth that those objects convey, how can they make use of the fact that the visitor will regularly bring their own agenda to bear? As an artist-designer I support the pedagogic agenda of the museum and believe that this should be protected as the (relatively) opinion free context within which the artist-designer can use certain gimmicky flourishes to draw creative, possibly tasteless responses from the visitor.
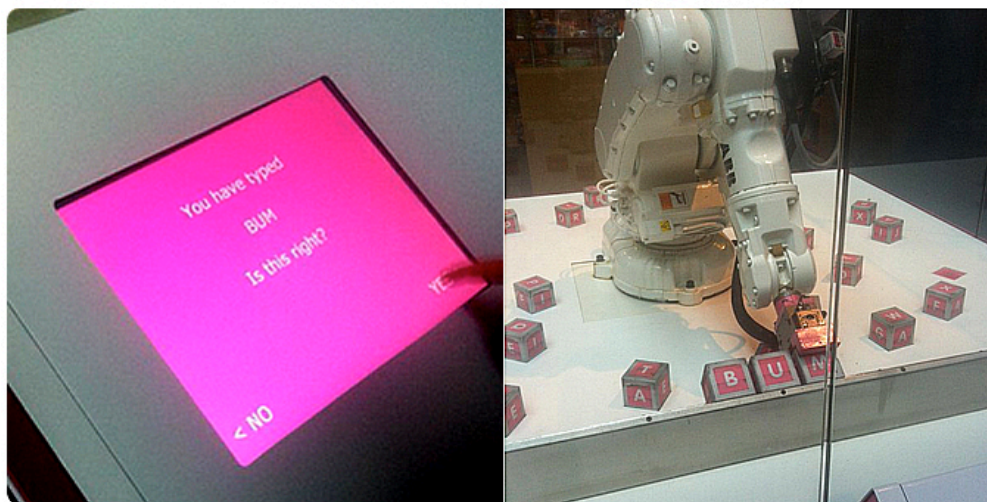
Figure 74: Anon. Date unknown. You have typed BUM Is this right? Robotics exhibit at the National Museum of Scotland Edinburgh Image: J. Cleverly 2014.

Not following the intended procedure, where testing limits in interactives (fig 74) adds a value to the audience experience, usefully allows more memorable encounters with non-linear interactives. This was evident in the evaluation of the *Universal Curator,* here creative misuse enhanced and extended interaction between visitors and shows that where there are opportunities for subversion, the visitor will find them.

The Artist Curator: A mediator Between Object and Visitor

Behind the scenes in a museum there are storerooms, offices, workshops and archives, these are the backstage spaces that ordinary members of the public never sees. To feel part of the machinery of a museum or gallery for an artist is a rare privilege, bringing a feeling of intimacy and a little power. To be invited to share an opinion of how objects and themes might be interpreted brings a responsibility too; why you were needed what more can you add to the museum's agenda needs to be addressed.

Curators or exhibit designers are in a distinctive position in that they give objects within the museum an authentic context. As described above, this authentic context is also a contextual opportunity for the artist. The curator and writer James Putnam discusses the idea of the 'artist curator': an artist who selects and sometimes collects objects for display. These objects are not necessarily chosen for traditional curatorial reasons. There are many examples of artist-curators, including famously, Andy Warhol, Marcel Duchamp, more recently sculptors Jeff Koons and Mark Dion. Putnam also designates eighteenth century collectors like Sir John Soane as artist-curators (Putnam 2001, 23). Paul Greenhalgh, in his preface to *Artists Work in Museums: Histories, Interventions, Subjectivities* (Pye and Sandino 2013), depicts the curator as necessarily having a wide range of understanding, interests and opinions. Greenhalgh continues that the artist may become a professional curator, usefully bringing to bear a practitioner's skill and eye. Equally, an artist might be brought in with his or her own readings of collections, to disrupt, enrich and re-examine the professional curatorial standard (Ibid). The artist is then invited to test and review the museum, a risky proposition for the curator.

Former Director of the National Portrait Gallery, Charles Saumarez-Smith, whilst acknowledging the historical convention of artists becoming curators, discusses the breaking down of barriers, viewing artist interventions and curators with much more concern, suggesting that the curator is to a degree reckless, to take risks in pursuit of a popularised collection. Smith sees this process as a 'de-professionalisation of the museum profession, rather than

the professionalisation of the artist' (Saumarez-Smith 2013, 30). The alliance between the artist and the museum curator, therefore, might be seen as one fraught with conflict, as well as an opportunity for both parties to reconsider and learn.

Authenticity and Materiality of the Museum Object

The Enlightened Eye, the main case study of this PhD has authentic objects at its heart. As to whether these objects actually need help from an artist-designer is an important consideration; in examining my own specific interpretive and interactive procedures within the ecology of action, some evidence revealing how some particular museum visitors approach certain authentic mineralogical objects is presented in Chapter 5.

The authentic context of the museum is nothing without its collections. Calling all museum objects 'discrete lumps', Professor Emeritus of Museum Studies at the University of Leicester, Susan M. Pearce, pronounces that only a conferment of cultural value transforms an object into material culture. She takes the example of a grandly displayed sample of moon rock presented as a spectacle, with an aura and reverence surrounding it.

She argues that despite without these techniques of display, which turned it into a 'humanly defined piece', it was an apparently uninteresting grey chunk. Usefully for me, Pearce suggests that collected natural history specimens have as much social agency, by way of constructed discourse, as do more obviously narrative objects (Pearce 1994, 10). Describing the unreliable nature of defining an object in a museum context, Pearce argues that the job of a curator in making editorial assertions is part of 'a dialectical process, so that each presentation of an object is a selective narrative, and the curator is engaging in a rhetorical act of persuasion which has an uncertain outcome' (Pearce 1994, 27). The example of the moon rock shows how the agency of the object, its uniqueness guaranteed by an authentic context and unquestionable provenance, becomes animated by the responses of the public to this truth.

Museum objects can provoke many different feelings and reactions in the visitor, depending on what kind of knowledge and experience they bring to bear. What might excite one individual may mystify another, and may not

even draw a glance from some. This is where the job of interpretive design can make a difference. In the case of minerals, for example, if an object has no evident intrinsic value, is not evidently curious or beautiful, then it needs some help:

> A core assumption in object-centred learning is that real objects 'speak' in ways that representations of those object do not. Objects evoke personal reactions as well as a shared knowledge and history. Furthermore, central to museum lore is the belief that it is the authenticity and uniqueness of the museum based object that summons the most powerful reactions. Questions have been raised as to whether the 'locus of authenticity resides not with the object but with it's mark' or interpretation. (Evans et al. 2002, 55)

If the interpretative opinion of artists, visitors and curators is paramount to the amplification of authenticity of things, then this arena is full of possibilities for new ways of establishing authenticity.

According to Hannah Lee Chalk, a museum researcher and curator within mineralogy, there is 'an act of negotiation' between the collecting and sourcing of specimens from the earth and their cataloguing, preservation and exhibition (Chalk 2012, 23). The curator must consider the purpose of the display and the conditions surrounding the actual excavation, with all its contingent environmental conditions. A further taxonomical transformation of a natural object, Chalk notes, is the museum inscription, a numerical code that makes the object a 'tangible vessel for the associated information that this number represents' (Chalk 2012, 24). Chalk also refers to Latour's observation that the felt-tip annotations on bagged specimens are the only 'fragile link' with their original context (Latour 1999, 46), even though the purpose of a museum display can be this very re-connection. The taxonomical inscription of objects can become part of the business of creative interpretation. For example, the mineral samples in *The Enlightened Eye* have museum accession codes too, small patches of white paint with black accession numbers painted directly on the rock. These numbers occasionally appear in *Enlightened Eye's* picture gallery (fig 76). Whether the participant recognizes them as artificial is not apparent but at high magnification, the artificiality is not obvious. When I noticed this, I was faintly annoyed that a man-made element was drawing visitor attention, however on

reflection there is something hermetic in the prosaic and functional stamp of authenticity becoming a stimuli for creativity.

Sarah Dudley, a lecturer in Museum Studies at the University of Leicester, discusses how the process of acquisition in museum objects introduces readability: 'The transfer of understanding from what was once termed a natural history specimen and is now understood as material culture, the moment an object such as mineral is excavated and de-contextualised and is assessed and catalogued then it can be read in the same way as any other perhaps more clearly narrative article' (Dudley 2012, 5).

It is by interactive affordance and the performativity this requires that allows connections with the real object and this creates authenticity. Making his or her own meaning is critical to the visitor's experience. However, discussing whether a museum object needs to even be an original or even replica, museum experts Bain and Ellenbogen counter the importance of real objects: 'The question of authenticity should not lie in the object, but in the event' (Bain and Ellenbogen 2002, 156). Some of these performances are captured in Chapter 5 and are critical to this study. A myriad of circumstances and perspectives may be inherent in the raw material of a rock sample, not least that of the educational agency the curatorial agenda requires. Perhaps base materials need to work harder to speak for

themselves in a museum context, despite any significant value in heritage or intrinsic aesthetic topology they might also possess.

Touch and Agency in the Museum

My own work with museum objects, concerned with immersion, creative transformation and participatory interaction, discussed in the introduction to this thesis, tries to take into account the multi sensory nature of experience. *The Enlightened Eye* affords a measure of physical agency of authentic objects. The primary sense that is catered for is vision, though interactive elements are by their very nature, tactile. Helen Saunderson, a contemporary artist and PhD researcher writing about the dominance of sight in museums, asserts that 'multi sensory experiences of museum objects are arguably distinct from single sensory ones, which tend to favour a particular form of attention and hence experience' (Saunderson 2012. 165). She also concedes that persuading people to touch, where they are actually allowed to, is not always easy. Citing both personal and observed examples of visitor reticence to physically engage with exhibits, despite encouraging labels, Saunderson declares the 'hands off' instinct 'naturalised' (Saunderson 2012. 168). The instinct not to touch can be overcome by visual affordances and of course by a museum label saying *please touch*.

The impulse to touch objects is often quite powerful in museums and art galleries, and not conventionally allowed, the preservation the fabric of sensitive objects being important issue. The possibility for touch is then an important factor in the design of interactives, where an exhibit designer might exploit this conflicting urge. Increasingly in museums there are examples of tactile exhibits, sometimes specifically designed for visitors with impaired vision, there are also examples of ways in which direct physical contact is allowed with models of authentic objects (fig 77).
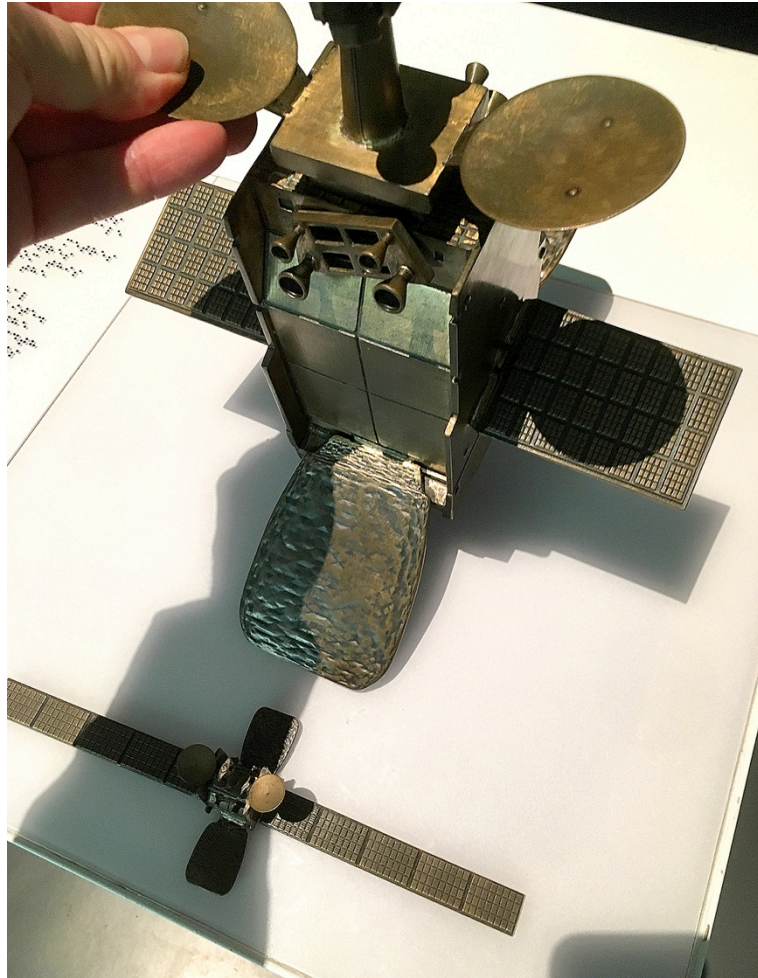
Figure 77: Topografik. 2016. Bronze tactile model of Eurostar 3000 satellite Science Museum London, Image J. Cleverly 2017.

The sample of moon rock in fig 75, despite being an extraordinary object, can be touched by visitors, indeed this tactile opportunity means that not only is its provenance important but straightforward physical connectivity elevates it beyond its intrinsic qualities, after all who would not want to connect, and perhaps to tell others of their close encounter with something so rare? The potential for close interactions with museum objects has a number of manifestations; one is direct tactile contact with real objects, objects in this case have to be robust enough to allow the problems associated with wear and contamination. Another example is that of the production of facsimiles; objects that stand in for their real counterparts, reproductions that afford an ersatz physical connection; my project *The Universal Curator* uses this procedure. Another kind of close interaction is the phenomenon of the

museum 'selfie', this is a record of personal proximity with world famous artworks, often shared on social media. Finally, there is another kind close intervention that allows creative transformations of objects by suitable technologies; this is the category that *The Enlightened Eye* falls into.

Figure 78: British Museum. 2017. Room 2: Collecting the World (featuring the Rosetta Vase fig. 79), image: © Trustees of the British Museum.

I was in the British Museum, in Room 2, *Collecting the World* (Fig 78), a gallery that featured objects and stories about benefactors to the museum, each of whom had donated collections and supported the museum in a variety of ways. In the middle of the room was a substantial glass vitrine containing a large yellow and blue vase by Grayson Perry. Made in 2011, *The Rosetta Vase*, had Perry's musings on the nature of modern museums on its glazed surface. As I moved around the display, I noticed that the floorboards shifted under the vitrine and the pot started to wobble quite a bit. This unexpected aspect of physical control began to interest me more than the work.

Nikki Clayton and Mark Goodwin are specialists in poetic, creative workshops often devised in relation to museum collections who report that a good deal of 'the physicality, the materiality of objects stimulates the imagination' (Clayton and Goodwin 2012, 190). Museum objects, because of their untouchable, sacred qualities, become desirable through their unobtainability. When I was younger I used to lick paintings. I wanted to get as close as possible to the physical material of work by fabulous, arcane artists. With one eye out for museum staff and heart racing, I would lean in closely, examining the brushwork, then flick out my tongue briefly making contact with something, probably varnish and not the actual corporeal matter of the painting. I realise of course that this was wrong on many levels, and something I would never do again but the urge to connect physically with precious objects was quite a pull.

The tactile nature of objects was explored in a show called *Tactual Explorations* (ISSUU 2015). In 2006 a group of artists were invited to

respond to a fourth century B.C. bronze bust of Sophocles from the British Museum. Asked to consider tactility in their interpretation, many participating artists created three-dimensional versions of the delicate, untouchable original. Artist Murat Ozkasim (Onol 2008, 98) chose to make chocolate casts from a small rapid-prototyped master. These lolly-stick chocolate replicas entitled: *Takes a Lot of Licking* were handed out to visitors to the exhibition, allowing for a different approach to the theme of tactility. Sadly, visitor reactions to the licking of Sophocles' head were not recorded.

The museum object can be extricated from the museum context and lead multiple existences. For example, high resolution digital 3-D scanning of objects can create convincing simulacra. However, far from depleting the original auratic embodiment of the authentic object, museum theorist Andrea Witcomb suggests this distribution of an object enhances authenticity. Increasing virtuality creates a demand for a counterpoint in, and from, the material object itself (Witcomb 1997). I would agree with this argument, clearly an object can have influence beyond its corporeal self, just as an individual may spread their ideas through technologies; these representations of oneself and one's opinions are no less important for being not in person.

A way for agency to be conferred on the visitor may be is perhaps through phenomenon of the museum 'selfie' where objects, including famous paintings, become an online currency. An image of oneself chatting to the *Laughing Cavalier*, recoiling from a dinosaur skull or reflected in a crystalline mineral sample, all confer a direct connection, proof of a physical relationship, and extend and stretch the object further from its auratic self. In fig 80, two hugely famous figures of popular culture pose in front of what is the world's most famous painting. This picture maybe seen to do a number of things, firstly shows participants as cultured and interested in the world, it also confers upon them a certain ordinariness: they are only doing what many others have or are able to do. Additionally, there is a tension here, a sense that the individuals are competing with an object with an auratic influence more enduring and powerful than their own.

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Figure 80: Beyoncé. 2015. Beyoncé, Jay Z, and the Mona Lisa, image: iam.beyonce.com.

Contemporary evaluations of interpretation, particularly in art galleries, have shown a mediation of interpretation between curator and visitor: the visitor is able to respond and leave traces, decide on new histories and new, individualised perspectives for the artefacts and images they encounter. Professor of Museology at the University of Newcastle, Christopher Whitehead, discusses this shift: 'such practices are indicative of a new tendency for the museum to directly challenge its own interpretive authority' (Whitehead 2012, 39). In part this stems from the commercialisation of museums, prompted by the increasing absence of state funding, and an emerging taste for heritage culture as a leisure activity. Allied to this is the emergence of social media platforms that allow for the free flow of opinions and affording equal status to connoisseur, expert and layman. Luigina Ciolfi, a specialist in human computer interaction, who describes herself as 'committed to a participative approach' (Ciolfi 2012, 69). She describes this new fluidity and opportunity for visitors to participate in museums: 'This resonates with recent developments in interaction design for museums and exhibitions that have experimented with ways of facilitating visitors' participation and direct involvement in shaping, and even creating the content and message of exhibits rather than just allowing for comments or more limited forms of participant interaction' (Ciolfi 2012, 69).

My own work makes use of this ebb and flow of opinion between visitor and museum and the possibilities afforded by the digital. Professor Angelina Russo of the University of Canberra is interested in the intersection between cultural collections, media and design is positive about the rise of this digital discourse: 'Experienced focused online cultural communication can maintain the museum's traditional remit as an authoritative source while enhancing the relationship between institutions and audiences by means of new forms of cultural participation' (Russo 2012, 147).

The creation of interactive resources that allow visitors to share content in response to museum collections and objects, to distribute and literally expand the object, has significant creative appeal for me. This latest breaking of boundaries by new media technology, allows easy and remote access to museum resources. This may have implications for institutions, perhaps meaning there is no longer an incentive to visit the 'real' collection. However, by creating particular activities that are enhanced by technology, new opportunities for 'active meaning making' (Hooper-Greenhill 1999, 51) can be created. Museum visitor responses that require physical and digital dialogues with objects and collections can support and attract a wider located and co-located audience. Museum educational theorists Paris and Hapgood say that: 'The potential for technology to enhance object-based epistemology in museums is huge. However, it requires more imaginative use of the tools and touchscreens and audio recordings that simply mimic text' (Paris and Hapgood 2002, 49). This is a point that I have considered and addressed through my own use of technologies.

In discussing the process of remediation, by which new platforms can represent and readdress objects and images of objects, Michelle Henning contends that 'old media can remediate new media too, as they reinvent the latest techniques and media for their own purposes' (Henning 2007, 27). She notes also the relationship between the way objects are displayed, as if in an archive in a postmodern museum, means that the 'museum store becomes the exhibit' (Henning 2007, 40). This physical display of museum objects as a resource bears a close resemblance to the museum's navigable digital archive; both can be navigated without the mediation of curatorial support. I

have explored to degree a sense of archive through my own recent work. A feature of *The Enlightened Eye* is its' capability to afford the physical selection of its archive contents, that are then digitally transformed and shared further online.

The possibilities afforded by the ability to creatively transform a museum object, to then digitally archive it and to save online, is a feature that further animates *The Enlightened Eye*. This Internet enabled aspect of a physical object situated in the museum operates to a certain extent like a digital visitors book, allowing a trace of a visitor's engagement. To some extent this capability, aside from its attraction for visitors to leave their mark also equips *The Enlightened Eye* with a data generating capacity, enabling further information on its use and distributed nature to be examined. The embedding of networked technology that generates data and social interaction aligns *The Enlightened Eye* with the so-called Internet of Things (Valhouli 2010). Chris Speed, Chair in Design Informatics and Jon Oberlander Professor of Epistemics, both of Edinburgh University, are particularly concerned with the evaluation and potential of networked objects. They discuss the value of this emerging distributed scenario: 'people can use social computing systems to interact with data; they can use data to interact with systems; their interactions generate further data; and what they can do will depend upon their role in the largest system' (Speed 2016, 4). The capacity of *The Enlightened Eye* to allow online sharing is also allied with data about that interaction, however I am mindful of Henning who argues that 'the real social, and aesthetic potential of new media in museums remains to be explored', despite its role in affording museums ways to track the visitor experience and to attract audiences with novel exhibits (Henning 2007, 44). However, this is challenging because the landscape of new media moves quickly. The networking of objects, the application of touch screens, of digital pens and the like, that at first appear experimental and challenging become rapidly out-dated or superseded.

Relational Aesthetics

The artist-designer situates an interactive to engender visitor action, this is

the function of my case study project, *The Enlightened Eye.* How this is achieved may take account of *relational aesthetics.* An insightful way of thinking about the artist as a facilitator for action, rather than as the main protagonist is through relational aesthetics, a theoretical approach that enables the artist to be seen as the choreographer of the museum visitors' actions. The concept was defined by curator and art critic Nicolas Bourriaud as: 'A set of artistic practices which take as their theoretical and practical point of departure the whole of human relations and their social context, rather than an independent and private space' (Bourriaud 2002, 113).

Figure 81: Carsten Höller.2015. Flying Mushrooms, image: Linda Nylind 2015.

Bourriaud proposes 'artistic activity is a game, whose forms, patterns and functions develop and evolve according to periods and social contexts' (Bourriaud 2002, 11). He focuses his attention on contemporary artists who use human behaviour and response as one of their raw materials. For example, Carsten Holler's giant metal slides (Tate Modern 2016) installed at Tate Modern in 2016 elicit a loss of control and excitement in their participants. Furthermore, it is the conduct of the participants and their response to the slide structures that constitutes the art. This confirms to me that there might be many degrees of response that the individual may have to the contents of a museum or art gallery. Events ranging from the *Stendahl's syndrome* (Heath et al. 2002, 15) of the nineteenth century to the provocation of Damien Hirst's shark or Marcus Harvey's *Myra* (Royal

Academy London 2016)*,* bears no comparison to the excitement in a child responding to an interactive.

Since my own work relies on encouraging interaction and participation in the visitor, a consideration of what potential patterns of behaviour and action might take place becomes of great importance. Heidi Overhill, in her paper *Design as Choreography: Information in Action*, considers the museum visitor's body movement and deportment, how they seem to follow a relatively predictable pattern of movement, creating a kind of dance performed by visitors against her curatorial planning. The position of labels and exhibits become 'devices used to persuade visitors to assume, in sequence, a series of desired poses and gestures' (Overhill 2015, 5). This observation resonates with my own immersive, participatory interactives. Overhill is concerned with architectural spaces and the compositional positioning of certain details and affordances that persuade the visitor to move around, according to their individual approach. The design of my previous work compels a scaled-down, more intimate dance to be performed around its assembly, a dance that is constructed for a number of purposes, utilising configured affordances and plays on visitor behaviour and motivation.

We now live in the 'era of consumption rather than production, one in which the creation and exchange of experiences is paramount' (Borja in Sansi 2012, 226). The art gallery and the museum space are ideal arenas for a consumption of performance and participation.

The proto-conceptual Italian artist Piero Manzoni (1933-1963) created many significant avant-garde works, including *Magisk Sockkel* (*Magic Bases,* 1961), a series of wooden plinths that when stood upon confer the status of a living sculpture. Above, a visitor can be seen at the exhibition *Brera in Contemporaneo* (Accademia Di Brera 2015). After being invited by a docent[1] to mount a Manzoni plinth, the visitor immediately and unbidden began to adopt a series of statue like poses. This work makes the audience the exhibit, the plinth a mechanism and ecology for creative action.

The relational aesthetics of *The Enlightened Eye* are revealed by the visitor responses in the ecology of action. Details and patterns can be seen and connected through a reading of the action constructed around the machine. It may seem overstated and perhaps tenuous to yoke relational art to the parochial concept that drives *The Enlightened Eye*, however parallels are demonstrated in the encounters and experiences of the visitor and my interest in the contingent aesthetic compositions they make.

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[1] A docent is a term used in museums and art galleries for a voluntary guide.

The museum is an ideal arena for the artist-designer to experiment in, to test any number of possible strategies, personal preoccupations and ways of creating relational interchange and choreography around objects and themes. The museum is, by its very nature, a relational space. Visitors move around self-sufficiently, often in groups, corresponding and responding independently to the curated agenda. The museum is not explicitly a relational space but implicitly understood and used as such.

Implications: Museums Today

In recent times, museums and their contents have been recognised as cultural capital (Bourdieu 2008, 82). They are places where visitors can expect objects and themes to be presented and interpreted in a variety of ways in order to enhance and empower active and flexible discourse. This is a context within which as an artist-designer, I can draw upon both the ambitions of curators and the desire of the public to engage and to develop new situated assemblies. A quote from *Creative Engagement,* a report commissioned by the National Museum Directors' Conference, frames the position for contemporary museums: 'Museums and galleries should now be perceived as active rather than passive institutions; producers as well as suppliers of knowledge and experience' (NMDC 2004, 10).

This new, inclusive museum has been a theme for evaluation and debate amongst museum specialists. The museum has also formed close relationships with artists and with designers in order to create new forms of interpretation, to draw the visitor in, to engage with collections in a number of new and idiosyncratic ways that enliven the museum visit.

Contemporary Artists and Designers Working in the Museum Setting

This section reviews contemporary interpretive work by artist and designers who have responded to themes and collections held within art galleries and museums. Through a survey of the characteristics adhering to a range of interpretive initiatives, I have identified four key approaches to interpretation that are specifically relevant to this study: artistic, didactic, situated and situated interactive interpretation.

Artistic interpretation is characterised by an individual artist's interpretive response to a collection: a personal, conceptual and contextual interrogation of museum objects and related material. This approach can be seen in Grayson Perry's 2011 exhibition, *The Tomb of the Unknown Craftsman* (British Museum 2014), created through his engagement with objects at the British Museum. The nature of this engagement is captured in his rather provocative line in the flyleaf of the accompanying book: 'Do not look too hard for meaning here. I am not a historian I am an artist. That is all you need to know' (Perry and British Museum 2011). If Perry does not feel the need to explain himself, the comment reveals his bravado. Hi comment is also, I feel, meaningless when assessed alongside the evident strength of the work: Perry has a to lot say as he journeys around the British Museum making his art and allowing the visitor to see his 'pilgrimage' as a sophisticated version of our own museum expeditions.

A precursor to Perry's work with the British Museum was Philip Eglin's 2001 exhibition of his contemporary ceramic interpretations of eleventh Century religious woodcarvings at the V&A (V&A 2014). In an accompanying video, '*Carving out a Future'* (Victoria and Albert Museum 2014), Eglin describes buying a catalogue of Northern Gothic sculpture from the V&A (Williamson 1988). In finding the catalogue, Eglin is drawn to the illustrations of eleventh century figurative woodcarvings and decides to investigate further. Discovering that the objects are in storage, Eglin gains access to the

archived sculptures and evaluates them from an artist's perspective. Eglin draws attention to specific features, such as the crudely finished back of the woodcarvings, which reveal they were once fixed in a church building. Eglin is fascinated with the parts of the sculpture that would not have been seen, thinking about the original artist and the way that this aspect of the carvings that reconnects him to them. This also draws attention to the fact that the artefacts are no longer in their original context: they are now museum acquisitions subject to taxonomical rigour.

Once on show in the V&A together, the woodcarvings and the ceramics animated each other, encouraging us to look again, although perhaps it is the eleventh century that wins out, having been rescued by Eglin from the museum stores. This process reveals the artist as a practice based researcher and scholar.

Figure 83: Anon. c.1280-1300. St Anne with the Virgin and Child, image: © Victoria and Albert Museum, 2017.

Eglin recognises his growth in knowledge and the expansion of his practice and comments on the sharing of this with the exhibition visitor. This artistic version of scholarly activity resonates with my own practice experience, whereby through the close study of the themes and objects that are submitted to the interpretive process, one becomes affected, and informed by the process. James Putnam describes the value of the growing use of artistic interventions by museums and art galleries as:

> Helping to break down the more formal standard classification system, and the frequent preoccupation with the self also works well in helping deconstruct the impersonal nature of museum displays […] The increasing phenomenon of the artist curator often crosses the boundaries between exhibition design and installation and is regarded by some artist as a natural extension of the everyday practice. (Putnam 2001, 132)

The enquiring impulses that drive the artist can often be similar to those of the scholar. However, without being confined by the rigour of the scholarly methodology, the artist, when allowed behind the scenes, acknowledges this privilege and applies their own methods of enquiry.

What I am calling *didactic interpretation* ranges from audio guides, labelling and more complex interventions. These are designed solutions to the enhancement of more formal, object-based museum learning. Generally, they have a restricted set of possible outcomes for the participants. Many museums have interpretive resources of this type and there are some sophisticated examples of didactic interpretive that are novel in conceit and engage the visitor in interesting ways. *The Enlightened Eye* has a broadly didactic agenda and takes some of its key influences from the designs outlined below.

Two Interactive installations for the exhibition *Constable: The Great Landscapes* (Tate 2014) held at Tate Britain in 2006 were designed and developed by the design agency AllofUs (AllofUs 2014). The first of the installations featured a large wall mounted video screen showing Constable's painting *View of the Stour near Dedham* (1822). As visitors moved within range of the image, a camera sensed and captured their movement to reveal an X-Ray view of the under painting.

The second installation featured a digital simulation of Constable's technique of 'squaring up'. A copy of the oil sketch for *Salisbury Cathedral from the Meadows* (1831) was positioned under a touch sensitive acrylic panel; a thread grid divided the oil sketch. Touching sections of the grid revealed an image of the finished version of the painting on a large wall-mounted screen.

A study by W.I.T., including a video ethnographic evaluation, discussed the design brief from the curator to the design team as intending to 'foster an understanding amongst visitors: both those using the interactives, and importantly those merely witnessing their use' (vom Lehn et al. 2007,1486). This contingent discovery of functionality is an effect seen here as a desired design system, rather than the unplanned version observed previously in the data from *Deus Oculi* (Heath et al. 2002).

Two fundamental differences were noted in the operational interaction with the two installations. Firstly, the X-Ray piece worked as visitors entered the range of the piece and often relied on the visitors noticing their influence on the image. The second interactive relied on a deliberate touching of the

squared-up panel to elicit interaction. Both these effects could also be witnessed in visitor interaction with *Deus Oculi.* The understanding and deployment of these affordances may be cognitively developed and become intuitive or tacit skills to a designer. However, design for interaction must also rely on careful planning and collaboration, as much as it does on tacit knowledge.

Figure 85: AllofUs. 2006. Constable sketch interactive Tate Britain, Image: studio@allofus.com 2006.

Experienced interactive interpretation designers take their orders from their clients and are aware of the subtleties of audience responses, though the results of previous success and failure may or may not be shared. Most publicly funded exhibits require an evaluation. However, the process of interactive exhibit evaluation is a complex task. A recent paper published by the Visitor Studies Group (Visitor Studies Group 2014) discusses this problem:

> 'Content' associated with particular types of 'interactive' will vary significantly, and the content rather than the forms of 'interaction' the device or display provides, will have a profound impact on the experience of visitors. To make matters more difficult still, the location of the interactive within a gallery of objects, or other interactive, will bear not only upon its use but also on its effect on the visitor's engagement within other exhibits in the same gallery. (Heath and Davies 2014,54)

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These observations demonstrate the subtleties and complexities that can occur within the ecology of a museum gallery; these connections between actants, objects and interpretive resources form an intricately calibrated, highly contextual space.

Situated interpretation emerges as a conflation of artistic and didactic interpretation. The artist-designer in this case, pays particular attention to the aesthetic sensitivities of the design employed and the situated educational and curatorial agenda. Another feature of situated interpretation is that it has open-ended contributory visitor content. Examples of this can range from artist-directed workshop activities that form a finished installation/exhibition, to sited interactives that autonomously capture visitor responses. Below I discuss two distinct variants.

Cathy Miles (Cathy Miles 2014) is a contemporary maker working in wire to create figurative sculpture. In 2010 Cathy was selected as part of the Museumaker Initiative (Arts Council 2014) to work with The Guildhall Museum, Rochester (Guildhall Museum 2014). As a focus for the project, the museum identified the Seaton Tool Chest, a unique and significant object that contained a complete set of eighteenth century furniture making tools.
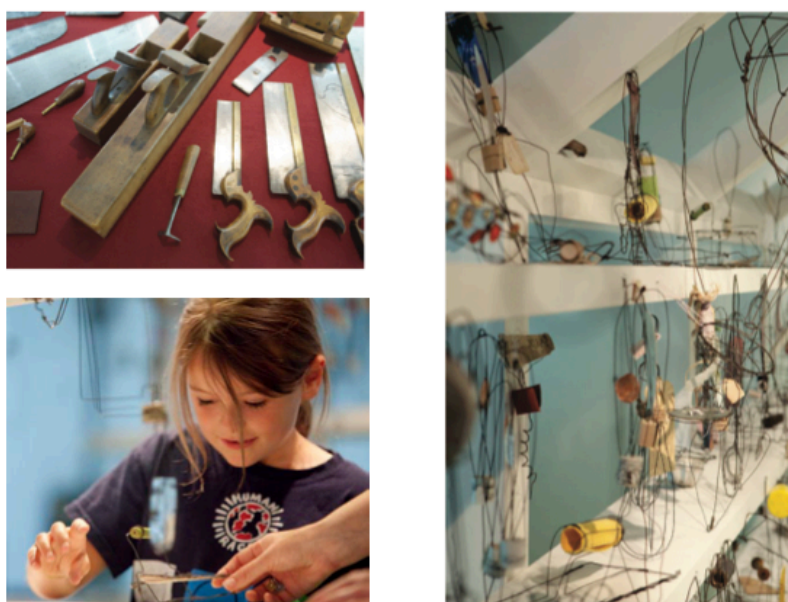
Figure 86: Cathy Miles. 2010. The Seaton tool Chest Museumaker project Rochester Guildhall Museum, image: © Matthew Andrews 2010.

The Toolshed brought together tools created by maker Cathy Miles, alongside a special display of the Seaton Tool Chest. Wire tools created during the community engagement workshops were exhibited in a shed-like structure. An evaluation of the project (Jackson. 2011) revealed many positive reflections, for example a curator at the museum, identified as Peter is quoted: 'It is a brilliant collection. Makers look at things in totally different ways. They can make very important linkages between disparate objects which we might not see as curators. Makers act as a conduit between the museum and the public' (Jackson 2011, 4).

The report goes on to demonstrate through discussion of the results of a participant questionnaire, that respondents felt that the museum was more approachable and that they would now have more contact with the museum because of their involvement. A respondent reported that they felt that 'it makes the children understand more about the skills involved and makes the exhibition more relevant' (Jackson 2011, 7). The physical act of making and collaborating with the artist clearly enhanced understanding of the object. The project enlivened the tool chest, enriching it beyond its undoubted historical and physical assets, through increased interaction and discourse between the object and the museum staff.

By directly engaging participants with collections, this workshop-based approach, like the one devised by Miles, allows for physical and aesthetic choices to be played out and rendered relevant. This kind of approach can be seen as creating the opportunity for active participation and may be a powerful tool for creating and reinforcing memories in participants. As Falk and Dierkling discuss in their key text *The Museum Experience*, 'memory emerges as an important ingredient in the phenomenon of learning' (Falk and Dierking 1992, 108). Later in the book, discussing the physical context of recollections of visitor experiences, they describe how: 'Many children's recollections of field trips to zoos, farms, and nature centres include memories of smells, heat, or physical discomfort, such as mosquitoes, getting their feet wet, or getting muddy' (Falk and Dierking 1992, 121).

The way in which movement can enhance understanding and memory making is described as 'kinaesthetic learning'. Activities that require a physical task in a museum setting, coupled with other requirements contained within the task such as aesthetic choices and social interaction, enhance the experience and contribute to the learning experience.

Figure 87: Museu d'Historia de Barcelona.2013. Kinaesthetic learning in action with a linear interactive, image: D. Cleverly 2013.

The Wedgwood Virtual Portrait Medallion ('Wedgwood Museum 2014) is a wall mounted-digital interactive display, part of the Wedgwood Museum in Barleston, Staffordshire. It was designed by the digital design agency Keepthinking (Keepthinking 2014), in collaboration with the interactive design and user experience agency AllofUs (AllofUs 2014). The Wedgwood Museum encourages visitors with the following invitation: The great and the good have all been immortalised by Wedgwood on one of their iconic jasper portrait medallions. Visitors to the museum have the opportunity to join this

illustrious group through our *Virtual Portrait Medallion* interactive. (Wedgwood Museum 2014) The virtual medallion allows the visitor to create a self-portrait by aligning their face to a screen, and a filter gives a cameo effect to the image.

The visitor is able to save their selection and subsequently navigate, via the museum's website, to review and download their creation. This aspect of functionality was a significant consideration for me as it demonstrated the possibility of networking an installation and informed the concept of The Dr Johnson Project and its online gallery. *The Virtual Portrait Medallion* is relatively simple in concept, requiring its users to position themselves in the attitude of a neoclassical subject. A head and shoulder side profile makes use of the decorative oval frame and the curved cropping at shoulder level. A visit to the website reveals some unorthodox poses by visitors; common gestures include the V's Up - the single finger gesture, moose ears and the traditional stuck out tongue. This subversion of use is a feature of these kinds of open-ended interactives. Curatorial moderation, when variable created content is to be made public, forms an area for considered exploration and discussion.

Figure 89: Keepthinking. 2008. Wedgwood Medallion 'Moose Ears', 'V's Up', 'stuck out tongue', 'single finger' gesture, image: ©Wedgwood Museum

Implications: Contemporary Artist and Designers in the Museum Context

There are a number of possible ways of undertaking interpretation within museums and art galleries. The examples I have discussed in this chapter so far do not necessarily to point to the success of any particular interpretive method of its own. However, in considering and examining the range and ways in which different approaches operate, I have been able to usefully isolate aspects of each method and compare them to my own practice.

Artistic responses such as those by Eglin and Perry take on subjects with reverence and irreverence, exploring objects on the behalf of a visitor and making physical responses to objects they seek out and are allowed contact with. Artists also make responses in the form of films, books, drawings, web pages and other indications of close and detailed study, much like their trained curatorial counterparts. Interactive designers can treat interpretation in subtle and interesting ways but it is not always easy to judge what the visitor will do. Artist led workshops appear to be successful in their open-ended production of active creativity. Situated interpretation can take a number of forms, including projects run by artists who help participants to engage with collections. These initiatives are often rewarding for the artist, participants and curators but are very time consuming. Interactive situated interpretives can allow for creative but unintended responses. These unexpected responses should be considered and exploited, as they show what the experimental and the open-ended can allow.

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Visitor Studies

As we have seen, the museum is an arena for communicating knowledge. Indeed, the contemporary museum is predominantly concerned with supporting learning. However in order to do this, the museum must become increasingly a cultural destination: 'a day out'. Museums have a vested interest in understanding the origins and motivations for the museum visit and there are commercial organisations that work with museums to evaluate these motivations. Morris Hargreaves McIntyre (Morris Hargreaves McIntyre 2016), for example describe 'culture segmentations' that outline types of visitor, their values, wealth, cultural aspirations and interests. Identification of these segments help to support the focus and range of a museum's public relations and facilitate the targeted support of audience development. This kind of audience evaluation, whilst interesting, is of less importance to this PhD study. What is of more significance however, is the close-grained study of situated visitor behaviour that reveals in detail how visitors actually respond with both the interactive exhibit and with each other.

I will now introduce a number of theoretical concerns surrounding the study of the museum visitor. If modes of visitor behaviour can be usefully interrogated, then there are implications for exhibit designers. Approaches to the study of visitor behaviour in museums, art galleries and heritage centres are many and varied. Ethnographic, sociological and anthropological methodologies are important. As a designer of interpretive resources it is important for me to consider how visitors interact with objects on display, with interpretive resources, and especially with other visitors.

Informal Learning

Some of my previous situated interactives, such as the *Universal Curator*, were specifically designed to enhance interaction with museum objects and to promote interpretive engagement amongst participants through its use. The kind of learning they allowed was different from the compulsory kind found in schools: they allow for *informal* learning. The concept of informal learning can be defined as voluntary, self-directed and motivated by intrinsic interest discussed below, providing an experiential base for further activity

and learning. Informal learning is commonly found to occur within peer or family groups of visitors and is reinforced by learning from others (Diamond 1999, 26). As we have seen earlier, the Constable interactive relies on contingent and observed behaviour to confer understanding of use between visitors. An effect that I have understood since the evaluation of *Deus Oculi* reveals that others often support engagement in the same space. This is then a platform for further engagement; therefore, informal learning is stimulated by situated curiosity in the behaviour of others as well as one's own.

Falk and Deirking regard informal learning as superior in many ways to compulsory learning, claiming it allows an investigatory approach, finding things out throughout a participatory, inclusive setting which allows learning to weave in and out of a context, playfully and without risk of failure (Falk and Dierking 1992). This flexible approach to learning within the museum is an appropriate context for open-ended interpretative interactives to operate.

The Contextual Model of Learning

Learning in museums is achieved by interpretive connections between the museum visitor and the objects on display: the museum visitor is not an empty vessel, they bring with them individual concerns, tastes, understandings and expectations. Majijke Van Eeckhaut, visiting Professor at the School of Fine Arts and Royal Conservatory Department of Autonomous Arts at the Hogeschool Ghent, puts it this way: 'Interpretation is a dynamic relationship in which it is important for visitors to be able to connect what they know and feel with the objects on show' (Van Eeckhaut 2012, 119).

Falk and Dierking's contextual model of learning systematically breaks down the visitor experience of museum interpretation; it is, as its authors outline 'more descriptive than predictive' (Falk and Dierking 2000, 10) and is unstable, ebbing and flowing between the key influences on learning. However, the contextual model of learning presents a valuable rubric to dissect and describe visitor action, learning and response. This is of course particularly valuable in regard to the design and evaluation of interpretive initiatives such as *The Enlightened Eye*. In the book *Learning from*

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Museums: Visitor Experiences and the Making of Meaning (Falk and Dierking 2000)*,* Falk and Dierking describe a significant framework of factors that affect learning behaviour in the museum. There are three main factors: firstly 'The Personal Context': this concerns individual motivation and expectations, prior knowledge, interest and beliefs, as well as choice and control. When observing visitors using *The Enlightened Eye* there was clear evidence of individual knowledge and preoccupation. In fact, the drawing task set by the interactive was, by its very nature, able to capture evidence of this within the drawing task the visitors were invited to undertake. Second is 'The Sociocultural Context', concerning group mediation and facilitated mediation by others. This factor is particularly obvious in my data analysis of visitor behaviour, predominantly the effects of structuring of behaviour known as scaffolding in groups of visitors, especially in mixed groups of adults and children. Thirdly 'The Physical Context' that concerns orientation, exhibit design and the reinforcing events that occur outside the museum space. This portmanteau factor is only of particular relevance to exhibit design, as described in the main case study, *The Enlightened Eye* (Falk and Dierking 2000, 137).

These factors show that visitors make meaning around objects according to their own life experiences, their social and family groups and personal agendas. If an interpretive exhibit dealing with a museum theme is configured in such a way as to be sympathetic to this range of factors, then both the inexperienced and the connoisseur of a subject can gain experience through engendered participatory engagement.

Visitor Groups and Socially Situated Learning

Informal learning often occurs and is supported within family groups. This was the case during the data collection that I undertook at Liskeard Museum, where *The Enlightened Eye* was well used by family groups of various compositions; to clarify; family groups are not necessarily standardised in their composition and may contain a range of related individuals and friends.

Evaluating learning and interaction in museums can be described through theories of situated learning. Proposed by educational theorists Jean Lave

and Etienne Charles Wenger, situated learning explores and emphasises how rather than the conventional understanding of learning as a direct transmission to and reception of information, learning is supported within social groups and contexts (Lave and Wenger 1991). Relationships between 'apprentices', 'young masters' and 'old-timers' (Lave and Wenger 1991, 56) are discussed in relation to a number of contexts. I would argue that within a museum visit there might also be evidence of these kinds of relationships where knowledge is gained from interaction with experienced family members. Additionally, in the museum context, learning could occur concurrently with all ages of family group members, particularly in regard to unusual exhibits. Within these structures of sharing experience and learning, a useful phrase of Lave and Wenger's is 'constructively naïve' (Lave and Wenger 1991, 117) which describes how 'inexperience becomes an asset' and how questions and approaches within the context of group 'invite reflection on on-going activity' (Lave and Wenger 1991, 17). This was evident in the action around *The Enlightened Eye*, as shown in the section Data Analysis I: the Ciriden Halls.

Writing about the value of the exhibit as a stimulus for family groups Minda Borun, Director of Research and Evaluation at The Franklin Institute Science Museum in Philadelphia, says: 'The exhibit acts as a catalyst to conversation amongst family members. Objects, particularly interactive, stimulate conversation involving observations, recollections, associations, and connections to prior learning members of the visiting group' (Borun 2002, 246).

Working in museums and in response to collections, I have often attempted to generate conditions for extra interaction between visitor groups; making, for example, designs that have configurable elements and controls that create opportunities for collaboration between visitors. I see this is an ingredient for choreographing a successful experience, if not a successful interpretive learning experience. Museology expert Kristine Morrissey highlights how objects allow for and generate discourse: 'Museums today are challenged to use objects to help us all more clearly see not only the special qualities of objects, but the special qualities of ourselves and our relationship

to others' (Morrissey 2002). The evidence for the way in which museum visitors in groups use objects within collections as starting points for discussion, is consistently echoed in the literature and is clearly evident in the analysis of behaviour around my own situated interactives.

My concept for the playful experiences to be generated by the subject of the main case study, *The Enlightened Eye,* took into account the way visitor groups interact. Participants generally appeared to be family groups. Encounters with *The Enlightened Eye* were entertaining, open-ended and creative, with a number of possible approaches available. Participants could learn about the mineral samples through exploring the image-making task together. Indeed, throughout the data shown in Chapter 5 there are many examples of family groups working together in different ways to engage with each other and the task I set them. A family group often begins to guide its younger members in the use of the interactive, although this happens in different ways in different visitor groups: essentially, helping each other out is an important aspect of engagement and experience.

Jessica Lindblom, Senior Lecturer in Cognitive Science School of Informatics, University of Skövde, says of group learning: 'Collaborative interaction is characterized by the coordination of one's perceptions with others through joint attention, i.e., choosing what to attend to in the perceptual space. Different forms of gestures, in particular pointing to a target of shared interest, are common ways of establishing 'active' forms of joint attention' (Lindblom 2007, 159).

Types of pointing '(imperative and) declarative pointing' (Lindblom 2007, 160) can be seen clearly in my data in chapter 5 and are a gestural embodiment of the shared experience the participants are engaged with.

Scaffolding

Museums often design exhibits specifically for accompanied children and the term *scaffolding* is a recognised behaviour pattern in mixed age groups. To describe the *scaffold* in basic terms, it is, in the museum context, a simplification of ideas or tasks, where more experienced or confident

members of a group support other group members: 'The adult role in scaffolding children's learning experiences occurs when the adult or parent recognizes that some additional form of support, guidance, or resources is needed to help the child move toward understanding, independent learning or mastery of that task or concept' (Wolf and Wood 2012, 33).

The Enlightened Eye was not designed with a particular age group in mind, however, as previously mentioned, the majority of visitors filmed for my study were in family groups. I witnessed and was able to compare and evaluate a number of mixed age interactions that revealed examples of scaffolding. Supportive scaffolding action between members of a group was revealed very clearly and could also be identified in discrete forms shown in my data analysis in chapter 5.

Situational Interest and Individual Interest

The concept of interest, including its relationship with learning, has been an area for serious study since the early nineteenth century and many assumptions and different lines of theorisation have developed and fragmented. This diversity in research meant that the study of interest fell into decline. However, a revival in the later twentieth century began to focus on two distinct types of interest: individual and situational interest (Renninger et al. 1992, 4).

Individual interest is specific to an individual. This can relate to their career trajectories, a disposition to the scientific or the artistic, or a personal attitude. Its counterpart, situational interest, is used to describe interest in individuals that is engendered by circumstances and environments. The psychologists Csikszentmihalyi and Hermanson assert that this type of interest can be enhanced: 'with a degree of uncertainty, challenge, or novelty' (Csikszentmihalyi and Hermanson 1999, 149). This circumstance could describe a situated museum interactive, such as *The Enlightened Eye*.

Educational psychologists Anne Renninger, Suzanne Hidi and Andreas Krapp describe situated interest thus: 'Like individual interest, situational interest can be described from the perspective of either the cause, the

conditions that induce interest, or the perspective of the person who is interested' (Renninger et al. 1992, 8). Evaluating my data, the 'cause' of interest is not only the *The Enlightened Eye* itself; an examination of video data reveals that situated interest is evidently produced through the involvement of other people within the circumstances. As the organisational theorists Orlikowoski and Baroudi describe: 'Interpretive studies assume that people create and associate their own subjective and intersubjective meanings as they interact with the world around them' (Orlikowski and Baroudi 1991, 5).

Visitors construct, in other words, the choreography of action in the ecology around *The Enlightened Eye*, from a series of reciprocal reactions to objects and to other people within the space. This connects to the work by Irwin Goffman on social interaction (Goffman 1990) that I discuss in relation to the contingent aesthetic in chapter 5.

Extrinsic and Intrinsic Motivation

Extrinsic motivation is powered by a reward from outside of an experience, for example a salary in return for employment, while intrinsic motivation emerges from the reward gained from within a process. Csikszentmihalyi and Hermanson have called this kind of absorbing immersion in an activity 'the flow experience' (Csikszentmihalyi and Hermanson 1999) and wonder how intrinsic rewards can be made part of the museum experience:

> Another universally mentioned characteristic of flow experiences is that they tend to occur when the opportunities for action in a situation are in balance with the person's abilities. In other words, the challenges of the activity must match the skills of the individual. If challenges are greater than skills, anxiety results; if skills are greater than challenges, the result is boredom. (Csikszentmihalyi and Hermanson 1999, 39)

In the case of *The Enlightened Eye*, the ability or skill required in creating a visual response to the selected mineral samples are not necessarily advanced and are tailored to accommodate and encourage individual responses. Indeed, responses are not set; participants may do whatever they like. Navigating the embedded interface is relatively simple, resembling many ubiquitous mobile phones apps. Additionally, the participant is instructed

through the sequence of actions, from selecting a mineral sample through to focusing and then navigating to the touch screen. Interaction design must be considered carefully: Csikszentmihalyi and Hermanson warn that:

> Museum visitors may at first attend to an exhibit because of curiosity and interest. But unless the interaction with the exhibit becomes intrinsically rewarding, the visitors' attention will not focus on it long enough for positive intellectual or emotional changes to occur. Therefore, it is important to consider what makes an experience rewarding in and of itself, so as to understand what may motivate a person to look and think about an exhibit for 'no good reason,' that is, in the absence of external rewards. (Csikszentmihalyi and Hermanson 1999, 150)

The Enlightened Eye data shows instances of rewarding situations, particularly when scaffolding is in place. However, when the actants are not obviously 'correctly' engaged with the exhibit, there is still a reward to be seen and this incorrect engagement could be characterised as playful or ludic behaviour (see below), emerging from shared experiences with others as much as the designed intention of the interactive. Unintentional use is discussed earlier in the evaluation of the *Universal Curator* and the *Narrative Engine*, *The Enlightened Eye* supports and accommodates this by encouraging creative transformation within its design.

Ludic and Epistemic Behaviour

Since *The Enlightened Eye* was created in order to engage the visitor with a museum collection in a playful way, it is worth considering the concept of play in regard to museum interactives. According to the psychologist Corrine Hutt there are two forms of play; epistemic and ludic play (Hutt 1981). Epistemic behaviour asks 'what does this object do?' (Hutt 1981, 251). Characteristics of epistemic behaviour are problem-solving activities, like doing jigsaws, making things or acquiring new skills. During epistemic play, individuals do not like being interrupted, this is clearly the 'flow' described by Csikszentmihalyi and Hermanson and can be seen clearly in the data analysis section, *Time and Relative Dimension in Space* in chapter 5. Ludic play asks 'what can I do with this object?' and features two kinds of approach (Hutt 1981, 251). Firstly, there is symbolic fantasy play, where objects and people are given imaginary names and roles. This behaviour taps directly

into the playful function of *The Enlightened Eye*, where images of minerals can be transformed by drawing. A second feature of ludic play is the carrying out of repetitive actions for self-amusement, sometimes creating new accidental learning (Rennie and McClafferty 2002, 195). This mode of play is evident in the data seen in *Riot Squad* in chapter 5. Movement between these two modes of thinking is possible and evident; children often begin by exploring and investigating to find out more about the potential posed by a new experience; once they have explored its properties, they are then more confident about trying out new approaches for use (Fumoto et al. 2012, 37).

The task of object transformation and re-appropriation that *The Enlightened Eye* offers is open-ended and creative. Since *The Enlightened Eye* is designed to allow for a playful response, it draws out examples of both ludic and epistemic behaviour in visitors. Educational theorists Rennie and McClafferty's analysis of children's learning from a science exhibit, concluded that the 'the poorly designed exhibit invited ludic behaviour rather than a prolonged epistemic behaviour' (Rennie and McClafferty 2002, 209). The data analysis of *The Enlightened Eye* shows that children in particular, need a scaffolding structure to support epistemic behaviour, however engagement with the interactive can be rewarding as an experience for those who demonstrate a ludic approach to engagement.

Implications for Visitor Studies

Within the situated context of a museum, an exhibit can be calibrated to afford and allow a range of behavioural modes in the visitor. An understanding of the ways in which visitors behave supports an understanding of the ways in which an exhibit may be designed. The success or failure in an interactive can be demonstrated by examining visitor behaviour. My study will make use of these implications in regard to the data analysis. The way that visitors move around the ecology of action and the way that they conduct themselves and engage with each other, brings *The Enlightened Eye* to life. In other words, visitor behaviour largely contributes to and constructs the shape of my work.

