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# From Wunderkammern to Kinect – The Creation of *Shadow Worlds*

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## ABSTRACT

This paper focuses on two projects, *Still Life No. 1* and *Shadow Worlds | Writers' Rooms [Brontë Parsonage]*, to reveal the creative approaches the authors take to site, technology, and the self in their production of shadow worlds as sites of wonder. Informed by the uncanny (re-animation and the double) and an interest in the limen (thresholds in the real and virtual realms), the projects explore white light and infrared digital 3D scanning technologies as tools for capture and transformation. The authors will discuss how they suture the past with the present and ways that light slips secretly between us, revealing other realms.

## Introduction

This paper will focus on two recent projects: *Still Life No. 1*, installed for Dark Matters: Shadow Technology Art, The Whitworth, Manchester, UK (2011-12), and *Shadow Worlds | Writer's Rooms [Brontë Parsonage]* (2011-12). Our description of these two projects will reveal the different creative approaches we take to site, technology, and the self, in our engagement with and production of shadow worlds as sites of wonder.

For 10 years, a major focus for our collaborative practice has been to examine the nature of the double – what it means to create one, how one might engage with an alter ego, how a double can “stand-in” for oneself, and how to populate chosen spaces with them. It is important for us to make these playful explorations manifest through our work, which often has improvised performance at its heart.

Our artistic practice is informed by ideas of the uncanny (re-animation and the double) and an interest in the limen (thresholds in the real and virtual realms). We return to these themes again and again in our collaborative practice. Our work reveals our long-term fascination with heterotopic spaces – the airport, the museum, publicly inaccessible spaces, as well as culturally loaded spaces [1]. For these reasons we find ourselves, or our doubles, in no-man's land, in imagined realms or occupying well-known collections. The projects described in this paper incorporate our interest in exploring digital technology as a tool for capture and transformation and as a hand-made, improvised, creative response to a situation or space.



Figure 1. *Moments of Death and Revival* (installation detail), 2008. 3D printed objects (14 figures, 19cm to 25cm high) in acrylic polymer, train, track, lights, plinth, switch. Dimensions variable. Commissioned for Skyscraping at Yorkshire Sculpture Park, 2008, and shown as part of Concrete and Glass, Hoxton Square, London, 2010. © 2008 Brass Art. Photo © 2008 Jonty Wilde.

For the past four years we have been researching and developing a body of work that uses digital scanning to capture ourselves as faithfully as possible – exploring the ontological question of what it is “to be.” In *Moments of Death and Revival*, our first project to use this technology, a moving light source illuminated a procession of human and hybrid animal models, casting their shadows upon the gallery wall. To create our shrunken doppelgängers, we were scanned using 3D body-scanning white-light technology (Figure 1). As part of this process, we actively tested and pushed the physical dimensions of the 3D body-scanning booth using improvised poses, explored 4D facial scanning to create faithful impressions of our features in motion (in order to develop large-scale 3D inflatable objects), and combined custom-written software with Microsoft’s Kinect to capture a “mise en abyme” revealing our disguised selves being recorded. Through these processes, we created doubles and doppelgängers from live data and selected museological specimens.

### **Still Life No. 1, Dark Matters: Shadow Technology Art**

#### **Perceptual Wonder - The Collection Revisited**

The awe evoked by global multiplexing, online streaming and desktop computer animations recalls the wonder once aroused by obsolete gadgets and registered in mostly forgotten modes of perception. These magical artefacts similarly operated somewhere between game and experiment, toy and tech. Locating emergent private and mass media in the long tradition of optical aids exposes the multiple ways in which humans have been, and continue to be, playfully entangled with their beautiful devices [2].

Our interest in technological developments in the 18<sup>th</sup> and 19<sup>th</sup> centuries – which led to the phantasmagoria show, the panorama and hot air balloon flight – has been a significant aspect of our practice, traceable to the beginning of our collaboration. This interest is made manifest in shadow plays using a motorized light source and in creation of virtual shadows and digital sprites.

From 2009–2011, we explored and responded to Manchester University Museum collections for a shadow installation commissioned by the Whitworth Art Gallery [3] (Figure 2). In our previous work with museum stores, we produced photographic works that appear to re-animate taxidermy specimens and illuminate strange juxtapositions of objects. It is significant that we were once again drawn to seek out specimens that had once lived and breathed and were now held in suspended animation, eschewing crafted artifacts and the ethnographic collections in favour of the zoology, mineralogy, and palaeontology collections.