Conclusion

This chapter has argued that the artist-designer is ideally placed to use the contemporary museum context as a flexible multi-agenda space for proposing unique interactive installations. I have discussed many examples of interpretive projects that are subtle and complex, delivered by artists, curators and exhibit designers but to be able to evaluate types of visitor action and engagement against one's own practice is a unique opportunity and forms a significant mode of art and design research.

Post-modernism in the museum context is examined by Morrissey (Morrissey 2002) in relation to the personal agendas of museum viistors identified by Falk and Dierking (Falk and Dierking 2000). Hooper-Greenhill (Hooper-Greenhill 2007) advises vigilance against the pervasiveness of hierarchical structures that treat visitors as receptacles of knowledge, rather than dialogic actants. Turning attention to the corporeal museum object itself, Susan Pearce's appraisal of the object as subject to variable and rhetorical definitions (Pearce 1994), raises important issues around the narrative aura attached to objects, specifically how intrinsic qualities might be superimposed by the contextual in order to support an editorial dialectic. The agency of an object, Helen Saunderson proposes, is very contingent on its display; an object under glass is conferred with different qualities than those with more accessible materiality (Saunderson 2012). The ways in which the museum artefact can be transformed and remediated by digital resources is of concern and interest for many researchers: Ciolfi, Dudley, Russo and Simon all are excited by the possibilities of the ways in which objects can be culturally expanded by new platforms, so that the object becomes relational, shared and discussed in new ways beyond the museum (Ciolfi 2012, Dudley 2012, Russo 2012, Simon 2010).

Also useful for this study was Hiedi Overhill's conception of designed space as a way of constructing or choreographing behaviour in an audience. Overhill examines the repeated dances that visitors are led on by certain situated architectural structures in a museum and concludes that bodily movement could become the subject of an exhibition (Overhill 2015). This is

an idea that conforms to my own conjecture, that the choreographing of action by *The Enlightened Eye* constructs an aesthetic composition.

The concept of relational art, as proposed by Nicholas Bourriaud (Bourriaud 2002), owes much to Guy Debord's mid-twentieth century Situationist agenda (Debord 1987). This is the idea of fine art as a social game or experiment that prompts interaction between people and the situation. This idea had some implications for my own understanding of design objects and their effect within the social context.

This is a rich landscape full of things and people and ideas, and an occupation of this new space of audience led participation allows for new interpretation; artists and designers are drawn into this rich arena where their own discourse on museum exhibits might flourish. The aesthetic responses to museum objects by Grayson Perry, Phillip Eglin et al. allow for a particular type of interpretation. James Putnam advocates artistic intervention in the museum, concluding that it allows for a useful breaking of boundaries as well as a natural extension of artistic practice (Putnam 2001).

As I have argued in this chapter the museum is also a space for artists and designers to allow audiences to participate and articulate their own views, a practice that recontextualises the museum visitor, allowing them to create meaningful interactions with museum artefacts. Curators suggest that these help not only the visitor, but also the curator, to think about objects in new ways, and there is enthusiasm amongst them for workshops by artists that support close visitor engagement (Jackson 2011).

The Enlightened Eye offers opportunities for museums, museum objects and their visitors are afforded by structured open-ended, creative engagement. To explore and to take account of specific visitor behaviour in a particular museum context and to develop a comprehensible account of those actions set against the unfolding development of a proposal, and the situating of this proposal, reveals what qualities that need to be brought to bear on a project, as I go on to show in the next chapter.

Chapter 4: The Enlightened Eye

Introduction

In this chapter I construct a case study around *The Enlightened Eye*. Here I explain the background to the project, how and why it came about and include some discussion of the design sensitivities surrounding its development and requirements. I also describe the ways in which a project like this can be modelled and broken down into a series of design procedures; I also outline and clarify these broad design procedures against *The Enlightened Eye* project.

I then detail my own practice research methods, the ways in which I assessed the nature of *The Enlightened Eye*'s context in the Liskeard and District Museum and how those factors regulated its design. I also describe the ways in which I drew upon visual imagery and appropriative techniques to assemble the visual, structural and dynamic composition of *The Enlightened Eye*. I also discuss where the visual aesthetics came from and offer images of relevant machinery, of influential paintings and some of the provisional sketchbook work that these inspired, as well as an example of a design by others, that resonates with this approach. Next comes a description of the process of design drawing, through to maquettes and prototypes that helped to establish the concept and its visual composition. I continue with a discussion of the evaluation of the technical process, including the live tests that saw participants drawing over microscopic images. Following this is a discussion of the close collaborations with others that made the project possible.

Finally, I discuss the making and fabrication of *The Enlightened Eye*, and consider the range of material processes and translation of design development research, through to physical construction. This chapter concludes with a brief overview of the finished work and an assessment of its function outside of its final destination.

The Design Brief

On Monday 24 September 2012, I attended an event at Falmouth University's AIR: Academy of Innovation and Research (Falmouth University 2014). The event was called: *In what ways might the Cornish museum sector and University College Falmouth work together for mutual benefit?* At the event, I demonstrated the microscope prototype interactive that I had been working on. I was subsequently contacted by the Curator of the Liskeard and District Museum and was invited to create an interactive in response to the museum's industrial mining heritage collection. This was to become *The Enlightened Eye;* below I describe in more detail the events leading up to and beyond this point.

Anna Monks, Curator of Liskeard and District Museum, had been the driving force in the revitalisation of the museum. It was Anna's vision to improve interpretation in a variety of ways and to show the importance of the mining heritage that is such a significant feature of the locale. It was clear that this was a difficult task and that she was taking a gamble on her choice of the ways in which her vision might be developed. The initial programme of work was to develop aesthetically interesting, tangible installations that would enable new forms of visitor co-participation and collaboration, and in which the spectators become an active part of the work itself. Building on previous projects, in particular the *Interactive Worktable and Escritoire* the designs were to address a principal aim: to create an installation that enables museum visitors, both alone and with others, to explore, curate and exhibit objects and artefacts that are part of an established collection within a particular museum or gallery.

Design Objectives.

In the case of *The Enlightened Eye* the key objectives were:

1. To evoke an enlightenment approach to mineral collection and taxonomy.
2. To enhance flow of visitor traffic to the Liskeard and General Museum by developing a situated interactive.
3. To help visitors to engage with a specific collection of local minerals.

4. To support creative, close inspection of minerals through drawing, a method for enhancing engagement, see Lineamentum page 63.
5. To compliment the context identified within the museum.

I will now use Hetzum's model of a design project (Hertzum 2014) to introduce the project and evaluate where the characteristics identified in my own practice are located.

The Vision Project

The vision project in regard to *The Enlightened Eye* is the way in which the initial concept was conceived and rendered through drawing and prototyping; it was indeed a project seeking a solution. A vision project can be used to communicate ideas to a third party and in this case Liskeard Museum were convinced by the vision. The job of any designer or artist working in the public context is to develop a convincing argument for their project: describing the project through speculative images is one way of doing this, to describe the project and create a vision. In the case of *The Enlightened Eye* the vision builds on my own interest in developing visually dynamic objects that can enable creative interpretive behaviour in its users. A useful method for convincing the museum stakeholders of the purpose and efficacy of this concept were illustrations of previous projects, including photos and film footage of use. These presentations showed how key characteristics of my practice; participative engagement with kinetic interactives, afforded creative interpretation. Additionally, I was able to demonstrate how this engagement occasioned informal learning and intrinsic interest within visitor groups in my data analysis in chapter 5.

The Existing Situation: Analysis of Project

The Enlightened Eye was proposed, developed and deployed specifically for this PhD project and provides the central core of primary research data. The function of the installation was to enhance visitor experience of a particular collection of mineral samples and was developed in close collaboration between artist-designer, museum professionals and technology specialists. The agenda for Liskeard Museum, located in a small rural Cornish town, was to communicate information about its local geology and mining heritage,

particularly through its collection of minerals, to serve the visitor in a more interesting and accessible way. The museum's existing displays were, according to the curator, uninspiring and unfit for purpose, being ill lit, and inaccessible to some, with poorly designed interpretation.

Figure 90: The original mineralogy cabinets at Liskeard Museum, image: J. Cleverly 2013.

For me, as the artist-designer, the commission presented a particular challenge not uncommon to small rural museums: the museum had a relatively low footfall and was seeking to increase it with the injection of a rather modest amount of money. There were also positive aspects, in that the curatorial team were open and enthusiastic, giving me a chance to shape and explore design concepts. For the designer in me the project provided an interesting, practical problem to solve; for the artist in me, it provided an outlet for my aesthetic creative drive, a vehicle for expression.

The Construction Project: Technical Possibilities

The physical properties of the design were to occupy a particular space with a functioning interactive, a self-regulating performative machine. The technology included a digital microscope, a touch-screen computer, kinetic controls and furniture-like sculptural dynamic forms. I made maquettes tests and working sketch models, and engaged with the construction processes, such as the digital routing. Additionally, I directed requirements for the digital interface with my collaborator and technology specialist, Tim Shear. The use of the digital to create an image seemed appropriate as a tool for making *The Enlightened Eye* versatile and understandable to the museum visitor and as a way of preserving their creative efforts. In the case of *The Enlightened Eye*, the digital component is prominent but owes more to the updating of technology, a knowing and direct line from Leeuwenhoek and Hooke.

For the designer, this concerned the selection and development of ergonomic, physical use. The artist's approach focused on the visual aesthetic affordances and the dynamic form.

The Process Project

The process project examined the efficacy of the concept, using prototypes to evaluate use, iteratively adjusting the design and continuing in the case of *The Enlightened Eye*, to live tests on the finished piece. This perhaps is the most design focussed part of the project, as the question became what actually works in an approximated context, and was the modelling and modification of subsequent iterations sensible? This proving of concept applied to the aesthetic affordances, as well as the practical aspects of use.

Responding to Jensen's Art and Design Characteristics

I will now use Jensen's chart that I introduced earlier to evaluate the design and the artistic qualities of *The Enlightened Eye*. I am not responding to Jensen's substantive findings here, in which she tries to define hybridity by evaluating objects against her list of characteristics, rather I have measured her rubric against my *Enlightened Eye* project. According to Jensen, design and art can be discretely divided into two sets of characteristics and she has devised a chart to show this (fig 91). To help to try and establish a

description of the aesthetic affordance and the hybrid nature of the *The Enlightened Eye*, I began marking those which I think could be applied to *The Enlightened Eye,* they can be seen here as interchangeable between Jensen's defined sets and my project to help me investigate distinctions and similarities. Those I have marked in yellow seem easily ascribed to *The Enlightened Eye*. However those marked in pink are less easy to assign to *The Enlightened Eye*: they are more problematic and in some cases hard to define against the projected response of museum visitors and the intentions of (myself) the artist.

Diagram of parameters or characteristic elements related to design and art

Design	Art
Function	Non-function
Practical usability	Contemplation
Using	Seeing
Utilitarian purposefulness	Disinterested, artistic perception
Meaning related to function	Meaning/content
	Aboutness
Requires understanding of use	Requires interpretation
	'Enigmatic' character
	Symbolic and expressive qualities
Problem solving activity	Problem raising activity
Solutions	Critique
Impact on people's lives/ social relevance	Reflects on human and social conditions
Part of consumer society and everyday life	Commenting on / critique of everyday life
Heteronomy	Autonomy
Close relations to technology, economy and commercial forces	Indirect relation to surrounding society
Constrained creativity	Self-initiated and free experimentation

Structural frameworks related to design and art

	Design	Art
Production/creation	Industrial mass production Repeatable items Everyday objects	Unique production Singular objects Artworks
Distribution/Circulation	Potential for wide distribution on consumer market ➜ potential massive impact	Circulated in galleries, museums and exhibition spaces
Consumption/Reception	Consumption in concrete usage Reception or evaluation relates to function and form	Contemplation Reception relates to form and meaning/content

Figure 91: Jason Cleverly. 2015. Annotated chart from Jenson, yellow easily ascribes to the Enlightened Eye. Pink less easy to assign to the Enlightened Eye, image: Jensen/Cleverly 2015.

The category *aboutness* in the art column is concerned with the reflection and critique on the condition and intention of artworks and is a special condition of art; *aboutness* is described as the way in which '(art) works have a theme or content that they address; they deal in the broadest sense with our thoughts or living conditions' (Danto in Jensen 2015, 68). When applied, this means there is content to be apprehended, made sense of, and which

may, in many cases be enigmatic in nature. This is clearly the situation with art works, but not traditional concepts of design. However the product of an artist-designer might shift this emphasis towards intelligibility of use in developing a relational object for a specific context, addressing a design in a personal way and introducing a mix of the idiosyncratic and the tacit to the problem.

I have created a new table that adds to Jensen's, a structural framework that asks what the artist-designer values in terms of characteristics and what could be conceptually applied to the visitor's response and consumption of *The Enlightened Eye* project.

Design	Art	Valued by Artist-Designer	Visitor consumption/reception
Function	Non- function	Interpretive function	Interpretive function
Practical usability	Contemplation	Both	Yes and perhaps
Using	Seeing	Both	Both
Utilitarian purposefulness	Disinterested artistic perception	No	No
Meaning related to function	Meaning/content	Both	Perhaps and perhaps
	Aboutness	Yes	Not necessary
Requires understanding of use	Requires interpretation	An attempt to combine design affordance with aesthetic affordance	Yes and perhaps
	Enigmatic character	Not too much……	To attract attention
	Symbolic and expressive qualities	Yes	Not necessary
Problem solving activity	Problem raising activity	Both	Yes and perhaps
Solutions	Critique	Yes and yes	Yes and perhaps
Impact on people's lives/social relevance	Reflections on human and social conditions	As an educational creative tool and as a research tool	Not necessary
Part of consumer society and every day life	Commenting on/critique of every day life	No	No
Heteronomy	Autonomy	If the museum is the client some sense autonomy arises from risk taking opportunity	If the museum is the hegemony a sense of autonomy is effected by creative freedom of EE
Close relations to technology, economy and commercial forces	In direct relation to surrounding society	No	Mining context
Constrained creativity	Self initiated and free experimentation	Yes and to a degree	Yes and to a degree

Figure 92: Jason Cleverly. 2015. Parameters and characteristic elements related to design and art annotated after Jensen, image: J. Cleverly.

Two useful characteristics, which apply in both columns, are firstly that it is a *problem solving activity*; a distinction applies here to both the artist-designer's problem of designing a work that is in itself a problem solving

activity for the visitor. The particular problem that I wanted to solve was that of situating creative action within a museum context.

Secondly, the *problem raising activity* asks users to consider how to approach activities in alternative ways. In the case of the EE, how to look at and interact with mineral samples through playful drawing, rather than through a didactic interpretation. In the context of the museum this is evident in the data. If memory and meaning made during the interaction is potent enough, then the visitor can continue to reflect on the experience in the future. This can be seen in Falk and Dierking's longitudinal studies of the museum experience, where visitors are interviewed about their experiences, both during a museum visit and several months later, which reports that interactive exhibits with engaging kinaesthetic affordances form deep memories (Falk and Dierking 2000).

One distinction between art objects and design objects is that designed objects are able to justify their existence by functionality, whereas art objects do not. Increasingly however, art objects created for experience, such as the relational art of Carsten Holler described by Bourriaud, have to take on functional purpose so that they can work safely and effectively in the real world and here this distinction begins to break down. I consider my own work to be a hybrid design artwork: its functionality is essentially interpretive and therefore it is a design work; it is an artwork that is not free from functional intention. Additionally, it's the interpretive, experience-making functional capacity that also allows for artistic expression in the visitor, regardless of the overarching didactic agenda of the museum environment.

Practice Research Methods

Hertzum's process project relies on establishing how change is brought about, asking, what are the methods that establish the validity of a vision project? In this section I will discuss my research methods. I describe how they are broken down into areas that cover making, testing, thinking, collaboration and planning in practice. In order to introduce these elements, they are separated out into discrete, descriptive headings. This disentanglement process required a provisional assessment, a list making, mapping procedure to probe and tease out the '*valid and reliable'* (Gray and Malins 2004) from the dense jungle of information. This mapping, in turn, becomes a tool for interpolation as well as a description of the data.

I identify my practice as a generative, on-going and reflective process; I am a researcher in action, using contextual referencing, design practice and field studies to analyse and critique my role as an artist-designer. Designs are developed through a cyclical application of drawing, maquette-making and material tests and the application of collected research materials. This part of my practice aligns to Hetzum's process project. This leads to the construction project, which results in the final piece. These were not the only components needed to support this project. There were also site visits and meetings, recorded and supported by extensive photo-documentation and note taking, both paper-based and digital.

Practice research methods are further broken down into six key areas of activity: these areas are defined as *develop, collaborate, make, test, context* and *collect.* A diagram of these of visual materials and processes can be seen in the practice research methods diagram (fig 91). Whilst there are six individuals arrayed around a central, larger cog, this does not mean that each cog is a discrete and impermeable method; a separating-out of methods will help clarify their importance. In order to describe the methods that served the project, I will describe and define each 'cog' with significant examples of practice: two categories: *context* and *collect,* describe the process of thematic, visual and compositional research; *develop* is the synthesis by drawing and model making of the previous methods; *test*

concerns evaluation of the design prerequisites that support both the visitors and the collection; *collaborate* examines the support and negotiations undertaken with key partners, and lastly *make* explores the practical requirements covering fabrication and assembly. Each of these research methods contributes to the final assembly of the work; they are ineluctably interrelated, however to separate them into discrete divisions allows for closer analysis and description of the procedures that this project entailed.
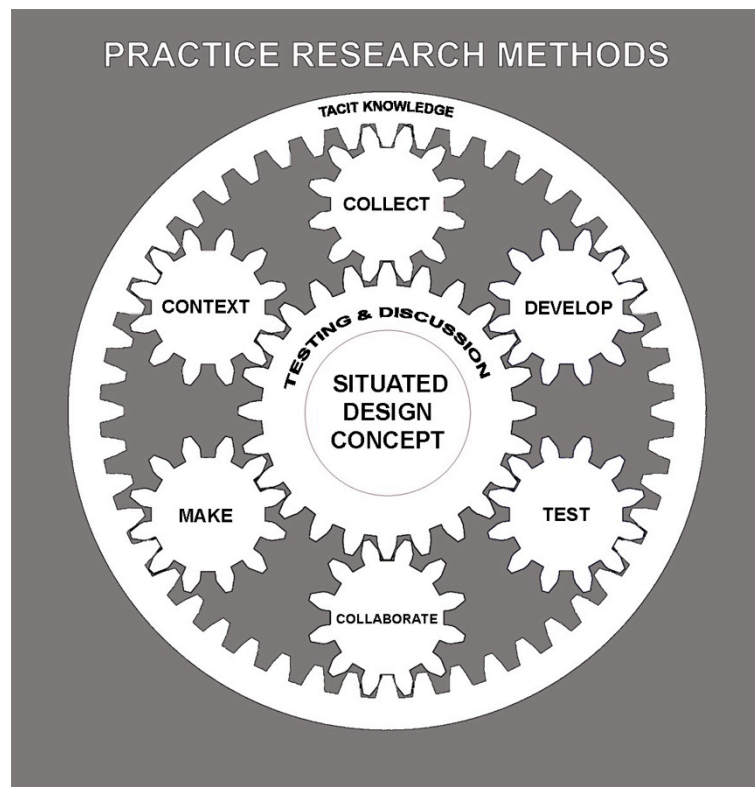
Figure 93: Jason Cleverly.2015. Practice Research Methods diagram, image: J. Cleverly 2015.

Context: Addressing the Collection

A highlight of the Royal Cornwall Museum in Truro is Phillip Rashleigh's (1729–1811) mineral collection (Natural History Museum 2015) that is housed in a large space filled, with dark wooden cabinets with many drawers and glass vitrines. Alongside the many interesting and curious mineral specimens are also examples of Rashleigh's work and life, including his collaboration with artists such as Henry Bone and Thomas Underwood, who had been commissioned to create detailed drawings of Rashleigh's finds.

Rashleigh's pursuit of mineralogical study earned him a fellowship of the Royal Society in 1788. He was working at a time when the study of natural phenomena, including minerals often exposed and revealed through the mining process which also funded this endeavour, was part of the taxonomical cataloguing of natural specimens, a way of taming nature through understanding and categorisation and a process, bound up with the Enlightenment. The Enlightenment covers a period in Europe towards the end of the Renaissance and which continued through to the late eighteenth century. The beginnings of the Enlightenment's first scientific revolution are bound up with scientists such as Galileo and Copernicus, who risked much in publishing their revolutionary, not to say heretical findings of astronomical structures. Their story is well known and it was these scientists that opened the way for many others, who changed accepted perceptions of the world, these included's Robert Hooke's microscopic revelations and the work of Sir Isaac Newton, who added, by scientific enquiry to a progressive movement of thinkers and scientist who questioned the orthodox religious and hereditary hegemony, through cumulative empirical rigour.

Figure 94: John Opie. 1786. A Gentleman and a Miner with a Specimen of Copper, Image: the Royal Institution of Cornwall 2015.

The idea for the interactive work that was later to emerge as *The Enlightened Eye* had been developing in my mind and in sketchbooks for a number of years. Inspired by the Rashleigh Collection at the Royal Cornwall Museum, with its large splendid gallery and impressively theatrical post-modern space clearly designed to evoke scholarly study (fig 95). I was very excited at the prospect of responding to this collection.

Figure 95: The Rashleigh Gallery Royal Cornwall Museum Truro, image: J. Cleverly 2012.

This gallery though, often appeared rather under-populated by visitors despite its wonderful collection; perhaps I could help attract more traffic with an interactive piece? I approached staff at the Royal Cornwall Museum with my idea and they were initially interested in the interactive which lead to sketches and tentative design proposals. In spite of their interest and despite securing funds for the development of a prototype, the RCM felt that they were unable to collaborate. The museum at that time was undergoing institutional transition, a change of director and staffing constraints. It appears that medium-sized institutions can come under a lot of financial

pressure and they cannot afford to take risks, or release staff time for writing funding bids, a time consuming and frequently speculative process ('Hilary Bracegirdle'. 2016). The museum therefore required strict focus on core functions; any initiatives such as mine were unfortunately beyond their remit.

I would very much have liked to work with the Rashleigh collection as one of the foremost mineral collections in Britain created by a gentleman scholar. I was inspired by individual biographical details embedded in the collection and Rashleigh's interests and preoccupations formed a particular picture in my mind of a characterful figure of his time: one might expect him to show great interest in the latest theories, tools and procedures of scientific enquiry. This was a time, after all, when wealthy individuals, mostly men, with time and energy, were able to make important discoveries, or at least to amass significant collections with important contributions to be made for the study and advancement of ideas about the world. These characteristics would have made a useful starting point for the proposed project.

Since the Rashleigh collection had been an important but abortive starting point for a piece that allowed creative interpretation of mineral samples, I had developed the microscope interactive prototype, to resonate with the eighteenth century styling of the Rashleigh gallery. A subsequent meeting with the curator of Liskeard and District Museum allowed the realisation of this proposal in a new but equally valid setting. Liskeard and District museum was keen to reinvigorate their collection in a number of ways and had secured funding for the development of their galleries, including lighting, cabinets and interpretive resources. In contrast with the Royal Cornwall Museum, Liskeard and District Museum were very open to my proposals. I felt that this openness was partly due to the character and energy of Anna Monks, the Curator, and partly due to the fact that perhaps a small museum like Liskeard would be more likely to take risks with a new experimental and untested interactive piece.

Working with the curator over a number of months prior to installation, there were many discussions and negotiations of how the work would fit and operate within the space, and what curatorial objectives the work would

address. Liskeard Museum has a mineral collection particularly significant to the local area, where the mining heritage of east Cornwall is an important feature of not only industrial but also social consequence. Some regular visitors to the museum, as previously mentioned, are sometimes also contributors to the collections. They may have mines on their land or be from mining families, or just interested amateur geologists. Other visitors come from post-industrial landscapes, places like Wales or Germany, and hold a shared common interest in mining heritage. This museum is actively alive to its context.

Figure 96: Liskeard and district Museum, Liskeard, Image: J. Cleverly 2014.

The museum was originally a bank, a Victorian Gothic building, one of the fine eighteenth and nineteenth century buildings that make up the centre of the small town of Liskeard. These buildings are an indicator of the wealth

generated in the past by the mining industry in this part of Cornwall. This small museum is full of highly localised museum artefacts, reflecting the mining history that has made Cornwall and West Devon a Mining World Heritage site (Cornwall and West Devon Mining Landscape 2016). The museum is composed of a number of interconnected rooms, each with themes of local history, displaying objects including maps, costumes, Meccano models of mining machines, and in one room, amongst a display of cameras and photographic equipment, is a large nineteenth century bellows type camera. Aligned to a life-sized mannequin, as if posed for a portrait, this camera was the focus of attention for visitors as people, including myself, looked at the upside-down image on the ground glass plate, this interaction prompted by a recognisable aesthetic affordance situated within an ecology of action.

Figure 97: Nineteeth Century Portrature Camera Liskeard and district Museum, Liskeard, image: J. Cleverly 2014.

The mechanical and visual dynamism of the camera (obscura) here provoked an interaction with a display and a number of operational handles for the camera were also resonant with the design of *The Enlightened Eye*.

Figure 98: Anon. Date unknown. Daniel Gumb's House Souvenir Postcard printed by Botterall & Son Liskeard.

The room in the museum that was to house a new minerals display is named after the curious figure of Daniel Gumb. Gumb was an autodidact mathematician and astronomer who, until his death in 1735, lived with his wife and raised a large family in a cave near the village of Minions, a few miles distant from the town of Liskeard (Spreadbury 1972, 34). This cave is surrounded by a landscape visibly affected by centuries of mining activity. As part of my early exploration of the locale I visited Gumb's cave, which still bears the Pythagorean diagram etched by Gumb on its granite roof. The cave is set beneath an extraordinary natural stone monolith known as the

Cheesewring (fig 98) and looks out over the many, disused mining engine houses dotted about, as well as the Neolithic stone circles known as the Hurlers. Whilst not in the same rarefied league as the Rashleigh Gallery collection, I began to appreciate that this was an amazingly rich context for a project. Back at the museum I began to take photographs and measurements of the proposed space and started to consider my approach to the project.

Collect: Visual Research

The term *collect* concerns the process of gathering and identifying suitable, useful imagery and forms, applicable to the development of the aesthetics and the design of *The Enlightened Eye*. This imagery is used to make aesthetic choices that inform the design and form an applied visual aesthetics project. Themes are sourced from representations of three-dimensional artefacts found on the web or photographed by myself in museums, as well as etchings drawings and paintings. These are key aesthetic and compositional source materials. I have always referenced and appropriated in my work. Sometimes this has included wholesale theft of

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paintings, but also more understated, latent compositional echoes of certain images and objects.

In outlining some examples of appropriative practices that resonate in various ways with this project, I want to show how important this process is, and additionally I will describe the way in which appropriation works for my use of a visual aesthetic.

The two main mechanical, dynamic forms that *The Enlightened Eye* draws upon for its visual and practical affordance are those of the camera obscura and the orrery. I determined to conflate these two forms, with the addition of an acrylic dome placed over the orrery recalling Wright's *Experiment on a Bird in the Air Pump* - and to support the orrery on a drum table. Fig 100 is an aide-mémoire of the compositional direction that *The Enlightened Eye* was to take.
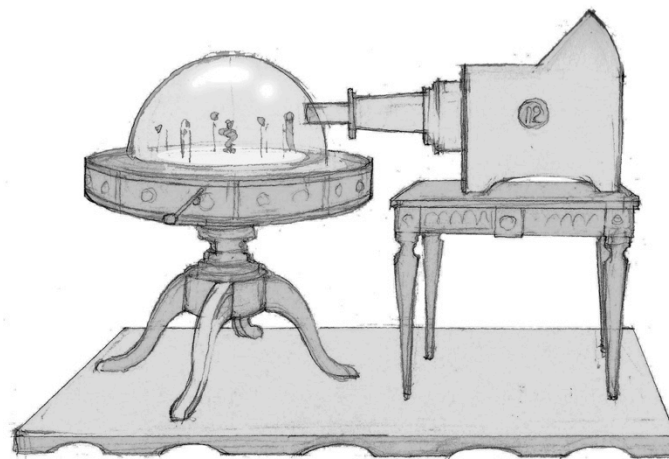
Figure 100: Jason Cleverly.2015. Design drawing of the Enlightened Eye, image: J. Cleverly.

I will now detail relevant aspects and features of the camera obscura and the orrery, as well as the drum or library table, to help describe why they were chosen to inform the design of the project.

Visual Aesthetic: The Camera Obscura

A visual and practical understanding of the camera obscura came about through work on earlier projects, such as *The Universal Curator.* Any

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investigation of the history and design of the camera obscura reveals a wealth of instructive illustrations. These are an important resource for the construction of a sense of engagement within the visual aesthetic. In fig 101 we see an example of an obscura in use. Note the air of intent in the user.
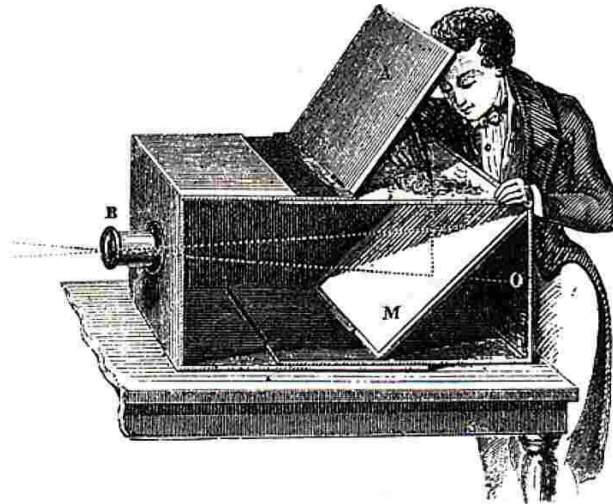
Figure 101: Anon. c.1875. Artist using a box camera obscura from Well's Natural Philosophy by David A. Wells 1875, image: public domain.

Like the magic lantern the obscura was a precursor to many later important technologies. The camera obscura is an enclosed space with an aperture on one side and an inverted image of the outside is cast, as the light rays pass through a lens in the aperture. The camera obscura has a long history, the principles having been identified by Aristotle in the fourth century (Hockney 2006, 202). The earliest recorded practical application of this principle in Europe was in the thirteenth century, when the English scientist Roger Bacon and his contemporaries began using a room-sized camera obscura to study solar eclipses (Terpak 2002, 308).

The camera obscura took two forms: the first is the self-explanatory 'room' camera obscura; the second a smaller, portable form used for drawing in a number of contexts and the clear precursor of the photographic camera. The obscura is, in many ways related to the magic lantern. There is though, a satisfying contrast between each device: in one, the constructed image is

projected and in the other, the unconstructed image is extracted from reality via a lens, the same configuration in reverse.

The basic design of the obscura was greatly improved by the development of lens technology. This brought about improvements in controls that enabled the user to sharpen and focus, and the positioning of internal mirrors to project the image correctly onto semi-opaque glass panels. Technical advances made the equipment perfect for drawing and tracing, for extracting information from the real world, achieving a new kind of observational vérité as equally extraordinary as the microscope, in allowing a new exploration of the world. This capacity of the camera obscura to create an attitude of intent in those using the machine, engaging carefully with the image, was a functionally and compositionally important characteristic of the camera obscura, and as with any device, to be complete it needed users. The obscura then is a critical compositional template for *The Enlightened Eye*; it produces an intent drawing attitude in a user, married to the dynamic form of the design. The obscura is a structure that allows for an overlay of new digital technology. A digital microscope and a touch-screen panel could be embedded within, complimenting and resonating with the proto-photography qualities of its structure.
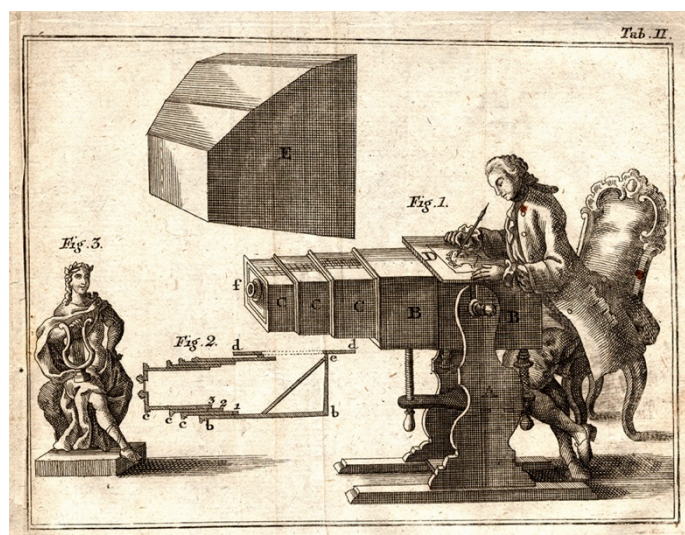
Figure 102: Georg Friedrich Brander. 1769. Drawing with the help of a camera obscura, image: G.F. Brander 1769.

Fig 102 shows an early example of the camera obscura in use. To me this image is wonderful; revealing a dynamic form and intent of use, it also prefigures modern technology, as well as exposing a kind of glamorisation of scholarly study that requires complex and seductive apparatus, fetishizing a machine that confers a romantic new power on a privileged few.

Visual Aesthetic: The Orrery and the Bell-Jar

An orrery is a mechanical model of the solar system, portraying the known planets and their relative position to the sun. The earliest of these were developed in the early eighteenth century; often made of brass they were principally designed as a teaching aid and were often highly decorative and fascinating objects that complimented the sophisticated household of the day (Museum of the History of Science 2016).
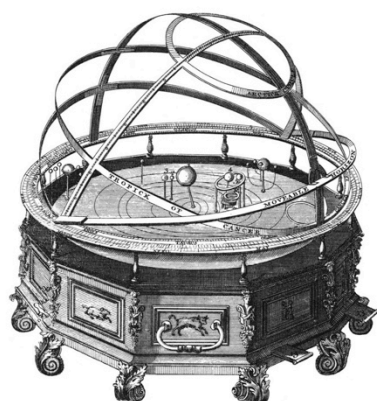
Figure 103: John Rowley.1749. An Orrery of John Rowley, Image: Detail of an engraving from The Universal Magazine 1749.

The idea for a hemisphere containing mineral samples occurred to me quite early on. Fig 104 shows a provisional sketch of a bell-jar structure, on the same page is a note of Phillip Rashleigh and the artist Wright of Derby's roughly contemporaneous birth and death dates.
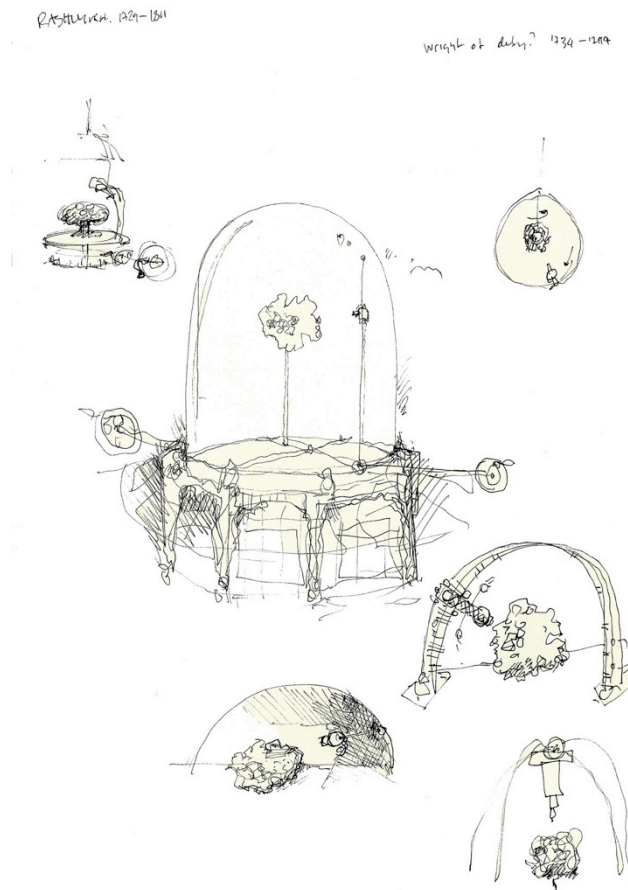
The paintings of Joseph Wright of Derby (1734-1797) and in particular *An Experiment on a Bird in the Air Pump* (National Gallery London 2014) painted in 1768 and *A Philosopher Giving that Lecture on the Orrery, in which a Lamp is put in the Place of the Sun* (Derby Museums 2014) painted in 1766, are important influences. These two paintings capture, through their use of pronounced tenebrist chiaroscuro (Murray 1997, 440), an intense theatrical quality of enhanced concentration on the faces of those gathered around. Art historian Richard Holmes describes Wright as having 'reinterpreted late eighteenth century enlightenment science as a series of mysterious, romantic moments of revelation and vision' (Holmes 2011, xix).

Figure 105: Follower of Jan Joest. 1515. The Adoration of the Christ Child (detail), image: © The Metropolitan Museum of Art, 2000–2017.

These paintings, along with others by Wright, often contain a central point of illumination, whilst drawing upon on the stark, dramatic lighting of Caravaggio and it is very clear that these are new, secular nativities. Wright clearly adopts and directly channels the mystical effects of a religious painting (fig 105), science superseding religion in a new age where there are uncertainties of faith. Even the bird in Wright's bell jar is a white dove, positioned to echo the dove often seen depicted in the annunciation.

Figure 106: Joseph Wright of Derby. 1766. A Philosopher Giving that Lecture on the Orrery, in which a Lamp is put in the Place of the Sun (detail), image: © Derby Museums 2014.

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The Wright paintings are significant to this study, in that they show enlightenment science being demonstrated to educate and entertain an audience of men, women and particularly children. 'Wright paints a picture of the ideal education: the children in his painting are not forced to learn by rote, but to acquire scientific knowledge through their natural inclination to play' (Hagen 1996, 130). These images contain clearly fascinated young people, revealing both beatific and horrified expressions as they are exposed to cutting-edge educational science. They are the iconic illustrations of the reach and illuminating power of the Enlightenment.

Figure 107: Joseph Wright of Derby.1768. An Experiment on a Bird in the air Pump (detail), image: © 2017 The National Gallery London.

The use of a painting as a metaphorical visual influence on design can be seen in designers Alison and Peter Smithson's 1956 *House of the Future* (Alison and Peter Smithson 2016)*.* The Smithson's acknowledged a fifteenth century painting, *The Garden of Paradise,* attributed to the Master of Middle Rhine (Städel Museum 2016) as a 'conscious crib' (Colomina 2016 , 58) and an 'enabling image' (van den Heuvel , 113) for the Smithsons. *The House of the Future* contained a furnished central area with a small private garden lit by a skylight; these elements were appropriated from the painting, including a distinctive hexagonal central table. This kind of borrowing accords with my

own procedure of extracting a quality and aesthetic arrangement, as seen in Joseph Wright of Derby's paintings.
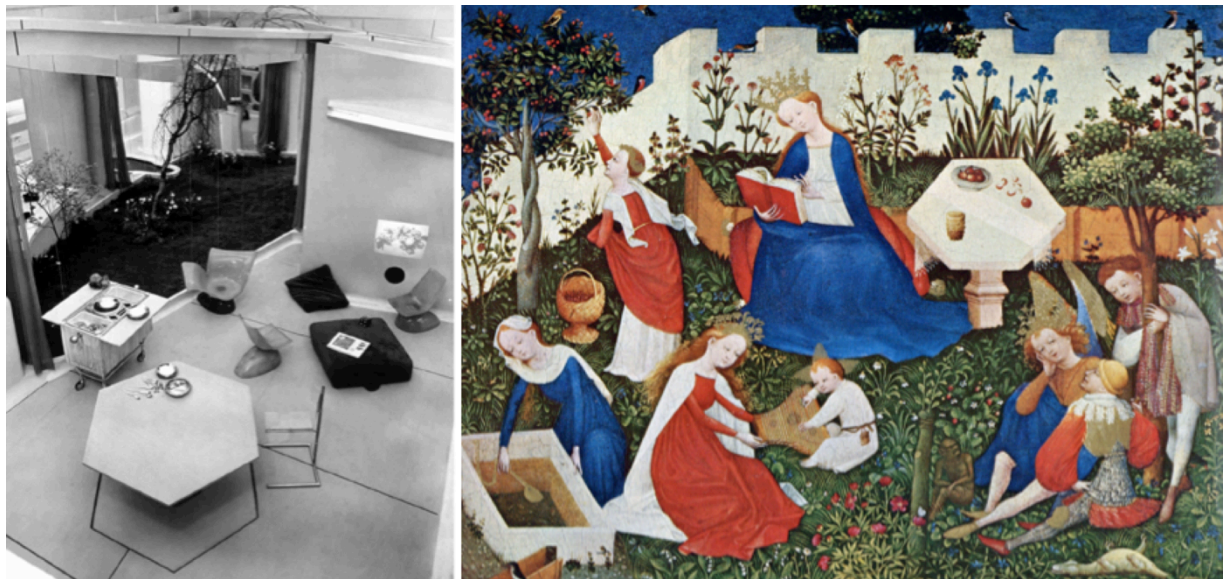
A sensitive appropriation of a visual image is wholly appropriate for the way in which particular spaces might be considered and communicated through a resonant image. For me, this inclination to lean on representational paintings, manifests as wholesale appropriation seen often in my earlier work such as *Hergés Pig* or *Deus Oculi* and it has been influential, more subtlety echoing through my design-process.

The representation of scientific equipment was of great interest to me and meaningful for the project, in particular the use of glass of the bell-jar, which suggests a quality of preciousness and otherness in its contents and critically the orrery, a hand operated, mechanical representation of the solar system. In discussing the value of the orrery in Wright's painting, the art historian Rose-Marie Hagen suggests that: 'The reputation, or even renown, of this mechanical representation of the dynamics of celestial bodies was founded not only on its simulative capacity, but also on the apparatus itself as the product of the latest developments in technology' (Hagen 1996, 128).

These images contain important key aesthetic and symbolic compositional qualities and components that I wished to draw on. They contain not only richly rendered signifiers of science and exploration, aimed to appeal visually to an audience and to create aesthetic affordances, but also construct a choreographed tableau of *a gathering around* of people intent on an illuminated subject. This focus can be seen in groups of visitors in contemporary museum settings, where something is happening or can be undertaken, thus inviting situated action by visitors (fig 109).

Figure 109: Intaglio seal display at National Trust Tyntesfield, image: J. Cleverly 2016.

To support the orrery and bell-jar, a structure known as a drum or library table, I considered to be ideal. These kinds of table were popular in the late eighteenth century, fitting with the time-scale of the design and were of a particularly appealing visual form, having brass handled drawers all around and a visually appealing pedestal base. The visual dynamic of these round tables is a generosity of freestanding form, allowing access from any angle. Like King Arthur's it is egalitarian and is to me, reminiscent of the golden ball interactive table of my youth.

Figure 110: Anon.c.1810. A Regency Period Mahogany Drum or Library Table, image: © 2017 Online Galleries.

Develop: Drawings and Maquettes

This category of method concerns the synthesising of source material through the use of hand drawings, photomontage, maquettes and prototypes, to help move the project forward and to assess visual and physical qualities of the proposed design.

Figure 111: Jason Cleverly.2011. Joseph Wright of Derby and Lego montage, image: J. Cleverly 2011.

During this part of the design process, drawings of the structure evolved and cross-pollinated other ideas I had been working on, for example, a proposed interactive for the Porthcurno Telegraph Museum in West Cornwall (Porthcurno Telegraph Museum 2016). This piece proposed that a small camera be guided over a topological model of the seabed, so that museum visitors could gain a sense of the vast, submarine landscape across which underwater cables lay. Drawings were composed, a working test model was constructed and although the project was not fully realised, it afforded an opportunity to consider a closed structure that used a controlled camera to engage with small-scale detail.
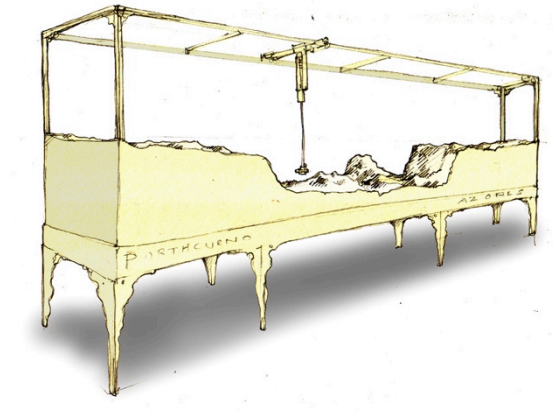
Figure 112: Jason Cleverly. 2012. Porthcurno Speculative drawing, image: J. Cleverly 2012.
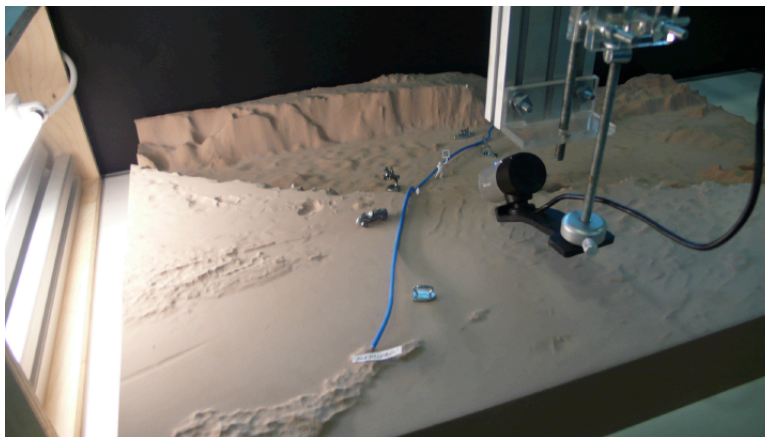
Figure 113: Jason Cleverly & Justin Marshall. 2012. Porthcurno interactive test, image: J. Cleverly 2012.

The artist-designer is always considering how to recycle ideas, how to create opportunities for the ideas they have, and how to test out possibilities. Even if they remain as tests or drawings, ideas are considered and held on to, as materials for new works and fragments of old; it is a broad, interchangeable, iterative and speculative process.
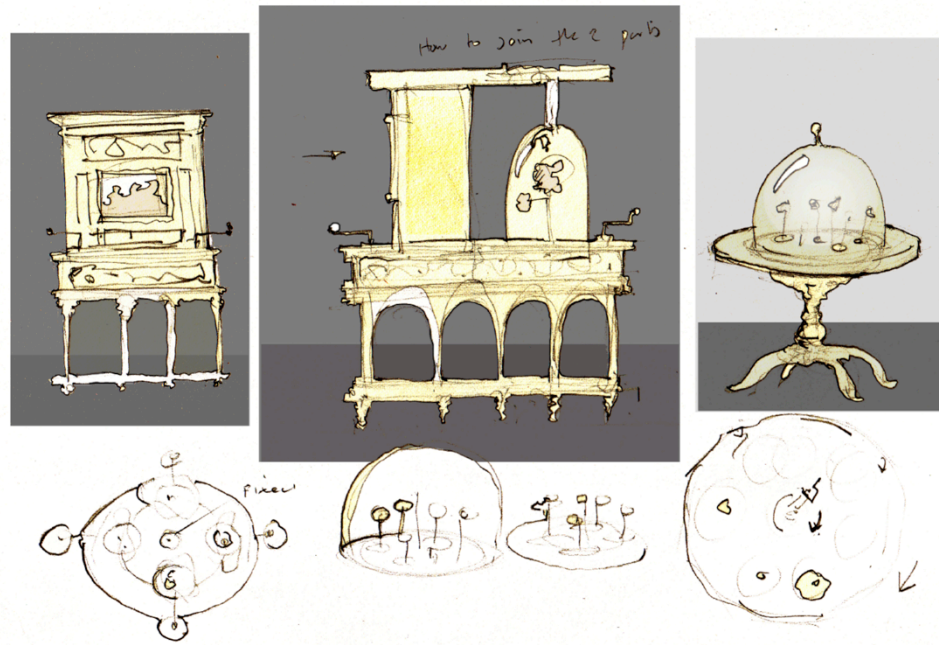
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Fig 114 shows tentative, structural compositions, including a bell-jar on a round table. The next stage for *The Enlightened Eye* project was to make a basic working three-dimensional 'sketch' of the concept. The design for this took some of its visual essence from the Rashleigh gallery collection and Wright of Derby's bell-jar.

A blown glass dome supported by a metal structure I had acquired, contained small-scale material samples on a raised, rotating platform, including a dead fly, a fossil, a bird skull and mineral samples. The dome also encased within it a USB microscope, positioned above the platform and an elaborately over-engineered handle allowed the user to turn the platform to change the view of the samples, while a secondary handle enabled a change in focus where required. The camera could be attached to a computer to allow closer inspection of the samples.

Figure 115: Jason Cleverly. 2012. Micro viewer prototype sketch, image: J. Mann 2013.

The design for the new interactive piece, whilst based on the sketch test, was to be much larger and more complex in structure. It also was to be networked: the digital microscopy enabling museum visitors to explore minerals close-up and to make their own digital, hand drawn annotations and share their creations online.

Figure 116: Jason Cleverly. 2012. Micro viewer prototype sketch (detail), image: J. Cleverly 2012.

The idea of inviting the visitor to participate in a drawing exercise was conceived to give the visitor an idea of the taxonomic process of closely observing mineral samples. Before the advent of photography, artists employed to render accurate representations, as part of the scientific process, routinely drew natural history specimens. Drawings were made of the Rashleigh collection of Cornish minerals by, amongst others, the painter Henry Bone (1755-1834) and these drawings formed an important part of the cataloguing and evaluation of the composition of minerals. Drawings of natural history specimens were a useful way of sharing specialist knowledge and representations were nuanced by the artist's eye. In order to provide the visitor with the opportunity to create similar drawings, a touch-screen digital tablet, attached to a microscope would be embedded in the structure of the machine. As discussed previously, the microscope is emblematic of the story of scientific discovery since its early development, so that the principle of magnification is well understood and part of 'the cult of public science' (Stafford 1994, 144). To embed a microscope in a larger structure that could be read by visitors in the museum context, I was interested in using the

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compositional configuration of the camera obscura, combined with the orrery, as can be seen in the cardboard models below.

Figure 117: Jason Cleverly. 2012. Initial Card Model, image: J. Cleverly 2012.
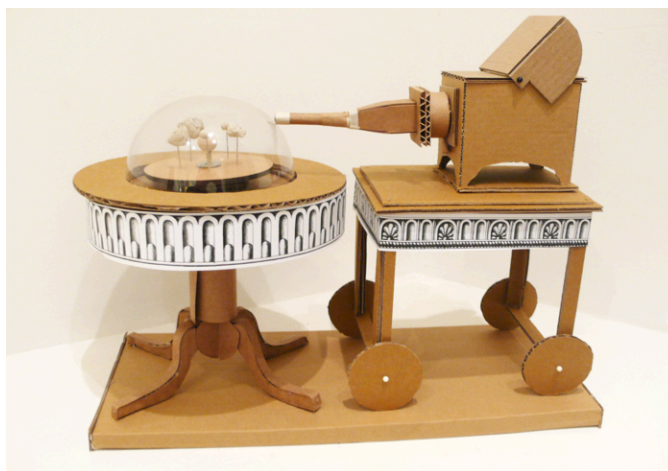
Figure 118: Jason Cleverly. 2012. Final Card Model, image: J. Cleverly 2012.
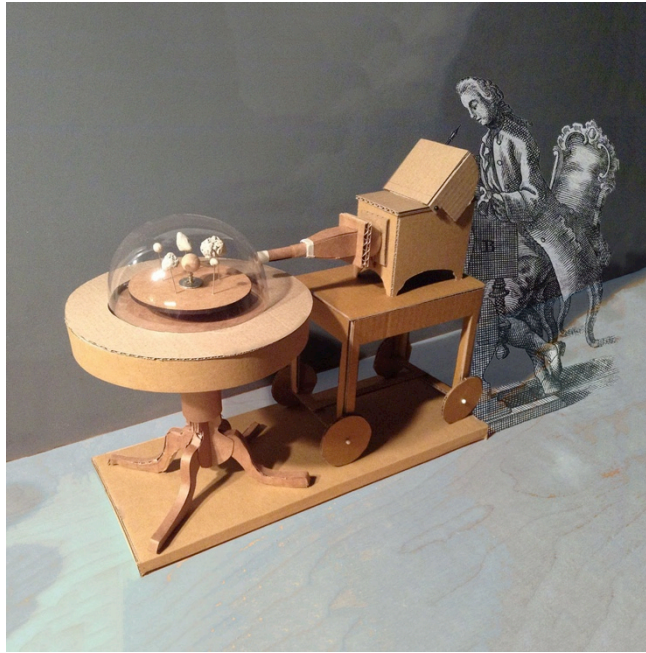
The structure of the camera obscura/microscope component and its compositional relationship to the orrery element was developed through drawings, maquette making and a study of the various types of portable camera obscura. The intention of this conflated assembly was to assist the museum visitor, firstly in reading how the device may be used and secondly so that the appropriation of these aesthetic design elements could underpin and reanimate an understanding of the historic, and ignite a sense of the wonder and discovery seen in the Joseph Wright Of Derby's paintings. I also wished to evoke some of the excitement revealing effects and images that early microscopy had created in the spectacles discussed earlier.

The Enlightened Eye is a complex interactive, requiring a set of instructions for the user. However there are discrete controls that can be seen as intuitive in their operation, and there are some basic, logically designed structures that can be navigated and approached. Yet it is clear that there ways of approaching and using objects that are designed with more playful intentions than that of a toaster or an iron. Designing a multi faceted, multi-modal structure like *The Enlightened Eye*, an assembly to be sited in a public place with a mixed agenda, poses potentially conflicting problems. These include a responsibility to curatorial procedure, to visitor amusement and interaction as

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well as the aesthetic predilection of the artist-designer. It is worth asking if and how the procedures for engagement with this object can be tested and adapted accordingly, no matter how it is aesthetically conceived.

Test: What works?

The possibilities provided by the testing of the main participatory and contributory function of *The Enlightened Eye* are described here. Often my previous interactive pieces have been tested rather perfunctorily and often when installed in situ. I was keen to make sure that the drawing task was one that visitors could and would like to do. The process of provisional, live testing could not take into account the situated qualities of the final installation: the tests were out of context and therefore only helpful to a degree, yet to perform no kind of operational testing would be unwise. I had found in the past that to evaluate the efficacy of an idea, based solely on one's own conception of what is required for interaction, is reckless. The artist-designer must take into account viable visitor function, amongst many other considerations. This is not to say that to test an object for the first time in the real ecology of action cannot be successful, however there will always be chances for the unexpected. For example, the first piece I made of this kind, *Deus Oculi* had some unforeseen design flaws. One in particular was that visitors were reluctant to lift the large mirrors containing the camera off the wall, so that they could align their faces correctly with the main scene. This resulted in visitors successfully using the work in a different manner from the one that was originally intended.

Figure 120: Testing the micro viewer prototype, image: J. Cleverly 2012.

The camera obscura component of *The Enlightened Eye* substitutes a microscope for a lens and a touch-screen digital tablet for paper. The visitor is asked to respond to a selected image, this is a deliberate design affordance, similar to my earlier use of Albrecht Dürer's 'net' system, to encourage visitor drawing when using *Lineamentum.*

The extraordinary emergence of the smart phone has made many familiar with the touch screen and it has become, despite its relatively recent introduction, a widely understood technology. Indeed a recent survey for trend analysts at the Pew Research Centre showed that adult ownership of smart phones in the U.K. in 2015 was estimated to be at 68% (Pew Research Centre 2016). In the U.K. digital tablets, such as iPads, were ownedby over 50% of the population, according to market analysts, eMarketer (eMarketer'. 2016). Touch-screen devices are ubiquitous and have become the calm technology interface, described by Weiser and Seely Brown (Weiser and Seely Brown in Cleverly, J.,Shear,T. 2013,104). The

interactive and connected nature of a touch-screen interface is firmly embedded in contemporary life, despite the fact that a majority of users have little, or no understanding of its black-boxed (Latour 2005, 202) complexity.

To test the viability of the microscope and tablet, several live, evaluative sessions were conducted. The first simple session used Wacom tablets (Wacom 2016). These Wacom tablets could be drawn with, and static images of minerals traced, and with responses varied and interesting. These trials elicited requests for a specific task, for example to find an image hidden in the morphology, specifically the shapes, tones and structures of the microscopic image.

Figure 121: Kathy testing the Wacom, image: J. Cleverly 2013.

Figure 122: Initial Wacom Tests by Emile and Kathy, image: J. Cleverly 2013.

The second round of tests were set up with a microscope providing a live feed to a touch-screen laptop that had been specified as appropriate in consultation with technical support. Participants selected from a set of minerals and were able to focus the microscope on a stand. (See appendix: Test Images).

Participants were given the following guidance and information:

- The research project involves the development of an interactive artwork for Liskeard Museum. We are looking at ways in which museum visitors can engage with the museum's minerals collection.

- This project will ask visitors to create a response to close-up images of mineral samples, to select a particular image and to draw over this selection, via a digital tablet and pen.

- Provisional tests reveal that participants would like to be given a task, for example to find an image hidden in the morphology; the shapes tones and structures of the microscopic image.

- These images may include landscapes, animals and figures. But there may be other images made by participants, more scientific in nature or abstract; this is what we would like you to help us with.

- You may also like to let us know if you have any other thoughts regarding this project, using the form provided.

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The touch-screen laptop had a basic graphics drawing programme and users could draw with a stylus or their finger and to select from a choice of line-widths, colours, fill tools, opacity levels, erase and 'undo action'. Those taking part produced some very accomplished images, however the majority were art students and might be expected to be adept at mark making and created visually skilful images. Feedback from the session included:

- "Think there should be less options of colours brush size etc. Might be a good idea"

- "I would have liked to have turned my camera off and on to see just my picture"

- "Perhaps make the brush options and the colour choice much larger so it's easier to poke at"

- "Liked the ability to zoom in and out of image and then continuing to draw"

- "Wanted to use grey but there wasn't any grey"

- "Would be good to see others drawings, and at the same time, like a gallery"

These suggestions were mainly to do with the way that the interface operated, and in consultation with Tim Shear the suggestions were then deployed, modified or considered in the latest iteration of the interface (see appendix: Test Questionnaires).
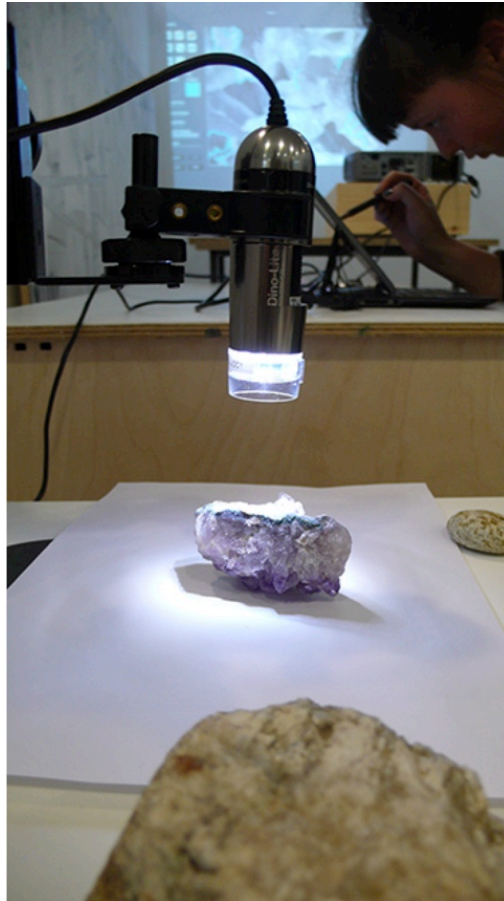
Many of the test images confirmed that the discovery of images in the morphology of the rock was, for participants, an appealing strategy in the creation of new images. This led me to consider the role of visual associations and 'morphology-seeking' within this multi-media assembly.
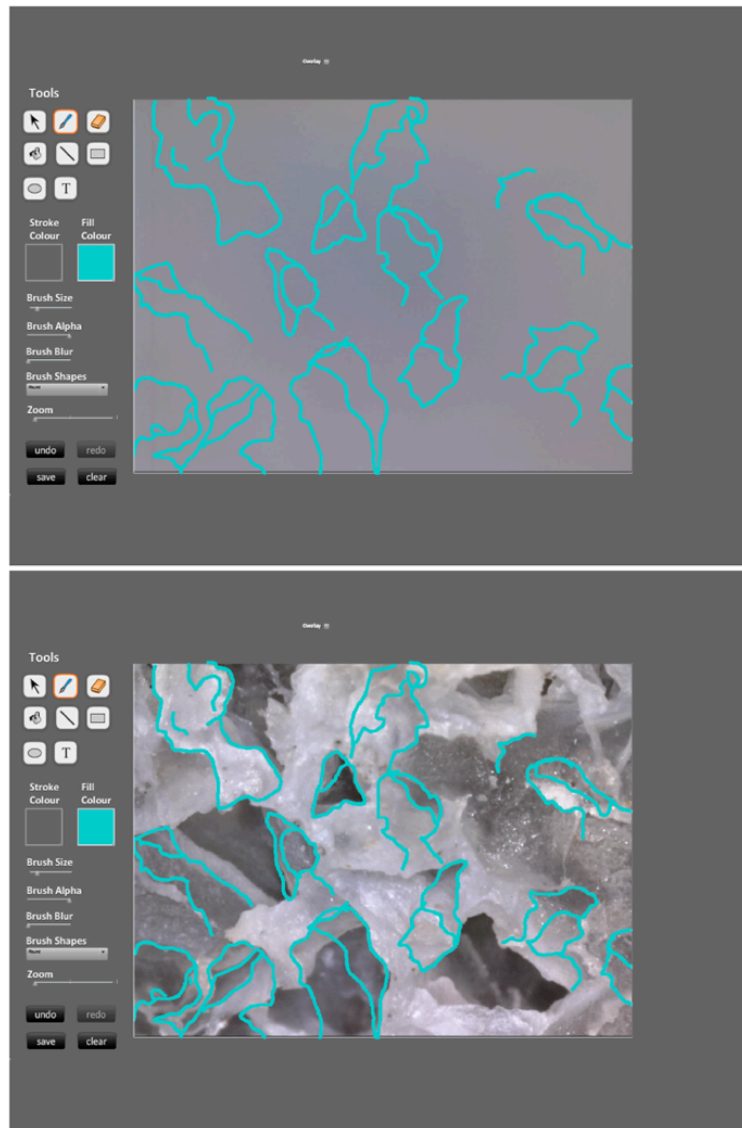
Figure 124: Tim Shear. 2013. Prototype Interface 'Sad Women' by test participant Leah Jenson showing visual associations, image: J. Cleverly 2013 .

The process of embedding the digital into the physical requires subtlety of design and consequently the supporting aesthetics and craftsmanship may be compromised. If the museum is now a venue for experience, as well as education, for an increasingly digitally literate population, here was an ideal testing ground for new initiatives that might satisfy both visitor and the experimental artist-designer.

Collaborate: You Can't do it Alone.

Collaboration with others was an important aspect of *The Enlightened Eye* project and a deeply significant, complex aspect of this kind of public

installation. The artist-designer has a project management role in orchestrating key collaborators. Despite being the originator of *The Enlightened Eye* project, I was only part of the whole production team. I will now discuss briefly the key collaborators in context.

The creative technologist Tim Shear (Shear Creative Technologies 2016) was a key collaborator, when our previous project *The Interactive Worktable and Escritoire* (Cleverly and Shear 2013) arose we formed a comfortable working partnership. My own understanding of Shear's repertoire of skills, which included coding, app and website design, were very limited, however a dim understanding of what might be technically possible had grown in me during our previous work. I was able to propose to Shear what I would like and he would tell me patiently and with provisos, how it might be possible. Shear constructed *The Enlightened Eye*'s drawing interface and the web interface, in consultation with myself. We had many meetings about the type and make of the digital microscope and the specifications of drawing tablet we were going to use. We were able to make use of a common understanding of visitor action and interaction, based on analysis of the preceding project (Patel et al. 2015). What and how museum visitors might do what I conceived for them, followed along similar lines to *The Interactive Worktable and Escritoire.* Additionally, a shared critical assessment of our relationship with the museum's curator, the problems of moderation and managing expectations in regard to technical support were negotiated in the light of our previous experiences. As part of the redevelopment of the minerals collection, Shear was commissioned by the museum to develop and build a linear interactive called, *The Rock Beneath our Feet.* Also to be sited in the Daniel Gumb room*,* it was the museum's curator Anna Monks who conceived this piece. Alongside new mineral display cabinets, specialist museum lighting, mining related displays and my own piece, *The Rock Beneath our Feet* formed a complete refurbishment of the Daniel Gumb room.

Figure 125: Tim Shear. 2014. Final interface design, image: J. Cleverly 2014.

The commission of *The Enlightened Eye* was undoubtedly risky, for some involved it did not fit into a normal concept of a museum display. During our meetings and discussions, we established a relationship that was protective and supportive of *The Enlightened Eye*. The curator Anna Monks was the most supportive and critical of my collaborators, she made the project possible. I was able to discuss with her at length the various possibilities and problems, and where possible, I adapted the project to fit her suggestions and requirements. I consider my concept for mineral interpretation was one that Anna believed would support new ways of thinking about the objects in question and form a shared vision that would support and diversify the visitor experience. For the artist-designer, the opportunity to test ideas by exposing my work to the museum visitor was an important ambition that matched those of the curator. According to the *Guide to Unlocking Potential Through Contemporary Craft* (Phillips et al. 2011), a museum's 'desire to enhance a venue or collection will be at the core of a creative collaboration' (Phillips et al. 2011, 50) and that a 'convergence with a maker's interest in a creative collaboration lies in the depth and quality of an audience's response and the amount of people who visit or experience their work' (ibid). This kind of convergence of vision, with all its minute negotiations, is both time consuming and rewarding and yet must be at the heart of any museum experiment.

One advantage of working in a university is having access to resources that might otherwise be difficult or expensive to access. The School of Design at Falmouth University, during the period of construction of *The Enlightened Eye*, was in possession of a CNC router. Collaboration with one of the School of Design's technical staff, Mark Lea, allowed sympathetic and experienced support in the use of the digitally control router that would accurately cut the birch-ply sheet that formed the main carcass of *The Enlightened Eye*. Mark advised on the use and preparation of the Adobe Illustrator files that instructed the router's cutting path. He was also able to operate the machine with a certain nuance, so that the cut quality was clean and efficient. Dialogue with Mark, although detailed in regard the procedure of fabrication, did not extend any further into the design and function of the interactive.

As far as possible, the design of *The Enlightened Eye* was to be operated without too much explanation, in order to allow the user to be intuitive, relying on the use of visual kinetic affordance in its controls and visual dynamic. Despite my aim of intuitive interaction, the curator was keen to have an instruction panel, something that I realised from previous un-invigilated interactive projects, would be necessary and useful: this might be called 'interpreting the interpretive'. I sent out a call to undergraduates on the Graphic Design course at Falmouth University, asking for help with an instruction panel. Third year graphic student Greg McCarthy (Mccarthy 2016) contacted me, and we made a visit to the museum, where *The Enlightened Eye* and had been recently installed in the Daniel Gumb room. The interactive was live and operational, although the interpretation and displays were not fully complete, and no data analysis had been carried out. Working with Greg, I was keen to specify that the instruction panel be as pictorial as possible. Greg was very good at taking situated elements from *The Enlightened Eye* and his finished information panel included an annotated diagram with the interface icons were all represented. Additionally, in his diagram, Greg had inventively added hidden faces formed by the table as a reference to the morphology-seeking task. This instruction panel was an important extension of the work and was positioned on the wall near the

touch-screen panel of *The Enlightened Eye*. Working with a graphic designer was useful and effective. However, a detailed evaluation of the efficacy of the instruction panel was not undertaken and this could clearly form a complex assessment of its own.
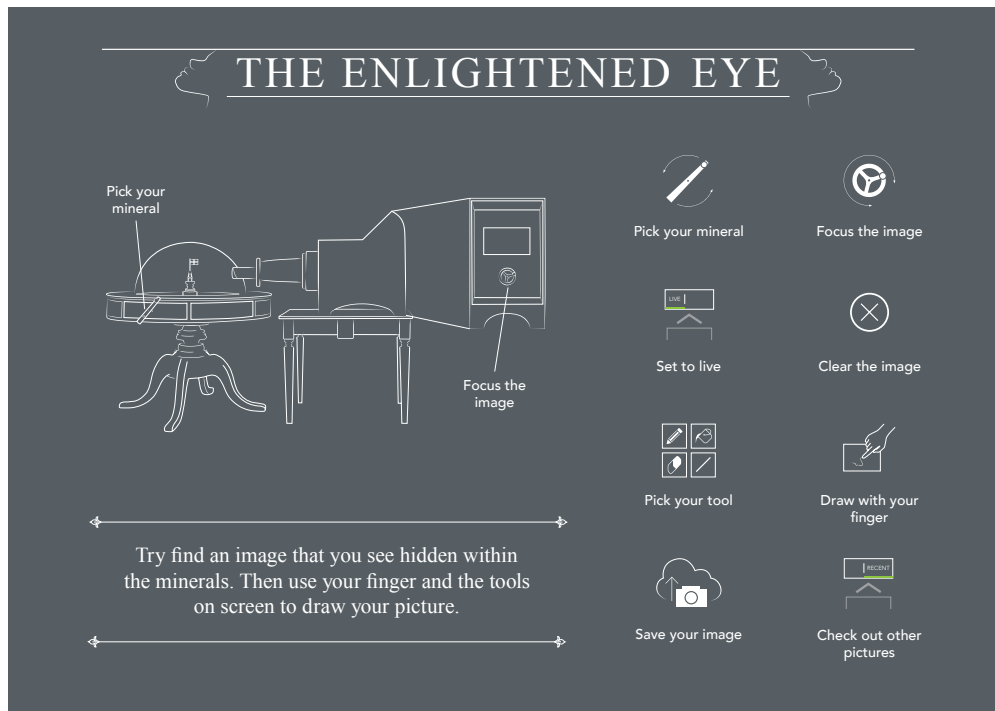
I would like to propose that the museum visitor is also a key collaborator. Not only are they the audience for the project, they create the contributory and participatory content in the form of their drawings. The imagined and conceptual action of the visitor is the material that forms the structure and composition of the finished interactive.

These collaborative relationships form a complex tracery around such a project; they are the key relationships that inform the design process. An examination of each of their contributions demonstrates how a project of this kind needs partners, in order to evolve and come to fruition. Centrally positioned in this network of relationships, the artist-designer acts as a crucial connection between these collaborators.

The collaborative nature of this project builds on previous projects, and various roles within the collaborative soup have allowed for a successful development of a multimodal object with both digital and physical affordances. Any creative attempt to blend collaborative skills and knowledge in an effective manner, whilst difficult, means that a project of this nature can actually be attempted.

Make: Fabrication and Material Process

A description of the making of *The Enlightened Eye* here is somewhat perfunctory and therefore I will not discuss the practicalities at any great length, as it is not the primary focus of this PhD. It is however important to give an overview of my approach and to discuss some of the significant aspects of the manufacturing procedure.

For me, the design and development of a project feeds naturally into the making and construction through to developing ideas through drawings and plans, the translation of visual aesthetic qualities to shapes and surfaces, the specifying of materials and equipment, the specification of the size of components, and questions such as, how will the cables or the camera be interwoven with the other components? a satisfying, problem-solving process provides the maker with an absorbingly complex mental and physical challenge. As the craft theorist and writer Martina Margetts has it in her essay *Action Not Words,* written for the V&A's 2011 *Power of Making* show: 'The reward of making is the opportunity to experience an individual sense of freedom and control in the world. Making is therefore not only fulfilment of needs, but of desires-a process whereby mind, body and imagination are integrated in the practice of thought through action' (Margetts 2011, 39). Undertaking both the design and making of an ambitious piece like *The Enlightened Eye* interactive, was a risk: my engineering skills were tested but I wished to hold on to the construction process. There were a number of considerations that informed this decision, including the relatively small budget for fabrication, a budget that amounted to only a few thousand pounds for materials and equipment. British visitor experience design

companies like Casson Mann (Casson Mann 2015) and Land Design (Land Design Studio 2015) regularly have multi-million pound budgets for museum displays that include interactive exhibits. But this project was the continuation of a series of low-budget projects that have formed my artist-designer practice. These series of works are part of an iterative process that I hope I have described clearly elsewhere. As an on-going exploration of the situated design process, each project has increasingly absorbed new practices and ways of assembling ideas, that are often speculative, experimental and feel at the outset, almost impossible to achieve and as such have an uncertainty that is exciting, engaging and demands some degree of creative freedom. Control of the making of an interactive, requires flexibility in refining and testing as the work progresses; this is an important aspect of the artist-designer's role.

Figure 127: CNC routing of table legs, image: J. Cleverly 2014.

As mentioned above, control of much of the material components for this work was made using CAD/CAM technology, supported at the time by technicians in Falmouth University's Design Centre, particularly in the use of

a CNC router. I have been lucky to access this equipment and it has opened up new ways of planning work, from the capacity for endless adjustment of digital files to the accuracy of cut. Michael Shorter, in his article, *The Craft Technologist* in the journal *Studies in Material Thinking* (Shorter 2015, 10), includes a useful diagram, showing the landscape of his practice, and the interplay between different aspects of practice (fig 128). The particularly pronounced downward trend of engineering in Shorter's diagram echoes my own disengagement from direct craft processes, such as the faux naive woodcarving and relatively crude assemblies seen in my earlier work. This new situation arose in part because the requirement for useable, publicly sited objects is for safe and effective functionality, a requirement that has, to a certain extent, made my practice appear less personal in voice. This lessening of character is also influenced by the choice and use of highly accurate cutting tools.
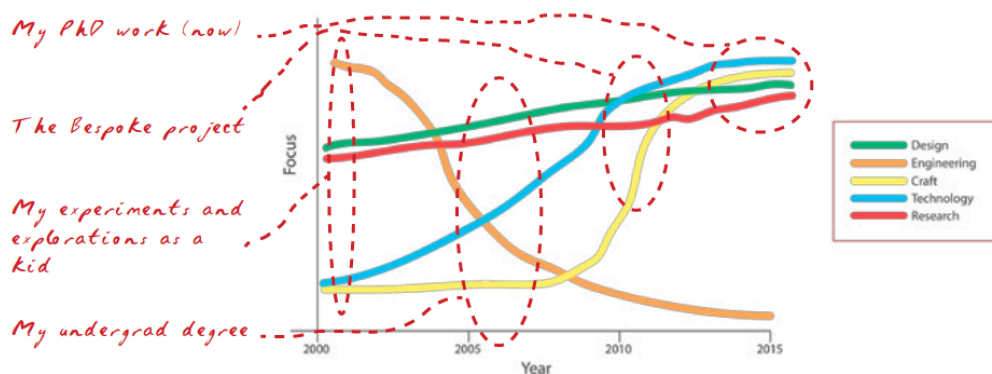
Figure 9. Diagram showing the ever-changing focus of my practice.

Figure 128: Michael Shorter.2015. Focus of practice diagram, image: M. Shorter 2015.

The overall compositional design of *The Enlightened Eye*, as described previously, is a conflation of table, orrery and camera obscura. The drawing and model making procedures that informed its design were now converted into digital files created principally in the Adobe Illustrator programme. There were certain elements however that I extracted directly from my sketchbooks using a combination of Photoshop and Illustrator, in order to preserve forms that seemed hard to create digitally. An example of this can be seen in fig 129, which shows a table leg extrapolated from a drawn pencil image. This

transposition procedure located the work more closely with the kinetic, physical action of hand drawing and to an extent was then closer to my earlier, cruder practice.

The drawings and Illustrator files became a way of composing and measuring components ready for assembly, as well as making cut paths. The interplay between the digital and the material has been very useful for my making practice. I do not consider myself a practitioner caught up in digital making as a theoretical, exploratory agenda (Bunnell 1998, Eden 2008, Tyas 2015), rather I am interested in how digital processes might assist me. Isabel Risner, in her 2013 PhD *The Integration of Digital Technologies Into Designer-Maker Practice: A Study of Access, Attitudes and Implications* (Risner 2013) discusses this issue as she 'explores the view that; from the language of digital aesthetics to implication for working practices, using digital technologies brings its own set of complex conditions' (Risner 2013, 15). Importantly, the use of the digital for *The Enlightened Eye* project was for accuracy in cut and in the practicality that CAD has for arranging and thinking through structural assemblies.
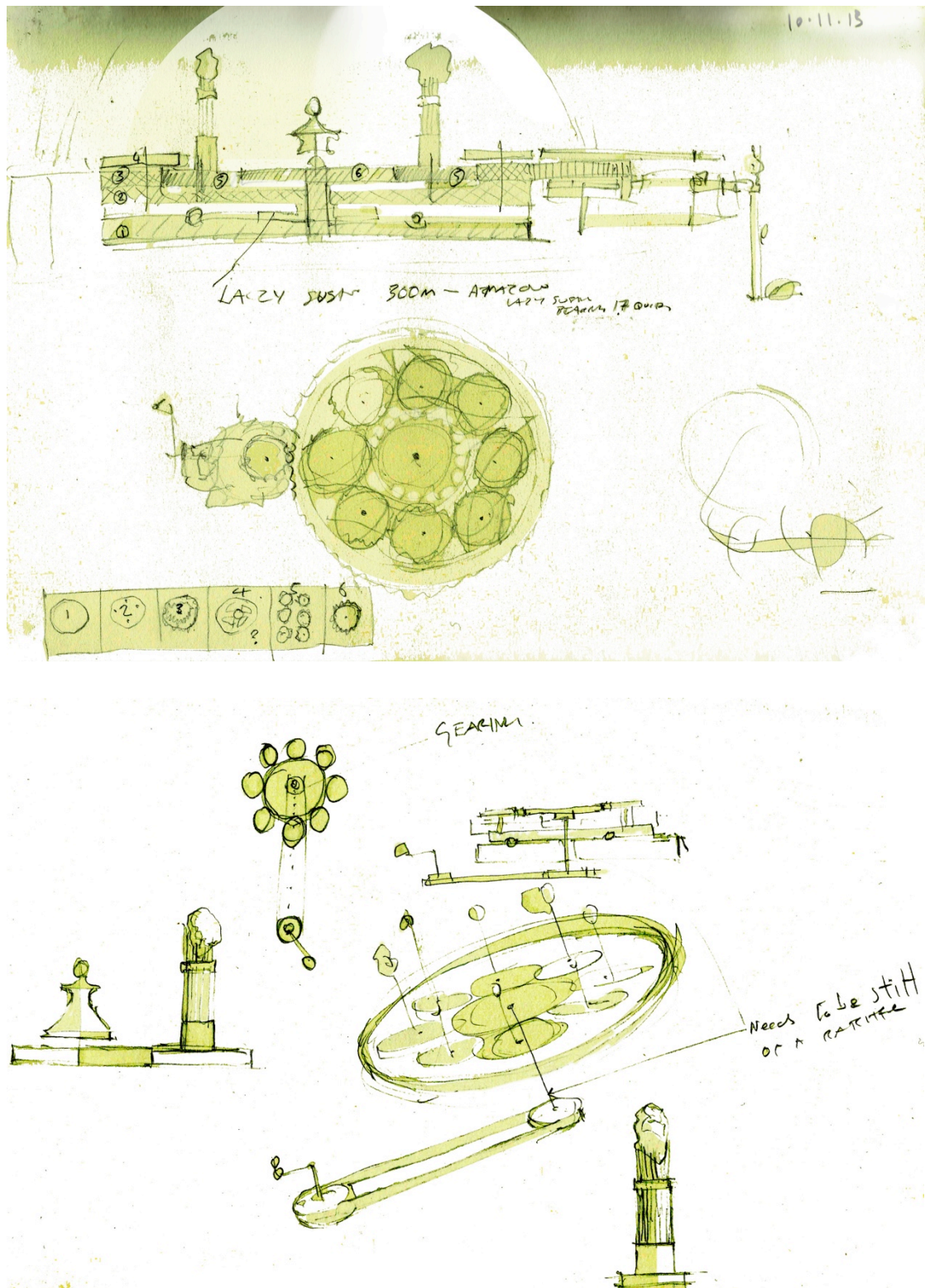
Figure 130: Jason Cleverly. 2014. Working sketchbook drawings, Image: J. Cleverly 2016.
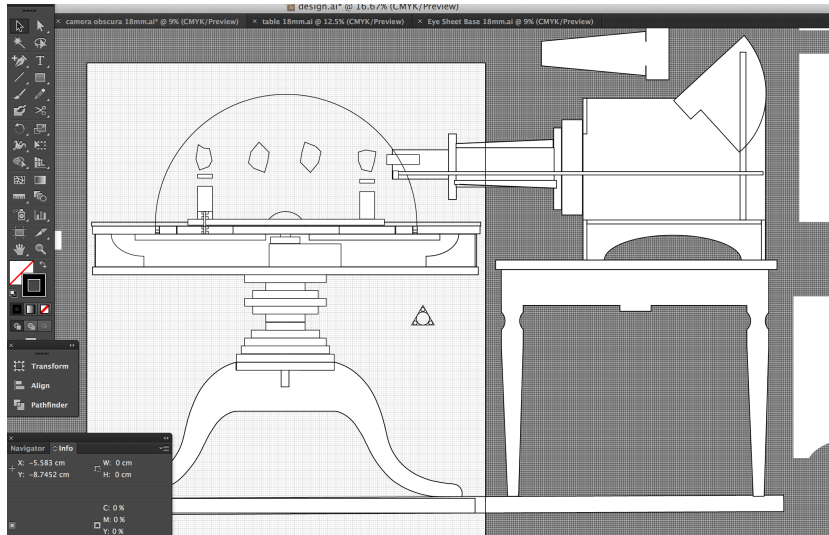
Figure 131: Jason Cleverly. 2014. Enlightened Eye illustrator file, Image: J. Cleverly 2014.

The structure of *The Enlightened Eye* was planned and composed in advance of, and during its assembly, utilising a range of practical methods. As the construction took place, I was able to make adjustments and test its practical and visual affordances along the way.

Figure 132: Jason Cleverly. 2014. On going planning, image: J. Cleverly 2014.

The making process is complex and absorbing and there are ways in which the creation of a piece affects in the maker -'a flow state' - as described by

Csikszentmihalyi and Hermanson (Csikszentmihalyi and Hermanson 1999). This engrossing state manifests itself, not only during the actual making sessions, but outside of them: the project is constantly being processed internally, and this creative immersion cannot be switched off easily, as it is perhaps a tacit method of helping a project resolve itself, a way of exploring solutions to certain problems.

Figure 133: Jason Cleverly. 2014. Making The Enlightened Eye, image: J. Cleverly 2014.

Design of the Finished Interactive

The final composition of *The Enlightened Eye* included a stylised library table supporting the orrery section, and a small table supporting the camera obscura component. The assembly also supports two handles. The first, on the library table, controls mineral samples via a system of planetary gears that allow the samples to be 'orbited' sequentially in front of the microscope in an approximation of an orrery. The second handle is positioned below the touch-screen drawing panel and controls the focus of the microscope. The position of the two handles was carefully considered, conforming to my programme of aesthetic design and affordance. The image from the microscope could be drawn over the touch-screen, mounted on the camera obscura and also appeared on a large wall-mounted screen.

Figure 134: Jason Cleverly. 2014. The Enlightened Eye, image: M. Tyas 2014.

The Enlightened Eye was provisionally exhibited at the *All Makers Now* conference at Falmouth University in 2014 (All Makers Now 2014). At the conference, it was well used by the delegates, which established that the piece did work and was functioning as intended. The next step was to install the work in its intended context - the Liskeard and District Museum.

Figure 135: Isabel Risner. 2014. Test drawing made on The Enlightened Eye, image: J. Cleverly.

Conclusion

This chapter has looked at the problem of how to develop and build a situated artefact that takes into account both design and artistic considerations. I constructed *The Enlightened Eye* to contribute to the museum's programme; a problem solving agenda with the aim to contribute to education, locatedness and modernisation. My interests in the design development and research for this project drew upon user testing and on functionality but equally the design process relied upon the way in which the qualities of resonant objects and images are complimentary to this design. For an artist or a designer there is sensitivity to certain phenomenological and sensory objects and situations, this is a metaphysical engine that shapes an artistic, designerly signature. One of my sensitivities is to situations that show people engaged and intent on something of interest, I particularly enjoy the sense of shared attention that is communicated and fortunately this interest is appropriate to the designing and making of interpretive displays.

An adaptation of Jensen's characteristics (fig 92) is a snapshot of *The Enlightened Eye* project and can also be applied more broadly to my approach. This assessment of the characteristics and requirements shows that whilst there are ways in which to address a design problem in an idiosyncratic way to produce a relational object, some of these factors cannot be determined, as this is a projected choreography of possible events. Those possible events include the structuring of shared interpretive experiences. In the next chapter I look closely at the results of this projected choreography and explore both the contingent aesthetic produced and the functional effectiveness of *The Enlightened Eye's* design.

Chapter 5: Analysis of Situated Interaction. Installation and Visitor Interaction

Introduction

This chapter outlines the installation of *The Enlightened Eye* and examines its operational behaviour. I discussed the various methods of recording that I undertook during a week of observations. I detail the analytical research methods that I deployed in assessing activity within the ecology of the interactive. I discuss here the value, as well as the procedure of video ethnography and attendant ethical issues. I chronicle the first-hand drawing and note taking that I undertook and describe the value of these kinds of field notes.

In this chapter I explain how the process of creating a series of detailed data review documents acquainted me with the substance and choreography of the action, seen in the video data. Additionally, I describe how I began to untangle the information contained in the drawings. I describe how these drawings became very useful for capturing an essence of action and in tandem with the video, begin to see how both of these formats might be combined in some way to help explore the data.

I go on to discuss the conflation of video and drawing and after considering a number of ways of representing and communicating the data, including an animation and comic strip panel, I settle on a combination of drawings and text. The process that I underwent in developing these ideas allowed me to get very well acquainted with the data and helped me to see where there were subtleties and detail I had previously overlooked. I also propose that the representation of data unlocked a contingent aesthetic that was visually satisfying in the way it revealed the choreography and drama of the situated action.

Finally, this chapter covers the communication of the action through the representation of selected data. This section develops a substantial succession of descriptive analyses of social interaction that effected the creation of a series vignettes. These reveal not only the form of discourse

between visitors, but generated and revealed the dramaturgical shape of the action that occurred within *The Enlightened Eye*'s immediate ecology. The action discussed and represented here includes several distinct versions of scaffolding, as well as many examples of embodied action, turn taking, recipient design, ludic and epistemic behaviour, as well as intrinsic interest and flow state. I also spend some time on an evaluation of the contingent aesthetic. In addition, there was a discussion of some of the drawings that visitors created during the operation of *The Enlightened Eye*.

The Enlightened Eye was installed in the Daniel Gumb room of Liskeard Museum in the summer of 2014.[2] Over the next few months I was able to evaluate some provisional audience responses to the interactive and to assess for myself how *The Enlightened Eye* was functioning in situ. Technical adjustments were undertaken intermittently over this period. The museum was closed for some of this time whist new lighting and cabinets were installed throughout the building. A formal launch of the new galleries and of *The Enlightened Eye* took place in the week of the 2015 February half-term school holiday when there would be a likely increase in visitor traffic to the museum. During this week I also introduced *The Enlightened Eye* to its audience, and observed and recorded their responses. In summary, this chapter now details the analysis of visitor behaviour with and around *The Enlightened Eye,* within its ecology of action, including the nuanced approach to ethnographic recording and analysis that I developed specifically for this case study.

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[2] A time lapse film of the set up at Liskeard is available online here
https://www.youtube.com/watch?v=8oSexrSyAtA

Figure 136: Jason Cleverly.2014. The Enlightened Eye in situ: J. Cleverly 2015.

Mineral Landscapes

Working with Liskeard Museum, I developed a programme of events during the February half-term holiday 2015. There was a grand opening and press launch of the new galleries, as well as my own interactive piece in the minerals and mining themed Daniel Gumb room. During the week, I organised a series of practitioner talks that examined the effect of landscape and geology on their work. I also ran workshops for children on the theme of minerals and curated exhibits of work by artists influenced by Cornish minerals and Cornish landscape (fig 138). The museum's curator also asked me to present lectures about my own work and to demonstrate the creative possibilities of *The Enlightened Eye.*

Figure 137: Jason Cleverly.2015. Mineral Landscapes poster, image: J. Cleverly 2015.

Figure 138: Jason Cleverly. 2015. Mineral Landscapes poster events, image: J. Cleverly 2015.

This week was an opportunity to capture data; I made a series of films and notebooks were filled daily with drawings and annotated written notes. I sat in the Daniel Gumb room facing *The Enlightened Eye* and was able to record notes and drawn images as a way of connecting with the action unfolding

before me, to examine the discourse amongst visitor participants and their use of the interactive.

On most occasions, when visitors entered the room, I was able to introduce the gallery, its new lighting, new cabinets and other interactives. Additionally, I explained that I was the designer and maker of *The Enlightened Eye* and described how it worked. I introduced the main features, principally the list of mineral samples, instruction panel, analogue controls - meaning the handle, the focus wheel, and the digital aspects - meaning the touch-screen interface of *The Enlightened Eye*. Furthermore, I mentioned that I would be video-recording the session for research purposes, and asking if there were objections to this, of which there were none.

My explanations may have been a catalyst for most visitors and participants to use the machine successfully, a conjecture born out, to a certain extent, by reviewing the quantity, quality and inventiveness of images produced during that particular week, compared to others. Additionally, having an understanding of the rationale and procedure of the way in which particular images were created gave me a greater affinity with those images, having subsequently made a study of the participants and the way in which the images were produced. The interactive was designed to be autonomous and at the time of writing still working, new images being actively created, and uploaded. Despite this predominant autonomy, the role of docent that I adopted during that week, importantly formed part of an ethnographic entanglement with *The Enlightened Eye* and its users.

Analytical Research Methods

The application of practice research methods, as described in the previous chapter, now allow for attention to shift to the analytical tools that contribute to the assessment, recording and representation of data captured. These tools, described as analytical research methods, help to reveal the situated effects of *The Enlightened Eye* on the users. Analytical research methods are broken down into six key areas of activity, defined as *record, draw, analyse, describe, communicate, and other data* (fig 139). There are, as with practice research methods, six individual cogs arrayed around a larger central cog: *the ecology of the interactive.* Again, this does not mean that each method is unconnected with one another, and in order to describe the methods that served the project, I will describe and define each 'cog' with significant examples of practice.

Figure 139:Jason Cleverly.2015. Analytical Research Methods diagram, image: J. Cleverly 2015.

An analysis of the interactive artwork's situational operation demanded six main analytical approaches and methods to elicit and assess data. *Record*

concerns Audio-visual data capture, mechanical filming and photographic procedures. *Draw* discusses the process of making field notes and drawings. *Analyse* covers the selection and identification of visitor motivations and relational behaviour. *Describe* identifies and considers how to interpret the data. *Communicate* constructs visualisations of the data and ways of communicating that data intelligibly. Lastly, *Other data*, such as museum visitor numbers and web traffic, are placed under a catch-all of *Other Data,* however these will not be examined here apart from web-traffic: this is important information, however the immediate ecology of the interactive is the main focus of these analytical procedures.

Record: Audio Visual Data

I videoed the action with a camera set up on top of a high museum cabinet adjacent to the interactive. The camera's view covered a good deal of the ecology of action. I made sure the batteries were charged and the sound was as audible as possible. At the start of this project I was unsure as to whether I would use video at all, however in re-examining my previous projects through the construction of this document, the value of this kind of approach and use of video recordings has become much clearer and more obviously valuable, versatile and adaptable.

Ethical Considerations

A notice was placed outside the entrance to the Daniel Gumb room. The notice described the nature and purpose of the study, advising that visitors should let a member of staff know if they did not want to be filmed. Additionally, I was able to verbally inform participants what the project was about and let them know that they would be filmed. No participant asked that the camera be turned off throughout the week of filming. However, the particular circumstances did not allow for signed, informed consent, as had been the case with my initial tests with student volunteers. Here the social scientists Christian Heath, Paul Luff and Jon Hindmarsh, in their definitive handbook on the subject *Video in Qualitative Research* (Heath et al. 2010) outline the problem:

In other situations, it may be inappropriate or even impossible to gain permission from all participants. Gathering data in public or semi-public environment, such as the concourse of stations, city streets, cafes, and museums and galleries, raises additional challenges with regard to informed consent. Even when recording more circumscribed domains, people, from whom written permission has not been secured, may happen to visit. If the researcher is unaware of new people entering the scene and is not on site at the time of recording it may prove difficult subsequently to establish informed consent in the conventional way. (Heath et al. 2010, 18)

Given the importance and attention paid to the ethical framework challenge set by the capture of visual data in this case video, I was concerned to conform to a standard of acceptable use of the video data, without detracting from the quality of the material.

Sociologist Dr Andrew Clark in discussing issues of visual materials and anonymity describes the uncertainty and unease with which researchers are faced (Clark 2012). Clark describes the ethical framework outlined by the ERSC in its 2006 inaugural framework (ESRC 2015) as recommending confidentiality and anonymity in all information and more recently, the latest ERSC framework (ESRC 2015) continues to stress the importance of a respect for individual confidential information. Clark continues to discuss the concerns of researchers regarding the value of the ethnographic material, against that of the ethical considerations. We learn that the digital blurring of faces and the giving of pseudonyms are methods of anonymisation of individuals which can have a detrimental effect on the quality of data for dissemination and that, despite these efforts, individuals can still recognise themselves and others and 'anonymity can be broken' (Clark 2012, 22).

The use of video ethnography is a very powerful tool for securing precise information, indeed its place in the social science field has never been more secure as a way of interrogating naturalistic, situated action (Hindmarsh and Tutt 2012). Video is particularly useful in representing fine details of action that can be closely examined and repeatedly reviewed but it is the interpretation of this detail that is critical. It has often occurred to me that the quality of visual data, represented in ethno-methodological research, particularly that of video stills, including anonymisation techniques, render

many images indistinct and underwhelming. Therefore it is an important outcome for this study, that the task of anonymisation became a very useful incentive to developing my own methods.

Draw: Field Notes and Drawing

I now discuss how I began to assess and capture some of the ways in which visitors engaged with *The Enlightened Eye.* It was always my intention to record visitor behaviour, in order to evaluate the operational value of this project as much as possible during the week. In addition to the video recording, I was positioned on a chair that had a good view of the ecology of action and I made notes and drawings that were intended to be complimentary to the video evidence.

In common practice, ethnographic field notes are taken in situ with an anticipation of further evaluation, for later data collation and analytic study. Field notes are, by their nature, qualitative. Qualitative research is 'any kind of research that produces findings not arrived at by means of statistical procedures or other means of quantification' (Corbin and Strauss 2008, 41). The legitimacy of making field-notes, and in this I would include drawings as visual notes, is further explored by Schatzman and Strauss, who formulate, three categories; observational notes, theoretical notes and methodological notes. *Observational notes* are reliable records of visual and aural information. *Theoretical notes* allow the researcher to take reflexive meaning from the information they generate. Finally, *methodological notes* are those that record operational information, such as timings, reminders and observations on practical processes (Schatzman and Strauss 1973). They also propose that 'the researcher is restrained by nothing to save his sense of honesty and objectivity' (Schatzman and Strauss 1973, 105).

With this in mind, I hoped that these notes were an attempt at establishing veracity by being sensitive to space and sensitive to participants. How would this play out in regard to my close connection to the interactive, its interpretive intention and design?

My approach to the production of these ethnographic notes and drawings owed their initial inspiration to the kind of fieldwork undertaken by naturalists - Darwin's geological and zoological accounts made on the Beagle, or Joseph Banks' botanical records on Cook's Endeavour voyages. This felt ambitious but appropriate; a Linnaean enlightenment kind of approach. Further inspiration for this lay partly in a tacit understanding of the ordinary research process, gained by many years of keeping sketchbooks. That is, the on-going, drawn recordings of first-hand sources, in combination with idea development drawings, that together form a dialogue and resource for the artist-designer.

I aimed to treat the ecology of the space and the interactive as a landscape populated by family groups and individual visitors, in the manner of wild creatures gathering round a water hole, or fish and other creatures living in and on a reef. Drawing and notes provided the 'on-going feedback' (Keller 2011, 162), as described by the American science illustrator Jenny Keller.

Edited by Evolutionary biologist Michael R. Canfield *Field Notes on Science and Nature* (Canfield 2011) is an illustrated, wide reaching survey of approaches to the art of making field notes., Canfield, in his introduction, states 'The value of taking field notes lays both in the actual information that is recorded as well as in what is gained in the process of recording itself' (Canfield 2011, 15). I felt that the process of drawing began to connect me powerfully to the unfolding scenes.

There has been some discussion on the nature and effect of the co-presence of the investigator: in the useful and instructive *Writing Ethnographic Field* notes (Emerson et al. 1995), descriptions abound of ineffectual attempts at unobtrusiveness and of how levels of participation in the action by ethnographers actively recording events and details vary enormously. Indeed, there were circumstances during the data collection sessions where the scratching of my pencil on the paper was clearly distracting for participants, prompting comments from myself about what I was doing; on occasion, I had to say 'I'm drawing you drawing!'

I felt as if I were an honorary member of each group but as choreographer and documenter of the action I should only really be an outsider, this sense of 'ethnographic marginality' (Emerson et al. 1995, 35) is described here in Writing Ethnographic Field notes: 'In most social settings writing down what is taking place as it occurs is a strange, marginalizing activity, marking the writer an observer rather than a full ordinary participant. But independently of the reactions of others, participating in order to write leads one to assume the mind-set of an observer, a mind-set in which one constantly steps outside of scenes and events to assess their 'write-able' qualities' (Emerson et al. 1995, 37).

I began to recognise that the drawings I made had become precious chunks of observation and information and I began to speculate on their use, on how and why they were to be useful.

I had imagined something authoritative with succinctly formed notes but in practice the drawings and notes were something different. I was unprepared for the visual qualities in my drawings; they were an unexpected pleasure to produce and a rich source of animate detail. As the days progressed, I began to fall into a pattern of sketching and note taking that could not really capture the full detail of a session. However, I was consciously reassured by the empiricism of the backup provided by the concurrent video recordings, with which I would be able to cross-reference with my own, more immediate, personalised record of events, although, as will be seen, this cross-referencing developed into a new hybrid artist-designer led method of decoding and representing data.
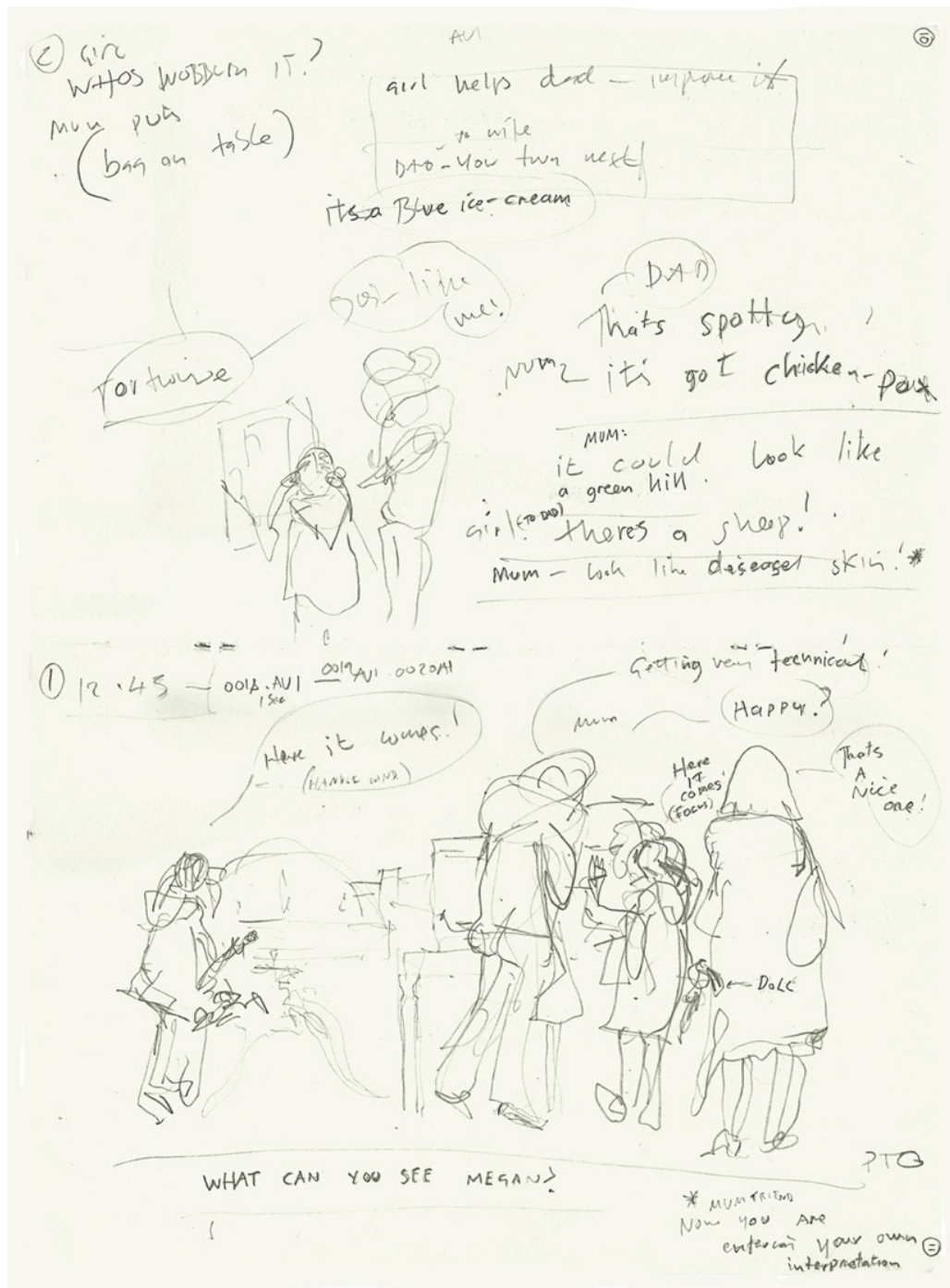
Figure 140: Jason Cleverly. 2015. Page 10/11 grey sketchbook part of Ciriden Halls sequence, image: J. Cleverly 2015.

The process of drawing was a method through which I began to develop schematic representations of particular patterns of behaviour, a distilled, selective version of the character and sense of the actions that arose with and around the interactive.

There came a point where I considered creating a template, a basic drawing to copy, featuring the fixed and immovable aspects of the scene and annotating this with the contingent events provided by the participant's actions. However, this was discounted when I considered the way in which the sense of detailed connectivity between participants and structure of *The Enlightened Eye* could be revealed in the construction of the actants in the formulation of the drawn image. That is, the object, the interactive and the visitors formed a whole, united and connected configuration: a composition.

Analyse

The week of video data gathering drew to a close and following this I began to examine and conduct a preliminary data review of the video footage gathered. There were twenty-one usable sequences; the preliminary data review was catalogued by basic factors, including date, length, number of participants and other observations. From this point, I was able to conduct more detailed reviews of visitor participation and behaviour. There were certain sessions that appeared more compelling than others and certain contrasts and comparisons became evident. The next step was to transcribe a substantive, detailed review of the video and audio (fig 141). This system of transcription, though time consuming, was relatively procedural and started to broadly reveal where social conduct and interaction, with and through the interactive, could be identified with my earlier contextual review of visitor studies (see appendix: Data Sets).

	A	B	C	D E	F G	H	I
1	DETAILED REVIEW FILE0018 DURATION 18.27 Adult M FF Child F Date 17 2 2015 12.43pm						
2	TIME	GENERAL ACTIVITY/ACTION/PARTICIPANT	TIME	TRANSCRIPT CORRELATES TO	RELATED SKE Defining characteristic	Photo	EE PIC
3	00.00-02.24	The subjects are held up from using the EE as the museum c...			AF1 BLUE TOP AF2BLACK TOP		1424177427.png
4	2.23	AF1 points at mineral sample list AF2 starts to point at the m...	Audio obscured by others				
5	2.25	AF1 starts to talk to CF about mineral list pointing at list	Audio obscured by others				
6	2.27	AF2 starts to talk to CF about mineral samples and gestures a...	Audio obscured by others				
7	2.28	AF1 Continues to point and read out the the list to CF	Audio obscured by others				
8	2.3	AF1 Continues to point and read out the list to CF	2.3	AF1 *Want to know where they are all from?*			
9	2.35	AF1 Continues to point and read out the the list to CF	2.35	AF1 *some of them are from Craddock moor*			
10	2.37	AF 1 Continues to talk about the list pointing at number 5	2.37	AF1 *Caradon hills*			
11	2.39	AF 1 Continues to talk about the list	23.39	CF *Ciridon halls* (deliberately mispronounced?)			
12	2.4	AF1 Continues to point and read out the the list to CF	2.4	AF1 *ok*			
13	2.41	AF1 Continues to point and read out the list to CF AF2 co...	2.43	AF1 *Caradon Hills, theres two from there..*			
14	2.43	AF1,AF2,CF all begin to look closely at samples	2.44	AF1 *Number 5 and Number 3*			
15	2.45	CF puts left elbow on table hand on chin (pondering?)	2.45	CF *Num....ber five* (pondering?)			
16	2.46	AF1,AF2,CF all continue to look closely at samples and very suddenly all point together					
17	2.48	CF starts to move round keeping her finger on the dome	2.48	CF *ooooh*			
18	2.49	CF takes her finger off the dome and then moves round places it back on the dome near the sample					
19	2.51	CF moves round pointing closely at malachite sample next to	2.51	CF *Number 5 is there*			
20	2.53	AF1 leans back AF2 moves round and	2.52	AF2 *which one do you want to look at?*			
21	2.54	CF points at a second sample nearest to her AF2 also points at this sample					
22	2.55	AF1 points at handle	2.55	AF1 *move this* indicating the handle			
23	2.47	CF starts to wind handle					
24			3	CF *shall I go this way?*			
25	3.01	CF starts to wind the handle anticlockwise					
26	3.2	AF2 indicates a twirling motion with her hand	3.02	AF2 *that if you want to take a short cut*			
27			3.03	General laughter			
28			3.06	AF2 *builds up the muscles of course!* General laughter			
29	3.08	CF continues to wind handle looking at main screen					
30	3.23	AF2 moves left					
31	3.23	AF1 moves closer to CF					
32	3.27	AF2 arrives at interface	3.28	AF1 *here it comes*			
33	3.29	AF1 and CF look up at main screen					
34	3.35	AF1 and CF go over to Interface					
35	3.37	CF starts to wind the focus handle	3.4	AF1 or AF2 *oooo* softly			
36	3.46	CF winds the handle in a different direction as tries to find focus					
37	3.57	AF1 leans in further put hand on top of interface as CF finds ...	4	CF *oooher*			
38			4.03	AF1 *that's perfect*			
39	4.05	AF2 points back towards the mineral samples	4.05	AF2 *want me to turn it a bit more and you say stop, and you can see what you want to see?*			
40	4.09	AF2 points to main screen	4.09	AF2 *or you can see it up there, can't you? (the main screen)*			
41	4.1		4	4.12 AF1 *would you like that one*			
42	4.13	AF1 takes handle and starts to move it carefully	4.13	CF *rabbit!*			
43			4.14	CF *oh for sure (?) AF2 yeah?*			
44	4.17	AF1 finesses the image	4.17	AF2 *leave it there?*			
45							
46	4.2	AF1 moves the image back towards almost to the original po...	4.2	CF *just there*			
47	4.27	AF1 AF2 CF move back to interface AM moves back out of shot					
48	4.3	CF leans in to the interface					
49			4.41	AF1 *Is that how you do it...and then you just touch it with your finger* Discussing the controls on the Interface withCF			
50			4.47	CF *that looks a bit like a lion*			
51			4.49	AF1 *ohh yeah*			

Figure 141: Detailed data review example, blue highlights indicates selected behaviour patterns image: J. Cleverly 2015.

Continued advanced analysis of this data helped to identify more particular detail in patterns of social conduct. The data was examined, reviewed and filtered against contextual analysis methods. Different analytics were brought to bear, in order to start to categorise, not only visitor behaviour but the way in which some sequences had a stronger dramaturgical aspect, that could be described and interpreted.