The phenomenology of wonder – “the experience of astonishment before the world and the beginning of philosophy” [4] – is worthy of exploration as an aspect of our encounter with the



**Figure 2. *Still Life No. 1* (installation mid-shot), 2011. Polypropylene, 3D printed objects in resin, from 7cm to 75cm high. Dimensions variable, tabletop 2m diameter. Uncanny “digital doubles,” coupling the artists’ bodies with mineralogy specimens, create the transparent tabletop landscape. A motorized revolving light suggests a shifting and allegorical relationship to cosmology as it re-animates the landscape and objects through shadow play. © 2011 Brass Art. Photo © 2011 Brass Art and Michael Pollard.**

museum, as well as the audience's experience of the final installation of re-animated objects. Our sense of wonder comes from the overwhelming quantity of specimens, the surprising juxtapositions and revelations at the turn of a handle or the opening of a drawer. As non-scientists, we approach the museum collection with the same wonder as the collectors of the first Wunderkammern. These cabinets of curiosity were legitimate precursors of the public museum:

...the fabulous Wunderkammern, or wonder chambers, of the Renaissance, those immense collections of "rare" objects, where the natural and the artificial – products of "divine" and human craft, respectively – lived side-by-side as objects of amazement [5].

Our approach to the museum collection was eclectic, enabling the formation of our own taxonomies and collections of curiosities for our own ends. We enjoyed the strange illogical relationships that occur between objects not on public display. We were drawn to objects rejected as useful scientific specimens for lack of provenance, the anthropomorphic, the outsized or miniaturized models, the overlooked and outmoded. Our role was as both explorers – responding to unexpected finds and physical phenomena, remaining open to shifts in the outcomes – and directors of a growing number of individuals and companies who worked with us to realize the project.



Figure 3. *Still Life No. 1* (installation view), 2011. Polypropylene, 3D printed objects in resin, heights from 7cm to 75cm. Dimensions variable, tabletop 2m diameter. This installation view reveals the scale of the 360-degree shadow play. © 2011 Brass Art. Photo © 2011 Brass Art and Michael Pollard.

#### The Object Twice Removed

Our ongoing work with 3D laser body scanning was extended to include the museum artifacts [6], and we selected a number of objects from the museum collection to be scanned [7]. Using the 3D scanner enabled us to watch a 3D digital copy of each object as it emerged on the screen, piece by piece. Twice displaced and now replicated, this process of removal and digitization marked the beginning of the objects' transformation. The data were stitched, filled, and remotely printed using stereo laser-sintering processes in a transparent resin [8].

The transformation in scale between the original object and its copy is echoed in our own shrunken doppelgängers. These objects are combined on the tabletop still-life landscape and through their re-animation in the revolving shadow play cast onto the wall [9] (Figure 3).

#### *Still Life No. 1* – A Shadow Play

The evolution of *Still Life No. 1* has been a playful and experimental process; each test leading to the introduction of new materials, bringing more delicate, temporary, and translucent elements to create both shadows and unexpected plays of light. There is a sense of the Kantian Sublime in relation to the gigantic scale of shadow achieved in the installation space. Our small 3D printed figures are absorbed into a landscape that turns as the motorized light makes its orbit, suggesting a shifting and allegorical relationship to cosmology. In direct reference to the heavens and our historical relationship to its signs, two comets appear. One is harnessed as a kite. The other "haired star" plummets toward a tiny figure holding a net. In other uncanny doublings, our figures appear to hold up elements of the landscape both inside and outside the transparent forms (Figure 4).

In *Still Life No. 1*, the most solid element is not the tabletop collection of imperceptible transparent objects and figures, but the shadow play which animates and completes it. There is a preserved wonder inspired by the museum and the continuous transformations and shifting relationships made possible by the agency of the light. Ordinary cellulose wrapping is transformed into shadows that belie their flimsy origins and in turn create a poetic light play. This is the second aspect of wonder in the work. Stephen Greenblatt, writing in the bulletin of the American Academy of Arts and Science, describes “resonance” in relation to the museum object as:

the power of the displayed object to reach out beyond its formal boundaries to a larger world, to evoke in the viewer the complex, dynamic cultural forces from which it has emerged and for which it may be taken by the viewer to stand. And “Wonder” as the power of an object to stop the viewer in his or her tracks, to convey an arresting sense of uniqueness, to evoke an exalted attention.

He describes an experience of “wonderful resonance and resonant wonder” in an exhibition worth visiting [10]. In *Still Life No. 1*, the audience becomes entangled in the shadow world as the orbiting light slips past.

#### **Shadow Worlds | Writers’ Rooms [Brontë Parsonage] (2011-12)**

Three artists have gathered at night in the Brontë Parsonage, Haworth, England [11]. Inside the shuttered dining room, they wait, with disguises in hand, to begin an improvised performance. A photographer leans into the scene and attempts to capture the shadow narrative cast upon the papered wall. An intimate connection among “performers,” site, and photographer is established.

Outside the scene, a curator and a collections manager watch from a distance. Between them and the wall, a fifth member of the assembled crowd hovers, approaches the scene, darts forward, and then steps back, Kinect and laptop balanced precariously in hand, like a director overseeing a film – the moment is captured.