The Style of Drawing

The analysis of the drawing was less straightforward. Due to the speed of capture, the notes and drawings appear expressive, they are aesthetically pleasing and the composition represented in the drawing completed a contingent situational aesthetic.
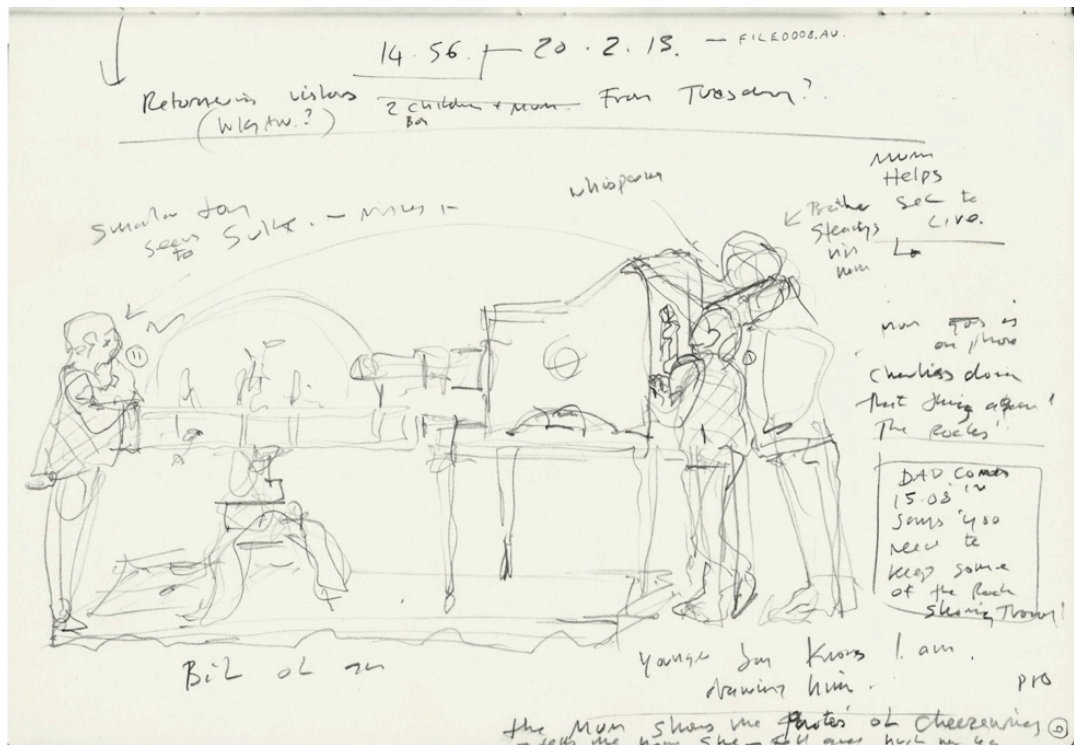
Figure 142: Jason Cleverly. 2015. Page 9 grey sketchbook drawing, note the boy in a padded jacket appears twice image: J. Cleverly 2015.

The drawings appeared to convey more than the video footage; the movement of the hand as it draws, resonates with the movement of the individuals, so that the action appears much more animated: where the pencil marks are tentative and then more refined, it seemed as if it had a quality of probing three-dimensional space and also of action in three dimensions, despite actually being static and two-dimensional. Discussing first hand-drawing and life-drawing during the Bauhaus period, Vasily Kandinsky held that: 'Drawing instruction is a training towards perception, exact observation and exact presentation not of the outward appearance of an object, but of its constructive elements, its lawful force-tensions, which can be discovered in given objects and the logical structures of same' (Kandinski in Lambert 1984, 75). My drawings are just visual notes but they do help to describe the kinetic and compositional arrangement of that particular space and that particular moment. The way that drawing has of reducing form and action to indexical marks, marks that are filtered through

an individual's own visual cortex and through an intention to describe a particular reality is a tool for analysis, as well as communication.

I then started to think about how first-hand drawings resonated with the video, and I wondered if there were ways of mixing the two forms? Video shows data sequentially, however some of my drawings describe a number of occurrences simultaneously, for example as can be seen in fig 142, the drawing covered quite a lot of action and was laid up with different bits of information. This layering up of timelines, action and notes is visually quite appealing, but almost meaningless, unless refined or restructured.

Comparing the video with the drawing, showed where I made mistakes in the annotation of the drawing and some other details in clothing shapes, for example. However, the audio analysis can be supported; where there is indistinct audio it can sometimes be corroborated with the written notes that surround the sketches. So by spending time with the video timelines and the drawn sketchbook data, there was a continuing dialogue between the two, informing and supporting the representation and description of data. I felt that the two forms could be conflated successfully to produce a fuller representation of what went on during significant events. Listening to the audio via headphones, especially where the sound was indistinct, forced close attention and therefore close engagement. Repeated listening creates an understanding of the behavioural sequence, conventions like turn taking could be clearly seen (Sacks et al. 1974) and characteristics such as embodied action (Goodwin 2000) were made really obvious, as I scrutinised the audio and video, over and over. I began to realise that the method for analysis of the data was in the application of a series of filters, both arising from a critique of the literature review that examined social conduct and an assessment of both the drawings and videos.

Describe: Interpreting the Data

Revealed within the statistician Edward Tufte's wide ranging surveys of data visualisation including *Beautiful Evidence* (Tufte 2006) and *Envisioning Information* (Tufte 1990) is a problem; representations of data can have such a strong visual appeal that they obscure the information they are trying to communicate. Tufte calls this 'Pridefully Obvious Presentation' (Tufte 1990, 16). This was also a problem for me; in attempting to explore and communicate movement and dialogue over time as I was trying to do, the challenge was how to represent information clearly and at the same time hold onto the nuances of my individual approach.

Figure 143: Kellom Tomlinson.1735. The Art of Dancing, Explained by Reading and Figures.

This problem of describing information visually was something that, as an artist-designer, I was very interested to tackle. A useful image from Tufte's *Envisioning Information* (Tufte 1990, 27) from an eighteenth century primer on dance (fig143) shows how music and the concurrent sequential movement should be undertaken. A version of this marvellous image might

be a method for showing how a series of small events might be presented. An attempt to construct something similar can be seen in fig 144.

Fig 144 shows a drawing I made as I was analysing the data and wondering if there were ways of overlaying types of activity onto an image of the EE. This could be regarded as a map of activity, showing some of the dynamics of action in the ecology of the interactive. This image is interesting visually and has a sense of meaning, depth and detail but it doesn't communicate well without some sort of prior understanding and therefore I felt that this only represented an initial exploration of the space surrounding the EE, in other words it was only useful for me, rather than for third party consumption. It was another tentative way of feeling the edges of activity, of sketching in areas of action

I began to clean up my drawings in Photoshop, to colour them and isolate certain elements, and to test ways of annotating a sequence of events by numbering them (fig 145).
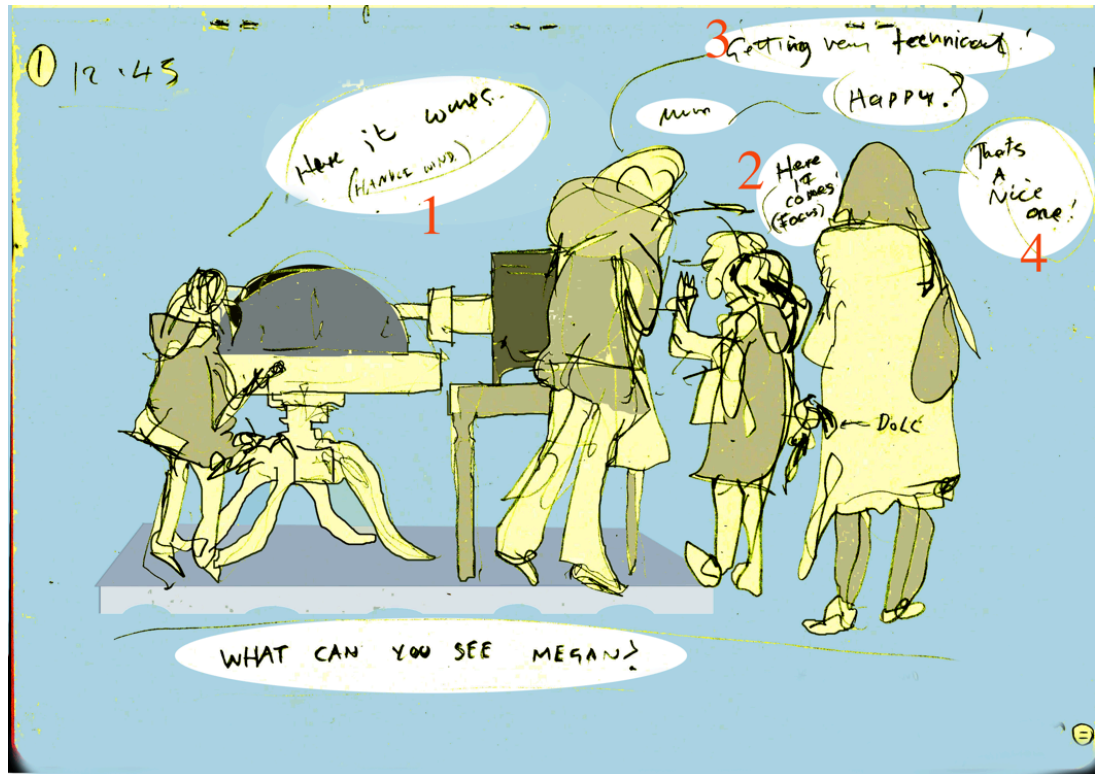
As I experienced my own installation vicariously through the visitor's actions, both at the time and later by reviewing the videos and drawings, there was an obvious resonance with my observation of visitors using *The Enlightened Eye*'s drawing capability to draw over the microscopic images of mineral samples. An exploration and analysis of the visual communicative qualities of the drawings lead to a consideration of the resonances between the drawings and the video data. I then tried drawing over the top of a still from the video using an iPad and stylus.

The result was bit flat, not unpleasant but dull compared to the sketchbook drawings, so I considering drawing free hand from video fragments. It was perhaps a risky strategy to reject the simplified drawing on the basis of aesthetic judgement, as the traced drawings actually simplify action in a way that can be useful in demonstrating interaction without the distraction of aesthetics. To show traced drawings to a prospective curator/client would

perhaps better persuade them of the value of the interaction. However I wished to interrogate the data from my own stance and to develop a process that allowed the artist-designer to bring alive a certain contingent aesthetic, a distinctive method of extracting useful, appealing visual data from the rich ecology of the interactive.

Figure 148: Jason Cleverly.2015. Free-hand drawing of fragment from Ciriden Halls sequence: image J. Cleverly 2015.

A free hand drawing from the video still had some of them liveliness of the first-hand drawings (fig 148), and I was happy about its composition aesthetically as well as its relationship to my interest in the tableau scenes of Joseph Wright of Derby. Alongside the original drawings, this drawing prompted me to consider making a moving drawing: an animation.

Figure 149: Jason Cleverly. 2015. Ciridon Halls test animation, image: J. Cleverly.2015.

From a series of drawings, and working with the video transcripts, I constructed an animation [3], making a sequence called *Ciridon Halls*. The point of the animation, I felt, was to communicate the action. It was an attempt to enforce an interrogation of the action and was a kind of formal and idealized representation of patterns and routines identified in the analysis. After reviewing this sequence, my observations were firstly that the transposition of the drawn image was successful at capturing some of the liveliness of the first-hand drawing. But the process showed that something extra was needed in regard to the communication of more detailed information. There was a point, for example, when the young girl in the sequence mispronounces Caradon Hills as "Ciridon Halls", another where

[3] To view the animation go to https://www.youtube.com/watch?v=kQL-Tj84cWU

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the visitors all seemed to point their fingers at the same time and these key events were hard for me to emphasise using animation. Despite this however, I did think that the speech bubbles worked well and I also liked the overall visual quality of the sequence.

I decided that I would like to create a static version of the animation, as this would be a more versatile format for communicating details. I began to evaluate the structure of comic strips, surveying the possibilities of page panels, looking first at Rupert Bear comic books (Perry and Bestall 1995.). These well-known and well established British comic newspaper strips and annuals contained a written story-text below the images, rather than speech bubbles, meaning the structure would be useful for tracking dialogue and information of different kinds.

An examination of the comic book panel structure developed by the celebrated Belgian cartoonist Hergé', in particular his *Adventures of Tintin,* specifically the page shown below from *Tintin in Tibet* (Herge 1990), shows a masterful use of speech bubbles, conveying a strong sense of the order of speech, with stresses on particular words through the use of bold text or punctuation. In some cases the form of the speech bubble edges are crenelated or jagged, in order to describe emotions such as anger and surprise. Indeed, Hergé was a pioneer of this kind of comic strip form, which dispensed with regular text in favour of speech bubbles (Farr 2001). Additionally, the comic strip allowed an important sequential flow to the visual information. A frequently occurring feature within individual comic strip pages is a narrative arc that leads the reader neatly through the beautifully described sub-stories used to help describe activity and events clearly. The way that each panel leads on to the next is choreographed and punctuated by key elements of the sequence. In many pages there is a point, approximately halfway through a page, where a significant event occurs. This is a focus point at which Hergé chooses to lead the reader through from the previous events, in which a problem is set up and flows on towards a *denouement*. Through the deployment of simple structural tools, information about the intentions and motivations of the characters is communicated. Physical actions are complimented by dialogue, while dialogue and physical

actions express types of relational and situational connections between the actants or characters.

Figure 150: Hergé.1960. Page 6 of Tintin in Tibet. Image: Herge 1960.

Modelled on the Tintin page structure, I developed a version based on the animated *Ciridon Halls* sequence and from a few drawings, I was able to assemble a flow of events that had more clarity than the animation, particularly in regard to the pace of narrative, see below.
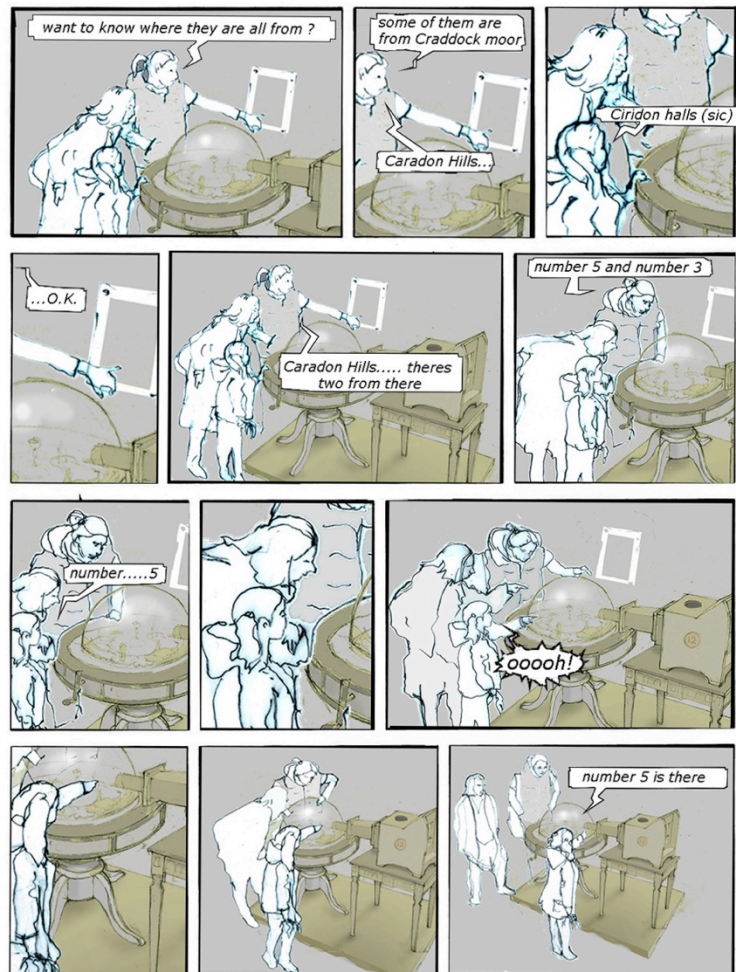
I was also concerned to emphasise the behavioural themes that could be drawn out from the data analysis. In order to illustrate these important elements, an annotated version of the basic comic strip was constructed using directional arrows with text and highlighting areas of specific relevance (fig 152).
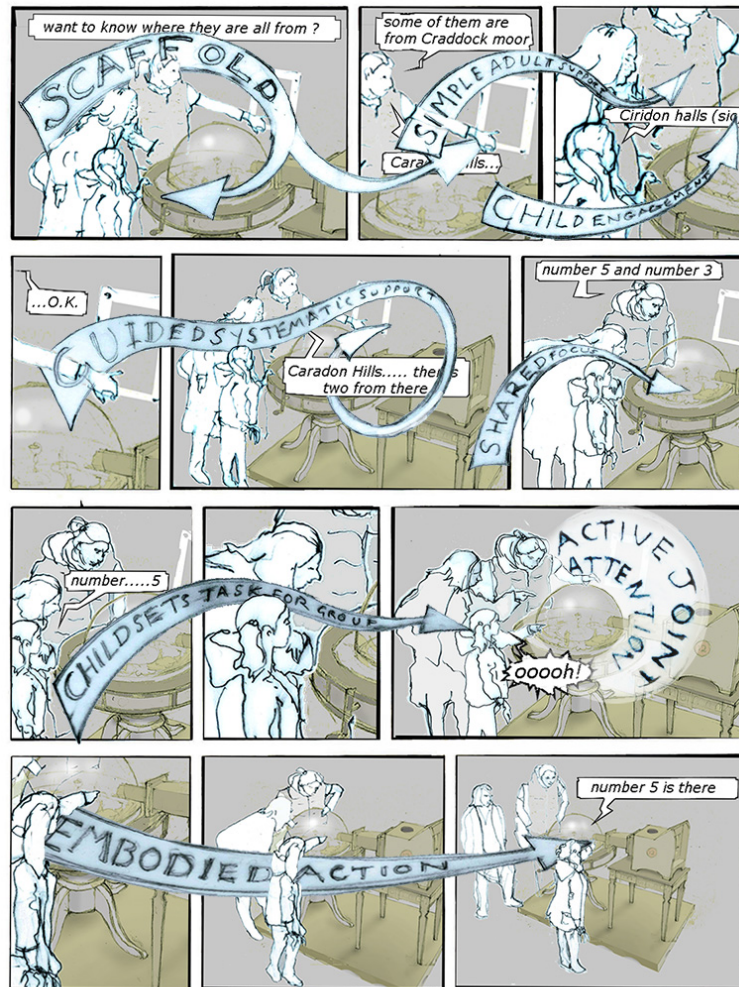
Despite the visual appeal of the comic strip, I considered it not entirely successful for communicating the data. The panels did not allow enough expression of essential details. However, this process was an attempt to make the data more comprehensible to others, but its use and construction was a way to help me evaluate the data; to familiarise and to immerse myself in the detail. The storyboard quality of the comic panels, the constructed short vignettes, enhanced the idea of the dramatic in the interpretation and representation of data.

A more comprehensive analysis was required. The hand-drawn fragments proved useful when used economically to illustrate key points in the data.

The next section will discuss in detail, selected behavioural patterns gathered from the data.

Capturing the Contingent Aesthetic

During the examination of the video data, the transcription into my own analytical representations, I have returned to considering the '"active spectator" who constitutes the sense and significance of objects and artefacts' (Heath et al. 2002, 10). If the textual analysis of data visualisation, the video, the drawing and transcripts are synthesised into digestible data, then they become the visual manifestation and record of choreographed artwork, in that they capture the contingent aesthetic. The contingent aesthetic could be described as the way the actants in the data are composed, in relation to each other and to *The Enlightened Eye* and then framed by my own subjectivity. The assessment and treatment of the contingent aesthetic is informed both by the value of the data, patterns of visitor conduct and the implications for interactive design work. Distinctively however, it is its representation and resonance for me as an artist, I am delighted by the choreography of the video, the qualities of the mark making and the selection process in the representation, as well as the technical implications for future work. I am under the influence of my own appropriative way of apprehending the world. I am able to assess the data as an artist-designer and this will inevitably include an iterative, reflective approach to representing and discussing the data, firmly united to the design development of museum technologies and the visual research it draws upon.

An analysis of the data is considered dramaturgically through the choreographed performance of the actors. Performances reveal relational, intersubjective activities being played out; they are responses to a design concept. The camera, pragmatically positioned, captures as much action as possible and is also a system for capturing a contingent aesthetic; the ecology of action is a stage and the actors respond to each other. Structuring their actions around the various affordances of *The Enlightened Eye,* they are also, in turn, considering and formulating responses to each other that have arisen from this very specific set of circumstances: these are

performances made for the benefit of each active member of the group (Goffman 1990). Erving Goffman, the influential mid-twentieth century American sociologist, in his seminal study of social interaction *The Presentation of Self in Everyday Life* (1959), describes these transactions in simple terms: 'the individual has "effectively" projected a given definition of the situation and "effectively" fostered the understanding that a given state of affairs obtains' (Goffman 1990 18). Extracted from the data and framed by my recording and exploring of the dialogue, reciprocal actions of the actants form miniature vignettes that have implications for the design of future interactives and the choreographed behaviour they generate. Therefore, the analysis of the data begins to 'feedback' visually, complementing the audio transcript and during analysis the figures in action reveal particular compositional structures. Observing a contingent aesthetic is part of my diagnostic process, a personal way of acquiring and processing ethnographic knowledge. Comparing the 'attentive engagement' (Ingold in Pink 2009, 35) of the creative practitioner with that of the ethnographer, Sarah Pink discusses distinctive approaches to ethnographic study, in that, through building on the observed action of others they will 'make this knowing our own rather than simply taking on that of others' (Pink 2009, 36). In this way, I examined and responded to the data, looking for indications of behavioural patterns that corresponded to the theoretical structures, as well as arising from the contingent aesthetic.

The contingent aesthetic corresponds to Bourriad's notion of relational aesthetics (Bourriaud 2002). The relational aesthetics of *The Enlightened Eye* are revealed by visitor responses in the ecology of action: details and patterns can be seen and connected through a reading of the action, arising and constructed around the machine. It may seem overstated to draw equivalences between Bourriad's relational art and *The Enlightened Eye*. Relational art suggests a greater complicity of the visitor to complete the artwork, embedding an artistic cultural experience within the social; rather *The Enlightened Eye* uses the social to reveal its shape. Whilst they focus on the creative task, the encounters and experiences of the visitor create a contingent aesthetic, one that they are unaware of but that the artist-designer

uses to analyse activity.

Many artists have explored the possibilities afforded by naturalistic events and occasions of compositional structures can be seen interrogated in paintings. My own interest in capturing the contingent aesthetic has been informed by representations of ordinary events. The concept of communicating ordinary every day actions and relationships could be said to start with the concept of a *conversation piece* (Murray 1997, 103). These are genre paintings of the 18th century that capture figures in relaxed situations; they are precursors to the naturalism that the advent of photography offered. An example of this kind, painting representing the everyday is: *The Kite* by Francisco Goya painted 1777-1778 (fig 153).

Figure 153: Francisco Goya .1777-1778. The Kite, image: © Museo Nacional del Prado 2017.

Goya's painting is riven with action and interaction, of interest for me too is how this Image captures the way that ordinary events have been given a composition, no doubt Goya spent time adjusting and reworking this image

it's naturalism includes an artistic device; an obvious central triangular geometry. The interactive focus in the form of the kite that draws eyes of certain figures within the painting, as well as our own gaze. The art critic John Berger considering the painting as a record of a moment argues that this poses a problem, a paintings images are: 'static whilst referring to the dynamic world beyond their edges' (Berger 2005, 23). Berger goes on to describe a painting as constructed and addressed to the moment of its being looked at rather than a preciseness of representation (ibid). A representational work of art then, is about communication and is nuanced as such. James Gibson unpacks this transaction too, he says in his *Theory of Pictorial Perception*: 'A distinction is possible between what is commonly called experience at first hand and experience at second hand. In the former, one becomes aware of something. In the latter, one is *made aware* of something'. (Gibson 1966, 92) The selection and method of my representation of the data analysis are constructed from my own perception of visitor action, based on real moments. I continue to discuss the geometry of painting in relation to my own data capture and representation below.

The attempt to describe action and contingent aesthetic through various visual formats was very useful in unpicking the close details of conversation and physical actions. The way in which I now choose to communicate the data is by a written description accompanied by my drawings of relevant sequences, concluding that this is the clearest way of representing the detail and nuance of the data.

Communicate: Representing the Data Analysis

I will now discuss four sequences of action drawn out by and through interaction with *The Enlightened Eye*. These sequences illustrate different aspects of visitor behaviour. Three of the sequences feature mixed age groups and one features young children. There are distinctive relationships within these groups of visitors and each sequence reveals something different about how each of these relationships operate. The actions and dialogues that take place within each sequence are connected, in particular,

to modes of visitor behaviour, as well as other aspects of social conduct. The actions and dialogues are indicators of success in the design of *The Enlightened Eye*. The situated action is choreographed by its design and although not all actions are correct in terms of my designed affordances, all modes of use are of interest and are occasioned by the situated ecology of the interactive.

The actants have been given simple abbreviated initials; AF= adult female, AM=adult male CF=child female CM=child male. As is often the case, there are more than one of each type: they are then ascribed a number and in the case of children where it is possible to discern relative age, then the lower the number, the younger the child, for example CM1. Sequences of film are called fragments.

Data Analysis I: The Ciriden Halls.

Scaffolding takes the form of guided support in mostly family groups of visitors. There were a good number of occasions where scaffolding behaviour was evident in the data. Scaffolding can follow differing structures, specifically assisting, prompting and guiding, and making mistakes, revealing possibilities as the choreography of the task unfolds. In this first instance, the adults support the child as the child undertakes the action. Also to note are certain gestures that take place: 'the body functions a representational device' (Lindblom 2007, 200). This representation, called embodiment, is indexical of the intersubjective.

Want to Know Where They are all From?

This fragment features two adult females, an adult male and a female child of about six years old, and the scaffolding occurs to varying degrees all the way through. The two women (AF1, AF2) take the lead in guiding and supporting the child (CF). The adult male plays little part in the whole session.

This first fragment of action under scrutiny starts at 2.30 minutes into the session and lasts until 2.51 minutes.
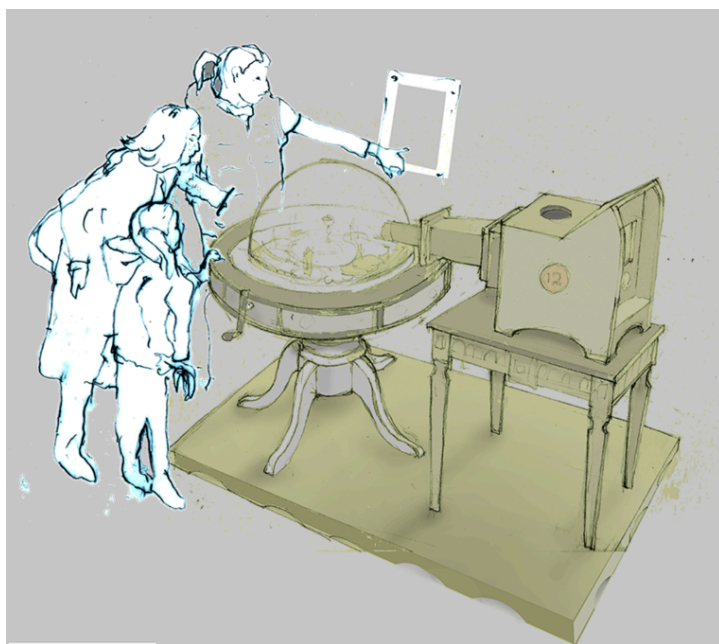
Figure 154: Jason Cleverly. 2015. Want to know where they are all from? Image: J. Cleverly 2015.

To begin with, the group are introduced broadly to the machine and its capabilities: they size up *The Enlightened Eye* then AF1 starts to examine the list that shows what kind of minerals they are and where they are from, there is a key that relates numbers next to mineral samples (fig 155).
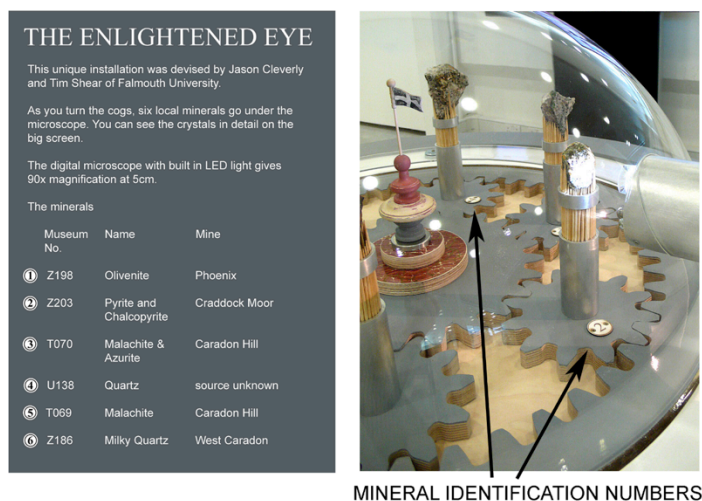
Figure 155: Jason Cleverly. 2015. (L) Mineral Legend (R) mineral numbers, images: J. Cleverly 2015.

AF1 begins to point to the list as AF2 and CF begin to attend to the list too. AF1 asks 'want to know where they're all from?' Continuing she says: 'some of them are from Craddock Moor, Caradon Hills'. CF interrupts with: 'Ciriden Halls', seeming to purposefully mispronounce the words. AF1 replies 'okay, Caradon hills, there's two from there, number five and number three'. AF1, AF2 and CF all begin to look closely at samples. AF1 places her hand lightly on the table; AF2 leans in to get a closer look.

FILE18.AVI 02.43

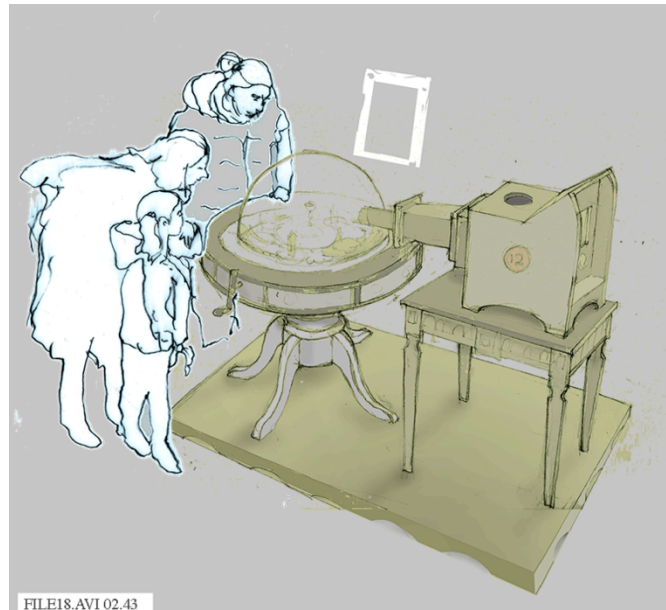*Figure 156: Jason Cleverly. 2015. They all begin to look closely at the samples, image: J. Cleverly 2015.*

CF puts her left elbow on the table, puts her hand on her chin as if pondering the problem, saying 'num….ber…five', and her words hang momentarily in the air as they all continue to look closely at the samples, until very suddenly they all point, apparently simultaneously and very swiftly, at number five.

Figure 157: Jason Cleverly. 2015. They all point simultaneously at number five, image: J. Cleverly 2015.

On closer inspection, there is a more subtle order to this. The whole pointing sequence lasts for less than a second and initially it appears as a synchronous action. However, this is not the case; firstly AF1 spots mineral number five and starts to point at it, followed by AF2 and fractionally later by CF. A further detail here is that CF has been apparently holding her index finger in a provisional pointing position before the near simultaneous pointing event has occurred. CF is then seemingly ready with her finger, so that when the two adults point to number five, she does so imitatively, very swiftly and fluidly, although not perhaps particularly accurately.

This (almost) simultaneous pointing arises from all three individuals evaluating the situation, from their search and ultimate success, to a shared social referencing (Lindblom 2007, 159), expressed in the pointing. The pointing here is a symbolic embodiment of the collaboration that is occurring within the scaffold.

AF2 withdraws her finger swiftly and AF1 continues to point her finger and gradually moves it closer and directly above number five. CF recalibrates her line of pointing, having now properly seen where number five is and, as CF's index finger continues to be important, declaring 'oooh!' she keeps her arm, hand and finger raised whilst turning to her right and navigating around the table to get a better angle from which to point.

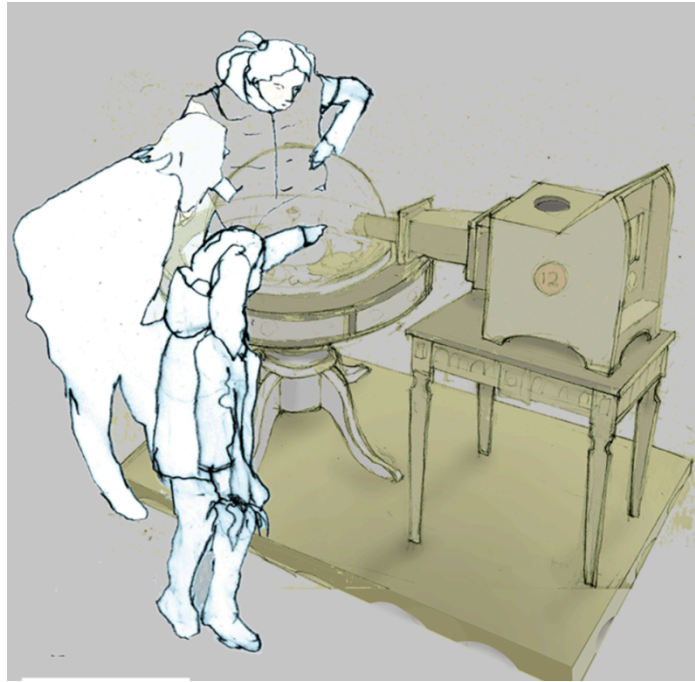*Figure 159: Jason Cleverly. 2015. Navigating around the table to get a better angle, image: J. Cleverly 2015.*

AF2 then steps back a little from *The Enlightened Eye* dome and AF1 puts her hand in her pockets and moves back too, as CF arrives at a closer point, saying firmly 'number five is there'.
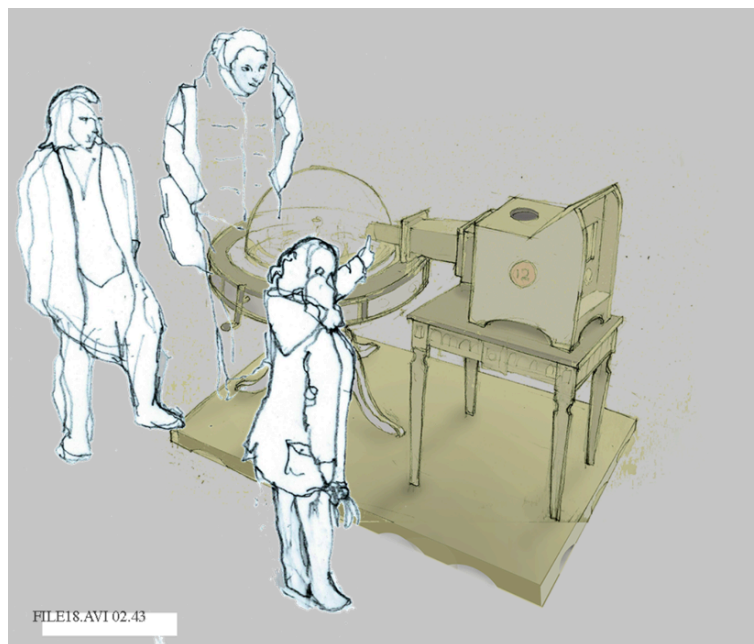

Figure 160: Jason Cleverly. 2015. Number five is there, image: J. Cleverly 2015.

This final act, confirming the location of mineral number five is a perfect example of supportive scaffold behaviour. The adults in guiding the child have been able to carefully manage the situation, allowing CF to preside over the final judgement of the true location of number five. As they respectfully step back, CF is now emphatically cast as the main protagonist of the task. CF has not only been allowed by the others to be the group's lead in the engagement with the interactive, she has also been creatively disruptive by mischievously calling the mineral sample Ciriden Halls. Thus Garfinkel's breaching of conventions (Garfinkel 1967.) can be absorbed by the scaffolding structure developed by this group.

It's Wonderful How She's Seeing It.

This fragment comes from 4.41 minutes into the same session: AF1. AF2 and CF have now all understood how to select a mineral and how to focus the image and are also getting to grips with the interface. Having decided against using mineral number five, between them they have selected a new mineral and begin to work on the task of annotating the microscopic image. This task falls to CF, while the adults, AF1 and AF2, stand close to the interface supporting and guiding.

Figure 161: Jason Cleverly. 2015. That looks a bit like a lion, image: J. Cleverly 2015.

CF, having considered the selected mineral, decides that it 'looks a bit like a lion'. AF1 agrees saying 'ahh yeah'. CF then turns away from the screen, glancing up at AF2 and then briefly AF1 and in doing so, she also makes a snake like movement with her left hand saying 'jumpin' over it', as she completes the mime.

Figure 162: Jason Cleverly. 2015. Jumpin' over it, image: J. Cleverly 2015.

This briefly pantomimed action animates a leaping lion and seems to confirm AF's resolve to fashion a lion, and returning to the screen, she immediately begins to do so. Now AF1 an AF2 glance at each other, smile and return to watching CF's progress, making encouraging, understanding noises: AF1 says 'aaaaah' as the image develops, CF responds with 'mmmm'; she is deeply engrossed in her work. It appears that intrinsic motivation within CF has caused her to experience a flow state (Csikszentmihalyi and Hermanson 1999) and that *The Enlightened Eye*, as an interactive with flexible levels of approach in use, has engaged CF and prompted careful scaffolding support from the adults.

After a while - about six seconds - AF1 asks 'where's his head'?' AF2 counters quickly with 'give her a chance!'. At this the two women look at each other and start to laugh, then AF1 seems to reconsider, perhaps feeling that asking about the lion's head might be an unsupportive comment. Leaning her whole body and head right over to get the correct viewing angle, she bumps her shoulder purposefully, perhaps conspiratorially into AF2's shoulder and she says 'it's wonderful how she's seeing it'. AF1, still bent over, points with arm and index finger outstretched at the large screen and AF2 concurs with 'yeah!' CF then looks round at the dome, then up to the main screen and declares: 'making a lion'.
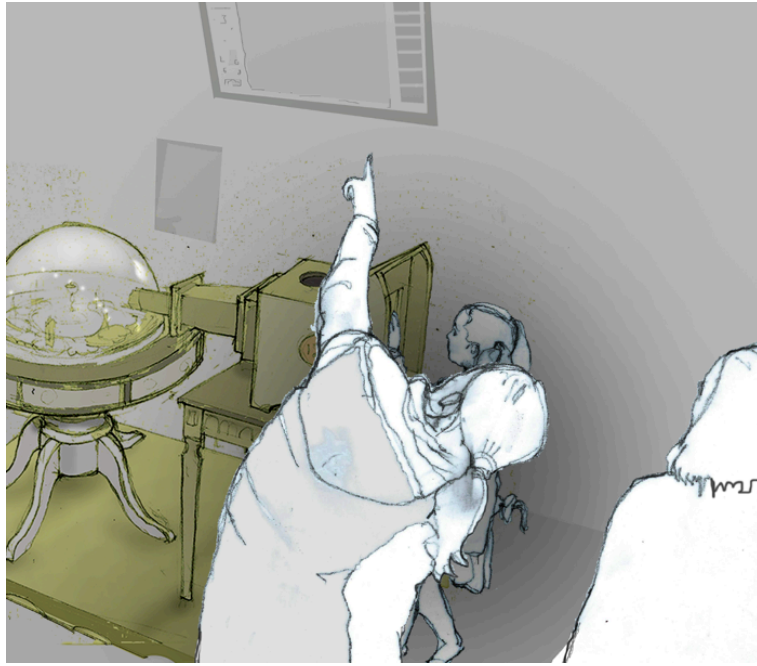
The child's ownership of the drawing is complete, as she has undertaken it with her own agenda intact.

Consider the image she has created (fig 165). The quartz mineral crystals that were selected have been annotated with a quite small, delicate, detailed and apparently upside-down lion. As the designer of *The Enlightened Eye,* I was delighted with this image, although when I first examined it I thought it was perhaps a hummingbird, only later when I was able to correlate this image with the video, when it became clearer what it was meant to be. The disparity between a more conventional image of a lion that one might expect, compared with CF's interpretation, a free translation and transformation of part of a mineral shape, unhampered by orthodox approaches to representation, emerges in this case only from this situated and unusual way of engaging with museum objects.

Figure 165: Anon. 2015. A lion, image: J. Cleverly 2015.

This drawing of a lion is emblematic of how visitors bring to bear their own experiences and understanding in to the museum context (Falk and Dierking 2000), through the open-ended task of object transformation. Object transformation is often a playful process, meaning that a reinterpretation, reattribution, reassembly or repurposing of an object can provide a new way of thinking about the object for a museum visitor (van Kraayenoord 2002, 231). Therefore, this creative critique creates new understandings of the object, as well as considerations that can be shared and reviewed with others. They do not perhaps, support the didactic agenda of a museum, however they arise from the literal meanings of an object as are they a recoded, and are made personal in this way. The intrinsic motivation for transformation is the creative act, which may alter visitor thinking and inform deeper or different readings of objects. An un-regarded aspect of a mineral has been appropriated and briefly been the focus of attention, in a small museum in small rural county town.

CF not only controls the transformation, she has also engaged the adults who contort themselves in support of her progress. This unique choreography of creative action, occasioned by my situated design is deeply satisfying to unpick and present here.

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Enforcing Your Own Interpretation

A third Ciriden Halls sequence, that comes later during the same session, is centred around CF's production of a new picture: this time it is a human face, again like the lion it is a rather subtle and understated image. It appears that something about the modest quality of the image animates the adults, and their support continues.

During this sequence, AF1 in AF2 are standing a little back from *The Enlightened Eye* and the AM (adult Male) is now in the shot. The adults have fallen into a routine; they watch the development of the image on the screen, this causes them to stand back to get a good view, as CF gets on with the job and occasionally an adult will come over and lean in to directly support the process at the interface.

The camera frames this particular configuration, so that it creates a pleasing symmetry; a triangle is formed between the figures and the focal point of the wall-mounted screen.
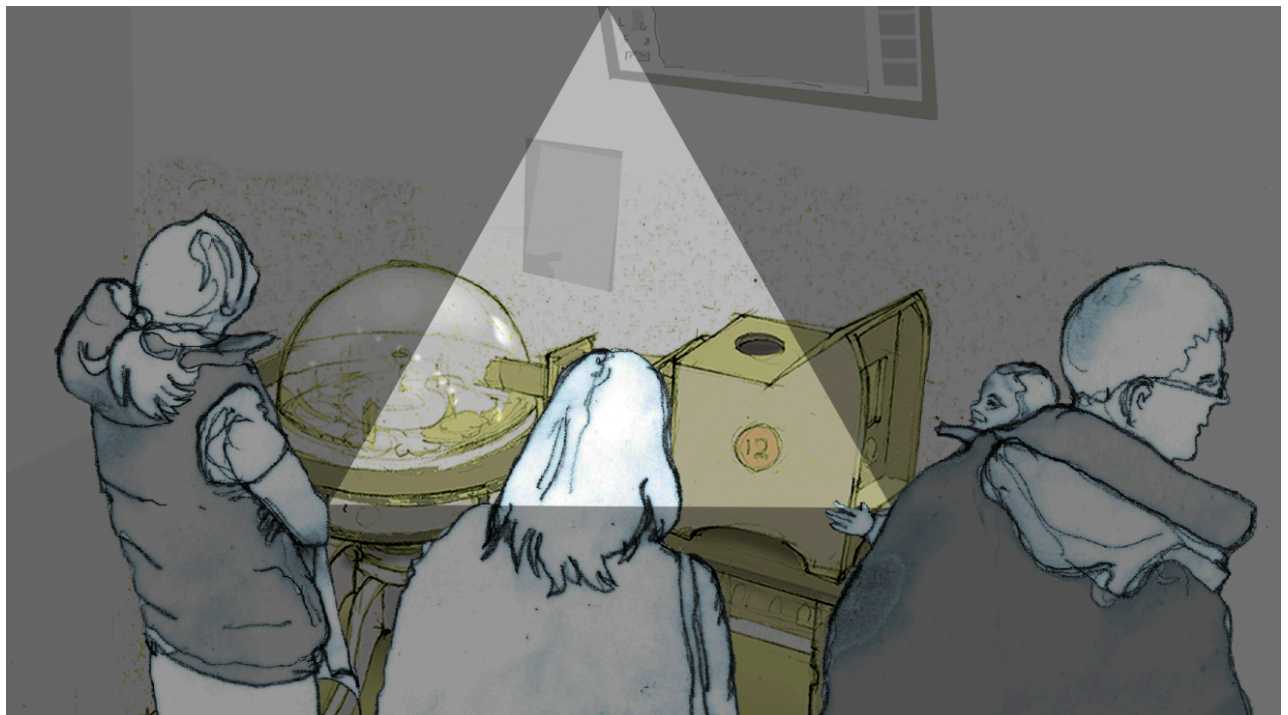

Figure 166: Jason Cleverly. 2015. Triangular geometry in fragment of Ciriden Halls, image: J. Cleverly 2015.

The visual dynamic of a triangular structure is a persistent and common device in art, sculpture and architecture. Emerging from the development of geometric perspective in the early Renaissance and a feature of composition and proportionality in depicted space, in painting the 'dynamic triangle' (Bouleau 1980,166), has been used to invoke a sense of height and to direct a viewer's eye to areas of significance.

The triangle device can be seen quite clearly in the Joseph Wright of Derby paintings, which had such an influence on *The Enlightened Eye*, in fig 167, additionally, the philosopher's pointing finger adds to the dynamic. An artist may consciously insert these constructs or they may arise from a tacit understanding of how a two-dimensional image may be invested with action and drama. The fact the moments that I have selected for analysis contain geometric synergies is inevitable; full of individual figures constantly moving, reforming and gesturing, particular moments symmetrical, other compositions flexing, stretching the balance, as the action unfolds.

Figure 167: Jason Cleverly. 2015. Annotated version of Joseph Wright of Derby.1768. An Experiment on a Bird in the air Pump (detail), image: © 2017 The National Gallery, London.

CF begins to draw, then stops and turns and smiles at AF2, who asks in return: 'what can you see Megan?'. Returning to the drawing, CF says 'an eye'". Both adults continue to watch the drawing unfold on the screen, and when CF appears to complete the eye she is drawing, she takes her hand from the screen and looks at AF1, smiling, to which AF2's response is 'Aaah nice' and AF1, laughing, rocks her body back, then as she leans forward to finish her laugh, CF, in a mirror image of AF1's action, leans her body right back smiling broadly to look over *The Enlightened Eye* interface at the larger screen. CF is conducting a show for the adults, clearly enjoying the dialogue, and she takes turns to prompt a variety of responses from her audience. Now AF2, (echoing AF1's contorted pointing from the previous section), makes a major assessment of the situation, pointing and advising.

Figure 168: Jason Cleverly. 2015. Look up 'cause I think you could have its eye then it's nose then you could have its mouth down at the bottom, image: J. Cleverly 2015.

AF2, her whole arm outstretched, points towards the screen with her index finger. This kind of pointing is known in anthropological terms as declarative pointing, it forms a way of directing attention to something out of reach, in particular to share attention with others (Lindblom 2007, 160). AF2 is creating active joint attention. As she points she says, 'Look up 'cause I think

you could have it's eye, then it's nose, then you could have its mouth down at the bottom'. AF2 is here recommending positions for annotating facial features on the selected mineral. During this descriptive discourse, AF2's index finger can be seen in fig168 right at the centre of action, enhancing the triangular dynamic of the image. One of the features of any interchange, as previously discussed, is the theatrical nature of conversation and action; the term *recipient design* describes the way speech and conduct is constructed by individuals, in order to take into account the conversation and actions of others (Campisi and Özyürek 2013, 14). I will discuss the concept of recipient design in more detail below. As AF2's finger traces the possible design, her outstretched finger begins by rhythmically describing seven small, circling motions very quickly. This circular pattern conforms firstly to the embodiment of how an eye can be drawn with a finger on the touchscreen interface. Secondly, it can be categorised as an iconic gesture, this is a symbolic action that clearly reflects the context of concurrent speech. And finally it has the characteristics of a beat gesture - a rhythmic metronome-like movement that relates to cadence in speech (Lindblom 2007, 135). During the phrase 'You could have its eye', seven tiny circles are completed, indicating the eye, before AF2's finger moves down.
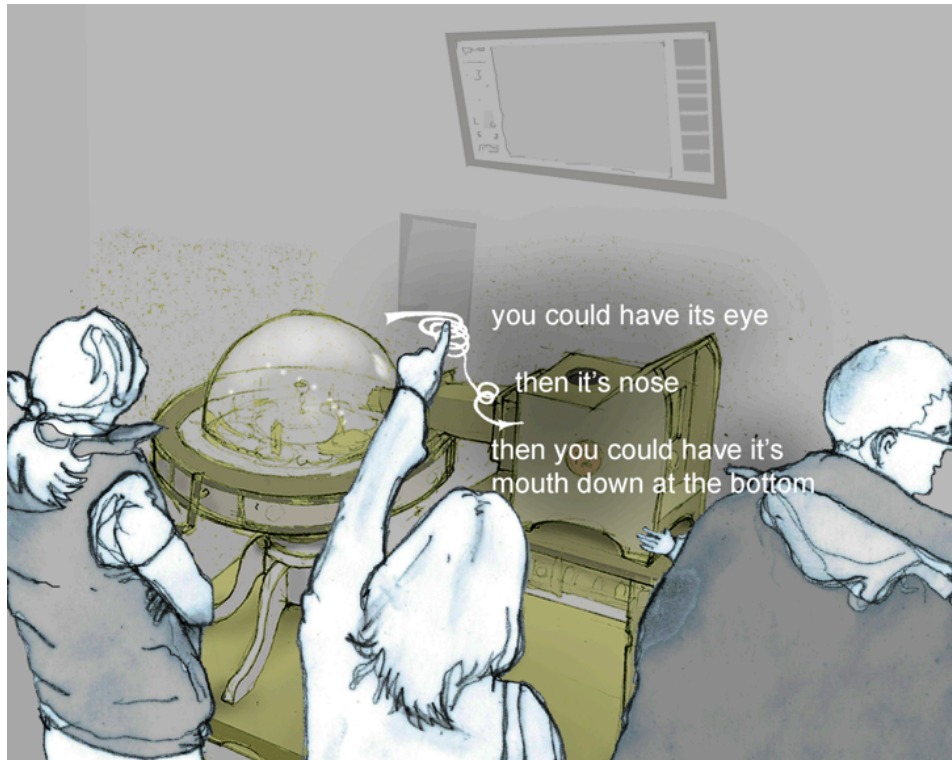
The second set of circles, relating to the nose position, is allowed only two small circles and the mouth has no circles, rather AF2 concludes with 'then you could have its mouth down at the bottom'. Saying this, she moves over to the interface to help CF with this idea, pointing at the interface and indicating what she means, then stepping back to allow CF to respond to the suggestions. Considering this development, AF1 says 'now you're enforcing your own interpretation he he he he', and with a rueful 'awww' AF2 seems to concede the point.

This interchange between the adults appears to reveal a nuanced difference of approach to the scaffold, and to the shifting power relations between them. AF1 seems to hold a purist approach to how her ward, CF, should engage with *The Enlightened Eye*, allowing her to assert her own way of finding the creative comparative morphology in the mineral samples, perhaps regretting previously asking where the lion's head was. However, her remonstration to AF2 shows a complex struggle within the continued scaffold; AF1 has conditioned her remark provocatively and this may include my own presence

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in the space for, as she completes her statement she glances at me, perhaps to convey that she understands the conceit of *The Enlightened Eye* from my (assumed) point of view, as apposed to than AF2's interference. The final image from this session is a delicate annotation of the mineral image: the rock does most of the work of presenting as a face in profile, see below, and it appears AF2's advice on noses and mouths was disregarded in favour of an eyebrow.

Figure 170: Anon. 2015. Stone face, image: J. Cleverly 2015.

Data Analysis II: Two Point Four Children

Not Very Good at Art

In the case of the Ciriden Halls' scaffold, the adults guided and shared the engagement, allowing the child to lead the activity. In this next example, an alternative scaffolding structure is evident; here an adult assesses the capacity of *The Enlightened Eye* before allowing the others in the group a chance to engage with it.

This nineteen-minute long fragment features an adult male and female accompanied by two male children. I have briefly introduced a family group of two adults and two children to *The Enlightened Eye* and now they begin to familiarise themselves with the interactive by selecting a mineral. CM2 has

wound the handle to align the chosen sample with the microscope, and now the AM has asked CM2 to 'just leave it there'. Now AM begins to consider the task, as the others watch patiently. With one hand in his pocket he tentatively jabs at the controls on the interface.
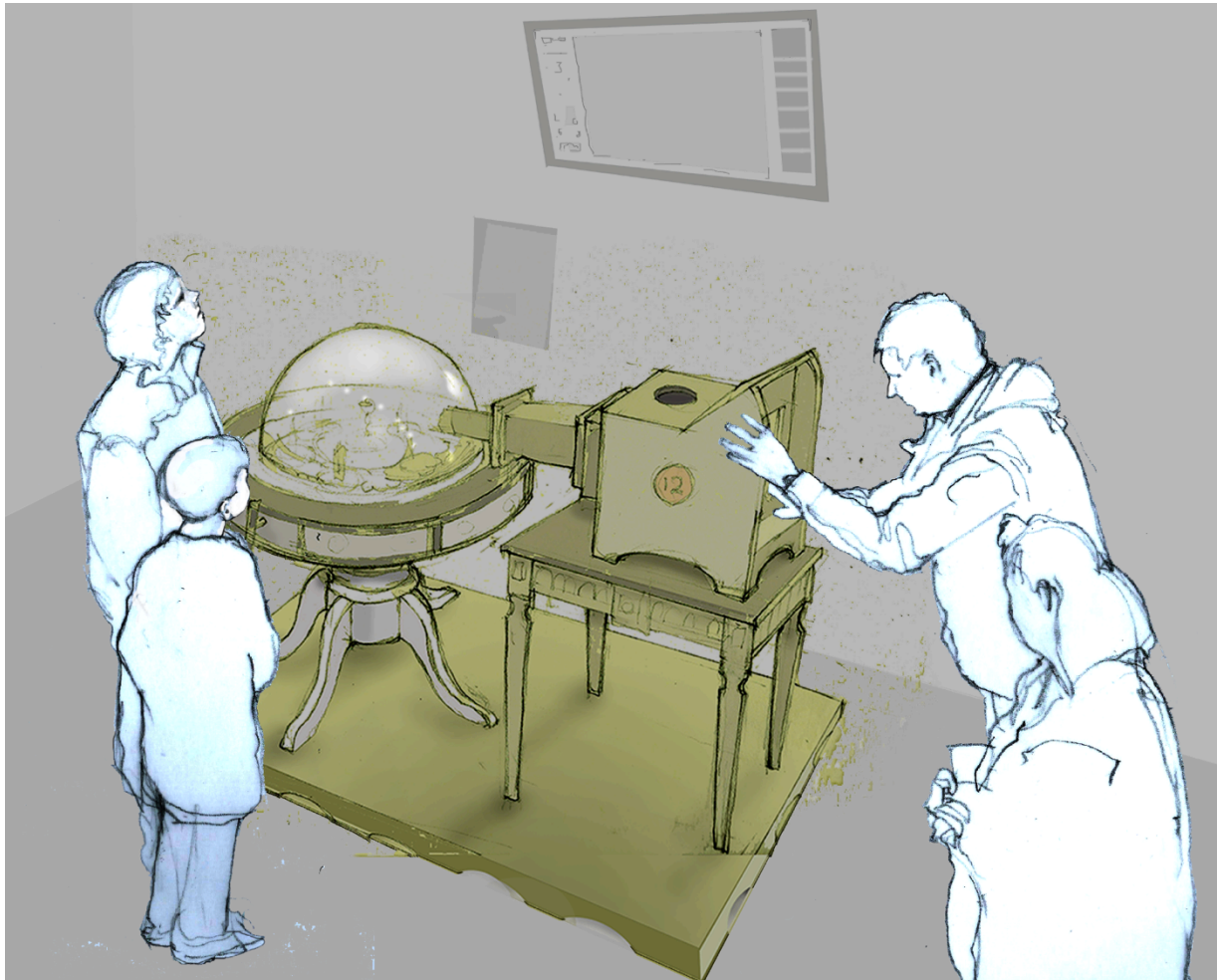
Figure 171: Jason Cleverly. 2015. Tentatively jabs at the controls, image: J. Cleverly 2015.

Then very quickly, AM Makes a small diagram in the air; first he makes a tiny riffle with the fingers of the right hand, then he lifts his right hand and points to an area just above the small screen, while taking his left hand from his pocket and bringing it up to point alongside the other index finger, he looks down and through his two fingers to the screen. Immediately he returns his right hand to the screen and with his left hand he holds on to *The Enlightened Eye*, and begins to work on a drawing.

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This small diagram, a sketch in space, appears to support AM's planning: he is thinking through the form of the image he is about to commit. A warm-up exercise, it forms a fleeting preparatory study, a squaring up of the screen. It is also an embodied action, seemingly intended to communicate to the others in the group the concentration required to work in this way, it narrates a creative thought in action. AM's gesture could be classified as a *metaphoric* gesture, this kind of gesture is similar to the to the *iconic* gesture that describes the semantics in speech, however it is more abstract, a proposal of something, and is often characterised by hand formations that physically outline possibilities (Lindblom 2007, 135). In this case the gesture is not supported by speech or directed at the others in the group but appears as the results of an internal monologue.

Although the gesture is not directed explicitly at the other members of the group, they are absorbed and follow the action on screen, as well as the pantomiming gestures. The other members of the group are apparently respectful of AM's status in the spotlight: they are quiet and they do not

interfere: they are being shown how things might be done when their turn arises, he is cannon fodder, making mistakes on their behalf. AM is learning how to proceed with the production of an image and he takes his time. AM is sensitive to his role as a teacher and aware of the responsibility to communicate the seriousness of the procedure, however AM soon begins to exhibit doubts about his capabilities, eventually admitting 'not very good at art…never was'. This declaration does not stop AM continuing with the project, indeed he carries on. The sequence lasts for three and minutes and during that time AM is increasingly supported by CM2, who advises on on-going technical issues. AF also advises and is supportive too, so the emphasis of scaffolding begins to shift slightly. Scrutinising the image more closely, CM1 asks 'what is it?' AF who has been advising, says 'a box'. Finally satisfied, AM even signs his image at the bottom.
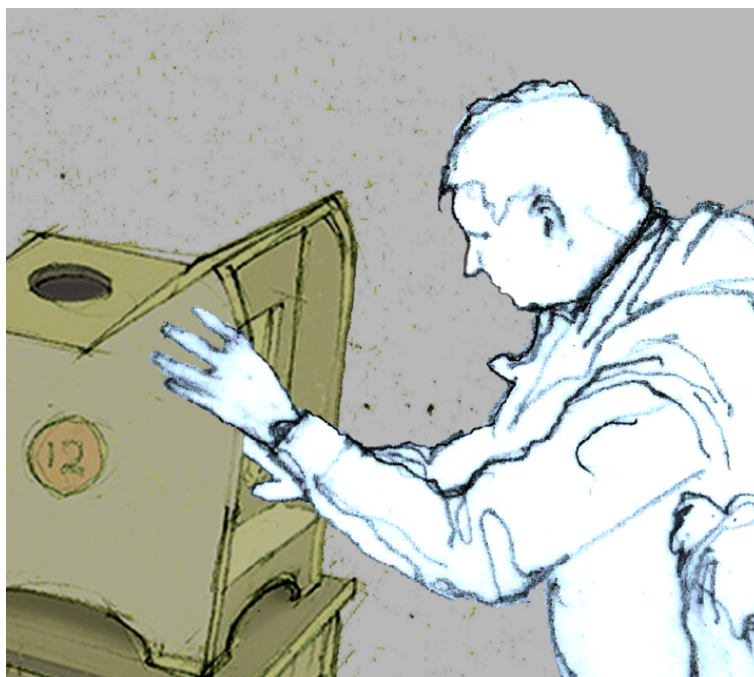

Figure 173: Jason Cleverly. 2015. Signs his image at the bottom, image: J. Cleverly 2015.
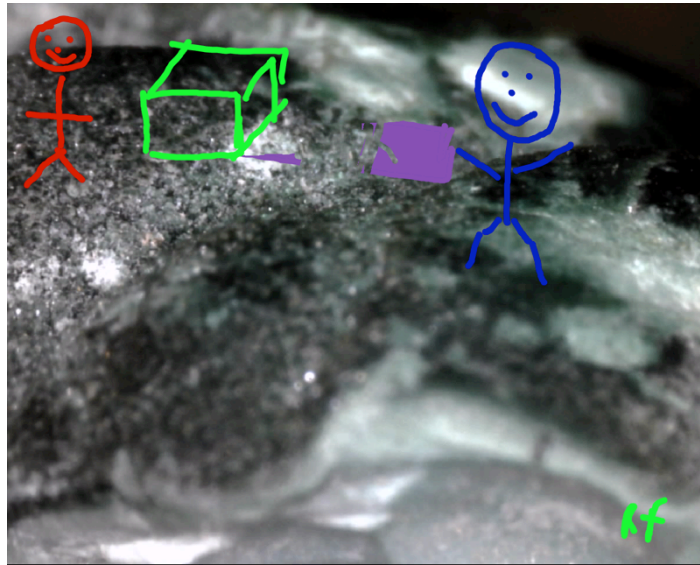
Figure 174: Anon. 2015. A Box, image: J. Cleverly 2015.

Be Imaginative

Now that AM has learnt how to use *The Enlightened Eye*, the session continues and the whole group are able to proceed. At about eight minutes into the whole sequence CM1 waits by the handle as AF finishes a picture and once the picture has been saved, he starts to turn the handle. After some advice from AM on which way to turn the handle to get the required mineral in position, CM1 manfully turns the handle. AM returns several times to support and it takes quite a few turns, during which time the handle squeaks loudly. The design of *The Enlightened Eye*'s gearing mechanism means that the mineral samples cannot be moved quickly, a deliberate design decision to help protect the samples and to protect the users from any dangerous free spinning. In addition, the effort required to move the minerals, coupled with the (serendipitous) sound, contributes to the agenda of kinaesthetic learning.

Now CM1 has positioned the mineral and quickly moves round to attend to the focus wheel and again the focussing is not straightforward, requiring support in finessing from AM. The design of the focus wheel arose from the idea of making *The Enlightened Eye* feel analogue to the user. I had initially

decided to use an autofocus system here, but the analogue solution contributes to the aesthetic and kinaesthetic affordance.

The focus is achieved and AM says in confirmation 'yeah? See y'can do whatever you want'. He turns and whilst walking away offers an afterthought, advising the corollary; 'be imaginative'.

Now CM1 begins to consider his drawing. This is reflected in his outward demeanour: after making a few tentative mark-making approaches with a finger, he puts his hand on his chin, looking out from *The Enlightened Eye*, then steps back, looking around for the others and starts to run his hands up into his hair. Gripping and rubbing his hair he continues to move back from the interface, eventually taking his hands down he inspects them briefly, then looks down and places his left hand back upon his head, then examines his hands again, before returning confidently to the screen to start work.
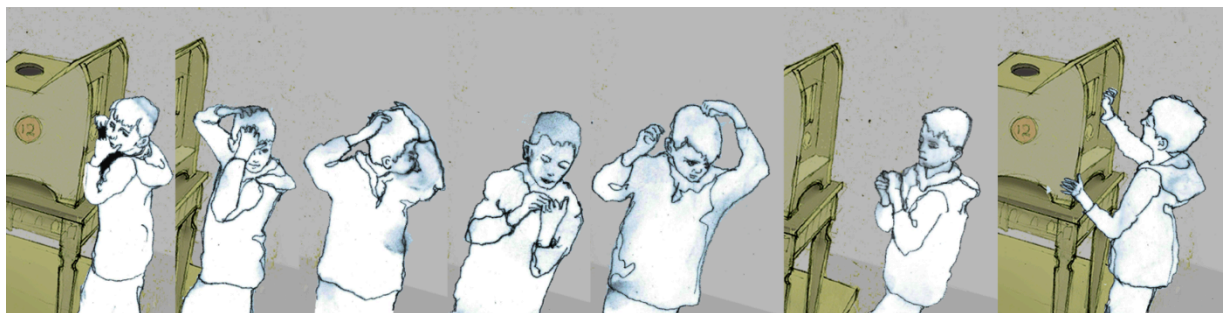

Figure 175: Jason Cleverly. 2015. A complicated display image: J. Cleverly 2015.

This complex display lasts fourteen seconds; if it is a version of AM's preparatory diagram assessment of the task, it is far more elaborate. If we consider this an expression to others of his inner deliberations on what to draw and how to be imaginative, it is a display worthy of their attention. The impression CM1 gives off is conditioned by the situation and conditioned by an attempt to communicate to others his current situation. According to Goffman there are several types of communication of this kind and sometimes they are thoroughly calculated to receive a specific response. In other cases, they are calculated but unconsciously so. They may also fall into expected traditions within a group, are almost a requirement of conduct

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and are performed according to their status within that group (Goffman 1990,18).
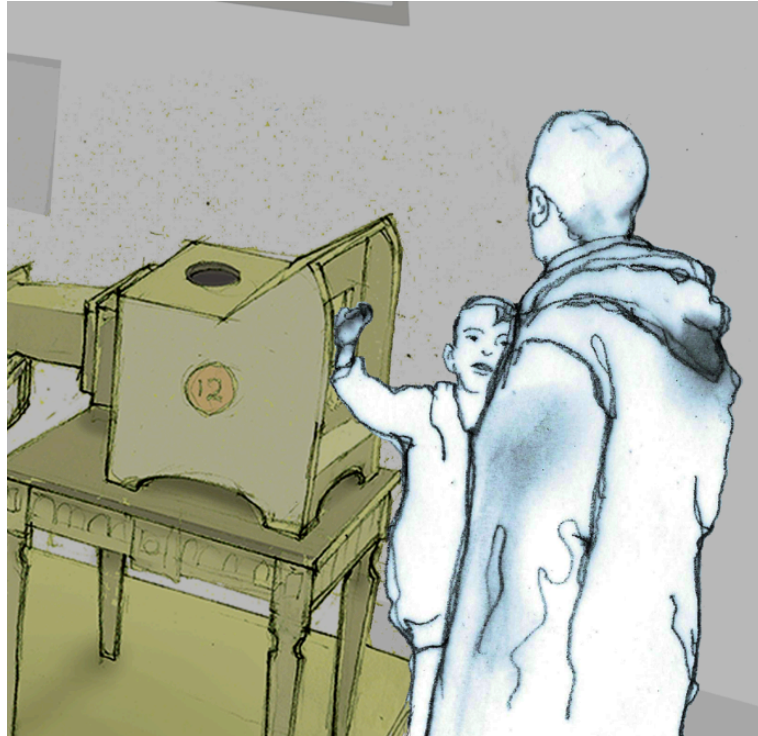

Figure 176: Jason Cleverly. 2015. The moon! Image: J. Cleverly 2015.

As CM1 prepares for his drawing the performance goes ignored. Perhaps the others have seen this kind of thing before from him. Now CM1 starts to draw in earnest and it is almost a minute before AM comes to have a look, and asks what it is he is drawing, whereupon a smiling CM1 replies 'The Moon!'. At this AM's reply is, 'the moon aye…traditionalist'. Its unclear what this is meant to mean exactly, though unmistakably a critique of CM1's drawing and choice of subject. From this point all the members of the group start to discuss and involve themselves with the drawing. Coincidently the image also features a creature that CM1 calls a lion. This creature is discussed at length: they debate the organisation of the lion's legs and arms and whether or not the moon is in fact a slice of cucumber that the lion is eating. Eventually CM2 asks if CM1 has saved the image and AM tells the others that they will be able to look at it online.
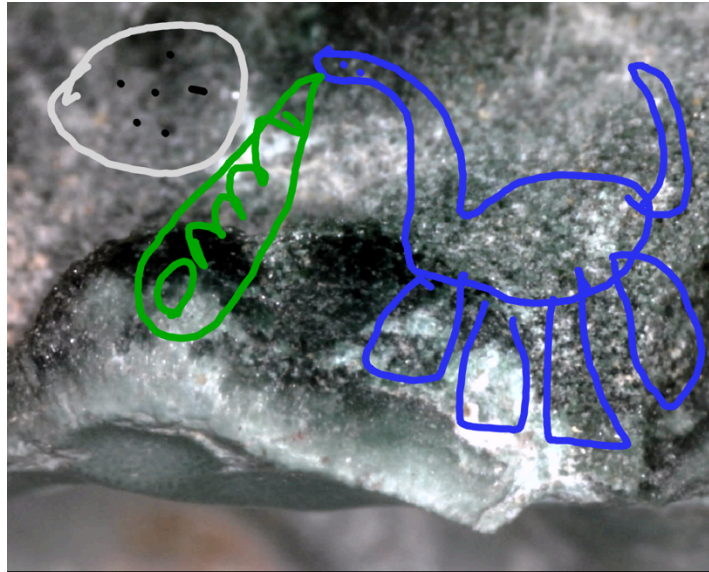
Figure 177: Anon. 2015. Eating the Moon, image: J. Cleverly 2015.

The whole session lasts approximately twenty minutes and during this time all the members of the group have a go at making images. AM is quite proprietorial and advises constantly and all members of the group focus not only on *The Enlightened Eye* but look at the other exhibits too. AM reports that its 'taking me back to GCSE Geography' and there are discussions of rock classifications; AM says to CM1 'you should know the three types of rock.. igneous, sedimentary, metamorphic, can you remember that?'. A discussion of why Cornish pasties were eaten down mines takes place between AF and CM2, as they look at a ceramic souvenir in a nearby cabinet, 'its something they could have for lunch, it was obviously dirty down there'. This kind of discussion pervades the sequence, alongside the creative action supported by *The Enlightened Eye*. This mixture of evaluation and interest in the whole exhibition is much more balanced than the previous session, which focussed almost entirely on the support of one individual in the use of *The Enlightened Eye*. Curiously, there was less interest in the other displays at the expense of a creative engagement with *The Enlightened Eye*. It would be difficult to draw a conclusion from the evidence on why this might be, however the reluctance of the adults to try out *The Enlightened Eye* for themselves in the *Ciriden Halls* session, created a slight competitive tone to the scaffold support and might have been a factor in

keeping the focus on one activity. Contrast this with the careful initial assessment of the features of *The Enlightened Eye* by AM, leading to a much more wide-ranging set of activities, once the ecology of action has been decoded assessed and made clear to all, by AM's example.

(Interesting to note that this family group returned the following Saturday to have another go).

Data Analysis III: Riot Squad

This sixteen-minute long fragment features five young children who were unleashed on *The Enlightened Eye* with some introduction to its operation but with no real adult supervision. The session lasts about fifteen minutes and while it starts relatively calmly, it very quickly changes its tone, becoming frenetic and chaotic, although not without interest and structure for my data collection. The session is also significant when considered against the previous examples of visitor conduct with and around *The Enlightened Eye*. The examples of data I have selected prominently feature children. They were not my intended audience; in fact I did not consider any specific demographic group when designing the work. This has been the case throughout all my work of this kind, however when designing a piece, I do consider the potential that children may have for recklessness when handling museum interactives, particularly ones that are difficult to use, or ones that are not immediately stimulating. This is a problem for many museums, alongside that of robustness of construction in the face of the misuse or boredom that can arise from a poorly considered interactive (Rennie and McClafferty 2002, 209).

There are four boys and one girl in this sequence: they move very quickly, they constantly group and re-group around the ecology of action, often gathering around key affordances. Some strike off on their own, the girl in particular seems to move the fastest, constantly dipping in out, finding gaps, and at one point she even climbs under and through the table legs. This

sequence is reminiscent of a marine ecology, the children darting about like shrimp around a coral reef.

What is apparent is that they are not particularly concerned with the task of finding forms within the mineral structures. The children exhibit ludic behaviour in different ways around the ecology of action, while not attending to the function of *The Enlightened Eye*. *The Enlightened Eye* is the object around which the children are constructing their behaviour, subverting the epistemic value of the task, turning the task into one of interaction, rather than interpretation. Their primary interest is interaction with each other through the agency of what must seem a curious object and they do not seem bored.

I Capture the Handle

The children are not concerned with aligning mineral samples with the microscope in the way that *The Enlightened Eye* was conceived - there are fleeting occasions when this appears important, but not many. This disconnection means that the functions of the handle and the interface are now separate areas of interest, and the handle is an affordance for discrete play.
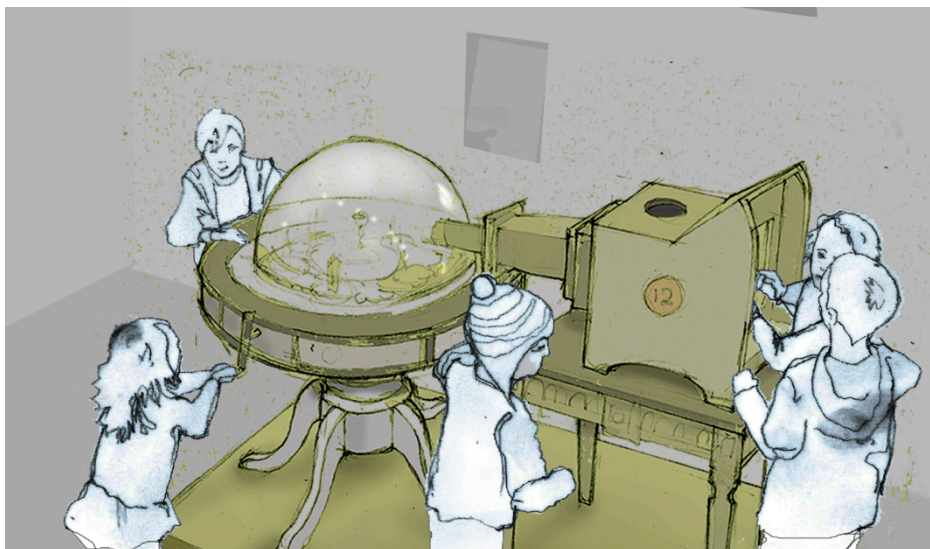

Figure 178: Jason Cleverly. 2015. Darting about like shrimp image: J. Cleverly 2015.

CM1 is leaning on the table looking over towards CF, who is moving the handle and looking up at the screen, observing the way that turning it affects the image. Still leaning on the table, CM1 slides round, slowly clinging on with his fingertips to a ridge on the table lip. CF seemingly ignores this stealthy movement: to return to the natural history metaphor, CM1 evokes a predator stalking his prey. However, soon CF can no longer ignore CM1 as he slides even further over and forces CF to lean around to see the screen. This blocking of her view is the first in a series of attempts to persuade CF to relinquish the handle; the preparatory body block is followed by a rather subtler signal to CF that she should let go of the handle.
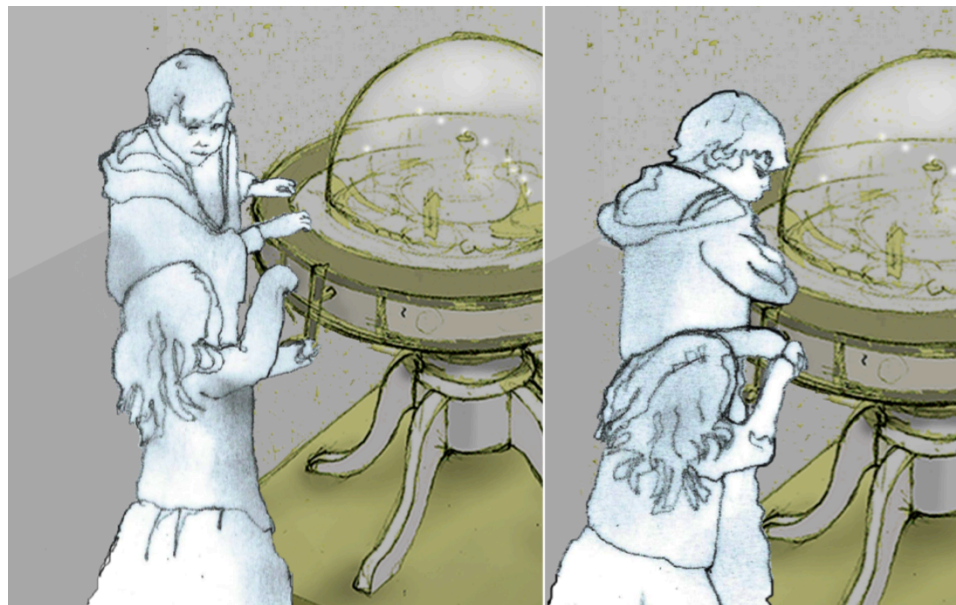

Figure 179: Jason Cleverly. 2015. CM1 slides round slowly, image: J. Cleverly 2015.

CM1 now slides his hand over the table lip and briefly touches CF's hand, looking down at his hand on top of hers. Psychologists examining features of interpersonal touch recognise a phenomenon known as the Midas Touch. They have shown that shoppers can be more open to sales, restaurant customers will tip more and stress in hospital patients will be less when they have been briefly touched during the course of an interaction (Gallace and Spence 2010). CF ignores both this touch and the undoubted symbolism of the placing of his hand near the handle to show his intention to have a turn. Even these actions do not have an effect, so CM1 resorts to a gentle

extracting of CF's hands from the handle, to which she is surprisingly compliant. Despite the engagement, CF displays enjoyment of the control of images appearing on the large screen and she acquiesces easily, her resolve evidently softened by the onslaught of embodied physical gestures. These may have made the difference.
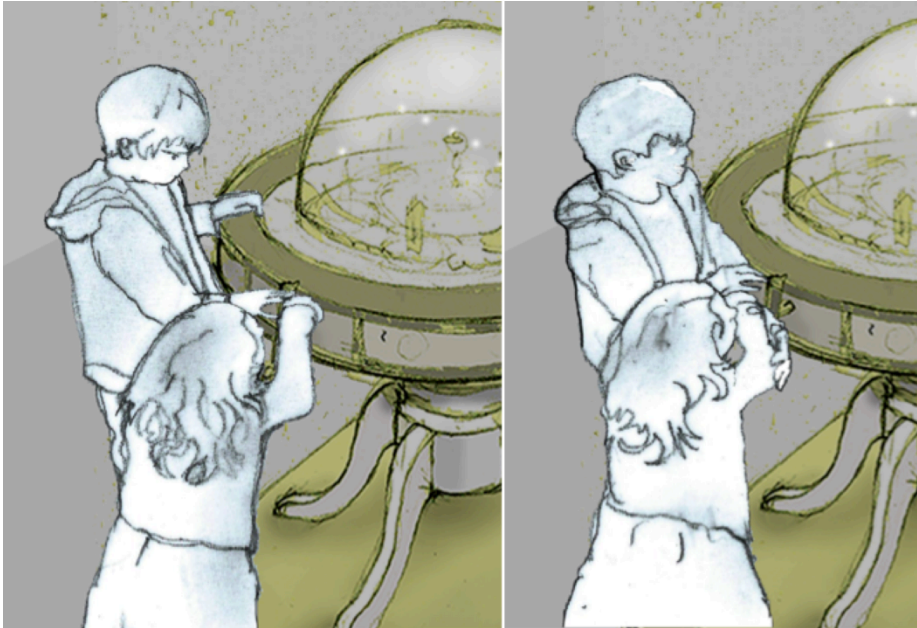

Figure 180: Jason Cleverly. 2015. A gentle touch, image: J. Cleverly 2015.

Virtual Reality

Now that CF has let go of the handle CM1 is free to show her how to use it, and with one leg braced on *The Enlightened Eye*'s base, he immediately starts to wind it vigorously, putting a lot of physical energy into the winding as CF, displaced, steps back and watches. The energetic winding goes on for four seconds until CM1 can see that a mineral is getting close to the microscope and he calibrates his winding accordingly, slowing down, checking both the big screen, a feed from the microscope and the actual movement of the mineral, angling and ducking his head down carefully to see how close the mineral might be. CM1 begins to flag, his winding becomes less urgent, listless: a lot of winding has not brought the mineral into view and so he carries on. This change in tempo is noticed by CF, who

moves closer and, leaning on the table edge, watches CM1 at close range until finally the crystals move into view, at which point CM1 and CF both look up at the screen.

Elsewhere, CM4 is draped over the main body of *The Enlightened Eye,* also watching the big screen and at the other end of *The Enlightened Eye*, at the interface, CM2 and CM3 have been drawing on the interface screen. The image they are working on is now aligned to the minerals that CM1 has brought into view. *The Enlightened Eye* is now completely occupied. All of the children are engaged in some way directly with it, both physically and intellectually and although they are not using it exactly in the way I had conceived, it is holding and supporting their interest - the reef is providing nourishment and accommodation. There is a brief, calm lull.
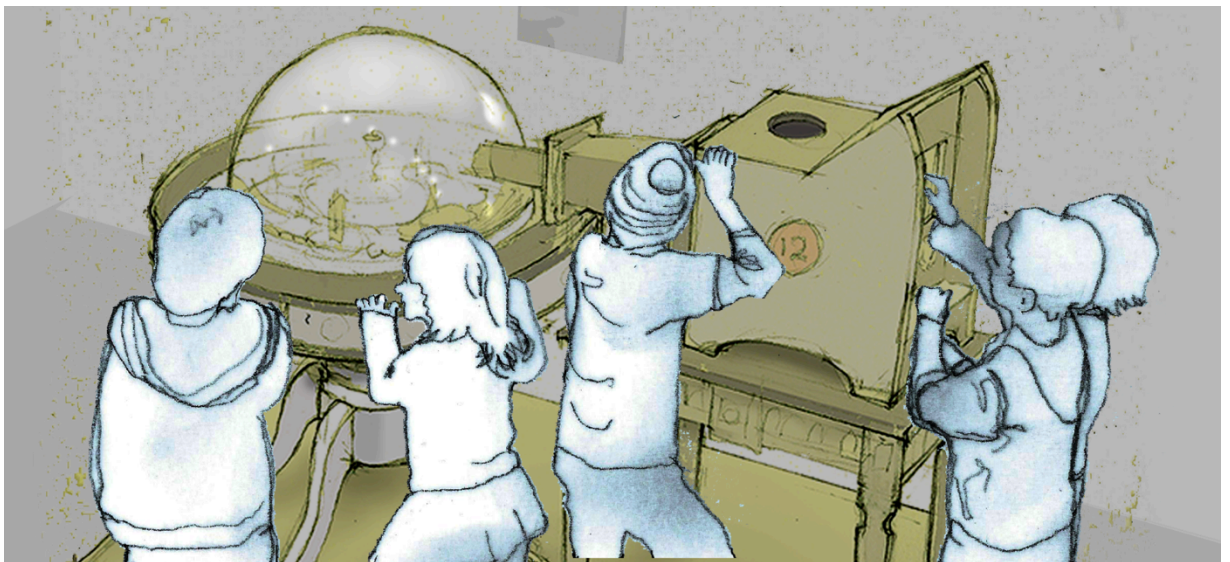

Figure 181: Jason Cleverly. 2015. A lull, image: J. Cleverly 2015.

Now that the mineral image has come into view, CM2 and CM3, who are drawing, suddenly become very animated, throwing themselves backwards, shouting and laughing, which attracts CM4 and AF, who also react excitedly, and they cluster round the interface. It is difficult to tell whether the appearance of the mineral on the screens has been the cause of this commotion, but concurrently CM1 is moving again. He has begun to rock from side to side, putting all his weight on one leg and then the other, whilst

holding on to and turning the handle, translating this movement to the screen. As CM1 rocks, he looks at the screen. It is as if he has entered the image, a close up of crystals, and his physical action has merged him with landscape, in a kind of virtual reality.

The Enlightened Eye is again a stage for complex action. The children, although not scaffolded, are having an experience, revealing, adapting and exploring affordances in different ways. As a consequence, the open-ended nature of the task that *The Enlightened Eye* is designed for, is pushed to the limits of intended function. This is an arena for ludic play, the 'what can this object do for me?' question is asked and tested; there is fantasy and intrinsic immersion through play; the museum is not serving a pedagogic agenda but the mineral samples are being explored in an extraordinary way and their materiality is at the heart of this sequence, although their presence is only indexical, revealed through the creative and social interaction between the actors, the objects and the technology.

Figure 182 shows some of the images made by the riot squad. It is clear that they do not feature any mineral samples but instead signed images of perhaps, (aptly) representations of themselves. The question, 'what can this object do for me?' is being asked and answered through these biographical images.
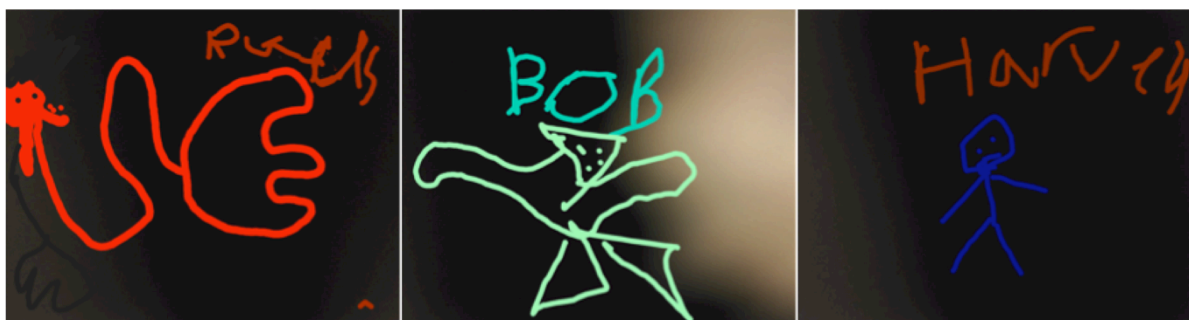

Figure 182: Anon. 2015. Rufus, Bob and Harvey, image: J. Cleverly 2015.

Data Analysis IV: The Cooperative

This fragment features an adult male and three children - a girl and two boys. The session lasts for approximately forty minutes, during which time all the children have a go. AM is very supportive of the children but perhaps the main protagonist is CF, who is about thirteen and confident. She negotiates and supports a lot of the action in collaboration with AM. The other children are CM1, who is about six years old, and CM2, who is about ten.

Look at Thaaaat Dad!

The group has learned how to move the samples around and now they have chosen a mineral for attention: it is number five, malachite. AM says, 'That's from Caradon Hills - you know where Caradon hill is don't you?' CF is now finessing the focus at the interface, which is proving a little difficult and as they turn the focus wheel for some time trying different directions, the dialogue is exclusively conducted between AM and CF, who make helpful suggestions to each other; and this lasts for about thirty seconds until AM says 'right just keep going ' til you're happy'. CF moves the focus a little more until AM exclaims 'WOW!' and looks at CM1 and CM2, who are watching the progress on the large screen. CM1 says 'woooh!' and CM2 says 'wow!' and AM looks at them and affirms 'that's cool isn't it?', CF concurs 'its amazing' and AM chuckles. We can see how the scaffolding here by AM and CF is gentle and playful. The four individuals have taken on easy-going, supportive roles for each other and there is no clear hierarchy of influence: the dialogue reveals equal levels of support for all. It is at this point that exchange of dialogue can be analysed for what is known as conversational *turn taking*.

How conversation is organised has been of interest to linguists for some time; it has been shown that children under the age of five for example, do not observe conversational turn taking, they have to learn the convention (Isaacs in Sacks et al. 1974, 698). Within the organisation of conversation, it is a highly useful strategy for individuals in a group to wait for their turn to speak. This convention can be observed in the twenty-second long transcript below that continues the *look at thaaaat* sequence.

1.09	CF: *Look at thaaaat dad* (almost whispered)
1.1	AM: *Cool*
1.11	CF: *Look, you can see it up there as well*
1.12	AM: *Its hitting the big screen yeh*
1.13	AM: *So now..if you want to you can draw on that*
1.17	CF: *I know*
1.16	AM: *Its cool innit?*
1.18	CM1: *Dad, I'm gonna draw on it*
1.18	CM2: *What are you gonna draw?* (to CF, who doesn't answer)
1.19	AM: *What are you gonna draw?* (to CM1)
1.2	CM1: *Not telling*
1.2	AM: *Oooh* (jokey)
1.21	CF: *Its amazing*
1.22	CF: *Riiight*
1.24	CM1: *Was a good place*
1.25	AM: *Are you gonna get closer?*
	CF: *That's the best picture, to be, y'can see what it's gonna be like…*
1.25	*but we should draw now*
1.3	AM: *Whatever you like!*

The left-hand column, showing the minute and seconds, shows just how little time there is between each turn. At this point, the conversational rhythm is very tight between the four individuals - each utterance and response is approximately one second long. This structure is characteristic of many normal, everyday group conversations. Though each is unique and extraordinary there is no script, no agreement as to how the conversation will be structured: it is a tacit, sequentially created dialogue.

In order for discourse to be shared intelligibly between individuals, what is known as 'recipient design' (Sacks et al. 1974, 727) is being deployed. Recipient design is 'the ability to shape the intended message, taking into account the needs of the addressee' (Campisi and Özyürek 2013, 1). Video analysis of data shows very clearly how each comment by a group member is tailored to form an intelligible, supportive sequence, whereby comments are either direct responses to previous questions or a statement of intent that refers to their own engagement with *The Enlightened Eye*, designed to communicate intent or description to the rest of their group, making use of the innate ability to take turns in conversation.
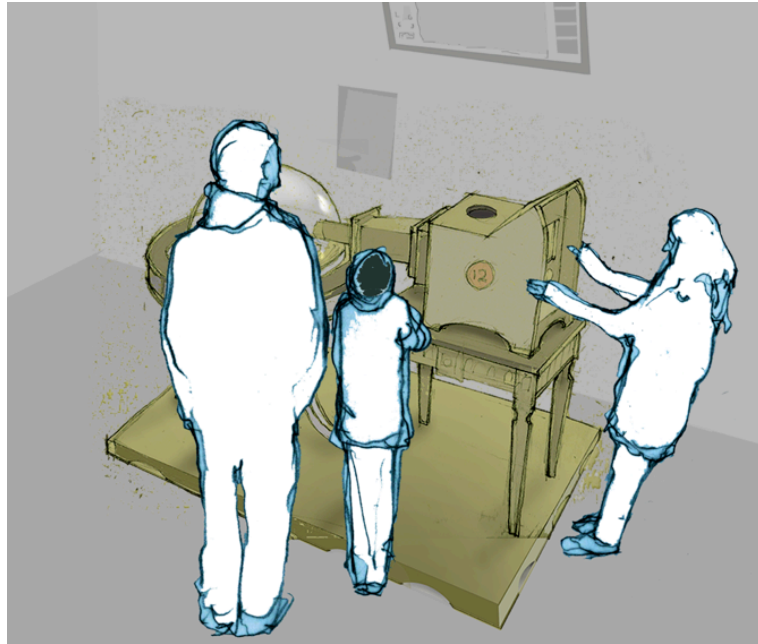
The linguist and sociologist Charles Goodwin argues that any analysis of conversational turn taking should not just take into account the dialogue of conversation in isolation (Goodwin 2000, 1490) but should also consider how the embodied gestures displayed by individuals provide semiotic clues that endow conversation with further detail and emphasis. This has been illustrated in earlier data analysis, such as the tiny circles seen in fig 169. Goodwin also asserts that the situated context within which the dialogue takes place is critical for the construction of turn taking in dialogue. This can be seen clearly with almost any analysis of *The Enlightened Eye* data, since this is the spatial topology and ecology of action under scrutiny. A good example of the situated interchange of dialogue and kinetic movement comes when CF says 'look at thaaaat', whilst pointing at the interface screen on *The Enlightened Eye*, then points up towards the large wall mounted screen and says 'look you can see it up there as well'. AM says 'Its hitting the big screen yeh' as he and CM1 walk round to look up in order to indicate that their attention is now on the big screen. CF holds on to the sides of *The Enlightened Eye*. CF hangs her body back and CM1 now leans on the camera obscura table proprietorially, still looking up (fig 183). This interweaving of discussion and physical intimacy with and around the

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interactive shows how a shared interlocution reflexively forms itself sequentially, and the cognitive interpretation of the work unfolds within the broad social scaffold.

Time and Relative Dimension in Space

Now moving attention forward within the same fragment to fifteen minutes in, CF has had her turn at making some drawings. She has spent a considerable amount of time working on her images, approximately seven minutes, and at one point she seeks help from me regarding tool function. CM1 subsequently takes a turn, receiving a lot of support and encouragement from CF and AM, taking about three minutes to make his images. Now CM2, who has been waiting patiently and actually is the most taciturn of the group, begins his turn. Having had some support from CF in the resetting of the interface to live drawing mode, CM2 confidently uses the handle on the orrery to select a mineral sample, whilst the others discuss the names of the minerals and observe CM2's actions. CM2 now settles on a sample and, after some finessing and some support from AM, he sets the focus and starts to draw.
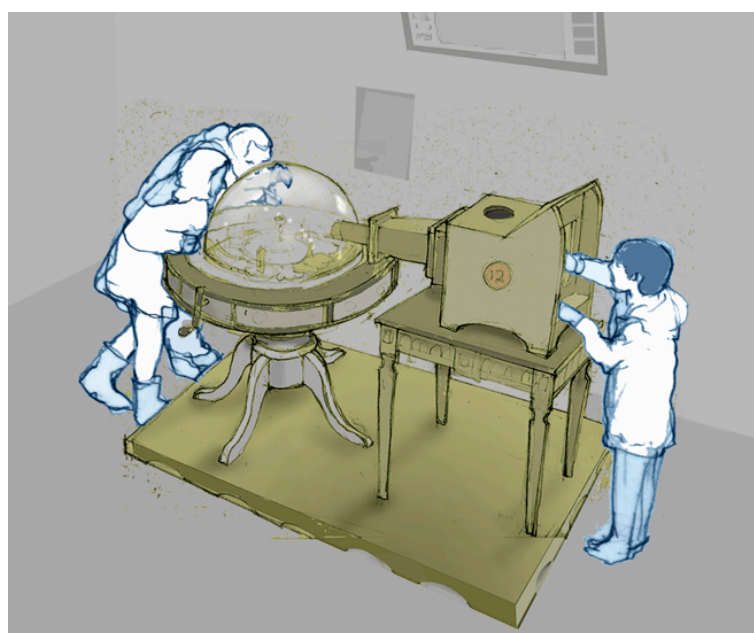

Figure 184: Jason Cleverly. 2015. Drawing the Tardis, image: J. Cleverly 2015.

CM2 has clearly been planning his approach, as he begins to draw immediately and the others now leave him to it, clustering around the dome and continuing to discuss the visual qualities of the various mineral samples as they peer through the Perspex. CM2 spends a total of eight minutes drawing and redrawing his image. During this time, the other members of the group come and inspect his progress, offering the odd comment and hint. CM2 stoically pursues his goal, carefully constructing an image of Dr Who's Tardis ('BBC One - Doctor Who - the TARDIS'. 2016). Placing it on a lump of quartz, as if it had landed on a glistening planet, he finishes his drawing, signing the creation with his name and adding an exclamation mark (fig 185).

Figure 185: Anon (Jobe). 2015. Jobe's Tardis, image: J. Cleverly 2015.

CM2 exhibits here a flow state (Csikszentmihalyi and Hermanson 1999), reflecting his individual interest and intrinsic motivation by his drawing of The Tardis. CM2's devotion to the pursuit of this endeavour takes eight minutes, almost a quarter of the whole time spent by the group altogether. Research scientist Sue Allen, writing about the interactive exhibits at the Exploratorium in San Francisco (Exploratorium 2016), describes the difficulties in balancing a museum's core function of instilling knowledge in the visitor and creating situations where visitors will want to engage with that knowledge. She concludes that: 'It is indeed possible to create exhibit environments where

visitors are simultaneously in a constant state of free choice and in the process of learning some form of science' (Allen 2004, 2).

CM2 has clearly been immersed in the task and has engaged with *The Enlightened Eye* on a personal and individual level. As to whether he has learnt anything about his selected mineral specimen is not possible to glean from the data. Whilst other members of his visitor group have discussed the location of minerals, as well as spent some time looking at the various other exhibits in the Daniel Gumb room, he has focused on his drawing. During CM2's wait for his turn, he has learnt from the others, his seeming peripherality then galvanized into action. To return to the evaluation of an earlier interactive, *Deus Oculi*, where the engaged interaction of apparently unconnected visitor groups and individuals with the work was shown to be dependent on an understanding of affordance created by observation of others: 'The transition point, from periphery into the principle strip of activity, hinges not on the spatial distribution of the participants, or even simply on the character of the conduct but rather through the ways that actions are treated as sequentially responsive and prospectively relevant' (Heath et al. 2002, 20).

Here, a different kind of scaffold structure is apparent from those shown in the data analyses above. This scaffolding, though received from members of the same group, operates for CM2 as a somewhat distant and observational version of scaffold. CM2 waits whilst others learn to operate *The Enlightened Eye*, and then engages himself. This scaffold is also dependent on each observing individual roles within the group. CM2 is supported in his intrinsic interest by the others, indeed at various points CF, CM1 and AM refer to the subject of his drawing; CM1 dances around saying, 'I know what that is' and CF repeats several times 'that's really good Jobe' as can be seen in fig 186 from my direct drawing of the session).
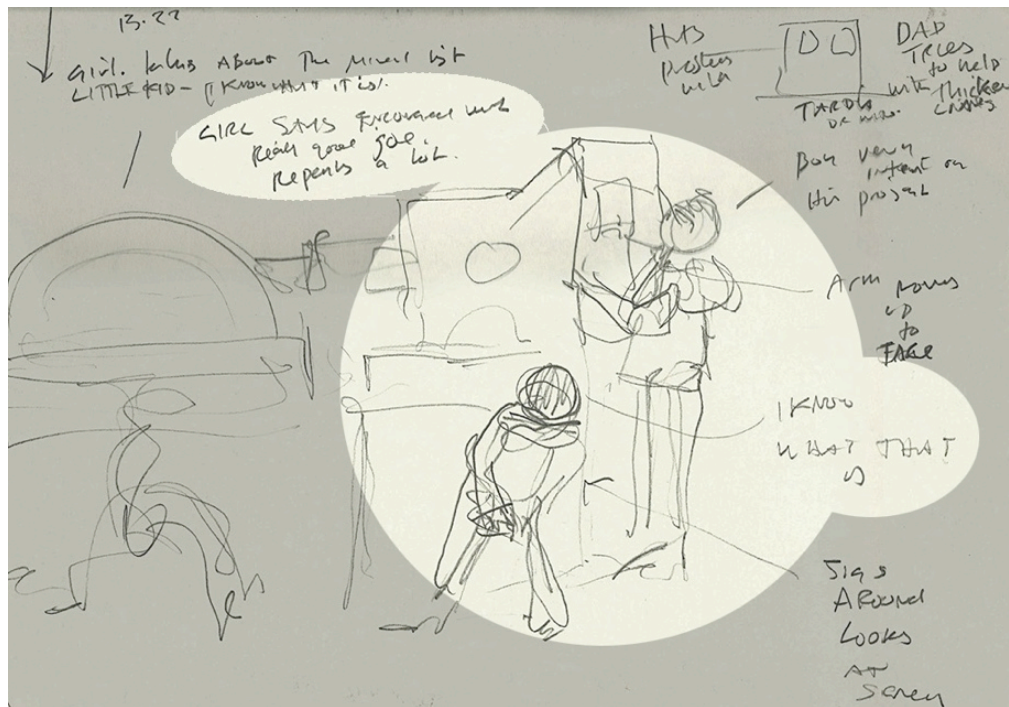
From the mentions of 'dad' in the transcript it be can assumed that this group, alongside those representatives in Data Analysis II, *The Ciriden Halls,* are a family. Although, as we have seen, there are multiple relationships and agendas occurring within these family groups, they are also perhaps on (half term) holiday, and are interested in enjoying themselves. Senior Museologist Theano Moussouri, explains: Families value different criteria in making leisure time choices from those valued by museum programmers and frequent visitors. Thus, family audiences put more emphasis on social interaction, active participation and entertainment than they put on opportunities to learn or do something worthwhile in their leisure time (Moussouri 2016).

This observation confirms that the museum is a space for multiple agendas, and if curatorial plans do not always coincide with visitor plans, then that is where a multimodal, open-ended device like *The Enlightened Eye* can be of value in the museum context.

Conclusion

This PhD project asked at the outset whether social science techniques could be exploited and integrated into an artist-designer's practice. Responding to this question, I have made an attempt to carefully select, and apply an understanding of some key social science analysis methods and connect those to the problem of developing interesting, viable situated interactives. The social science methods have been exploited in a number of ways; they show engagement with authentic museum objects, they also show evidence of informal learning. The social science constituent of this project was also a way of describing behavioural data and understanding the choreography of actants in the ecology of action. This distinctive approach in rendering the data allowed for anonymised, enhanced, ethnographic images and revealed *The Enlightened Eye's* value through the way in which it configured the reception of objects. These all combined to assemble a qualitative study of these interactions and actions, as well as showing *The Enlightened Eye* as a relational artwork. In addition, there is creative and artistic value in the individual drawings; they become accounts, vignettes of fleeting moments at once composed and natural.

The approach I took to the ethnographic study of the ecology of action owed much to the affiliation of several processes, including video-ethnography (Heath et al. 2010), as well as to the ethnographic field-note taking, described by Emerson (Emerson et al. 1995) and the traditions of field-notes developed for natural history studies (Canfield 2011). These various methods, once combined, increased my sensitivity to certain small details and sequences in the observable data. The theories of Erwin Goffman have been important to this study. The conduct of the individual and their engagement with others is often characterised by the way in which this engagement is calibrated by an understanding and a performance of the protocols within social organisation (Goffman 1990). There are many examples of this in the data and I was interested in attaching the notion of an on-going extemporised performance within visitor discourse to that of an aesthetic composition interrogated through my drawings and transcripts. Goffman's work exerts a great influence on the work of social scientists who

continue to develop understandings of the social conventions of conversation. Of particular interest to this study is the concept of recipient design and conversational turn taking (Goodwin 2000, Sacks et al. 1974), and the work of Howard Garfinkel in regard to underlying social conventions (Garfinkel 1967).

One of the main implications emerging from this chapter, are the ways in which different kinds of evaluative studies of visitor behaviour can be used to interrogate data, to cross-examine and confirm the presence of certain acknowledged patterns, conforming to a range of analytical frameworks. Of particular note is the work of Falk and Dierking for their contextual model of learning in the museum (Falk and Dierking 2000) and Eileen Hooper-Greenhill's ideas of meaning-making and kinaesthetic learning in the museum (Hooper-Greenhill 2007). Alongside these important figures from the world of museum research, are those whose work on social behaviour has very clear implications for visitor action. Lave and Wenger's concepts of situated learning (Lave and Wenger 1991) were crucial throughout my unlocking of the detail in family groups, through to Wolf and Wood's discussion of the idea of scaffolding (Wolf and Wood 2012). Scaffolding is a concept that is drawn on heavily in my study of the data analysis. Critical too was Jessica Lindblom's discussion on embodiment and joint attention (Lindblom 2007) - physical clues that are very apparent in the data analysis. Csikszentmihalyi and Hermanson's concept of *flow* (Csikszentmihalyi and Hermanson 1999) arising out of individual interest are clearly articulated in the data, as is Corinne Hutt's invaluable work on forms of play (Hutt 1981). Finally, Sarah Pink's description of the sensory entanglements that ethnographic study presents to a researcher (Pink 2009), allow for a layer of complexity that helps to justify my approach as an artist-designer, and the particular way I have dealt with the data analysis and its communication.

My ethnographic examination of the action surrounding *The Enlightened Eye*, from the standpoint of artist-designer adds another perspective for analysis. Fig 187 shows what influences and rewards there were for all those involved with *The Enlightened Eye*. In this diagram, although I am both the artist and designer, I have separated the roles out. This is to suggest my

relationship to the project as the provider of a service and an experience. Similarly, the curator and the visitor are separated but occupy a shared space. The whole shape of the project is also shared - the artist-designer is provided with a physical space, creating the situated ecology of action. Willing recipients enact the open-ended interaction, affording creative action and the museum fulfils its agenda as a place where learning and experience takes place.
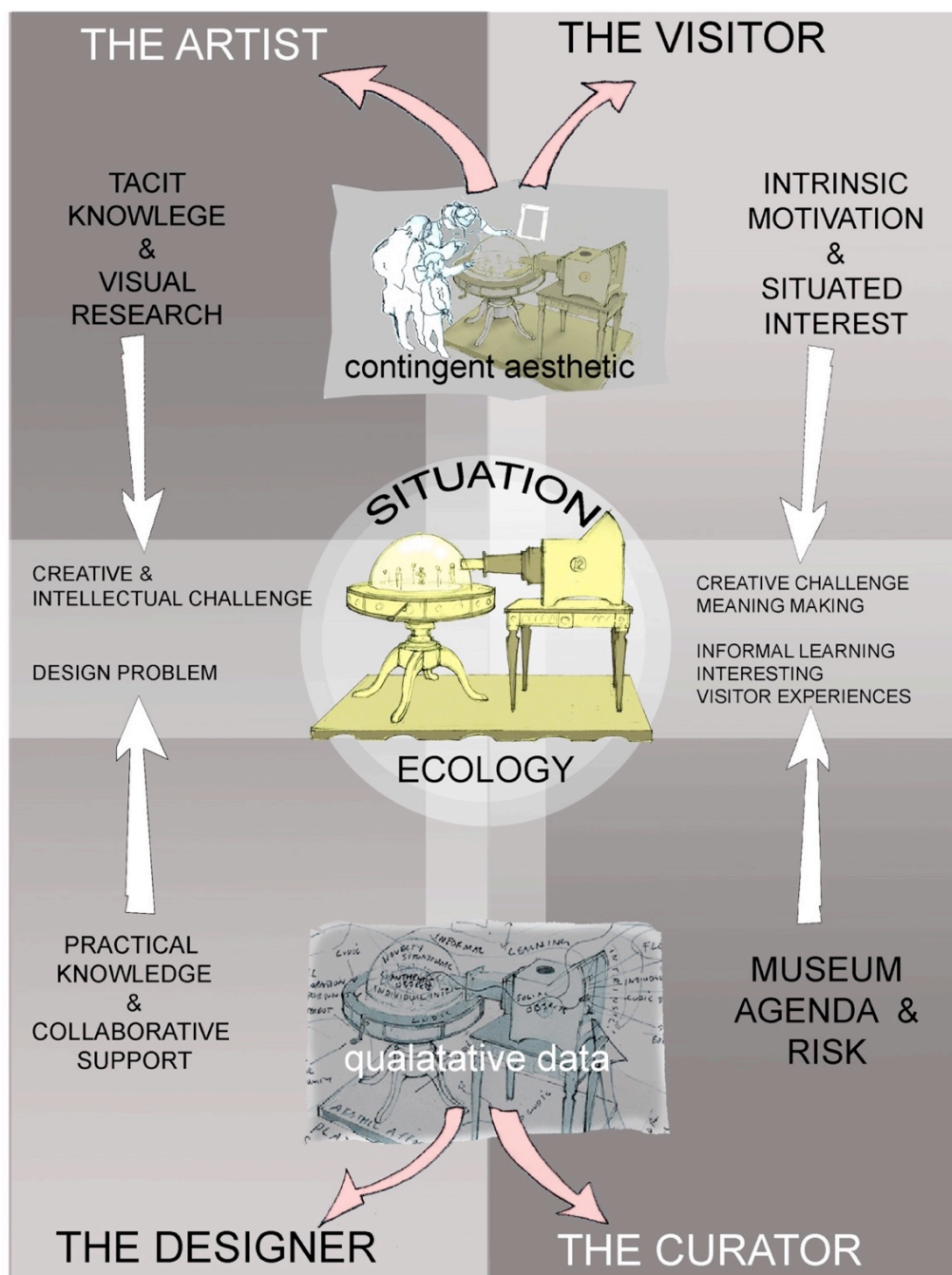

Figure 187: Jason Cleverly. 2016. Influences and rewards, image: J. Cleverly 2015.

On the left-hand side of fig 187 are the roles that are taken on in this project by the artist-designer. This dual role allows for a broad evaluation of the project, accounting firstly for an understanding of how the procedures for art and design methods are utilised and deployed. The right-hand side of fig 187 concerns the value of the project to the museum, this being the provision of interpretative interest for the visitor. This visitor interest is a key emphasis of the whole project; the value of this is observable in the data analysis, isolated from the ecology of action. The data is rendered visible in the interrogation of the social actions of visitors. The artist-designer then responds to the contingent aesthetic and the qualitative analysis of data. The diagram shows the cyclical structure of an iterative enquiry process and the implications for the artist-designer show how accumulated experience might inform new work. For the visitor, their experience may encourage and support further engagement with similar ecologies of action. This cannot be determined by this study, however it can be noted that the visitor group who featured in Data Analysis II returned to the museum a few days later to spend more time engaging with *The Enlightened Eye*. For the museum, the worth of the project may be derived from an analysis of increased visitor numbers and increased visits to the museums website, as well as engagement with associated social media platforms, although this is not recorded in this study.

The inevitability of my own involvement, firstly as *The Enlightened Eye's* designer and secondly as a slightly obtrusive observer, must be taken into account. The museum space is an open stage and my co-presence makes me another actant in context. Ethnographer Sarah Pink discusses this very point, asking if: 'The idea of places lived but open invokes the inevitable question of how researchers themselves are entangled in, participate in the production and are co-present in the ethnographic places they share with research participants, their materialities and power relations. These ethnographic places extend away from the intensity and immediacy of the local and are entangled with multiple trajectories' (Pink 2009, 38).

As I have argued in this chapter, *The Enlightened Eye* project constructs a situated place of action that includes my presence during the data capture

and the subsequent data analysis; this means my entanglement is complex and intimate. Though the unravelling and description of the 'tangle' only now exists from my perspective here in this document, the project generated a series of complex, fascinating vignettes, when analysed through the social actions of visitors, who by engaging with each other and through the affordances of *The Enlightened Eye,* make its material and situated condition both an active drama and a source of evidence.

Chapter 6: Conclusions

Overview

These conclusions open with a broad discussion of outcomes and go on to set out key contributions to knowledge. These are outlined as: the identification and characterisation of the artist-designer and the significance of their role in creating effective situated interactives; and more specifically within the identified artist-designer role, the evaluation process developed for the Enlightened Eye. The value of the research is discussed in relation to both the museum and to visitors.

A set of core objectives for the artist-designer are drawn out from the research and followed by some proposals for the future work as well as some suggested areas for developing new research. I conclude by reflecting on my original research questions.
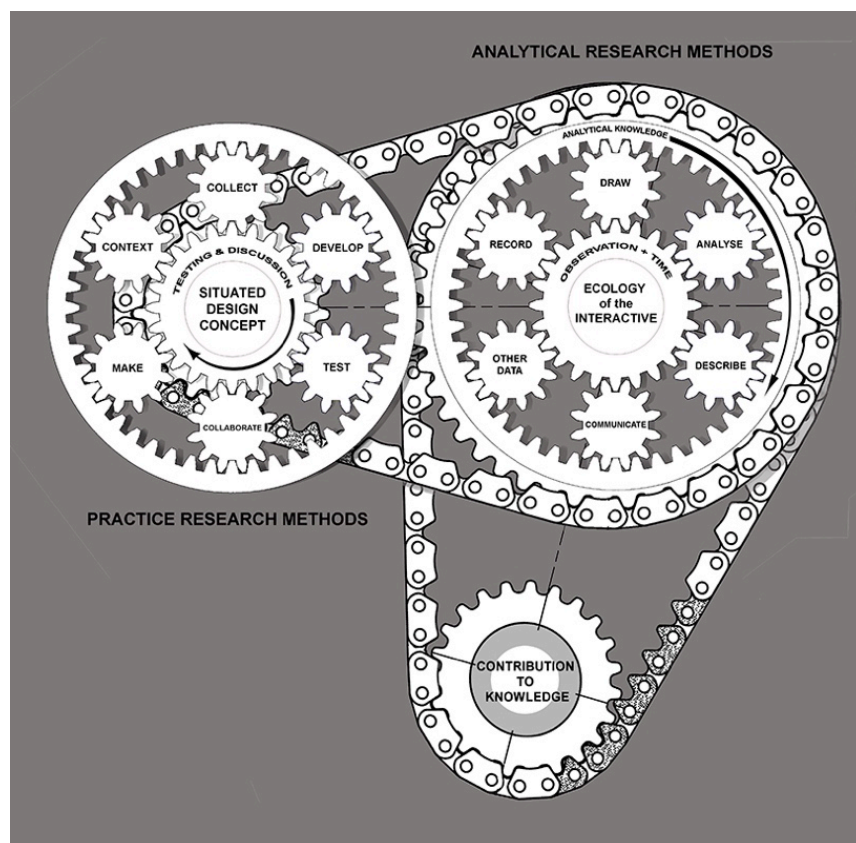
Figure 188: Jason Cleverly. 2016. Practice, analytics and knowledge generation overview diagram, image: J. Cleverly 2016.

The Role of the Artist-designer

Assembling and identifying the figure of the artist-designer has been a difficult, complex process. The purpose of constructing this figure through this thesis has functioned as a tool to examine the potential of my particular way of approaching museum interpretation. The artist-designer is by no means a new kind of individual but through this thesis I have been able to explore a duality of practice undertaken by this figure, as a way of describing the complexity and breadth of approach undertaken. It is this examination of individual practice that shows how new kinds of objects like *The Enlightened Eye* are devised and constructed and how they can make an effective contribution to museum interpretation.

As we have seen, there are designers who implicitly think of themselves as artists, no matter how they outwardly frame themselves (Williams 2012). There are also artists who practice as if they *are* designers: the work they produce conforming to many design-like parameters. For example, the work of Carsten Holler, described by Nicholas Bourriaud (Bourriaud 2002) as Relational Art. Here artwork is designed to involve the spectator to such an extent that they become part of the work itself. Relational Artwork not only depends on a creative vision but also requires a practical understanding of an audience, their behaviour and requirements in an exhibition, therefore presenting a design problem.

There are also designers who approach design so that practical considerations are interrogated and reflected upon in curious new ways. These *design art* and *critical design* projects are part of an advanced, contemporary design agenda (Taylor 2013), although often superficially akin to the sculptural critique characteristically deployed by Marcel Duchamp.

Where others have assessed subtle and overt contraventions of territory and ultimately decided to label themselves and others as either an artist or a designer, the evidence of my own practice allows me to consider a conflated, close alliance of art and design. The artist-designer holds a dual approach to creativity. Building on Jensen's analysis of art and design, the diagram below shows how these two kinds of creative attitudes and agendas constantly

push back and forth between design and art. The difference in these creative attitudes can perhaps be most generically understood in terms of the push and pull of Ingold's morphogenetic approach to creativity, contrasted with what he describes as a predominantly hylomorphic approach to design (Ingold 2011, 372).

In short, the character of the artist-designer emerges from a position of creative risk-taking that is informed by the elements identified in the diagram (fig 189). The ebb and flow for example, between the contextual and artistic propositions, between the vision and the construction project, means that situated design experiments can come into being in unconventional ways. The pursuit of a practical agenda, as well as a full engagement with the contextual and theoretical aspects of practice, means that dialogue between these approaches is where distinctiveness emerges.
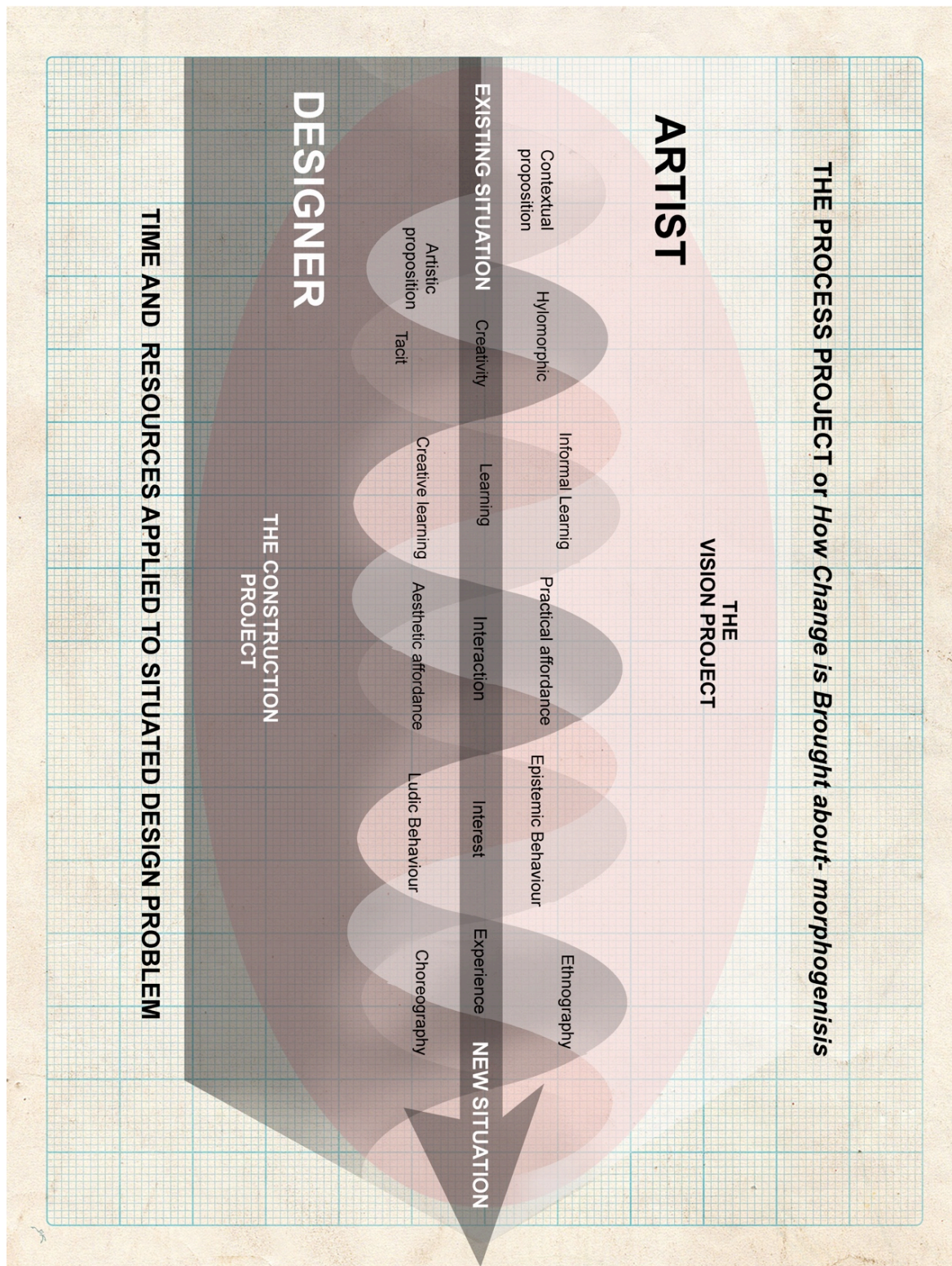
Figure 189: Jason Cleverly.2016. The ebb and flow between the contextual and artistic propositions, image: J. Cleverly 2016.

Recalling Graphic designer Milton Glaser's caution never to conflate art and design, it is worth noting that Glaser is well known for the influence of artists,

such as Piero della Francesca on his own practice. To avoid such dissonance, perhaps it is useful to adopt anthropologist, Tim Ingold's position of disregard for the labels of art, design and craft (Ingold 2013), in recognition of their irrelevance in any wider investigation, insisting that the improvisatory flexible nature of creativity is where the focus of attention should lie.

Consider the artist Grayson Perry's stated refusal to take accountability for interpretive meaning, in staging *The Tomb of the Unknown Craftsman* in the British Museum (Perry and British Museum 2011). Despite this denial, Perry clearly situated work that encouraged audiences to encounter a museum collection in new ways.

As Martha Fleming says, in discussing her art/science duality of practice 'this self-reflexivity is the best thing we have acquired as artists and is the most important thing we bring with us as artists' (Fleming 2013, 165). Artistic self-reflexivity enables the artist-designer to make idiosyncratic and surprising connections for the museum visitor, re-animating a collection and returning the museum to a new kind of Wunderkammer.

While working at Liskeard Museum, I observed members of the public visiting the curator with mineral samples to be donated to the museum. Personal accounts and discourse would emerge, though these would not be conferred to the sample; cataloguing and accessioning of the objects became a new, neutrally anodyne story, now merely name of donor, date and place of discovery, and type of mineral. Part of *The Enlightened Eye's* function was to reanimate the minerals, to give them new and unconventional stories and agencies.

Interactive assemblies need controls and visual clues for the user. The data collected for the Enlightened Eye, reveals that audiences respond to these affordances particularly through social engagement. Artist-designers can use their aesthetic values and approaches heuristically to evoke responses. Where designers of museum interactives might be apprehensive of experimenting with aesthetic composition, cautious of distracting from didactic functionality, the artist-designer is required to push against these

cautions. Artist-designers should trust their tacit instincts at the outset of an idea and then begin to nuance and finesse work through situated design methods.

Although *The Enlightened Eye* was commissioned and positioned as an educational interactive and certainly this was an important aspect of the piece, I always intended that the playful nature of the design would allow for individual expression. The structured affordances of *The Enlightened Eye* allow an informal open-ended reading of the minerals: an analysis of it in use reveals that individuals and groups can discover a syntactical relationship with literal locations and names of the minerals, while in the pursuit of the main task.

The evaluative process developed for the *Enlightened Eye* has led to considerations of its implications for future practice. The possibilities for forecasting certain kinds of audience behaviour seem considerable and if the intention for a piece draws value from the relational, contingent aesthetic (Capturing the Contingent Aesthetic, chapter 5) as well as its functional operation, then the spectrum of data is wider and richer. *The Enlightened Eye* is an installation that affords an open-ended creative task that, as we have seen, generates and supports creative activity in the museum visitor. This activity supports a contingent aesthetic. This contingency in the design provides the researcher with the opportunity to develop new forms of qualitative analysis in behavioural structures. When combined with traditional methods of analysis the data gathered provides the evidence base for the value of installations to museum audiences, and can be used to generate and underpin proposals for new work. The visual and textual analysis of user behaviour can be adapted and referenced in writing funding applications and presentations to museums and curators.

The Enlightened Eye supports a distinctive interface that allows new creative affinities between digital content and material objects. Although the museum visitor may be familiar with the digital affordances (the touch-screen) and the kinetic affordances (the handles), they are able to engage in a unique manner with museum objects via this configuration. *The Enlightened Eye*'s

content and resources are designed to support and enhance activities and tasks that are relevant and situationally sensitive to the objects on display. The design allows for both literal and poetic responses by visitors. These responses in turn enable the individual to engage in collaborative and contingent forms of cooperation. *The Enlightened Eye* encourages and enables user-generated content and supports group experiences of museum objects that transform and reposition the museum visitor as curator, artist and scientist.

This artist-designer's approach embraces the creative opportunity to make a complex, interesting object. *The Enlightened Eye* is the latest in a body of work that involves observation of the details of visitor engagement within an ecology of action. In some early work with W.I.T. my responsibility was as a creative partner. Latterly and specifically through this research project my role has evolved, absorbing and recasting social science research analysis techniques within the practice of a maker of interactive sculptural objects.

The creative urge to make an object like *The Enlightened Eye* can only be accounted for in both artistic and design terms. In some cases the production of an object involves both artistic and design approaches in almost indistinguishable and often closely allied ways. This PhD thesis identifies this synthesised activity, in order to demonstrate its particular value.

Summary of Outcomes for the Museum

During the week of data-capture it was clear that many visitors who entered the Daniel Gumb room, took advantage of the possibilities afforded by *The Enlightened Eye* in order to enjoy themselves. Museum visitors, particularly those in family groups, often regard museum visits as a leisure-time activity, where they seek experiences and interesting things to do together. This is evident in the data; for example, in the '*look at thaaaat dad'* sequence, the museum is revealed as a context for experiences that overlay the curated objects and themes. The data shows some elements of didactic crossover between the material objects on display and connection with local context.

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Data collection for this study examined the *social* within the milieu of the exhibition, during a particular week. The information gathered was rich, intricate and useful, however to answer further questions about the operational success or failure of the work, the design of its affordance and the concept of the task, a study could be developed to evaluate just how effective creative, situated interaction is in encouraging learning and creating memorable experiences in the museum. This is not easy to measure without post-visit study including the kind of longitudinal studies undertaken by Falk and Dierking. These studies have analysed not only the experiences of an individual's museum visit but also compared it with the memories and any consequences of that visit four months later (Falk and Dierking 2000). This kind of study is something that could be considered in future projects.

I would also suggest that a shortcoming of this research is that it does not address a deeper evaluation of the museum's influence and rewards, and that there should be ways in which the data analysis might be fed back to the curatorial team, not only in regard to the operation of the particular interactive at the centre of this study but for other principles that this study might offer. I will add that, at the time of writing, this is an on-going project and since *The Enlightened Eye* is still operational, there is an opportunity to address some of these concerns.

Summary of Outcomes for the Visitor

Constructing Visitor Action

The Enlightened Eye supported the visitors as poetic agents; *The Enlightened Eye* encouraged and elicited visual poetics from visitors by asking them to think about mineral samples in new ways. The artist-designer choreographs activity within this version of the Wunderkammer. Visitors could bring their personal interests to bear, to use mineral samples as a starting point for their imagination. Visitors to a museum are there because they want to be there not because they have to. The curatorial prerogative is educational, but the visitor is often there for an experience, a kind of entertainment. The designer of any curated space creates a space for action,

a stage for the participants to navigate and to respond to physically, in ways that have been at least premeditated by the authors of the exhibit.

Poetic Objects and Poetic Response

In regard to the minerals, the material objects that lie at the centre of this project, I have created a system of material analysis for the visitor, permitting them to view the mineral sample as a sculptural object as well as a museum specimen, through the agency of *The Enlightened Eye*. In the post-museum the visitor can become a curator.

If the drawn responses are considered 'poetic' or expressive, what do they say about the objects that they respond to? If the responses are restricted in ambition, only by the mechanistic limitations of the touch-screen interface and if the task is also free of any right or wrong way of proceeding, then the personal dialectic of a visitor, regardless of age or knowledge, becomes valid. So, in fact, what the visitor's drawings say about the subject of attention becomes an imaginative, transformation of the object, at once both playful and serious. That is, it is added to the wide range of possible interpretations that stretch from the Cartesian certainty of 'where and when it was dug up' (although as we have seen, even these facts can be tainted with variability), to 'it reminds me of a lion' or 'I'm going to land Dr Who's Tardis there'. This is not to do with certainties but with 'metaphysical contradictions' (Clayton and Goodwin 2012, 183). In creating these contradictions, there is a reflection of the artistic process, of devising literally, a point of view on a subject, so that the visitor is constructed, not only as a simulated natural historian but also an artist.

Making the Objective Subjective

The museum object, particularly natural specimens such as bones, fossils, botanical and mineral samples, by virtue of a catalogued and curated *thingness*, are regarded as having an inherent, intrinsic characteristic of empirical scientific objectivity.

There are arguments for the inevitability of a semiotic within all curated objects, to be instinctively decoded by a range of visitors with a range of agendas. Indeed, according to Hiedi Overhill who's work on tactile exhibits

says: 'even the most staid repository of mineral samples must be understood as "interactive" in the sense that visitors within its tangible space personalize their experiences' (Overhill 2015, 7). However, *The Enlightened Eye*'s intention is to afford an aesthetic and poetic subjectivity from a visitor towards the mineral samples, at once divorced from the regimen of a museum catalogue and intuitive and emotional, concurrently tied to a sense of place and a sense of history.
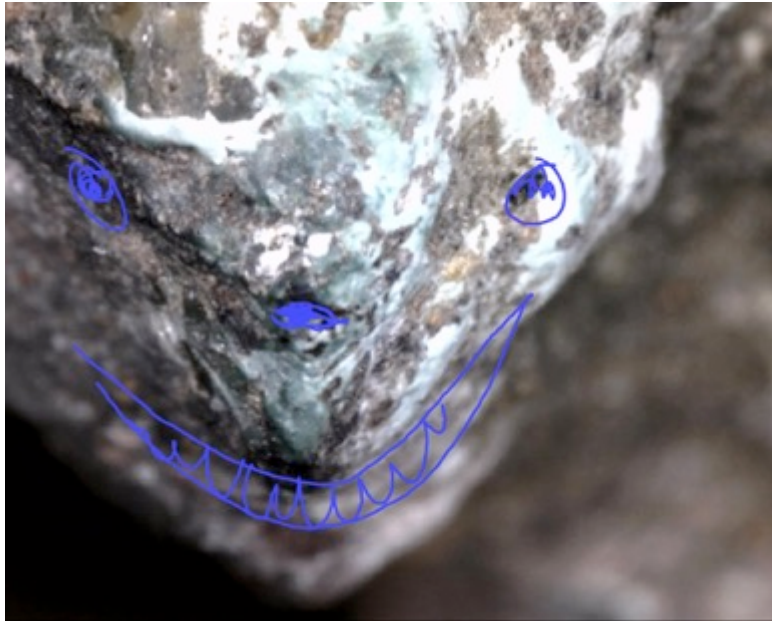

Figure 190: Anon. 2015. Enlightened Eye Image annotated Malachite, image: J. Cleverly 2015.

Visitors are invited to a museum collection and as we have seen, they bring with them their own experiences and understandings. Conversely, the museum needs its objects to communicate their own fundamental qualities and histories. To make a space for this dialogue, *The Enlightened Eye*'s configuration allows the mineral samples to be viewed conventionally, framed through the Perspex vitrine of the dome. The visitor is also allowed to personally and physically connect with the minerals, completing this ownership with a drawing. *The Enlightened Eye* is not explicitly designed to examine or support an understanding of any particular question of a scientific nature. Practicing as an artist-designer, interested in a broad range of subjects and themes, I have enjoyed the idea of taking a subject and exploring it from my own stance and have been interested in a way of

serving both an artistic agenda and supporting learning in an unconventional way within the museum context. The visitor is invited to consider the selected minerals against their own artistic motivations, interests and skill levels; the educational agenda is reinforced by proximity with conventional exhibits and authentic museum mineral samples. The data analysis shows just how rich situated visitor action is and how the opportunity to transform objects stimulates and allows this.

My approach to interpretation design, constructs and directs the visitor as a *simulated expert,* to emulate some action of the scientific process. *The Enlightened Eye* was developed to invite the participants behave, to some degree, as if they *were* experts, drawing taxonomical samples, confronted with an authentic object in an authentic context. It might be concluded that the majority of museum visitors are not experts, or even connoisseurs, but what they do bring with them is much personal knowledge and experience (Falk and Dierking 2000). Although we see the visitor as a simulated expert, simulating practical science in regard to the situated museum context, this is just part of the composition. The empirical evidence and the data analysis shows engaging, subtle and complex interrelationships between the actants. As an artwork, *The Enlightened Eye* might be constructed as my own rhetorical, editorial narrative account of the mineral samples, relying on the visitor's participation to complete it. As a design object the piece directs the participants to give their own responsive reading of the object; the selection and annotations of the mineral samples articulate a good range of individual flexibility and interest, to an extent on my terms, as the designer. The passive subjects of this scrutiny, the mineral samples however, retain a contextual authenticity afforded by the museum gallery and ultimately retain 'objective reality' (Pearce 1994, 28).

Encountering a museum's arrangement and display is an understandable context to a visitor, a visual aesthetic affordance to be approached, inspected and decoded. *The Enlightened Eye* supports this; the authentic context is not merely borrowed or appropriated; it is, in the case of *The Enlightened Eye*, used for multiple ends: curatorial, interpretive, artistic and educational. *The Enlightened Eye* attempts to give the authentic mineral

sample an authentic context. This attempt is supported in the first instance by actually being in a museum. Within this context, the Perspex dome confers a recognizable preciousness on the mineral samples and a glass vitrine makes the viewer look at things differently, more intently, like the framing of a painting (Saunderson 2012. 161).

The Enlightened Eye is an object that creates a conduit to another object, a mineral sample. It has been argued that the object can become irrelevant and merely subservient to a curatorial theme when safely incarcerated in a cabinet, some objects being more interchangeable than others (Petrov 2012, 232). This inter-changeability must surely apply to mineral samples, as much as it does with say, everyday objects, like examples of packaging or of clothing that occupy an exhibition to illustrate a theme. Then the opportunity for these particular samples to acquire extra layers of individuality, through a visitor's dialectical discourse via *The Enlightened Eye,* is beyond their purely representative value, and renders those particular samples unique.

The arrangement of the minerals within the dome, although not conventional, is still ordered, taxonomical and recognisably scientific. Furthermore, the microscope and kinetic controls give a good degree of power over these objects to the visitor, who in turn bring their performativity to the piece through their situational and individual interests and are rewarded in many cases, with an epistemic experience.

An intimacy of touch is not easily allowed in the museum setting, however *The Enlightened Eye* in some ways allows for a level of tactile connection, initially through kinetic physical manoeuvring of the mineral samples by the planetary gear system and virtually, by use of the touch-screen interface. These affordances offer the visitor a level of situational interest. By using *The Enlightened Eye*, I wanted visitors to explore and be curious about the minerals, to take on an investigatory stance. I felt that a level of control over real, catalogued mineral samples would support this investigation and so, if you could physically move these objects, then visitors would be handed agency and power: some sense of being a researcher, an expert.

Making the authentic object, the mineral sample, the primary focus in the designed, operational action of *The Enlightened Eye* is intended to create idiosyncratic experts of all its users. It gives visitors to the Daniel Gumb room, surrounded by conventional displays, associated artefacts and information panels, the opportunity to make their own sense of real mineral samples. *The Enlightened Eye*, despite its construction echoing features of conventional display cabinets, creates an artificial distance between itself and the normal language of the didactic linear exhibit. *The Enlightened Eye* urges the visitor and challenges them to respond in a new and alternative way, with no option to fail, no right and wrong. As Frank Oppenheimer, the first curator of San Francisco's Exploratorium famously said: 'No one ever flunked a museum' (Allen 2004, 18).

Summary of Outcomes for the Artist-designer

If I had not undertaken this PhD project I might have continued to produce valuable, unique artefacts, my tacit understanding and design development research would have continued to support my practice, however it has been extraordinarily useful to gain detailed insights into the way I and others make and consider the work and its context. In addition the capture and reflection on visitor behaviour in action has opened up new possibilities for examining how a visitor might experience a museum visit and is a foundation for further practice, and research.

When designing for interactive interpretation the individual visitor is well catered for in the museum and art gallery. Audio guides, labels and the like, are all intended to be flexible and communicate directly to a visitor. However the visitor as a group is often overlooked in interpretation, despite the evidence that visitors together enhance and expose interpretation. If an interactive can support simultaneous users, offer creative participation, then it is the visitor group that rewards the museum and the artist-designer. My data analysis has shown that there is complexity and rich experience of the museum and museum objects when these conditions are facilitated. This data, its production, collection, communication and analysis by an artist-designer proposes a modest contribution to the field. This data, now that it is

captured can be integrated into new design proposals, and can also be drawn together to form a series of objectives outlined below.

Summary of Key Contributions

The evaluation and definition of the artist-designer has been a tool for interrogating my practice. The artist-designer is a figure that approaches projects both theoretically and practically in order to construct and evaluate aesthetic and functional affordances through a multi-disciplinary practice. The specific contribution within my own arena of practice is the exploration of what I call a contingent aesthetic, a way of framing and communicating fragments of time, within which actants are engaged with each other through the affordances of a situated interactive design, this is an art and design research method that supports an aesthetic *and* scientific unravelling of the effectiveness and impact of a design in context. There are possibilities for others to adapt their own personalised method of illustrating the way in which their own designs are revealed by shared actions. That any set of actions cannot be fully predicted is part of its appeal, a dramaturgical choreography forming a series of aesthetic tableaux can be appreciated and analysed in multiple ways, with which to inform and draw conclusions. Assumptions may be made about ordinary affordances, handles, touch screens and so on, however predictions about use when combined with the relational are less so. This is a heuristic approach to data analysis that combines established social science and emerging art and design procedures to draw conclusions about the effectiveness and use of an object.

Corollary to the above is the integrated support and production of creative transformation through and by an object. In a situated design, in order to motivate those within the ecology of action to produce rich observable data visitors should always be empowered. Non-linear designs allow individuals to manipulate a situation in idiosyncratic ways. As we have seen in the data, affording creative and sometimes unexpected transformations generates rich relational interchanges. The social structures that underlie these participatory interpretive acts condition and reveal this creative action and in turn this conditions the quality and detail of the data.

These contributions in approaching a design are also effective when the artist-designer controls not only the analysis of use, but also the kinaesthetic and compositional choices for the assembly of a situated interactive.

Drawing on the outcomes of this research, the following proposes a core set of objectives that enable the artist-designer to operate effectively in a museum context.

1. Address the existing contextual situation to permit an artistic proposition.

A museum needs to know that an artist-designer understands the context that they wish to experiment in. The opportunity to help transform an existing situation in a unique way needs to take account of this. In order to insist on innovation, the artist-designer must show how the context and the management of a museum or gallery impacts on their approach to practice; what is there about a particular situation that can be drawn upon to inform a design? In the case of Liskeard museum the focus was not only the primary subject of minerals and mining but also other essences of the locale: Daniel Gumb's curious story and the photographic equipment on display in the museum for example, had a sensitive morphogenetic influence on my approach to the project.

2. Work Collaboratively

In order to develop projects of this nature you cannot do it alone. Collaboration brings with it other attitudes and skills, with which to support a project.

A major collaboration in the case of *The Enlightened Eye* was with the curator of the museum, this is a crucial relationship that cannot be overstated in its importance. This collaboration is based on mutual trust. There is compromise and agreement, as a constituent part of the morphogenetic push and pull of other considerations that the artist-designer contends with.

An interactive piece also relies on collaboration from those actually using the work and creatively engaging with it, this may also be considered as a

choreographic, dialogic relationship; you design for particular a kind of result and you get back an open ended, individual response.

The interim testing that I carried out with undergraduate art students showed good levels of creative responses and critique, in regards to design development. This too, is a dialogic interchange that moves an idea forward. The collaboration here is formed around an honest respect for those taking part in the testing.

Collaboration with technical partners is indispensable for this kind of multi-modal project. Those who can supply expert knowledge create another kind of creative friction, another push and pull. What is it that you require and what is it that they can supply? In a push-pull dialogue, the artist-designer might ask for something unexpected based on a lack of understanding of the technical possibilities. The technical partner however, then might counter with a solution to the problem that in turn requires the artist-designer to rethink and adjust to accommodate this new situation. A sharing of responsibilities and a 'transition of influence' (Cleverly and Shear 2013, 109) must be understood between each to move forward, this is not just supply and demand this is dialogically collaborative.

Isabelle Risner's investigation into emergent digital craft practice discusses collaboration as 'a move away from a traditional focus of individual craft productive autonomy and towards a broader, authorial and collaborative approach, that harnesses a diverse range of skills and facilities' (Risner 2013, 70). This is not necessarily a definition of an artist-designer's position on collaborative authorship: Risner is not only talking about individuals collaborating but also authorial relationships with software and hardware that create inevitable asymmetrical collaboration. Certainly, in order to create complex objects there has to be a letting go of autonomy to some degree. There is an inevitable hierarchy of authorship, since despite the contribution of others, the artist-designer is the originator of concept.

This raises questions about authorship within collaboration and degrees of separation: would the artist-designer for example collaborate closely and fruitfully with a skilled artisan, a furniture maker or metal smith? This alliance

might shift the paradigm influence: if the artist-designer takes on a supportive role do they just become a facilitator? These kinds of questions relate to the ownership of fabrication procedures by the artist-designer.

3. Control the Means of Production.

In chapter 4 I proposed that the construction project was not one that I wished to examine too deeply. However, it is evidently important to consider the means of production. In the case of the *Enlightened Eye* self-fabrication was expedient, it kept the costs down and helped to develop something quickly, without the need to consider how to communicate what was needed to a third-party fabricator.

Yet there is another concern here; to control fabrication gives one a deep understanding of the structural, sculptural three-dimensional assembly of a piece, its problems and nuances. To establish a concept through design development includes a mental rehearsal of its assembly this is the vision project (Hertzum 2014). During the process and construction project (ibid), the physical manifestation and completion of an object, there is a special sense of accomplishment. When the work is situated within the ecology of action, when it reveals a projected choreography, this is a personal reward for the work it had required in its construction. Therefore to hold on to the whole design process is of great value to the artist-designer. There may however, be special circumstances, new opportunities found when working with specialist artisans, or to collaborate with other artist-designers.

4. Enable Creative Transformation Through a Non-linear Design

A non-linear interactive is the first, basic choice for this kind of design. Having a single predictable outcome, linear designs commonly only accommodate individual interaction, they do not typically create complex social dynamics and have been shown to be frustrating in use for the visitor (Bradburne 2000). Non-linear designs however permit multiple and simultaneous interactions, generating complex visitor activity.

The Enlightened Eye's design builds on the evidence of previous work, that museum and gallery audiences enjoy being drawn into creative action. *The Enlightened Eye* asks that users respond to a group of mineral samples by

selecting one for magnification. The artist-designer uses this seemingly simple conceit to conceptually pierce the vitrine glass between the visitor and the object: an affordance that allows transformational agency over a museum object. The kinetic agency of turning the handle to rotate the mineral samples and the transformation of the selected mineral into an abstracted, magnified image, constructs an inter-subjective spectacle. This is a proposition that draws visitors in, holds their attention provides occasions for social action, creative learning and thus develops in the visitor distinctive affinities with museum objects and themes.

5. Promote playfulness for informal learning

Developing a flexible, non-linear design that facilitates playfulness is paramount in revitalising visitor engagement in a traditional museum environment of vitrines and labels. The design of *The Enlightened Eye* is multi modal, allowing any number of visitors to interact collaboratively or singly and this multi-modal design enhances creative action that may be ludic, or epistemic. The accommodation of ludic action by *The Enlightened Eye* is directly influenced by a positive assessment of creative misuse in earlier work. Visitor re-appropriation of use is an important opportunity for creative visitor action and experience in the museum. Not only has misuse been supported in unforeseen ways, such as the affect of a rocking action that engages and immerses a young visitor, but it is also in-built in the open ended transformational drawing task. The analysis of the *Ciriden Halls* sequence, reveals how both epistemic and ludic interaction can successfully compliment: each other; the adults discussed initially the specific empirical geographical location of a mineral sample, which led to a highly engaged interchange between the actants supporting the child of the group, in imaginative transformations of real museum objects. Not least of which, began with a playful alteration of a real place name.

Falk and Dierking's influential contextual model of learning encourages contemporary museums to support informal and non-traditional approaches to education. They state that is important to allow visitors to bring their own personal agendas to bear on collections, in order for them to fully engage (Falk and Dierking 2000). In *Time and Relative Dimension in Space* (see

page), CM2 took the opportunity to establish that Dr Who had landed his Tardis on a selected mineral moon, a personal preoccupation. In *Be Imaginative,* AM's encouragement of the others in his group included empirical discussions and were based on his own knowledge and understandings. Situated interactives, such as the Enlightened Eye that enable creative transformation support this approach and fit with a new learning agenda for museums.

6. Design then study - imagine choreographed interaction

A situated interactive design project is an attempt to imagine and generate user interaction and creative action. It is a confident projection forwards to a new situation. For the artist-designer, this projection of user interaction is like creating a working script for dramatic action and dialogue. It is a careful balance of prior knowledge, keen attention to the current situation and creative thinking about how the interactive itself, could facilitate improvised action, where the script is not set. This is a choreographic process: imagining people moving around and using the work. The converse of this is the evaluative ethnography that describes this dramaturgy of conduct and conversation, once it has been installed.

Figure 191, Jason Cleverly. 2017. Iterative choreography planning and evaluation cycle, image: J. Cleverly 2017.

An artist-designer predicts choreography as a structuring factor in the design development and composition of an interactive project. This is, as Tim Ingold proposes, the abductive reading forwards of the creative process (Ingold 2010). For the artist-designer I would describe this as choreographic forward planning for both desirable, predicted and unexpected, creative action.

Donald Norman describes user studies, conducted in advance of design production, as delaying and useless, insisting that the process of 'study first, design second' should be inverted to 'design, then study' (Norman 2006). This action-led method concurs with the approach of the artist-designer and can be seen as part of an iterative process that integrates prior personal and contextual knowledge with new understandings. Planning visitor choreography based on prior knowledge, mixed with heuristic assumptions, involves the artist-designer the exploration of aesthetic appropriation, contingent aesthetics, as well the information gained from social science that informs and describes a situated project. Prior knowledge enables some reliable assumptions to be made and testing functionality develops reliability in desired use. In the new situation, the artist-designer's engagement with context and aesthetics allows unpredicted outcomes to appear naturally, stimulated by the push and pull of morphogenesis. These outcomes cannot be planned but emerge from practical, tacit and aesthetic influences, allowing new flexible narratives. Examples of this can be seen in the quality and detail of types of embodied action. For example, in the sequence *Its Wonderful How She's Seeing it,* AF1 makes use of the large screen to discuss an emerging drawing with AF2. Pointing directly at the screen and in angling her body to help share her opinion, she has generated an expected kind of action. The configuration of a large screen has been a standard device in my work, helping visitors observe creative transformation. However what is unexpected in this instance, is the way that in the next sequence: *Enforcing Your Own Opinion*, the embodied pointing continues, carried out this time by AF2 which not only includes gestural shared attention but also expresses subtle and detailed suggestions for CF1 as she literally rehearses her compositional advice in the air (fig 169). For the artist-designer this particular dramaturgical, contingent aesthetic builds on the expected choreography,

and is evidence of high quality participation and is in my opinion exceptionally beautiful.

7. Seek out practical and aesthetic affordance

The Enlightened Eye is compositionally constructed around an assembly of affordances; some are purely visual and decorative, whereas some appropriate their visual dynamism from suitable objects. There are also highly functional affordances that need to operate without any artistic flourishes, the touch screen interface, for example.

I have found that a useful way of developing ideas is by examining the work of historical figures or historical movements, those that have been generated by pioneers. That is to say, when emerging historical objects, ideas and scientific principles are established, it shows the way in which some themes might be structured and styled for use by museum visitors. For example the emergence of early microscopes generated an artful drama, when one considers the amazement that visions of a hidden world stimulated. Consider also the dynamic shapes that these devices assume through the simplicity of their nascent engineering and their contemporaneous styling. The camera obscura is the prototype for many modern devices, however the black-boxed video camera, embedded in a smart phone does not have same visual presence and aesthetic affordance.

The Enlightened Eye interactive as a whole accommodates some of these elements and forms a single compositional affordance, constructed around the qualities of representational paintings. In earlier works of mine this took the form of wholesale appropriation, for example in *Deus Oculi*. In more recent work, this inspiration has been less direct, influencing the composition and tone of a structure in the first instance and secondly acting as a kind of compositional aid for social action, triggered by simple devices like the handle and a round table, lessons learnt from my earlier work with automata. By of appropriating in this way, the artist-designer can orchestrate complex assemblies to create new and stimulating experiences for museum audiences. Though there is no strong evidence from the data that any visitors recognise explicitly the aesthetic and practical antecedence of

devices that influence *Enlightened Eye,* it may well be subconsciously or tacitly known.

8. Design and undertake your own evaluation

Prior to undertaking this doctoral study I had a modus operandi, one that had emerged from many years of iterative practice. In the first instance there was a commercial aspect to the production of work. This included engaging with galleries, trade fairs and the like and an interest in the audience in regard to simple engagement with automata, as well as the way I might present my work and myself. During this time, my work concerned drawing for design development and material practice. Latterly, I would take part in projects directed towards stimulating particular kinds of behaviour and reaction in particular contexts. These were the collaborative projects with social scientists, although I did not really stray beyond the design brief. At the time this work was more about the procedures of making, planning and enjoying the increasing technical problems of projects that provided a chance to advance my practice. The programme of work for these projects required me to have a reasonable understanding of the ethnographic evaluation of behavioural responses to my work but I contributed little to research analysis. Conducting my own evaluation within the framework of this research has been revelatory. I have been able to immerse myself in certain narrative behaviours within the ecology of *The Enlightened Eye* and have begun to understand and develop my own procedures for examining the choreographed action. To investigate visitor action I developed my own approach to studying *The Enlightened Eye's* ecology of action. This adaptation of ethnographic methods involved the integration of my skills as an artist-designer, observing and drawing human action in context and combining these with reviewing audio-visual data captured using a video camera. Sarah Pink discusses the definition of ethnographic data and acknowledges that film is always in some way subjective and cannot ever be considered as totally truthful. Similarly, observation and drawing methods undertaken by one individual can also be characterised as subjective. In the hands of a researcher who has made these methods an explicit part of their fieldwork, they combine together to provide rich and valid data (Pink. 2013,

78). For *The Enlightened Eye* I developed a unique evaluation process combining observation, drawing, and audio-visual recording as the basis of an evaluation of the completed design in context. The ways in which I created the data are unique to me in style and delivery but the general procedure of drawing out gobbets of useful visitor action is eminently transferrable. Through a designed evaluative process, the artist-designer can enhance their understanding of the projected choreography of their design and observe new forms of unpredicted ludic behaviour. In the particular instance of designing a brief that will facilitate unexpected playful interactions, a strong case can be made through the use of structured evaluation that illustrates the fruitful inter-relationship of epistemic and ludic behaviours facilitated by this approach. An analysis of the data I collected, revealed patterns of social interaction and evidence of distinctive successful creative learning that are usefully persuasive for future work. The artist-designer might then be shown, through this study, to be usefully influenced by the social science techniques of data collection and analysis but needs to build their own procedures in ways that are unique to them.

9. Think about what and why different kinds of Interaction are sought, and what technologies are useful

The Enlightened Eye is an object riddled with technology, indeed it relies on technology for its *interactiveness* and without technology it is inert. This technology is both analogue and digital.

Analogue technology, by which I mean the kinetic affordances such as handles that make something physically happen, are useful visual clues, enabling visitors to understand the possibilities for interaction. In use they support kinaesthetic learning and help to create memorable interactions between the actants and museum objects. The artist-designer is interested in switches, levers and handles that can be wound to animate and bring to life. This mechanical fetishism, combined with the egalitarian device of a round table, can be seen in the paintings of Joseph wright of Derby and the exhibitions of Fredrick Kiesler. For the artist-designer the rewards are visual, as well as functional and they encourage action.

A combination of analogue and digital that *The Enlightened Eye* supports is an attractive proposition for the artist-designer, the satisfying, simple engineering of the planetary gears connecting through to the black-boxed complexity of the microscope and feeding through to the touch screen and the large screen. Kinetic affordances are novel and attractive to visitors, they afford power over the real mineral specimens; this is not a simulated or virtual control. This kinetic appeal is then combined with the contemporary ubiquity of digital, interactional affordance.

This analogue digital combination was also tested and valued in the *Interactive Work-table and Escritoire,* where real paper was written on, in an authentic context overlaid by the digital. In this case, the choice of technology was considered thematically, an updated contributory dictionary was delivered within a 'calm interface', the way that digital technology might be subtly integrated into objects to encourage interaction (Weiser and Seely Brown in Cleverly and Shear 2013, 104). Discussions and design choices that approached technology as challenging to the public are now becoming irrelevant as digital technology becomes increasingly prevalent. Now hands-on physical interaction *becomes* exotic and plays into the artist-designer's flexible approach to creating interaction.

What of the networking of objects? The Internet of Things (Speed 2010) is currently a major consideration for many contemporary product designers. My Initial interest in the way a piece might be extended beyond its situation was sparked by an encounter with the Wedgewood interactive medallion (fig 88). The possibility that an interactive could trace and record creative action was a way of offering visitors an extension to their visit and to allow them to compare their efforts with others. According to the data analysis some visitors discussed the possibility of reviewing their work online at a later date.

However it is worth noting the analytics of *The Enlightened Eye's* website showed that there were 904 page views in January 2015, but only 639 in February 2015 during the *Mineral Landscapes* event dropping to 374 page views in March 2015, then rising again to 707 in April of 2015, (See appendix: Web Traffic). These numbers are not easy to explain set against

an assumption that though many more pictures were created and uploaded in February 2015 when the *Mineral Landscapes* exhibition took place. It might be expected that people would subsequently view their designs online during that time and potentially into March. However views to the site were actually less than might be expected during this period.

My assessment of the networked capability of *The Enlightened Eye* is that despite the low web traffic, the real value is in the awareness that creative actions are preserved and viewed online. This was noted as a feature of the networked nature of the *Interactive Work-table and Escritoire* in that: 'entries for the dictionary in this case consider the socially organised character of the entries and how an orientation to an anonymous, even abstract reader, was a critical element of the definition's interactional production' (Patel et al. 2015). This networked capacity adds to the animated nature of the work, affording greater power and agency, a reassuring social media familiarity to its users.

The appeal of the screen: previous iterations, particularly those such as the *Universal Curator* have shown that if a large screen can be used to show the creative action unfolding during an individual's interaction, then this forms a very useful device for scaffolding support in visitor groups. The screen is also a very useful navigational tool for those engaged in creative engagement, as even though they can see their efforts on the interface, there are occasions when individuals can be seen to appraise the work on the large screen, as if to confirm the quality of their response as others see it. This device can also attract contingent attention from those in the same space and allow separate engagement by strangers.

Reflections on the Research Questions

1. How can a critical analysis of historical and contemporary museum contexts inform a situated design?

A substantial component of this PhD has been a survey of museums' historical and contemporary contexts. I have examined and discussed the concept of the spectacle as a complementary history to that of the museum; both are concerned with engaging audiences. One of the concepts that this study reveals is the way in which the museum has to some extent returned to its origins as a space for experience and wonder and this is why it resonates so well with the concept of spectacle. This circular evolution has recently opened up a space in which an artist, or indeed an experimental designer, can introduce their vision to connect with an increasingly personalised museum experience. Notwithstanding this revelation, the history of the museum and of the spectacle forms a rich, visual resource for the artist-designer, many of the concepts surrounding display and engagement being not only visually useful but also helpful in forming an understanding of the motivations both of visitor and curator. There are key moments in museum design, such as the pioneering approach of Frederick Kiesler (fig 71) that reinvigorated my own appetite for creating a dialogue between visitors and content. This example is one of many that have helped me think about my own practice in new ways, this inspiration is also not just about how histories of public engagement resonate with a practical ambition for the work but are also influential in the treatment of museum objects. The artist-designer connects with objects, becomes excited about them and extends curatorship in unconventional ways.

2: How can social science be employed and integrated into an artist-designer's practice in order to examine the implications of a situated design?

The evaluation of visitor interaction with *The Enlightened Eye* was successful in creating credible accounts of distinctive sequences of events that surrounded it. My close engagement with the ethnographic data collected was surprisingly fruitful enabling me to see and define different types of visitor behaviour that was revealed through unexpected and sometimes tiny

nuances in action and related to underlying social conventions. These subtleties of exchange and action around the piece would otherwise have gone unnoticed and are fascinating to me as an artist-designer. This ethnographic study of my work has enabled me to construct a broader, more elaborate choreography of action and interchanges and I have started to consider taking account of this when making new work. My connection with *The Enlightened Eye* was cemented further by observing its use in detail and in capturing its contingent aesthetic. The method for capturing and presenting the action for analysis and evaluation was developed specifically for this project. As such it provides a useful basis on which to form new approaches to evaluation as well as an evidence base for developing new work in a variety of contexts. New projects can benefit from this knowledge of previously observed behavioural patterns, using at the outset of a design process to think through the ways in which they might set conditions for a design at a later stage. For example, Garfinkel's concept of 'breaching' (Garfinkel 1967) can be exploited in a design to create memorable interactions in the museum, where creative non-linear tasks can take advantage of *normal* affordances, as well those confusing and conflicting idiosyncratic relational responses. This can be seen in data analysis examples such as *Enforcing your Own Interpretation* in chapter 5 where established scaffolding is disrupted by ludic behaviour, this then helps to frame the unexpected and unconventional in a museum setting.

Social science data analysis can also be used as evidence to convince potential museum partners of the depth, variety and quality of visitor interactions and the impact of informal learning. A structured, organised approach to data collection creating a rich seam of evidence is particularly useful in a highly competitive funding environment.

3. How are art and design methods integrated in order to create a situated interactive piece in a museum?

An examination of the relationship between art and design practice supported this question and my evaluation of this question forms the bulk of this PhD. I have discovered that the design of an object is clearly able to

influence the actions the senses and the emotions of a visitor group while the evaluation can be reliant on an artistic sensibility to reveal a contingent aesthetic. This contingent aesthetic is *also* a method for presenting data and the actants become the portrayed embodiment of ethnographic data. The process of designing and developing a situated interactive design draws equally on the tacit as it does on user testing and the qualitative evaluation of data, showing that research rigour is influenced by aesthetic sensibility. It is clear to me now that some of my original projects, including *Deus Oculi* did not specifically take into account research rigour in their design, being primarily tacit responses to an invitation to create an artefact that provoked interaction in visitor groups. *Deus Oculi* relied on a confection of craft, art and design in which the aesthetic considerations were more clearly influenced by images and paintings that interested me, and that can be understood as affordances. For example *Deus Oculi* clearly appropriated painting and parts of paintings of the human face and details, such as a human eye. These painted affordances were significant for audiences influencing action, however *Deus Oculi,* alongside *Ghost Ship* and *Keepsake and Viewer* were not intended to interpret museum objects or themes, rather to make the visitor and their action the subject of their interpretation. As soon as specific objects and themes were introduced (see *Designs for Creative Transformation),* then the designs changed, relying then on kinetic aesthetics and functional affordances to support visitor contact with museum objects and themes. As I have worked through to conducting my own evaluation of visitor interaction, the visitor's choreographed action and contingent aesthetic has been foregrounded. Reflecting upon this now, I feel that a return to the '*Deus Oculi'* way of working might be undertaken, particularly in the light of this whole body of research. There might be more value wrought then for both the museum context and for an artist-designer's practice. I feel that there is a need for independent, creative thinking for museum design and that the artist-designer, as a curious and reflective practitioner can certainly supply this. The artist-designer is able to exploit the museum territory, particularly those small, independent-minded museums that are open to new propositions. These opportunities create a particular value for the visitor

through the creative transformations that *The Enlightened Eye* afforded. This shared enjoyment, emotion and engagement has I hope, been rendered clearly visible here.

Implications for New Work

This project has been an opportunity to make a detailed evaluation of visitor behaviour, their motivations, interests, and interaction with and around *The Enlightened Eye*, as well as with each other. I have concluded that social action has been the key to describing the form and use of this object and I therefore take account of what has been learnt and will in future build into new projects, mechanisms for testing interaction. Choreographing interaction and social behaviour is actually the purpose of this kind of work, in that any learning experience that is engendered by situated design, must take into account the subtleties of visitor conduct. The evidence of this research has led me to believe that an understanding of why and what is happening should be within the remit of the artist-designer.

It is also possible, through iterative examples, to make projected evaluations and data analysis available to curators and institutions in advance of project work, as well as summaries and reviews to conclude projects. It is also desirable to design and conduct longitudinal data collection methods in order to evaluate longer-term effects on the visitor, of engagement with situated interaction design in the museum context.

Considerations for future research

The act of drawing in museums and art galleries as an aid to learning, memory and meaning-making, is a rich area for future investigation. This PhD research project, in part, focuses on the task of drawing, looking closely at mineral samples the visitor was asked to creatively engage, to transform and connect with objects how the value of this be measured more clearly.

The active role of aesthetic affordance in design and interpretation, as a question, might be devised around the difference between kinetic affordance and visual aesthetic affordances.

The impact of situated interactives on visitors' engagement with existing and traditional displays and interpretation in future visits, the question here would concern how interactives like *The Enlightened Eye* might help complement and support linear interactions and typical curatorial interpretation, including labelling, museum guides and exhibit layouts.

The role of materiality, craftsmanship and uniqueness to the effectiveness of design for interpretation: that is to say how much is an interactive object is supported by its intrinsic, static qualities, against its functionality.

The use of embedded digital technology, including the opportunity to review, preserve and share creative input and its role in sustaining interest and enhancing interpretation: Increasingly, the museum has become an arena for designers offering different kinds of engagement with digital archives. *The Enlightened Eye* is part of that current movement; however, this PhD project has not explored in-depth this emerging area of museum engagement.

The nature and role of collaborative practices in designing situated museum interactives: I have touched on the collaborative nature of working in the public arena of a museum, however what would it mean to collaborate, not only with digital specialist, curators and the like but also with artisans and other designers, designer-makers, craftspeople, artists or indeed, other artist-designers?

The development of artworks that rely on the contingent aesthetic: that is to say the way in which visitors interact with my designs in the manner of eighteenth century conversation pieces (fig 153). They then might become the embodiment of action, the value of a project that reflected the informal actions of groups of individuals might be developed as a series of representational images or sculptures that capture shared intent, embodied action and the relational, in order to interpret interpretation. This reportage of the details of interaction captured and rendered becoming the basis for a new artwork.

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Appendices

Contents

List of figures

Test Images

The images below (fig 1 and 2) represent my initial tests using a Wacom tablet. Loaded with still photographs of minerals from the Rashleigh Gallery in the Royal Cornwall Museum. I asked a small group of mixed age volunteers to respond to these images, to consider the morphologies they found and to annotate them in any way they wished (fig 4). The results show a good range of creative transformations undertaken, some more literal than others.

Fig 3 shows a sample of advanced tests conducted with undergraduate students, here the level of sophistication evident here in the results conceivably reflects the volunteers' background in art and design education.
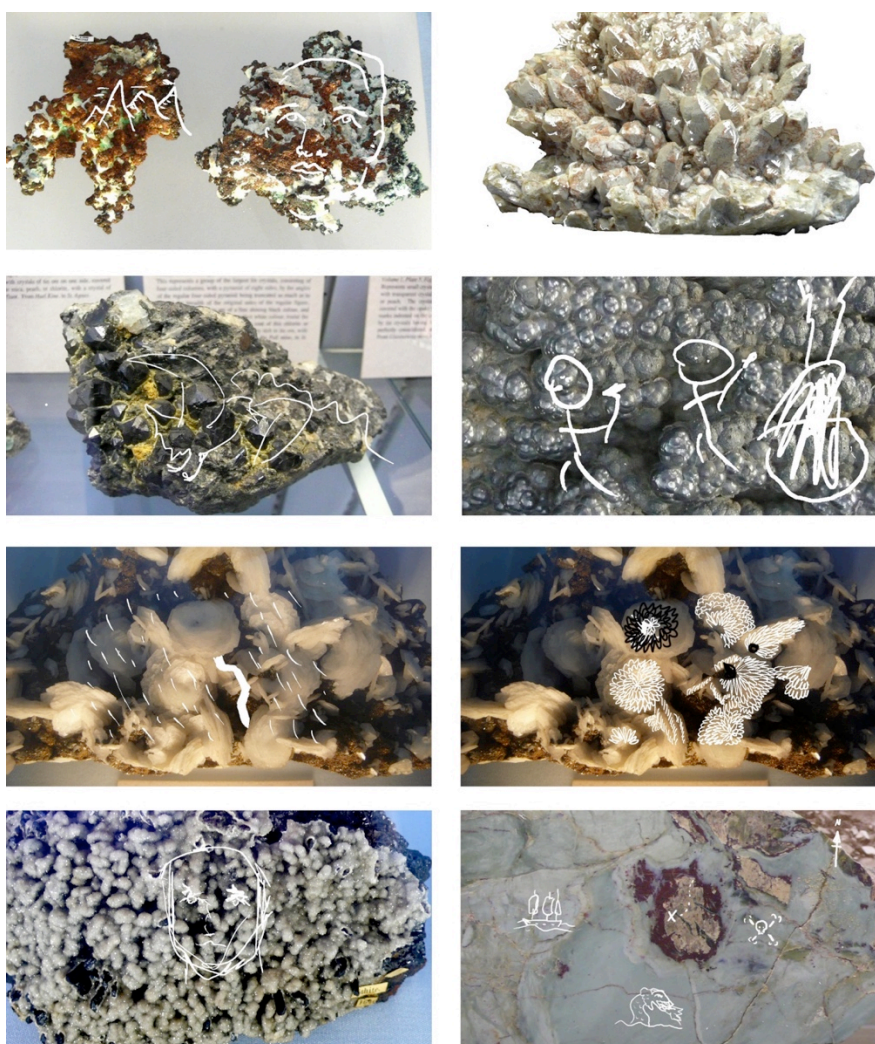
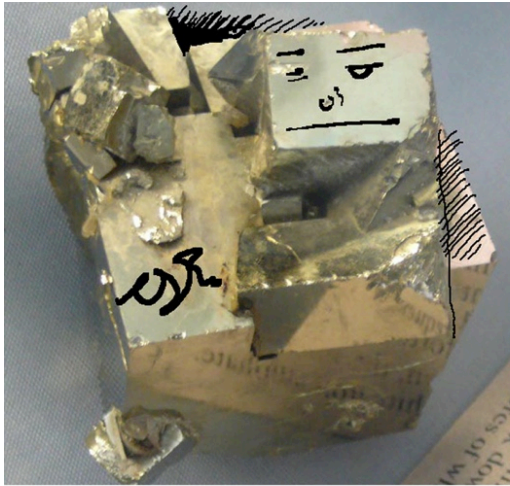*Figure 192: Jason Cleverly. 2013. Wacom tests, image: J. Cleverly July 2013.*
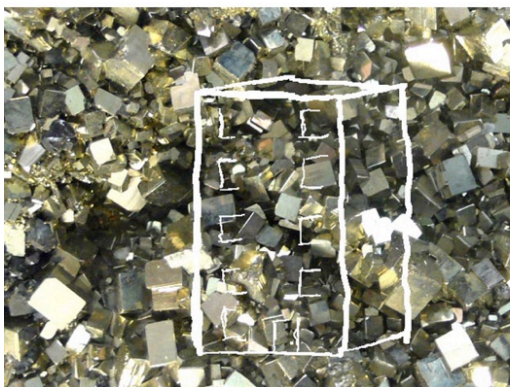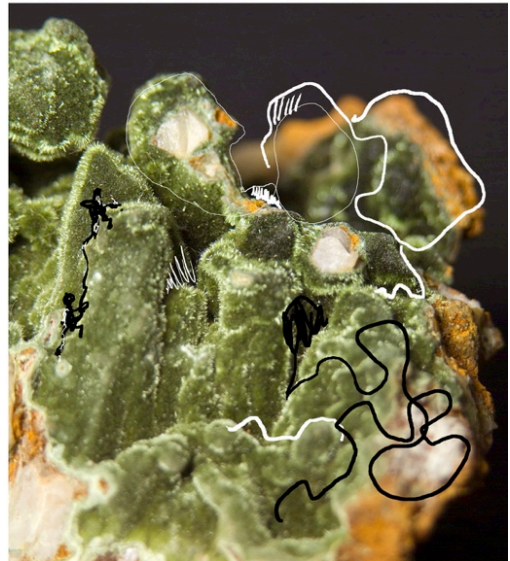
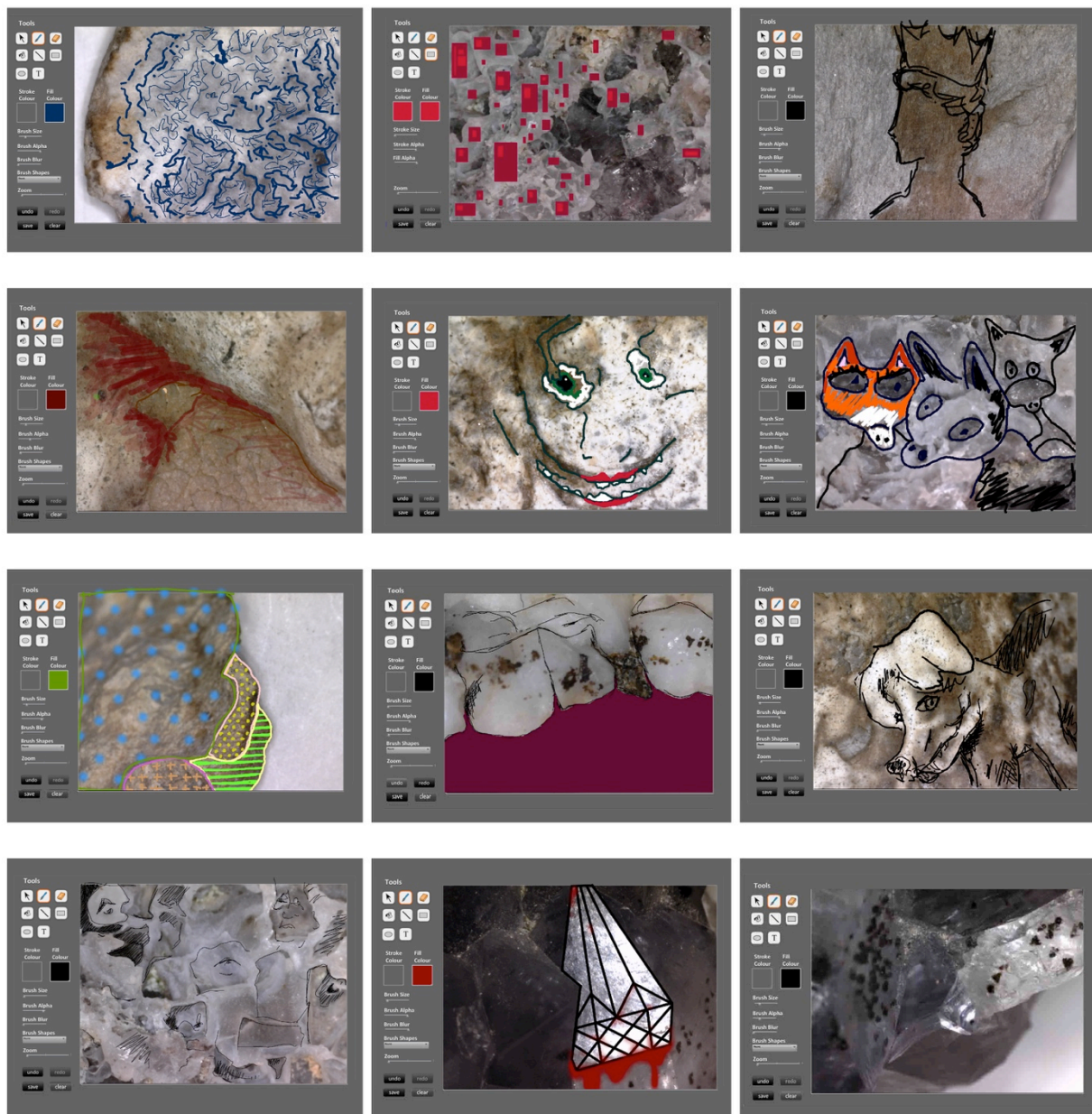*Figure 193: Jason Cleverly. 2013. Wacom tests, image: J. Cleverly August 2013.*

Figure 194: Jason Cleverly, Tim Shear. 2013. Selected Mineral Morphology Drawing Tests, image: J. Cleverly 2013.

Test Questionnaires

The volunteers who took part in the tests were also asked to comment on the experience of using the test microscope rig. To consider the design of the interface and to say what kind of improvements and features they would like to see on the finished interactive.

About The Project.

The research project involves the development of an interactive artwork for Liskeard Museum. We a looking at ways in which museum visitors can engage with the museum's minerals collection.

This project will ask visitors to create a response to close up images of mineral samples, to select a particular image and to draw over this selection via a digital tablet and pen.

Provisional tests reveal that participants would like to be given a task, for example to find an image hidden in the morphology; the shapes tones and structures of the microscopic image.

These images may include landscapes, animals and figures. But there may be other images made by participants, more scientific in nature or abstract; this is what we would like you to help us with.

You may also like to let us know if you have any other thoughts regarding this project using the form provided.

A Model of the Interactive project

Figure 195: Jason Cleverly. 2013. Participant information, image: J. Cleverly 2013.

THE ENLIGHTENED EYE/LISKEARD MUSEUM PROJECT.
LIVE TEST:
DATE:

NAME: Jamie Collins   Male/Female   AGE 23 OCCUPATION: Croft Student

PICTURE TITLE/NAME: Squiggly man

COMMENTS:

Really to watch other people do it. No two think alike. Reminded me of my childhood and looking at clouds. look forward to. seeing it done. first thoughts were it would be fun for kids, but in 23 and i thought it was fun.

Figure 196: Jamie Collins. 2013. Participant response, image: J. Cleverly 2013.

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THE ENLIGHTENED EYE/LISKEARD MUSEUM PROJECT.
LIVE TEST:
DATE:

NAME: SOPHIE JARRAM   Male/Female   AGE 22 OCCUPATION: Student.

PICTURE TITLE/NAME: FOXY FAMILY

COMMENTS:

- really interesting elements of having an interactive piece of work.
- inspiring to have a 'base' (the network) to work from instead of it being a blank page.
- would be good to see everyones drawings at the social hub - like a gallery

Figure 197: Sophie Jarram. 2013. Participant response, image: J. Cleverly 2013.

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Figure 198: Samantha Gerlach. 2013. Participant response, image: J. Cleverly 2013.

Figure 199: Jonathan Kinna. 2013. Participant response, image: J. Cleverly 2013.

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THE ENLIGHTENED EYE/LISKEARD
MUSEUM PROJECT.
LIVE TEST:
DATE:

NAME: PHOEBE GOWEN   Male/Female   AGE: 21   OCCUPATION: STUDENT

PICTURE TITLE/NAME   SURPRISED FISH

COMMENTS:

Easy to draw on the screen.
→ It is always fun to find faces in things
→ But you don't have to draw faces?

Fun!

Figure 200: Phoebe Gowen. 2013. Participant response, image: J. Cleverly 2013.

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THE ENLIGHTENED EYE/LISKEARD
MUSEUM PROJECT.
LIVE TEST:
DATE:

NAME: VIOLET SUMMERFIELD   Male/Female   AGE: 24   OCCUPATION: STUDENT

PICTURE TITLE/NAME   HORIN

COMMENTS:

WAS INTERESTING TO BE ABLE TO LOOK SO
MUCH MORE CLOSELY AT AN OBJECT YOU
WOULD USUALLY OVERLOOK.
MEANS YOU CAN SEE THINGS YOU WOULD NOT USUALLY
SEE.
COULD HELP PEOPLE TO APPRECIATE SMALL SCALE
DETAILED OBJECT FAR MORE - AND THE
REVOLVING SIDE BRINGS MORE FUN TO IT
THROUGH INTERACTION.

Figure 201: Violet Summerfield. 2013. Participant response, image: J. Cleverly 2013.

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NAME: Alice Jenner   Male/Female   AGE: 20 OCCUPATION: Student

PICTURE TITLE/NAME: Queen's head

COMMENTS: It was nice to be so directly interactive with something so solid eternal (usually rocks aren't usually very interactive) I like the link between the start of what we think of as technology with the very modern, state of the art stuff.

Figure 202: Alice Jenner. 2013. Participant response, image: J. Cleverly 2013.

NAME: BEN SCOTT-PYE   Male/Female   AGE: 26 OCCUPATION: STUDENT

PICTURE TITLE/NAME: PATTERNS / BEN SCOTT-PYE

COMMENTS: I like the aesthetic quality of the prototype machine model. I'm not sure how this will appeal to a younger audience and get them interested in going to museums and make them feel more involved.

Figure 203: Ben Scott-Pye. 2013. Participant response, image: J. Cleverly 2013.

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THE ENLIGHTENED EYE/LISKEARD
MUSEUM PROJECT.
LIVE TEST:
DATE:

NAME: TAREG MORRIS   Male/Female   AGE: 23 OCCUPATION: STUDENT

PICTURE TITLE/NAME   BLOOD DIAMOND

COMMENTS: "I really enjoyed the experience of drawing on the tablet – Never done that before. very user friendly – would like to use "undo" more than it allowed." Nice idea, like the involvement of each step. choosing the rock, colours etc.

Figure 204: Tareg Morrris: 2013. Participant response, image: J. Cleverly 2013.

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THE ENLIGHTENED EYE/LISKEARD
MUSEUM PROJECT.
LIVE TEST:
DATE:

NAME: Claire English   Male/Female   AGE: 31 OCCUPATION: Curatorial Intern.

PICTURE TITLE/NAME   Blue Speckle.

COMMENTS: When approaching the drawing I think its important for it to be easy to play – to try and ease spending. Initially I felt self conscious when drawing but became absorbed and really enjoyed the activity.
I think an explaination and images around the activity + other objects) enhance the experience.

Figure 205: Claire English. 2013. Participant response, image: J. Cleverly 2013.

Figure 206: Chaz Easingwood. 2013. Participant response, image: J. Cleverly 2013.

Figure 207: Bethany Robinson. 2013. Participant response, image: J. Cleverly 2013.

Figure 208: Bethany Robinson. 2013. Participant response, image: J. Cleverly 2013.

Figure 209: Justin Marshall. 2013. Participant response, image: J. Cleverly 2013.

NAME: Chris Wooton   Male/Female   AGE: 24   OCCUPATION: Gardener.

PICTURE TITLE/NAME   Mountain

COMMENTS: Perhaps make the brush options & the colour choice pallet larger so it's easier to poke at.

(• Also maybe it would be nice to have the rocks able to spin on a platform as in this test version you have)

Brilliant idea. I look forward to having a go on it in the Museum — Rocks are great!

CSM maybe have good visual rock ideas as they spend all their time looking very very closely at rock...

Maybe ps CSM do come out and draw on the screen and see how their Geological views differ from the Arts & Crafts folk views on wild living forms.

NAME: Clara Henrich   Male/Female   AGE: OCCUPATION:

PICTURE TITLE/NAME

COMMENTS: I really like the idea it would be nice if it could be a lot bigger and zoom out more.

Figure 211: Clara Henrich. 2013. Participant response, image: J. Cleverly 2013.

Figure 210: Chris Wooton. 2013. Participant response, image: J. Cleverly 2013.

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THE ENLIGHTENED EYE/LISKEARD
MUSEUM PROJECT.
LIVE TEST:
DATE:

NAME: VICTORIA ANDREW   Male/Female   AGE: 20 OCCUPATION: STUDENT

PICTURE TITLE/NAME

COMMENTS:
MADE ME LOOK AT THE OBJECT IN NEW WAY,
ABSTRACTED, DIDN'T LIKE BEING WATCHED DRAWING,
DIFFICULT TO DRAW AT THAT ANGLE,
BE GOOD TO BE ABLE TO TAKE DRAWING
AWAY WITH YOU / SHARE IT.

Figure 212: Victoria Andrew. 2013. Participant response, image: J. Cleverly 2013.

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THE ENLIGHTENED EYE/LISKEARD
MUSEUM PROJECT.
LIVE TEST:
DATE:

NAME: EMILY HARNETT   Male/Female   AGE: 41 OCCUPATION:

PICTURE TITLE/NAME

COMMENTS: Interest in the appreciation of subtle and
endless supply of textures rich.
Do museums ignite creative awareness
- this in a way to bring creative interaction into
places of contemplation.

Figure 213: Emily Harnett. 2013. Participant response, image: J. Cleverly 2013.

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THE ENLIGHTENED EYE/LISKEARD
MUSEUM PROJECT.
LIVE TEST:
DATE:

NAME: Jimi Simons   Male/Female   AGE: 21 OCCUPATION: STUDENT

PICTURE TITLE/NAME: Eye

COMMENTS: Using a microscope to find new patterns
or shapes is a good way of seeing
something new in an everyday item.

Figure 214: Jimi Simons. 2013. Participant response, image: J. Cleverly 2013.

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THE ENLIGHTENED EYE/LISKEARD
MUSEUM PROJECT
LIVE TEST:
DATE:

NAME: DEBORAH GAVIN   Male/Female   AGE: 21 OCCUPATION: STUDENT

PICTURE TITLE/NAME: GREY SCALE

COMMENTS:
- Very interesting to use, as you see new
imagery shapes and patterns in the textured
of the rocks
- Fun to learn how to use the tablet too,
and see how drawn work become digital

Figure 215: Deborah Gavin. 2013. Participant response, image: J. Cleverly 2013.

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THE ENLIGHTENED EYE/LISKEARD
MUSEUM PROJECT.
LIVE TEST:
DATE:

NAME: LEAH JENSEN   ~~Male~~/Female   AGE: 23 OCCUPATION: Student/ Cinema worker

PICTURE TITLE/NAME   SAD WOMEN

COMMENTS: it was 'difficult at the start
but the longer you look the easier it
becomes to create a pattern that
allowed the theme I accidentally
chose. The original object becomes
something different entirely.

Figure 216: Leah Jensen. 2013. Participant response, image: J. Cleverly 2013.

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THE ENLIGHTENED EYE/LISKEARD
MUSEUM PROJECT.
LIVE TEST:
DATE:

NAME: Jenny Cheeseman   ~~Male~~/Female   AGE: 20 OCCUPATION: Student

PICTURE TITLE/NAME   Seabed,

COMMENTS: a wonderful way of free-drawing —
interesting interpreting the lines on
rocks. I have not drawn on an
I pad before.

Figure 217: Jenny Cheeseman. 2013. Participant response, image: J. Cleverly 2013.

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FALMOUTH UNIVERSITY

THE ENLIGHTENED EYE/LISKEARD
MUSEUM PROJECT.
LIVE TEST:
DATE:

NAME: CHERYL CORK   ~~Male~~/Female   AGE: 18   OCCUPATION: STUDENT

PICTURE TITLE/NAME   Age

COMMENTS:
Being playful is the best way to learn and
stimulate further interest and knowledge.

Figure 218: 2013. Cheryl Cork. Participant response, image: J. Cleverly 2013.

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THE ENLIGHTENED EYE/LISKEARD
MUSEUM PROJECT.
LIVE TEST:
DATE:

NAME: Becky Avery   Male/(Female)   AGE: 22   OCCUPATION: STUDENT

PICTURE TITLE/NAME   Becky Avery 'Had a good night?'

COMMENTS: VERY EASY To USE, MUCH EASIER THAN ANY OTHER
GRAPHICS TABLET I HAVE USED BEFORE.
IT SEEMS THAT THERE IS AN INFINITY OF
DRAWINGS HIDDEN IN THE FACE OF A ROCK.

Figure 219: Becky Avery. 2013. Participant response, image: J. Cleverly 2013.

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FALMOUTH UNIVERSITY

THE ENLIGHTENED EYE/LISKEARD
MUSEUM PROJECT.
LIVE TEST:
DATE:

NAME: Lydia Stanwix   Male/**Female**   AGE: 38 OCCUPATION: Student.

PICTURE TITLE/NAME   Rock Party

COMMENTS:

Loved using the interface. I felt the image
was a good prop to respond to in a creative
way

Figure 220: Lydia Stanwix. 2013. Participant response, image: J. Cleverly 2013.

FALMOUTH UNIVERSITY

THE ENLIGHTENED EYE/LISKEARD
MUSEUM PROJECT.
LIVE TEST:
DATE:

NAME: Hannah Couper   **Male**/Female   AGE: 21 OCCUPATION: Student.

PICTURE TITLE/NAME   Man in a mine-shaft.

COMMENTS:

I chose the amythyst because of the rocky surface...
so I could draw a scene.

The colour selection needs to be more varied and also
bigger in scale as it's hard to select.

Figure 221: 2013. Hannah Couper. Participant response, image: J. Cleverly 2013.

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Drawings

The images below are scans of the sketchbooks used during the data analysis period at Liskeard and District Museum in February 2015. They initially formed a resource for corroborating elements of video data subsequently, however they also became useful in influencing the quality of the drawings accompanying the written evaluation of the data analyisis.

Figure 222: Jason Cleverly. 2015. Page 1 Grey sketchbook 17th Feb: image: J. Cleverly 2015.

Figure 223: Jason Cleverly. 2015. Page 2-3 Grey sketchbook 17th Feb: image: J. Cleverly 2015.

Figure 224: Jason Cleverly. 2015. Page 4 Grey sketchbook 17th Feb: image: J. Cleverly 2015.

Figure 225: Jason Cleverly. 2015. Page 5 Grey sketchbook 17th Feb: image: J. Cleverly 2015.

Figure 226: Jason Cleverly. 2015. Page 8-9 Grey sketchbook 17th Feb: image: J. Cleverly 2015.

Figure 227: Jason Cleverly. 2015. Page 10-11 Grey sketchbook 17th Feb: image: J. Cleverly 2015.
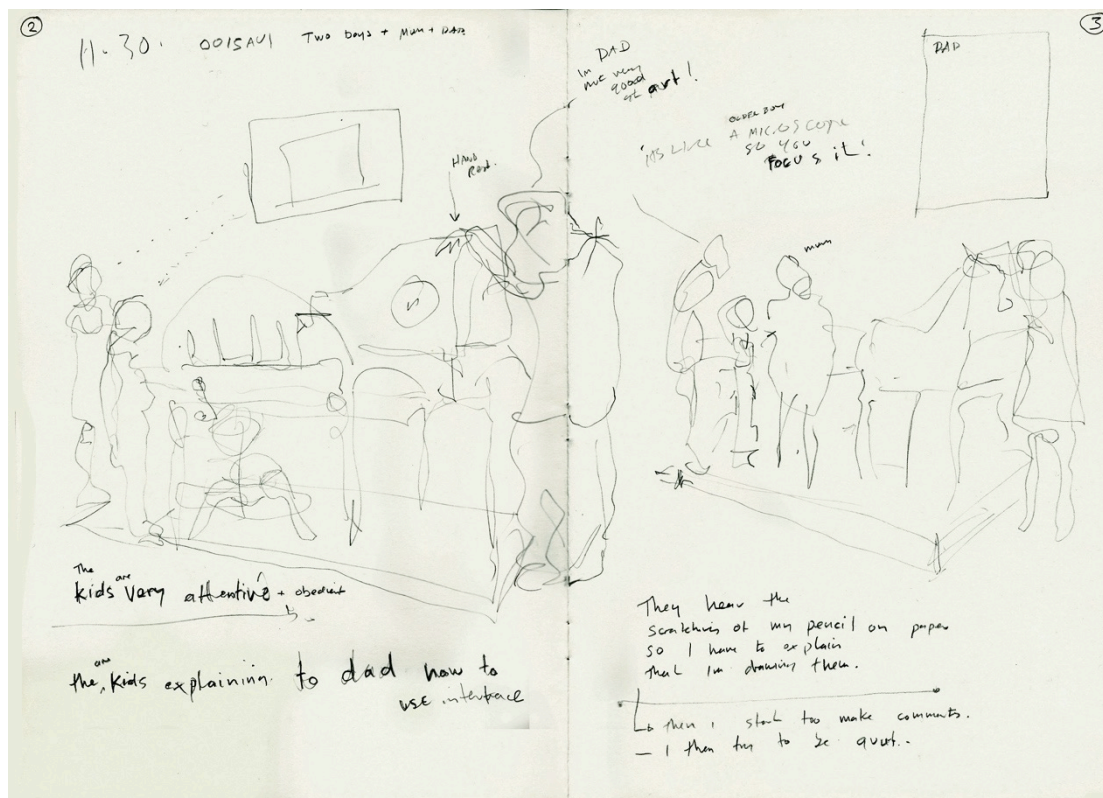

Figure 228: Jason Cleverly. 2015. Page 12-13 Grey sketchbook 17th Feb: image: J. Cleverly 2015.

Figure 229: Jason Cleverly. 2015. Page 14-15 Grey sketchbook 17th Feb: image: J. Cleverly 2015.

Figure 230: Jason Cleverly. 2015. Page 16-17 Grey sketchbook 18th Feb: image: J. Cleverly 2015.

Figure 231: Jason Cleverly. 2015. Page 20-21 Grey sketchbook 18th Feb: image: J. Cleverly 2015.

Figure 232: Jason Cleverly. 2015. Page 22-23 Grey sketchbook 18th Feb: image: J. Cleverly 2015.

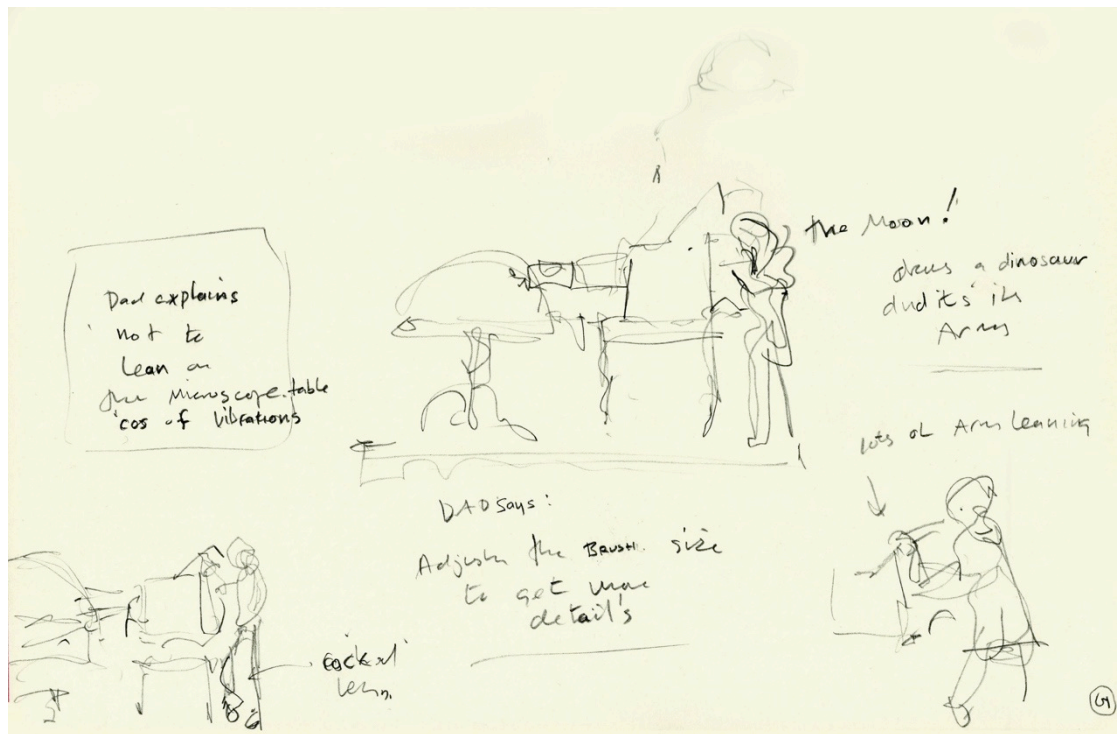*Figure 233: Jason Cleverly. 2015. Page 24-25 Grey sketchbook 18th Feb: image: J. Cleverly 2015*

Figure 234: Jason Cleverly. 2015. Page 26-27 Grey sketchbook 18th Feb: image: J. Cleverly 2015.

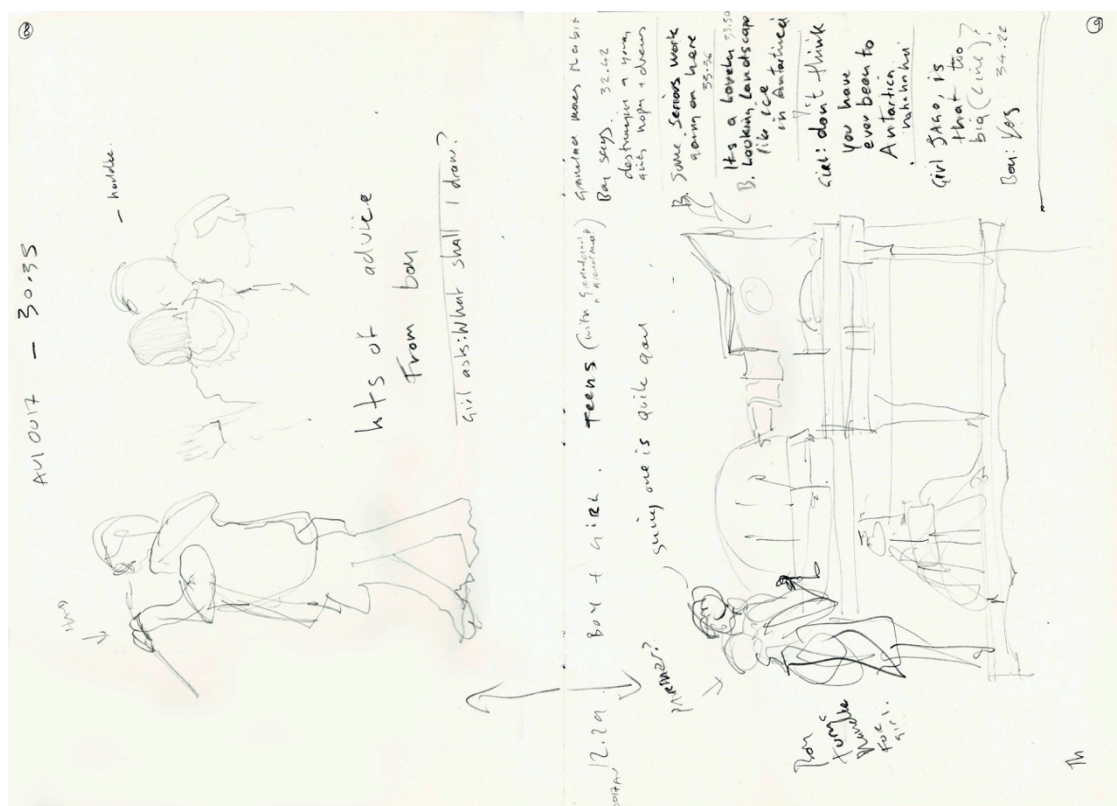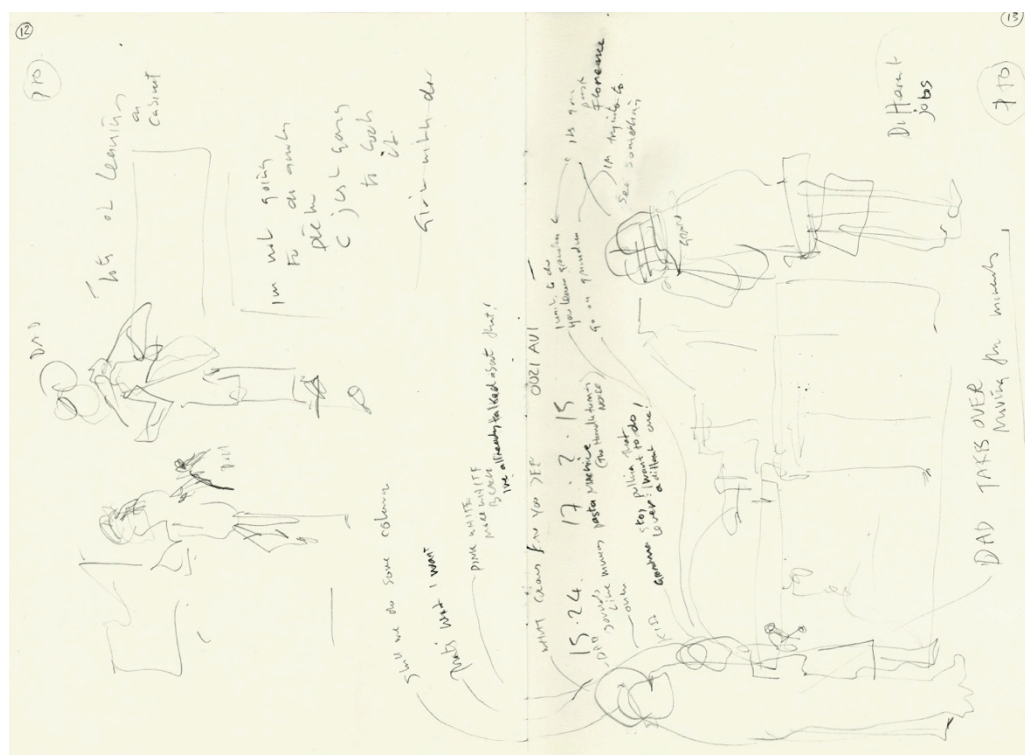*Figure 235: Jason Cleverly. 2015. Page 28 Grey sketchbook 18th Feb: image: J. Cleverly 2015.*
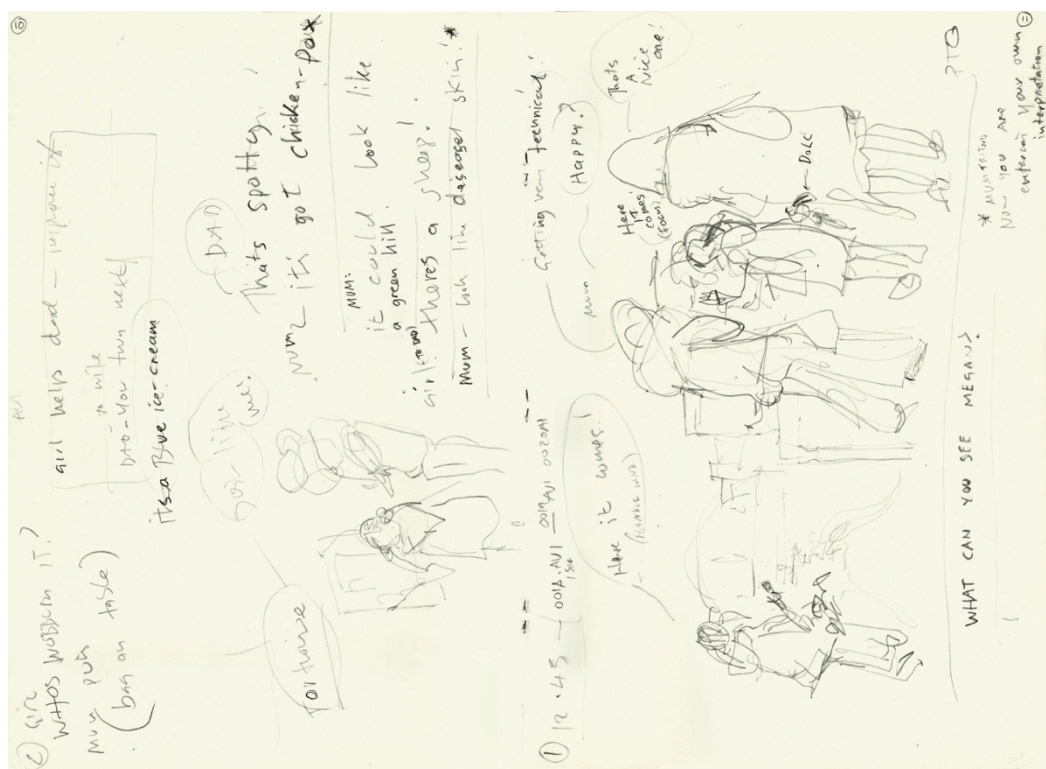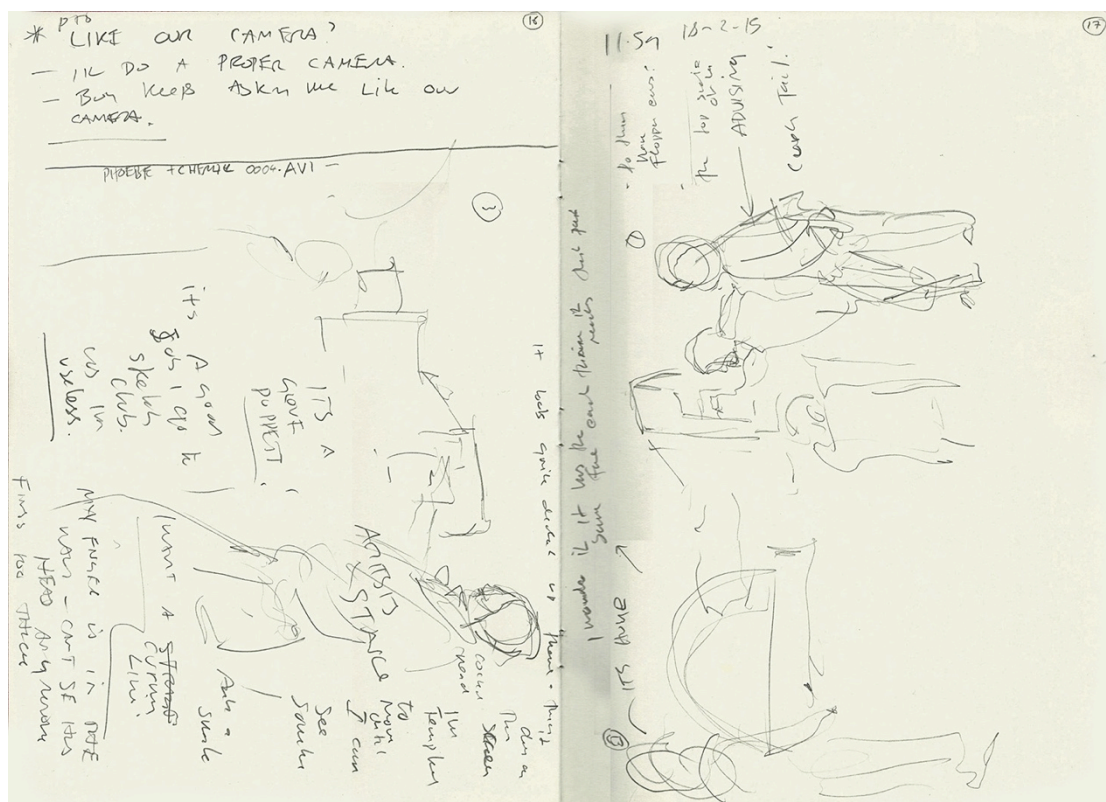

Figure 236: Jason Cleverly. 2015. Page 1 Brown sketchbook 20th Feb: image: J. Cleverly 2015.

Figure 237: Jason Cleverly. 2015. Page 5 Brown sketchbook 20th Feb: image: J. Cleverly 2015.
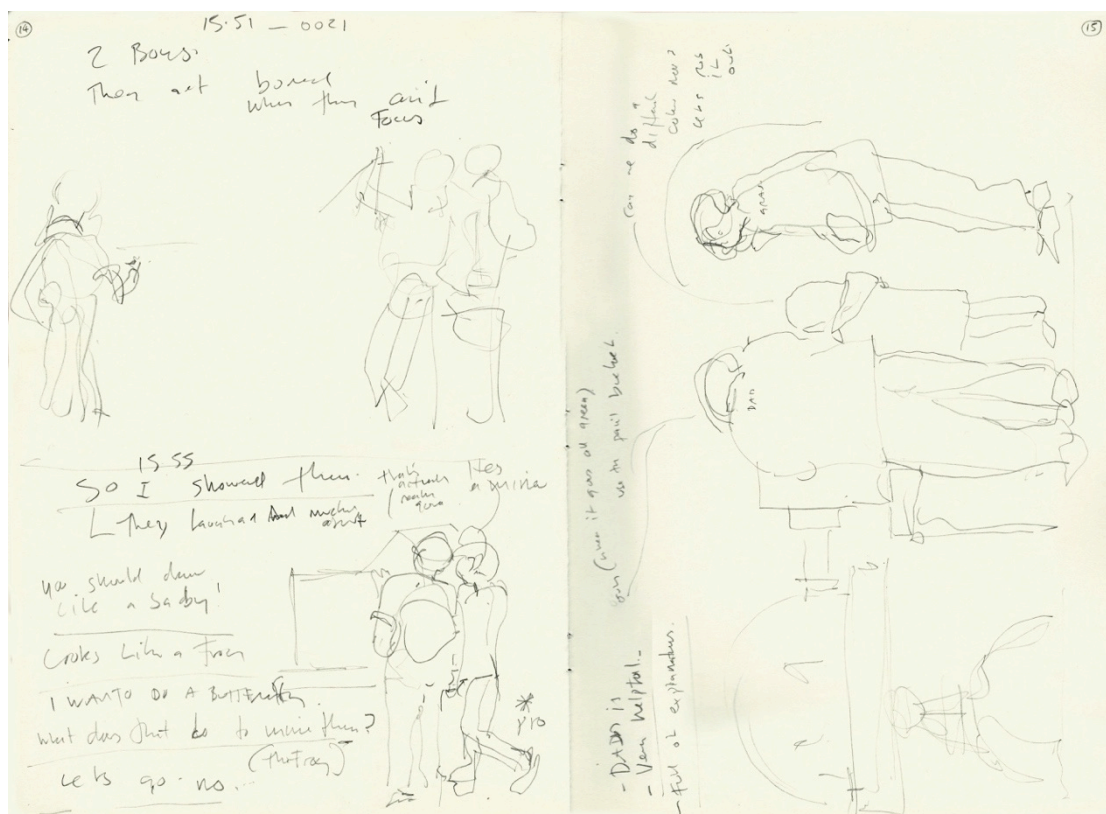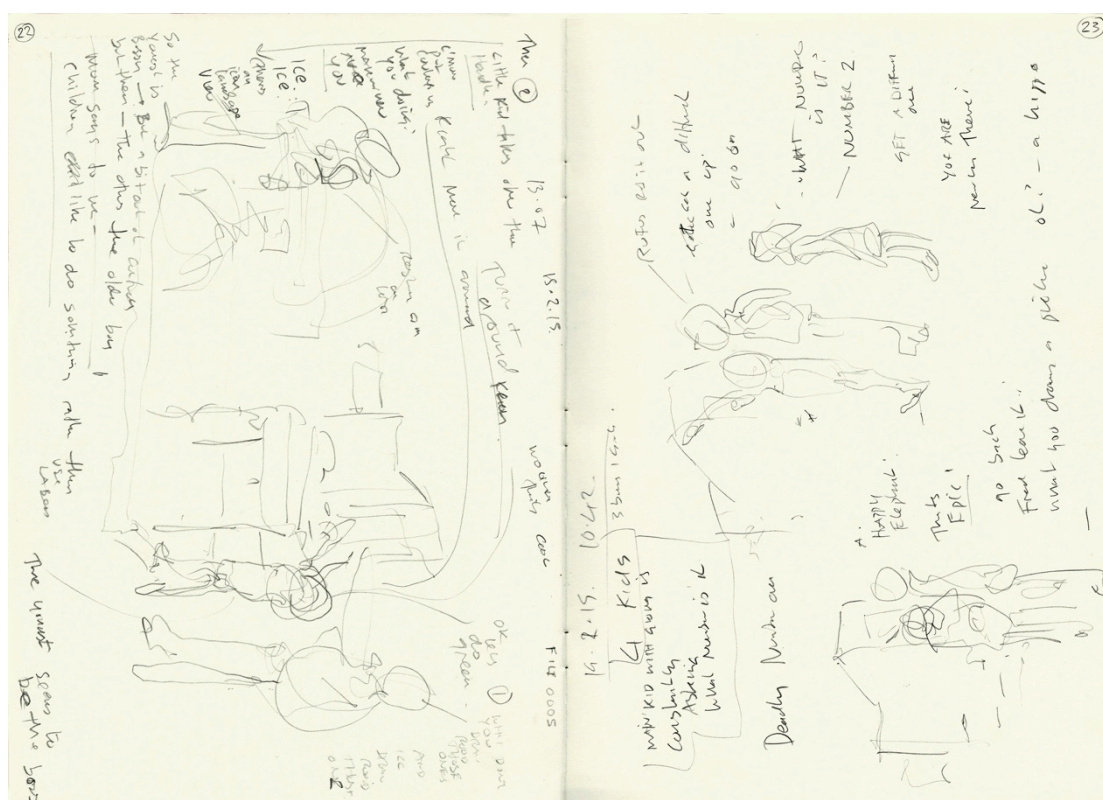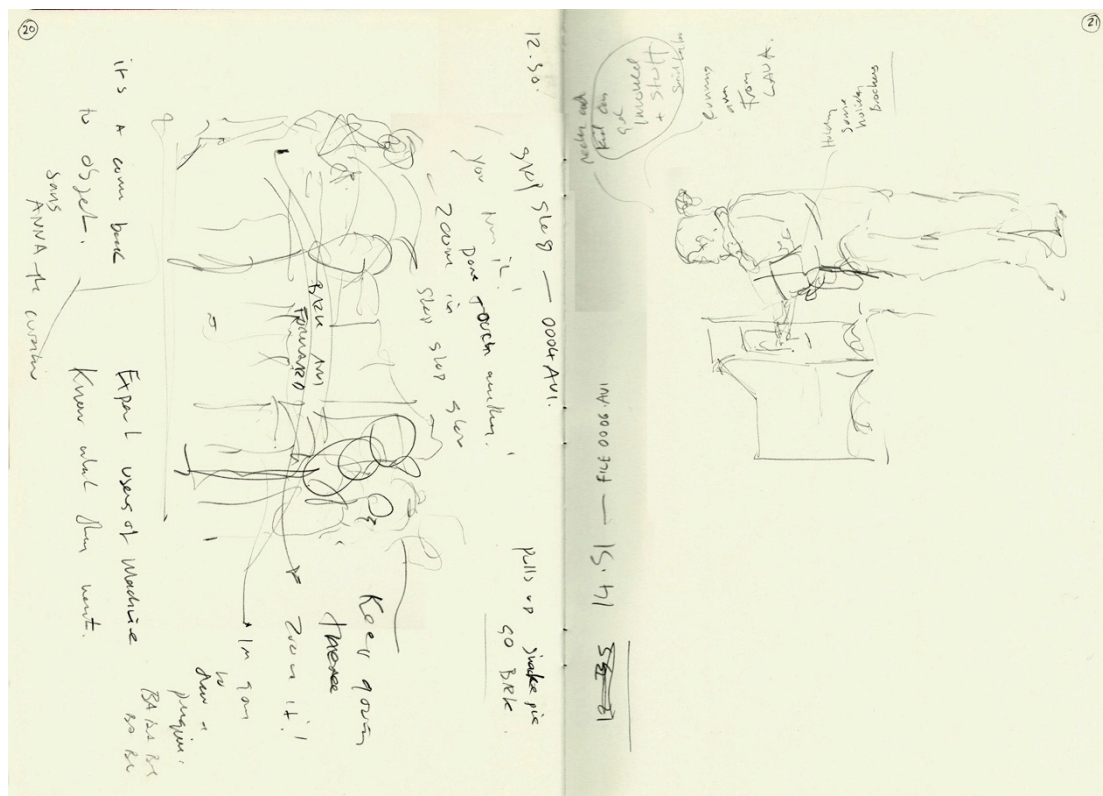

Figure 238: Jason Cleverly. 2015. Page 8-9 Brown sketchbook 20th Feb: image: J. Cleverly 2015.
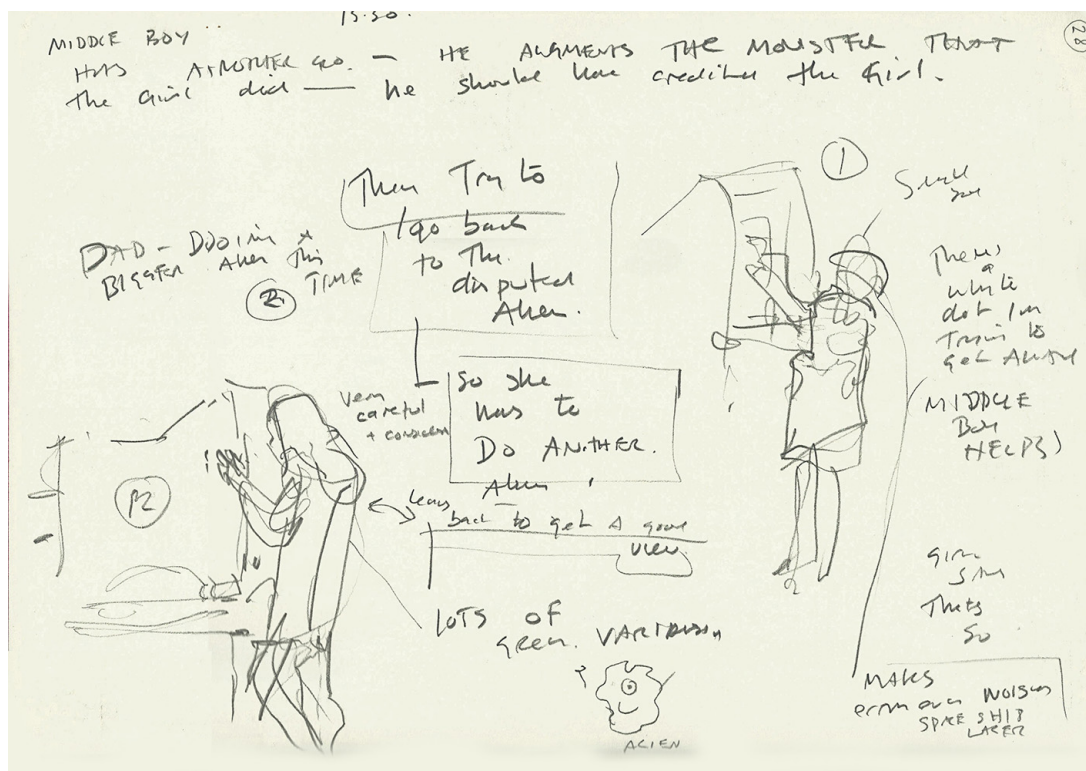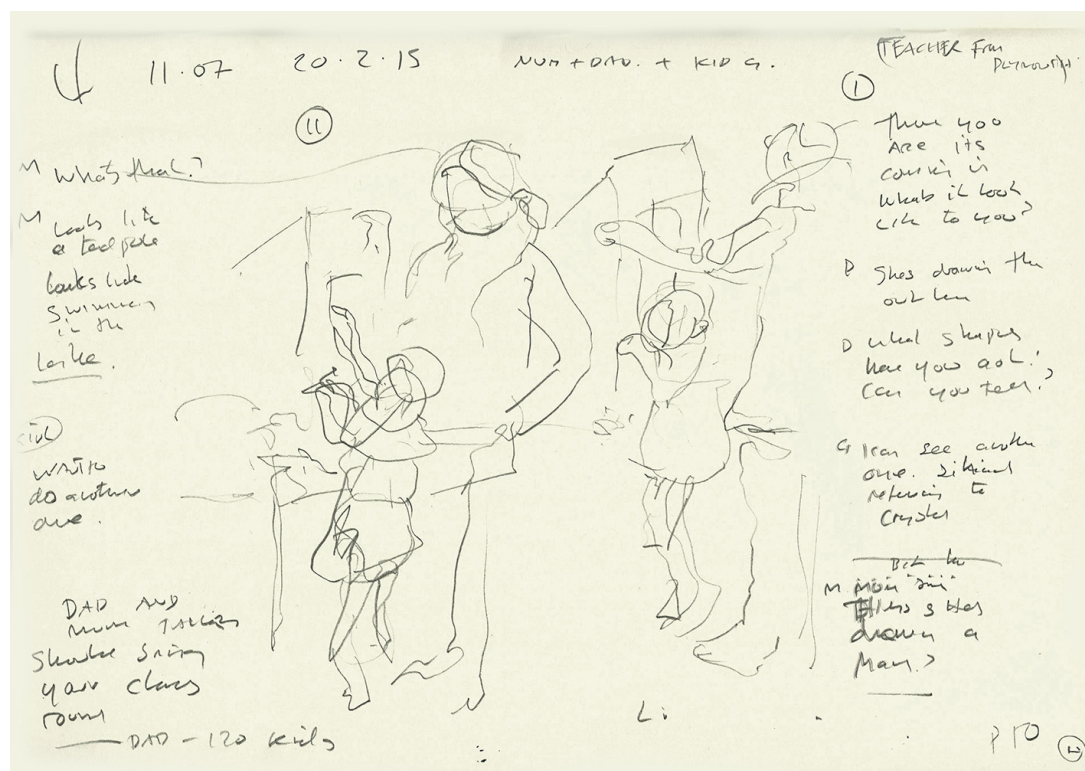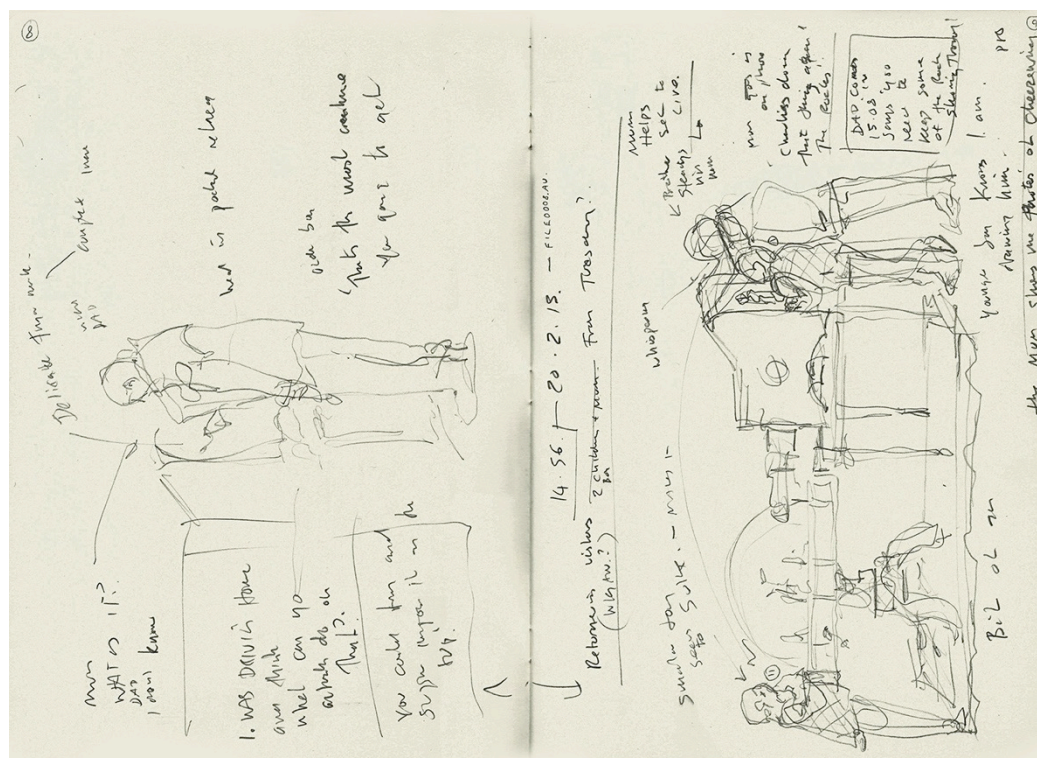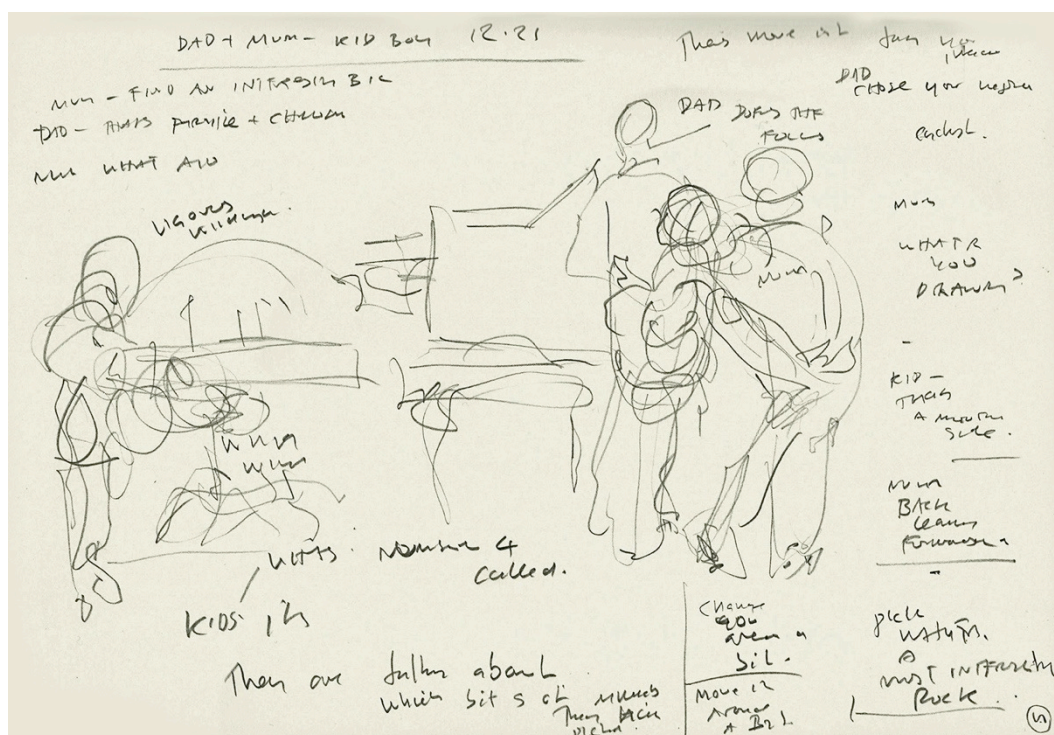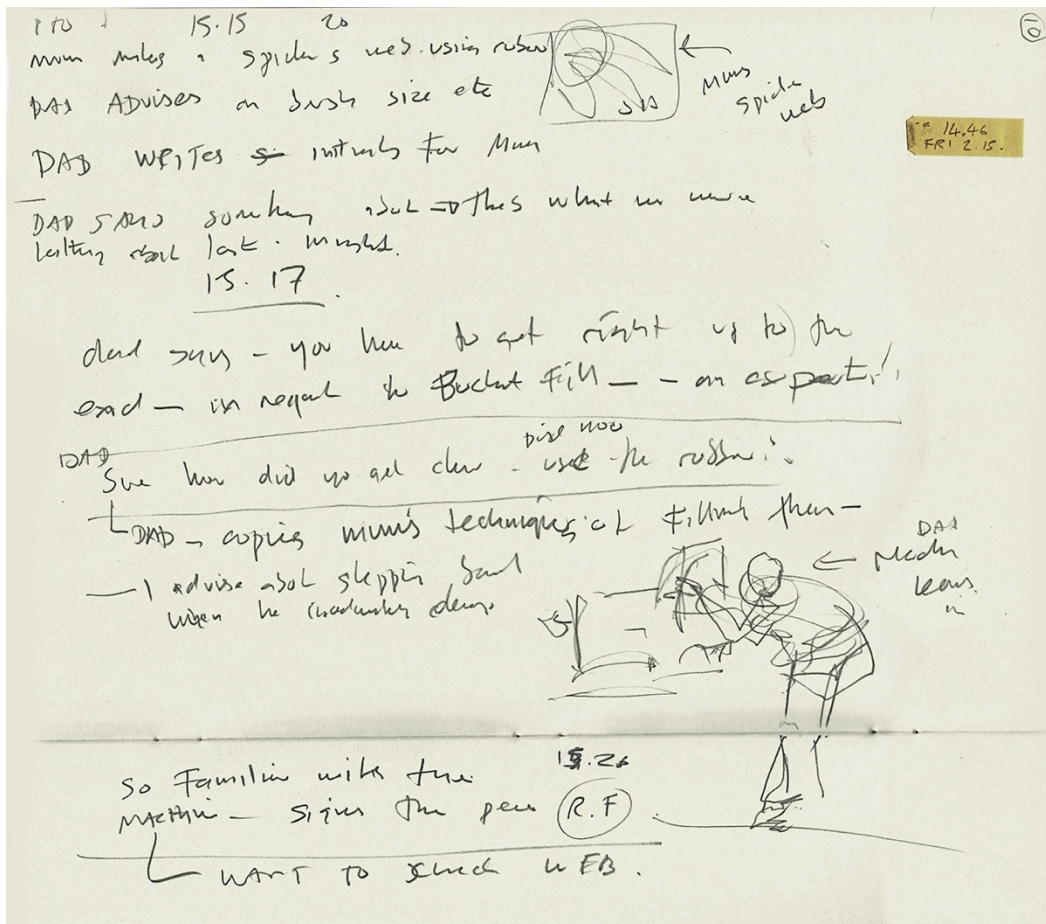
Figure 239: Jason Cleverly. 2015. Page 10 Brown sketchbook 20th Feb: image: J. Cleverly 2015.

Data Sets

These spread sheets represent detailed descriptions of action and conversation made by museum visitors on separate occasions during the data analysis sessions undertaken in February 2017. Fig 49 shows the preliminary review that helps to determine which videos to focus particular attention upon.

PRELIMINARY REVIEW EE

DAY	START TIME MIN	AVI FILE	QUICKTIM VISITOR	GRC BOOK	PAGES	notes	to evalu EE PIC FILE
Saturday 14 FEB	10	10.6 FILE0008	Adult F				
Saturday 14 FEB	12.5	12.06 FILE0009	Adult F	GREY	1		
Tuesday 17 FEB	11.07	3.59 FILE0014	Adult older M F	GREY	2,3,4,5	repeat visitors dad starts	
Tuesday 17 FEB	11.3	19 FILE0015	Adult M F kid M M	GREY	7,6,		
Tuesday 17 FEB	12.03	29.44 FILE0017	Adult M F kid F M	GREY	1		
Tuesday 17 FEB	12.29 29.44-39.44	FILE0017 pt2	TEEN M+F	GREY	9,8	male advises but doesn't have a go	
Tuesday 17 FEB	12.43 18.27 &1.10	FILE18/19	Adult M FF kid F	GREY	11,10,12	Battery ran out 2 files doll girl	
Tuesday 17 FEB	15.24 24.46	FILE021	Adult M Adult olde	GREY	15,13	overlap with next users	
Tuesday 17 FEB	15.51 23.17-40.03	FILE021 (pt2)	Kid M M		14,16	overlap with previous users and 2 discrete uses	
Wednesday 18 Feb	10.29 17.02	FILE0003.AVI	Adult F kid M	no		previous user there for workshop	
Wednesday 18 Feb	11.57 24.34	FILE0004	Adult F F	GREY	17,16,18,19		
Wednesday 18 Feb cont	24.34-32.11	FILE0004 (pt2)	Kid F F	GREY	20	joined by 1 boy 32.11 joined by slightly older girl 34.28 joined by boy in top hat36.27) joined by woman and boy from 0003 36.40 joined by 2 more women at 38.44 ends at 40.55	
Wednesday 18 Feb	13.05 38.46	FILE0005	Mum 3 kids F M M	GREY	22	Mother makes comment re labels 2 teen Fs join at 13.5 JC interviews at16.12 and resets PC as it has frozen fixed by 19.53.	
Wednesday 18 Feb	14.47 5.38	FILE0006	Adult Younglh M+	GREY	21	Joined by woman at beginning from 0004 who snows them what to do and stays around to advise	
Thursday 19th Feb	10.37 22.35	FILE0001	Adult M 4 young ki	GREY	23	very chaotic	
Thursday 19th Feb	11.39 16.4	FILE0002	Adult M 6 young kids M M M M F			even more chaotic	
Thursday 19th Feb	12.57 40.5	FILE0004	Adult M 3 young ki	GREY	24,25,26,27,28	Extrodinarly well behaved and productive. Spent 40 mins taking turns	
Friday 20 2 15	11.07 11.1	FILE0005,	Adult M F kid F	BROWN	1		
Friday 20 2 15	12.21 6.58	FILE0006	Adult M F kid M	BROWN	5	cyclist image	
Friday 20 2 15	14.35 3.41	FILE0007	Adult F F kid M	BROWN	7	suspicious	
Friday 20 2 15	14.55 30.05	FILE0008	EE 14.46 FRI 2 Adult M F kid M M	BROWN	9,8,10	same as FILE0015 came back for another go	

Figure 240: Jason Cleverly. 2015. Preliminary Review: image: J. Cleverly 2015.

DETAILED REVIEW FILE0015 DURATION 19 17 Adult M F kid M M Date 17 2 2015 11.30am

TIME ACTION	GENERAL ACTIVITY/ACTION/PARTICIPANT	TIME AUD	TRANSCRIPT GENERAL	CORRELATES TO	RELATED DRAWING	PHOTO	EE DRAWING
00.00-3.25	A.M. uses machine as if to learn how to use it in advance of others uses	0.01	A.M *just leave it there (toCM2)*		page 2 3 grey		
	0.1 AM Makes a diagram in the air: makes a tiny riffle with his fingers of right hand then lifts his right hand and points to just above the small screen takes his left hand from his pocket and brings it up to point alongside the other index finger						
	3.23 AM. CM2 winds handle and AM. Invites CM1 over CM1 stands in front	1.59	A.M. *Not very good at Art*		page 2 3 grey		
	3.3 AM pulls his hands off the focus wheel the others come round and the	3.08	CM2 *what is it? AF a box* CM2 starts to explain how to use interf		page 2 3 grey		1424173216.png
	3.49 some finessing with focus wheel	3.3	AM *come on then Charlie you can have a go like me. One sec wait*		page 2 3 grey		
	3.57 AM then leaves CM1 to have a go	3.5	*Yep that's OK so you have to draw a picture*				
	4.04 CM1 looks at main screen then turns round strokes chin smiling (embarassed?)						
	4.06 AF comes over to help talks confidentially/quietly together discussing idea?				page 4 grey Shall me and you do one?		
	4.27 AF leans in and touches screen						
	4.28 CM1 pushes AF hand out of the way						
	4.29 CM1 works on drawing AF stands behind hand slightly raised						
	5.11 CM1 leaves smiling	5.11	CM1 *that's it*				
	5.14 CM1 returns AF continues to work on pic	5.14	AF *save it (?)*				
	5.31 AF contributes to drawing CM1 continues to draw						
	5.45 CM1 saves image	5.23	AM *taking me back to gcse Geography*				1424173376.png
	5.57 AF clears screen CM1 rushes round to main handle						
	6.03 CM1 starts to wind handle						
	6.11 AF comes round to discuss which sample to rotate to microscope	6.16	AF *that one there*				
	6.14 CM1 pointing at one sample AF points to another						
	6.39 CM1 returns to the interface and starts to focus looking at main screen						
	6.42 AF returns to interface to assist with focus						
	6.48 AM returns						
	6.57 AM helps with focus wheel	7.06	AM to AF *now that's clear*				
	7.08 AM leaves to walk round in front of EE and AF starts to draw	7.07	AF to AM *keep your eye on it*				
	7.22 AM inspects mineral list						
	7.25 AM leans over to look at EE mineral display	7.28	AM *Malachite and Azurite think its called*				
	7.47 AF saves her picture and then starts to rework it						
	8.05 CM1 CM2 return to the handle. area.						
	8.18 CM1 looks at main screen						
	8.33 AF save the new version of her picture						
	8.41 CM1 starts to turn handle	8.4	CM1 *Carl do you wanna do one? Carl do you wana do one?*				
	8.43 CM1 continues to turn handle and check the main screen						
	8.55 CM1 points to a mineral sample as AM comes over	9	AM & CM1 appear to discuss the sample selection difficult to hear as others are talking and the handle makes a loud squeak				
	9.13 AM leaves CM1 to it who continues to turn handle manfully						
	9.31 AM returns to CM1 and oversees the turning						
	9.5 CM1 Returns to focus wheel						
	9.5 AM moves out of shot to neaby cabinet	9.5	AM *theres some over here* moving towards nearby cabinet				
	9.58 AM returns to CM1 and helps with focus						
	10.23 CM1n starts to draw…. AM withdraws continuing to point at the screen	10.24	AM *yeah? See y' can da whatever you want*				
	10.29 CM1 Puts hand to chin (again see 4.04) looks round	10.28	AM *be imaginative*				
	10.31 CM1 puts both hands on his head as he moves away						
	10.36 CM1 scratching his head						
	10.41 CM1 returns to the interface starts to draw						
	10.05 CM1 starts to hum a tune to himself						
	11.11 AM returns and CM1 looks round and up at him	11.13	CM1 *The moon! AM the moon aye..traditionalist(?)*				
	11.14 AM Walks left						
	11.17 CM2 follows AM	11.17	CM1 *The moon*				
	11.35 AM returns right CM2 turns and smiles at AM						
		11.41	AM *Lets see -*CM1 *it's a lion*				
	11.43 CM2 looks at main screen and move in closer from left	11.45	AF *what is it eating?*				
		11.48	AF *and what are those things coming out of its neck?*				
	11.52 CM1 moves round to get a better view of the screen	11.5	CM1 *its it's arms*				
		11.52	CM2 *and front legs?*				
		11.53	CM1 *is that coming out of its… wait?*				
	11.53 CM1 moves back to interface	11.53	CM21 *yesss..mmm. .(indistict)*				
	11.56 CM2 moves across to the interface	11.57	AF *other arms……higher are'nt they*				
	11.59 CM1 CM2 aand AM are now all clustered round the interface	11.59	AM *you can always*				
	12.05 AM and CM2 move away	12.05	AM *you shouldn't have to turn the handle..its the moon up there*				
		12.06	AF *right*				
		12.07	AM *not a slice of cucumber*				
		12.01	AF *hahaha*				
	12.13 AM indicating to CM2 to step off the platform AM wobbles his hand an	12.13	CM1 *just got it nearly finished*				
		12.15	AM to CM2 *might push..might just move it slightly*				
		12.21	CM1 *I just gotta …indistinct*				
	12.35 CM1 looks up to AM	12.22	AM *good idea good boy*				
	12.43 CM1 stands next to AF and they look at the screen together	12.35	AM *right ..got ter..save it*				
		12.43	AF *that's nice*				
	12.44 CM 2 returns to the interface	12.43	AF *hes eating it*				
		12.44	AF *eating the moon(?)*	Page 5 grey			
		12.46	CM1 *Eating the moon*				
		12.47	CM2 *are you savin that?*				1424173779.png
	12.5 CM2 saves the picture although its already been saved	12.48	CM1 *yep saved it*				
	12.51 AM Holding and ponting to postcard with the web address	12.51	AM *we'll be able to have a look at this*				
	12.51 CM1 starts to turn handle						
	13.2 AM approaches CM1 as he continues turn the handle	13.2	AM *are you going to leave it then Charlie?*				
	13.22 AM reaches CM1 and points to the EE	13.22	AM *Charlie Charlie*				
	13.23 CM2 looks over the top of the interface	13.24	AM *Carls doing this*				
	13.28 CM2 turns focus wheel						
	13.52 CM2 finalises the focus then places hands on each side of the interface	14.2	AM off camera to CM1 *you should know the three types of rocks …Igneous, sedimentary , metamorphic can you remember that?*				
	14.45 CM2 continues to work on his drawing AM comes over to look and walk	14.47	AM *adjusting the brush size to get more details* Referring to CM2				
	15.37 AM returns for another brief look						
	15.56 CM1 moves towrds the handle and looks at the Main screen	15.57	CM1 *Carl is that a leaf?*				
	16.05 CM1 puts his hands on the handle spins the small knob on the main har	15.05	CM1 *shall I change the…. Indistinct whilst gently touching the handle*				
	16.11 CM1 moves away left						
	16.26 CM1 comes back to the handle looks up at the Main screen						
	17.49 CM1 points at the screen	17.49	CM1 *Carl.. indistinct… is that a bullet?*				
	17.56 AM1 comes for a look	17.48	AM *should be able to tell what that is*				
	17.57 CM2 gesticulates at the main screen with both hands						
	18.18 CM1 touches the handle again						
	18.23 CM2 puts hands on hips and turns around smiling						
	18.23 CM1 comes over to interface for a look but is fended off by CM2						
	18.3 CM2 points at Main screen	18.3	CM2 *Mummy!*				
	18.33 AM comes over	18.33	AM *have you saved it?*				
	18.34 CM2 jabs at screen and pulls figer away during saving	18.34	CM2 *save*				1424174135.png

Figure 241: Jason Cleverly. 2015. Detailed Review, Two Point Four Children 17th Feb, 11.30 am: image: J. Cleverly 2015.

DETAILED REVIEW FILE0018 DURATION 18.27 Adult M FF Child F Date 17 2 2015 12.43pm

TIME	GENERAL ACTIVITY/ACTION/PARTICIPANT	TIME	TRANSCRIPT	CORRELATES TO	RELATED SKE	Defining characteristic	Photo	EE PIC
00.00-02.24	The subjects are held up from using the EE as the museum cu					AF1 BLUE TOP AF2BLACK TOP		1424177427.png
2.23	AF1 points at mineral sample list AF2 starts to point at the m	Audio obscured by others						
2.25	AF1 starts to talk to CF about mineral list pointing at list	Audio obscured by others						
2.27	AF2 starts to talk to CF about mineral samples and gestures a	Audio obscured by others						
2.28	AF1 Continues to point and read out the the list to CF	Audio obscured by others						
2.3	AF1 Continues to point and read out the the list to CF	2.3	AF1 *Want to know where they are all from?*					
2.35	AF1 Continues to point and read out the the list to CF	2.35	AF1 *some of them are from Craddock moor*					
2.37	AF 1 Continues to talk about the list pointing at number 5	2.37	AF1 *Caradon hills*					
2.39	AF 1 Continues to talk about the list	23.39	CF *Ciridon halls* (deliberately mispronounced?)					
2.4	AF1 Continues to point and read out the the list to CF	2.4	AF1 *ok*					
2.41	AF1 Continues to point and read out the the list to CF AF2 co	2.43	AF1 *Caradon Hills, theres two from there..*					
2.43	AF1,AF2,CF all begin to look closely at samples	2.44	AF1 *Number 5 and Number 3*					
2.45	CF puts left elbow on table hand on chin (pondering?)	2.45	CF *Num....ber five* (pondering?)					
2.46	AF1,AF2,CF all continue to look closely at samples and very suddenly all point together							
2.48	CF starts to move round keeping her finger on the dome	2.48	CF *ooooh*					
2.49	CF takes her finger off the dome and then moves round places it back on the dome near the sample							
2.51	CF moves round pointing closely at malachite sample next to	2.51	CF *Number 5 is there*					
2.53	AF1 leans back AF2 moves round and	2.52	AF2 *which one do you want to look at?*					
2.54	CF points at a second sample nearest to her AF2 also points at this sample							
2.55	AF1 points at handle	2.55	AF1 *move this* indicating the handle					
2.47	CF starts to wind handle							
		3	CF *shall I go this way?*					
3.01	CF starts to wind the handle anticlockwise							
3.2	AF2 indicates a twirling motion with her hand	3.02	AF2 *that if you want to take a short cut*					
		3.03	General laughter					
		3.06	AF2 *builds up the muscles of course!* General laughter					
3.08	CF continues to wind handle looking at main screen							
3.23	AF2 moves left							
3.23	AF1 moves closer to CF							
3.27	AF2 arrives at interface	3.28	AF1 *here it comes*					
3.29	AF1 and CF look up at main screen							
3.35	AF1 and CF go over to Interface							
3.37	CF starts to wind the focus handle	3.4	AF1 or AF2 *oooo* softly					
3.46	CF winds the handle in a different direction as tries to find focus							
3.57	AF1 leans in further put hand on top of interface as CF finds	4	CF *ooooher*					
		4.03	AF1 *that's perfect*					
4.05	AF2 points back towards the mineral samples	4.05	AF2 *want me to turn it a bit more and you say stop, and you can see what you want to see?*					
4.09	AF2 points to main screen	4.09	AF2 *or you can see it up there, can't you?* (the main screen)					
4.1	AF1 AF2 return to table	4.12	AF1 *would you like that one*					
4.13	AF1 takes handle and starts to move it carefully	4.13	CF *rabbit!*					
		4.14	CF *oh for sure* (?) AF2 *yeah?*					
4.17	AF1 finesses the image	4.17	AF2 *leave it there?*					
4.2	AF1 moves the image back towards almost to the original po	4.2	CF *just there*					
4.27	AF1 AF2 CF move back to interface AM moves back out of shot							
4.3	CF leans in to the interface							
		4.41	AF1 *Is that how you do it...and then you just touch it with your finger*	Discussing the controls on the interface withCF				
		4.47	CF *that looks a bit like a lion*					
		4.49	AF1 *ohh yeah*					
4.5	CF does a mime - making a snaking movement with her left a	4.5	*jumpin over it*					
4.51	CF starts to draw							
		5.2	AF1 *aaaaah*					
		5.03	CF *mmm*					
		5.06	AF1 *wheres his head?*					
		5.08	AF2 *got arms*(?)					
5.11	AF1 points to the main screen and turns her head at a right a	5.11	AF1 *its wonderful how shes seeing it..cos..*					
		5.14	AF2 *yeah*					
5.14	CF looks round at the dome?	5.15	CF *making a lion*					
5.38	AF2 moves in to interface	5.38	AF2 *do you want some help with some colouring?*					
5.38-6.05	AF1 also moves in and there is a protracted period of complex but inaudible discussion held in close proximity							
6.06	CF Suddenly 'bucket' fills the image with yellow, all pull back	6.08	AF1 AF2 CF all- *ooh!*					
6.1	CF 'goes back one step' to undo the paint bucket							
		6.13	AF1 *which one of these is....*					
		6.15	CF *there!*					
6.44	CF pulls back and looks at AF1	6.44	CF *eerh* soft					
6.45	CF continues to work on Interface	6.46	AF1 *Verygood!*					
6.51	AF1 AF2 look at main screen							
		7.01	AF2 *its getting very technical*		P11 grey			
7.07	AF1 Af2 move back to interface	7.16	AF2 *Happy?*		P11 grey			
		7.23	unitelligible as two other visitors FF talk off camera... *In a Cloud*	Refers to cloud icon for uploading				
7.26	CF leans in closer to the interface looking for Save button?							
7.29	At this point JC intervenes and CF is able to save CF goes on to select another mineral sample Battery runs out..							

Figure 242: Jason Cleverly. 2015. Detailed Review, Ciriden Halls 17th Feb, 12.45 pm: image: J. Cleverly 2015.

DETAILED REVIEW FILE0019   DURATION 1.11 Adult M FF Child F Date 17 2 2015 approx 1pm

TIME ACTION	GENERAL ACTIVITY/ACTION/PARTICIPANT	TIME AUDIO	TRANSCRIPT	CORRELATES	RELATED DRA	Defining characteristic	Photo	EE PIC
0.25	AF1 AF2 AM are standing in front of EE CF 1 is beginning to draw			P11 grey		AF1 BLUE TOP AF2BLACK T	2015-02-17 1	1424177721.png
0.28	CF at interface stops drawing turns to look AF2 and smiles							
		0.3	AF2 *what can you see Megan?*					
0.32	CF starts drawing again	0.32	CF *an eye*					
0.42	CF turns away from the Inteface and smiles	0.42	AF2 *Nice*					
		0.43	AF1 *hahehe*					
0.46	AF2 Raises left arm and points with index fir	0.46	AF2 *Look up* 'cause I think you could have its eye then it's nose then you could have its mouth down at the bottom					
0.51	AF2 moves over to the interface and shows CF what she means by either pointing closely at the small screen or working on it							
0.58	AF2 pulls away from the small screen leavin	0.59	AF1 *now youre enforcing your own interpretation hehehe* AF2 *heheh*					
		1.07	CF *what else can I see*					
		1.09	CF *ohhhh something*					

Figure 243: Jason Cleverly. 2015. Detailed Review, Ciriden Halls 17th Feb, approx. 1.00 pm: image: J. Cleverly 2015.

Table (Figure 244)

	A	B	C	D	E	F	G	H	I	J	K
1	DETAILED REVIEW FILE0002	DURATION 16.4	Adult M	Child CM1	CM2 CM3 CM4 F	Date	19 2 2015	approx 11.39am			VERY LUDIC
2	TIME ACTION	GENERAL ACTIVITY/ACTION/PARTICIPANT			TIME AUDIO	TRANSCRIPT	CORRELATES	RELATED DR	Defining characteristic	Photo	EE PIC
3											
4											
5	7.48	CF starts to move the handle observing the changing image on the screen									
6	7.5	CM1 leaning on the table looks towards CF									
7	7.51	CM1 still leaning on the table slides round towards CM1who is looking up at screen while moving the handle									
8	7.52	CM1 holding on the table slides round towards CM1who is looking up at screen while moving the handle									
9	7.54	CM1 slides right up to CF still clinging to the Table									
10	7.55	CM1 presses his hip right up to CF and the handle forcing CF to lean around to see the screen									
11	7.56	CM1 draws his hand from the tabel lip touches CFs hand									
12	7.58	CM1 wrests and disengages CF hands from the handle with quite a complex series of movements CF aquiesces promptly									
13	8	CM1 Takes control and immedietiately starts to vigorously turn the handle									
14	8.12	CM1 continues to wind the handle until a sample of crystals appear as CF displaced, watches									
15	8.14	CM1 and CF regard the screen									
16	8.17	CF moves out of bacwards out of shot									
17	8.18	CM1 starts to wiggle the handle only slightly so that the image of the crystals blur									
18	8.2	CM1 holding the handle with two hands and stands first on one (left) leg leaning left making the image move as his hands are fixed on the handle									
19	8.21	CM1 then rocks far over to the other (right) leg and continues to look up at the screen									
20	8.23	CM1 swings back onto his left leg so that he seems physically to merge with the movement generated on the screen									
21	8.24	CM1 Rocks back onto his right leg more gently then back againwith less momentum									
22	8.25	CM1 standing upright wiggles the handle very fast									
23	8.28	CM1 stops wiggling the handle									
24											

Figure 244: Jason Cleverly. 2015. Detailed Review, Riot Squad 19th Feb, approx. 11.39 am: image: J. Cleverly 2015.

Table (Figure 245)

	A	B	C	D	E	F	G	H	I	J	K	L
1	DETAILED REVIEW FILE0004	DURATION 40.5	Date	Thursday 19th Feb	AM	CF CM1 CM2	approx 12.57 am					
2	TIME ACTION	GENERAL ACTIVITY/ACTION/	TIME AUDIO	TRANSCRIPT GENERAL		CORRELATES	RELATED DR	Defining characteristic		Photo	EE PIC	Epistemic
3	0.00 to 0.42	the group learn to move the samples and select number 5 malachite the father says		Thats from Caradon Hills - you know where Caradon hill is don't you?								scaffold
4												
5	0.42	CF is has selected a sample, now turning focus wheel										
6	0.45	AM Comes round CM1, CM2 watch main screen										
7	0.46	CF stops turning focus wheel	0.46	CF which way now?								
8			0.48	AM I dont know its its going back to the same place								
9	0.49	CF Starts turning focus wheel	0.49	CF Yeahhheh								
10			0.5	AM Might be the other way								
11	0.55	CF continues turning focus w	0.52	CF I think it is, cos its not doing anything								
12	0.56	CF continues turning focus w										
13	0.57	CM1/2 alternate around che	0.57	AM that produced a very good sound..somethings happening								
14			0.59	AM somethings happening								
15			1	CF I think it is yeah								
16			1.01	AM that's better								
17			1.01	CF Yeah								
18			1.02	AM right just keep going bit more 'til youre happy								
19	1.04	CF stops turning focus wheel	1.04	AM WOW!								
20			1.05	CM1 wooah! CM2 wow!								
21	1.06	AF Turns smiling to CM1/2	1.06	AF That's cool isn't it?								
22			1.07	CF Its amazing!								
23			1.08	AM hehe he								
24	1.09	CF steps back a little and poir	1.09	CF look at thaaaat dad (almost whispered)								
25			1.1	AM cool								
26			1.11	CF look, you can see it up there as well								
27			1.12	AM its hitting the big screen yeh								
28			1.13	AM so now..if you want to you can draw on that								
29			1.17	CF I know								
30	1.16	AF walks round to get a bette	1.16	AM Its cool innit?								
31			1.18	CM1 dad im gonna draw on it								
32	1.18	CM2 walks round to CF who I	1.18	CM2 what are you gonna draw? (to CF who doesn't answer)								
33	1.19	AM leans in close to CM1	1.19	AM what are gonna draw? (to CM1)								
34			1.2	CM1 Not telling								
35	1.2	AM leans even closer to CM1	1.2	AM oooh (jokey)								
36		CF taps her fingers piano like on the shelf below the interface										
37	1.21	AM and CM1 look up at the r	1.21	CF Its amazing								
38	1.22	CF reaches for the focus whe	1.22	CF Riiight								
39	1.23	CF starts to turn the wheel ag	1.24	CM1 was a good place								
40			1.25	AM are you gonna get closer?								
41	1.26	CF waves open right hand arc	1.25	CF that's the best picture, to be, y'can see what it's gonna be like…but we should draw now								
42			1.3	AM Whatever you like!								
43												
44												
45												
46	17	CF leans on EE table Proprietorially		CF ooh that's cool								
47												

Figure 245: Jason Cleverly. 2015. Detailed Review, The Cooperative 19th Feb, approx.12.57 am: image: J. Cleverly 2015.

428

Visitor Images

Anonymous members of the public using the Enlightened Eye during the data analysis in February 2017 made these images below, they were subsequently uploaded to *The Enlightened Eye* webpage.

429
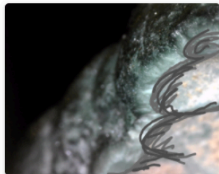
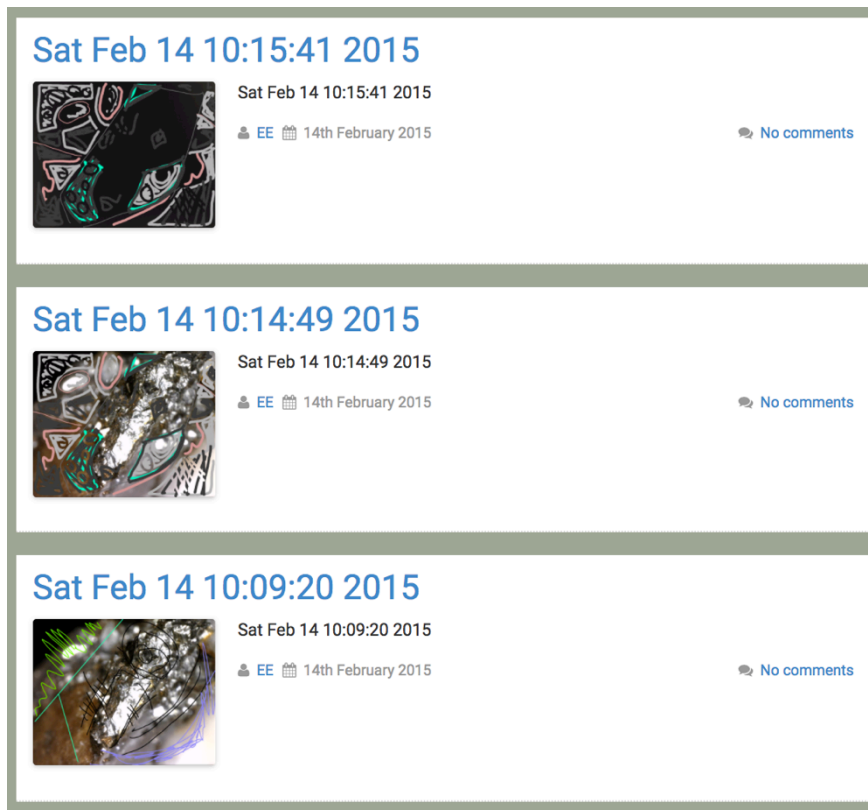*Figure 247: Anon. 2015. Enlightened Eye web page Saturday February 14th: J. Cleverly 2015.*

Figure 248: Anon. 2015. Enlightened Eye web page Tuesday February 17th: J. Cleverly 2015.
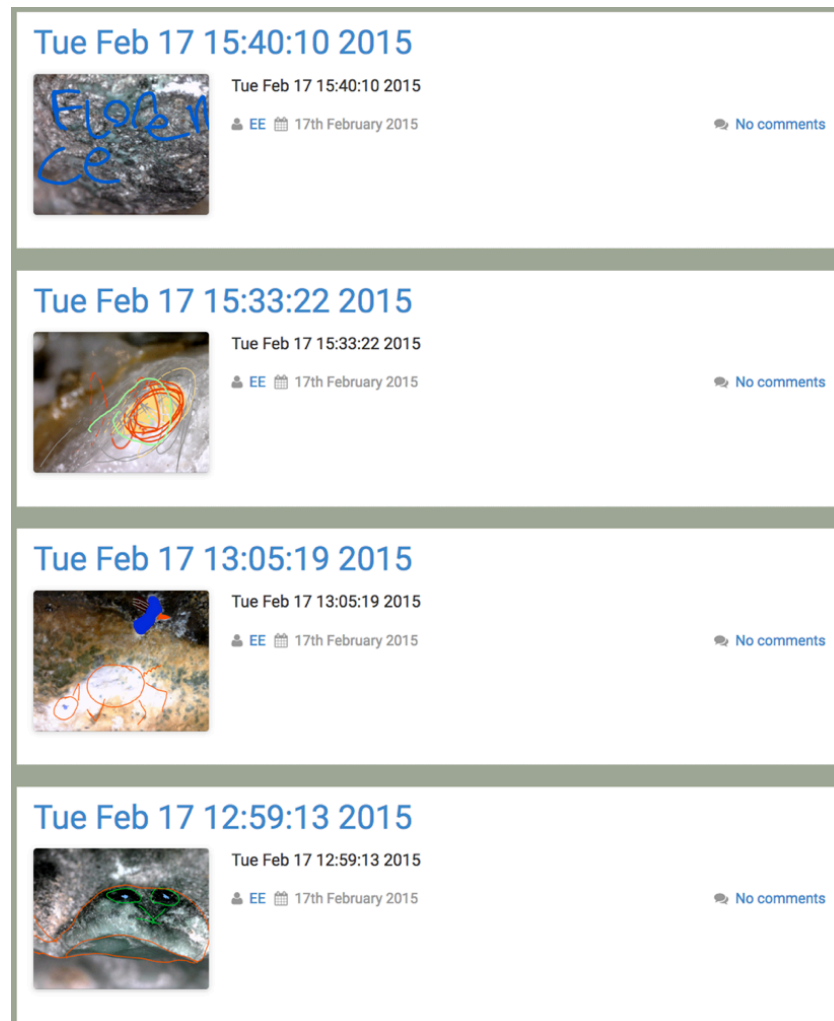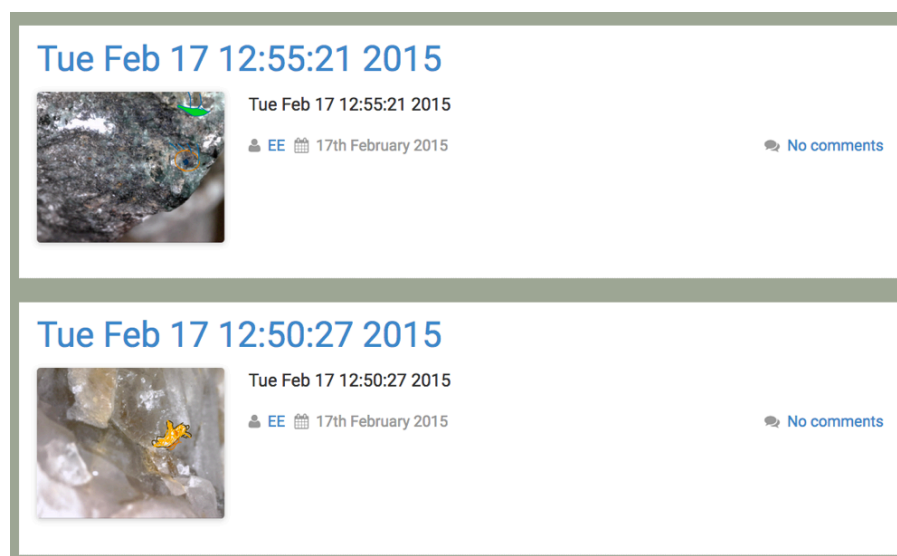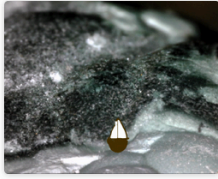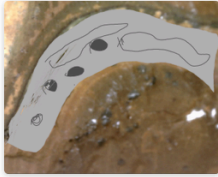
430

Tue Feb 17 15:40:10 2015

Tue Feb 17 15:40:10 2015

EE 17th February 2015

No comments

Tue Feb 17 15:33:22 2015

Tue Feb 17 15:33:22 2015

EE 17th February 2015

No comments

Tue Feb 17 13:05:19 2015

Tue Feb 17 13:05:19 2015

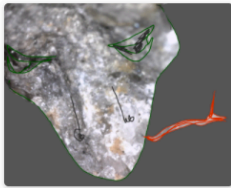EE 17th February 2015

No comments

Tue Feb 17 12:59:13 2015

Tue Feb 17 12:59:13 2015

EE 17th February 2015

No comments

Figure 249 Anon. 2015. Enlightened Eye web page Tuesday February 17th: J. Cleverly 2015.


Tue Feb 17 12:55:21 2015

Tue Feb 17 12:55:21 2015

EE 17th February 2015

No comments

Tue Feb 17 12:50:27 2015

Tue Feb 17 12:50:27 2015

EE 17th February 2015

No comments

Figure 250: Anon. 2015. Enlightened Eye web page Tuesday February 17th: J. Cleverly 2015.

431

Tue Feb 17 12:36:27 2015

Tue Feb 17 12:36:27 2015

👤 EE 📅 17th February 2015

💬 No comments

Tue Feb 17 12:27:22 2015

Tue Feb 17 12:27:22 2015

👤 EE 📅 17th February 2015

💬 No comments

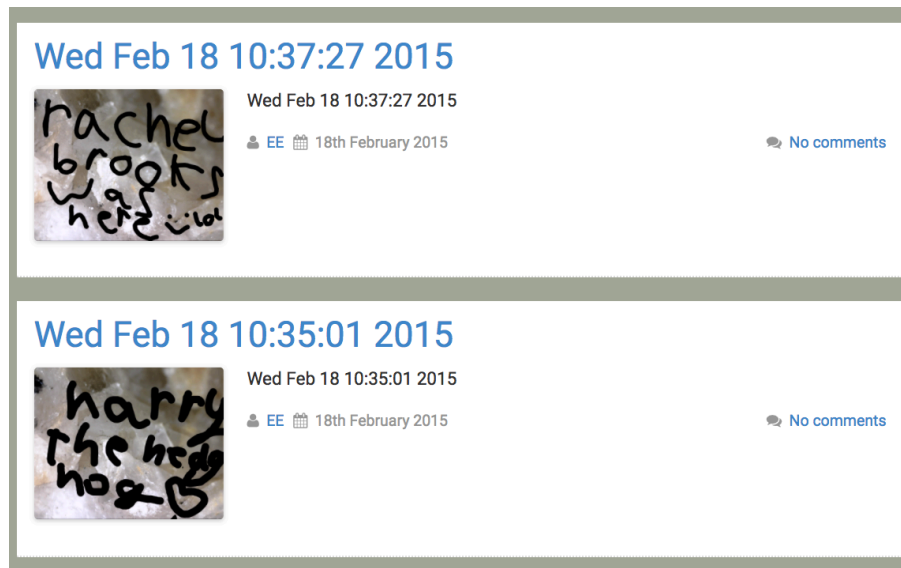*Figure 251: Anon. 2015. Enlightened Eye web page Tuesday February 17th: J. Cleverly 2015.*

Tue Feb 17 11:55:35 2015

Tue Feb 17 11:55:35 2015

👤 EE 📅 17th February 2015

💬 No comments

Tue Feb 17 11:49:39 2015

Tue Feb 17 11:49:39 2015

👤 EE 📅 17th February 2015

💬 No comments

Figure 252: Anon. 2015. Enlightened Eye web page Tuesday February 17th: J. Cleverly 2015.

Wed Feb 18 15:46:09 2015
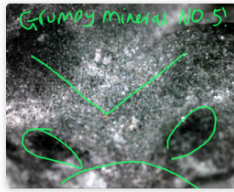
Wed Feb 18 15:46:09 2015

👤 EE 📅 18th February 2015   💬 No comments

Wed Feb 18 14:57:56 2015
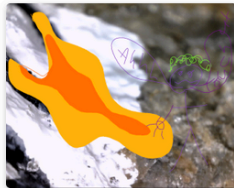
Wed Feb 18 14:57:56 2015

👤 EE 📅 18th February 2015   💬 No comments

Wed Feb 18 13:45:31 2015
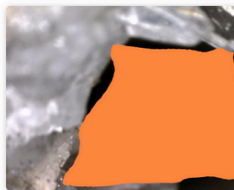
Wed Feb 18 13:45:31 2015

👤 EE 📅 18th February 2015   💬 No comments

Wed Feb 18 13:38:54 2015

Wed Feb 18 13:38:54 2015

👤 EE 📅 18th February 2015   💬 No comments

Figure 253: Anon. 2015. Enlightened Eye web page Wednesday February 18th: J. Cleverly 2015.

Wed Feb 18 13:19:12 2015

Wed Feb 18 13:19:12 2015

👤 EE 📅 18th February 2015

💬 No comments

Wed Feb 18 13:17:48 2015

Wed Feb 18 13:17:48 2015

👤 EE 📅 18th February 2015

💬 No comments

Wed Feb 18 13:16:39 2015

Wed Feb 18 13:16:39 2015

👤 EE 📅 18th February 2015

💬 No comments

Wed Feb 18 13:15:53 2015

Wed Feb 18 13:15:53 2015

👤 EE 📅 18th February 2015

💬 No comments

Wed Feb 18 13:09:12 2015

Wed Feb 18 13:09:12 2015

👤 EE 📅 18th February 2015

💬 No comments

Wed Feb 18 12:42:17 2015

Wed Feb 18 12:42:17 2015

👤 EE 📅 18th February 2015

💬 No comments

Figure 254: Anon. 2015. Enlightened Eye web page Wednesday February 18th: J. Cleverly 2015.

Wed Feb 18 12:30:56 2015

Wed Feb 18 12:30:56 2015

  EE   18th February 2015

No comments

Wed Feb 18 12:28:50 2015

Wed Feb 18 12:28:50 2015

  EE   18th February 2015

No comments

Wed Feb 18 12:27:56 2015
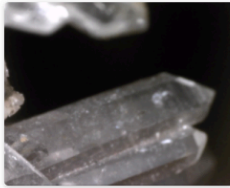
Wed Feb 18 12:27:56 2015

  EE   18th February 2015

No comments

Wed Feb 18 12:22:06 2015
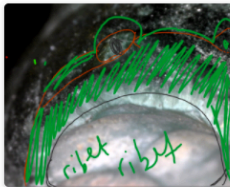
Wed Feb 18 12:22:06 2015

  EE   18th February 2015

No comments

Figure 255: Anon. 2015. Enlightened Eye web page Wednesday February 18th: J. Cleverly 2015.

Wed Feb 18 12:18:38 2015

Wed Feb 18 12:18:38 2015

👤 EE 📅 18th February 2015   💬 No comments

Wed Feb 18 12:14:05 2015
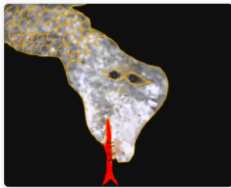
Wed Feb 18 12:14:05 2015

👤 EE 📅 18th February 2015   💬 No comments

Wed Feb 18 12:13:21 2015
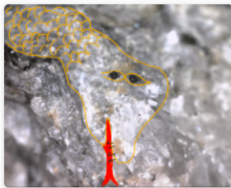
Wed Feb 18 12:13:21 2015

👤 EE 📅 18th February 2015   💬 No comments

Wed Feb 18 12:01:32 2015

Wed Feb 18 12:01:32 2015

👤 EE 📅 18th February 2015   💬 No comments

Wed Feb 18 10:46:28 2015

Wed Feb 18 10:46:28 2015

👤 EE 📅 18th February 2015   💬 No comments

Figure 256: Anon. 2015. Enlightened Eye web page Wednesday February 18th: J. Cleverly 2015

436

Figure 257: Anon. 2015. Enlightened Eye web page Wednesday February 18th: J. Cleverly 2015
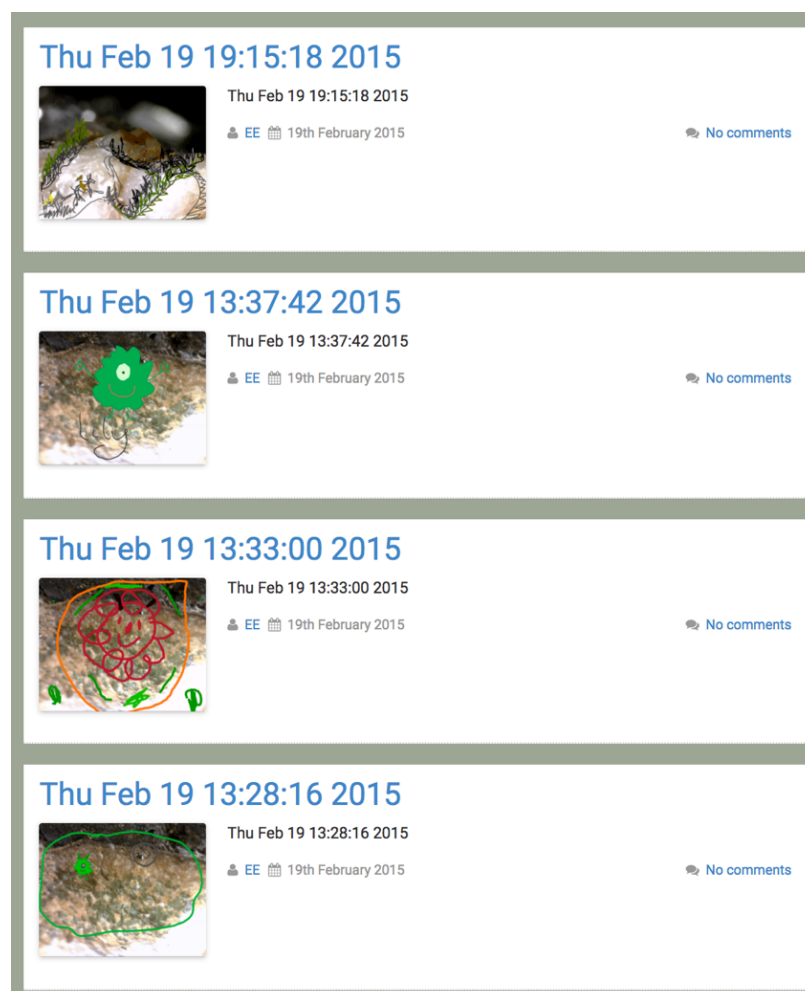
Figure 258: Anon. 2015. Enlightened Eye web page Thursday February 19th: J. Cleverly 2015.
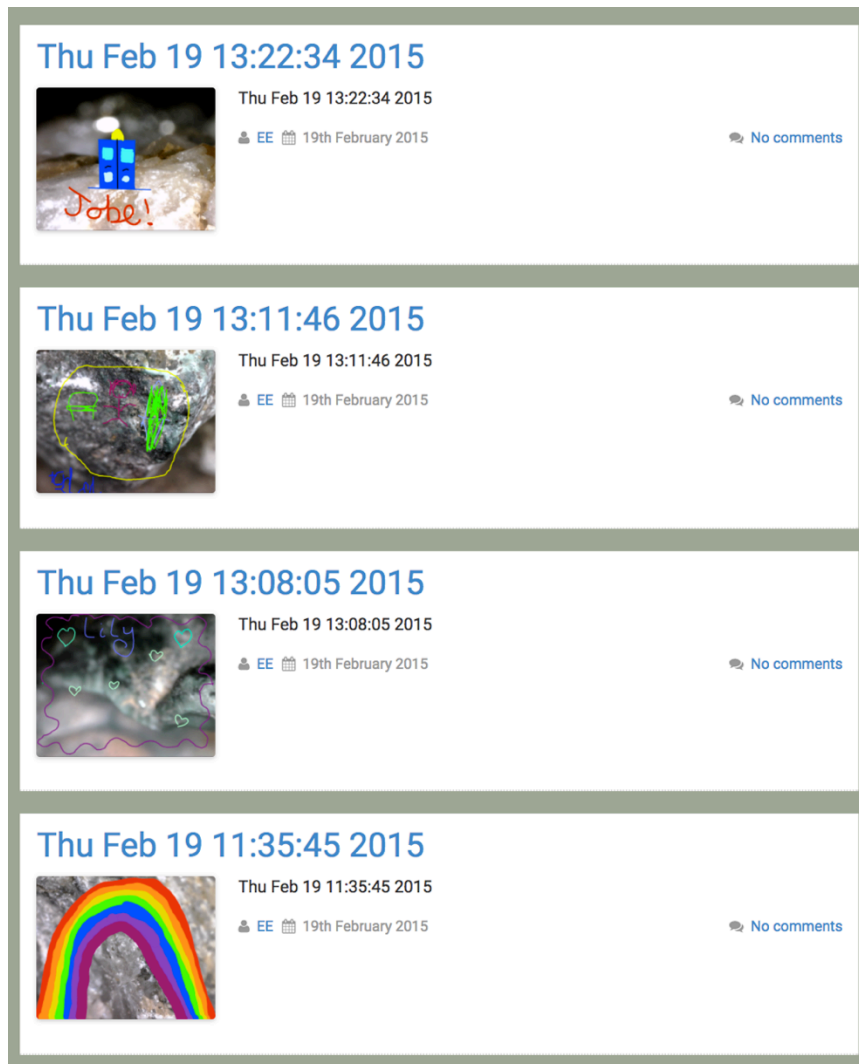
Figure 259: Anon. 2015. Enlightened Eye web page Thursday February 19th: J. Cleverly 2015.
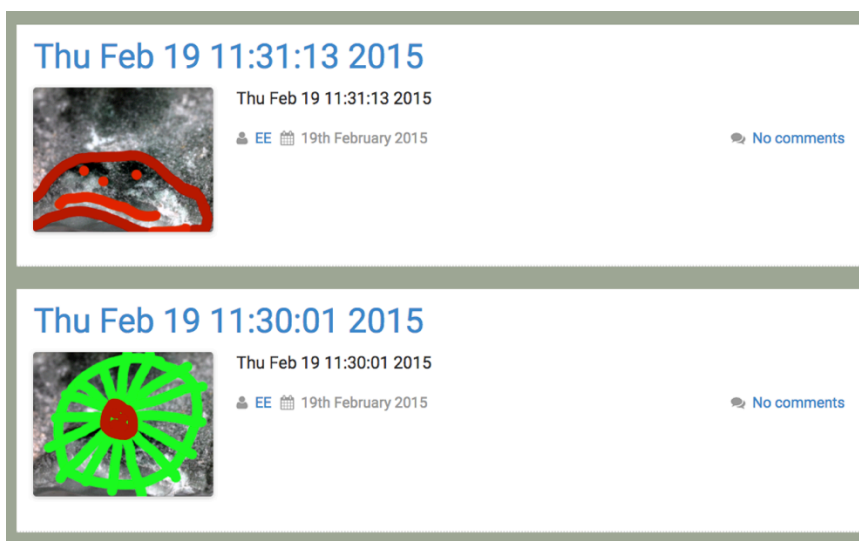
Figure 260: Anon. 2015. Enlightened Eye web page Thursday February 19th: J. Cleverly 2015.

Figure 261: Anon. 2015. Enlightened Eye web page Friday February 20th: J. Cleverly 2015
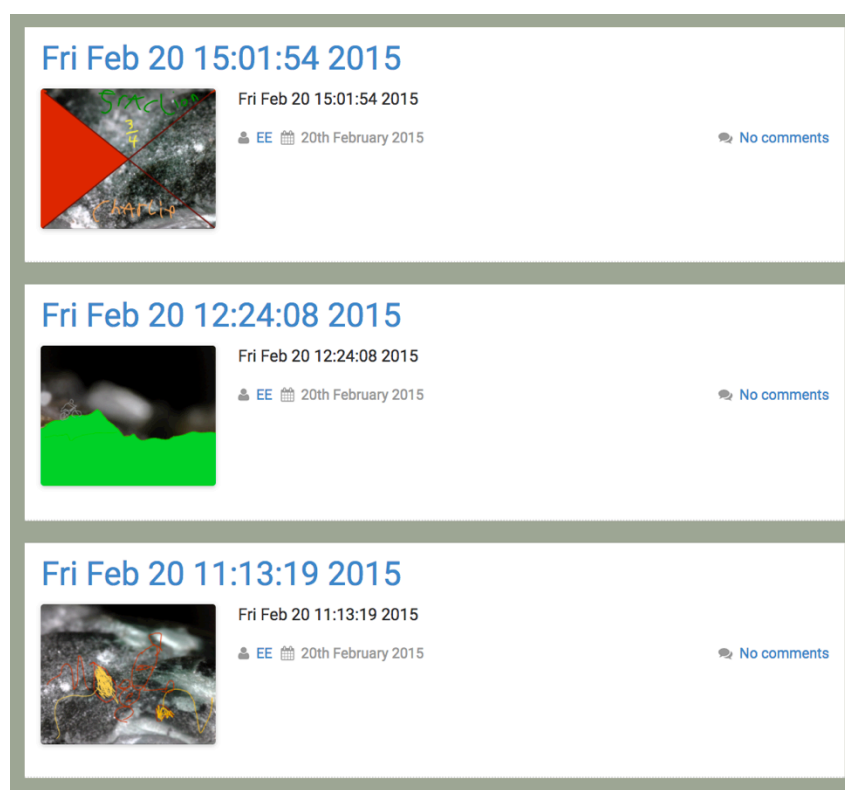
Figure 262: Anon. 2015. Enlightened Eye web page Friday February 20th: J. Cleverly 2015

439

Sat Feb 21 13:11:20 2015

Sat Feb 21 13:11:20 2015

👤 EE 📅 21st February 2015

💬 No comments

Sat Feb 21 10:21:02 2015

Sat Feb 21 10:21:02 2015

👤 EE 📅 21st February 2015

💬 No comments

Figure 263: Anon. 2015. Enlightened Eye web page Saturday February 21st: J. Cleverly 2015

Web Traffic
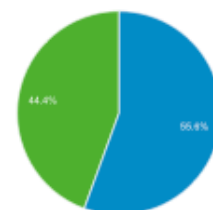
Figure 264: Google analytic.2015. Audience overview, January 2015, image: © 2017 Google. ('Audience Overview - Analytics'.)

441
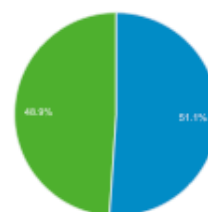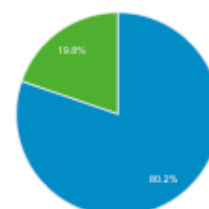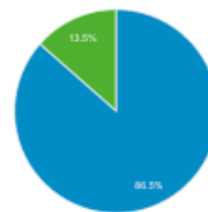
Figure 265 Google analytic.2015. Audience overview, February 2015, image: © 2017 Google.

Figure 266 Google analytic.2015. Audience overview, March 2015, image: © 2017 Google.

Figure 267 Google analytic.2015. Audience overview, April 2015, image: © 2017 Google.