This was our first performative foray inside the Brontë Parsonage, and it marked the beginning of a new series of works exploring the shadow. It is the second focus for our examination of shadow worlds.

#### **The Spectral Nature of Technology**

This site-specific project uses two forms of light to capture shadows: a medium-format digital camera to capture frozen moments from each scene as “shadows” on the wall, and Microsoft’s Kinect, an on-range camera technology, coupled with custom-built software, to capture the live data from the improvised performance. It was an artistic decision to move our shadows into a new



Figure 4. *Still Life No. 1* (installation detail), 2011. Polypropylene, 3D printed objects in resin, heights from 7cm to 75cm. Dimensions variable, tabletop 2m diameter. In other uncanny doublings, the artists’ figures appear to hold up sculpted copies of the delicate landscape, standing both inside and outside the transparent forms. © 2011 Brass Art. Photo © 2011 Brass Art and Michael Pollard.

color-tinted realm that drew us to the wallpaper in the Brontë Parsonage (Figure 5). We wanted to foreground this shift in our practice and draw parallels between our imaginary realm and those evoked by other female artists (writers Charlotte Perkins Gillman; Charlotte, Emily, and Anne Brontë; artist Francesca Woodman, et al.).

We chose to work with the Kinect because it was designed for domestic spaces and would capture the “mise en abyme” – the scene within the scene – successfully in the darkened room [12]. The captured shadows in the Kinect footage are, in fact, the points where there is no data, an invisible shadow realm that the human eye cannot trace. The potential of the Kinect and its lasers to reveal and trace this shadowy territory is mysterious: people and objects unexpectedly appear and disappear, sometimes passing through a surface that would appear solid. This invisible realm, with its surprising spatial transformations, intrigues us. It offers us the potential to develop a new form of shadow play as yet uncharted (Figure 6).

On our first nighttime visit to the parsonage, the focus was on using the Kinect to capture our close working relationship with the photographer. We wanted to show the process of our playful action research by recording it as a digitized shadow play. The work in situ is a form of private performance. It is not scripted but is pre-planned to a degree, and it requires spontaneity coupled with our willingness to adopt different personas, characters, props, and roles at will. Our aim is to arrange ourselves into tableaux that can be frozen at a moment in time. The recording of this moment ordinarily becomes the artwork. However, by capturing each of these short durational performances using the Kinect, we are able to review all the possibilities inherent in this new technology and foresee how we might further extend our practice.

The Kinect data can be re-viewed in a number of dynamic ways because the Kinect records the geometry of the space, and everything that takes place within that space, using depth algorithms. We are able to view our actions in real time, fully rotated around any 360-degree point, zoomed, angled, looped, or inverted. The timeline opens up a wealth of editorial possibilities. It was this realization that allowed a conceptual shift in the project, enabling us to put the Kinect center stage on our second nighttime visit, and allowing the digital still camera to capture moments that emerged from our action research. Once again it was possible to capture the scene within the scene, this time with the still camera offering the expanded view of the tableaux.

Having scrutinized the original footage, we further tested some of the scanning parameters, including the effect of reflective surfaces, foil, and mirrors. As artists, we were keen to see if we could disrupt the capture process and influence the likelihood of objects and people appearing and disappearing. As an example, we discovered that the Kinect could not easily



Figure 5. *Shadow Worlds | Writers' Rooms [Brontë Parsonage] No. 6*, 2011. Digital print on Hahnemühle Photo Rag, 70cm x 1m. The artists, working with hand-made masks and props, improvised roles to create shadow tableaux to be photographed. The resulting images allude to "a scene unseen" outside the frame of the final image. © 2011 Brass Art. Photo © 2011 Brass Art and Simon Pantling.

“see” aluminum foil, so we used this material to mask and remove a head in one of the performances. Similarly, mirrors proved to be magical. As in real life, they presented us with a new way to “see” the scene. They enabled us to re-present the view of the room back to the Kinect and allowed parts of the performers to vanish as the frame and reflection occluded our forms.

Throughout this iterative process, there remained a key focus: how could we manipulate the data holes and thus extend the reach of the shadow forms? Our discovery, achieved through playful improvisation with the equipment, was that the larger the distance between the objects, the walls, and the Kinect, so too the greater and more immersive became the shadow forms on screen. By placing ourselves at specific distances from the Kinect, we could manipulate the scale and reach of our shadows, and achieve a new, digital shadow world.

The still images provide interesting documentation, particularly when the camera “records” reflected or deflected action in a mirror and captures unexpected forms cast onto the scenes and figures. Concurrently, the data captured by the Kinect in the second visit is more considered. With a refined understanding of the playback possibilities for the Kinect footage, we were able to fully utilize the rotating view for an improvised dance scene around the dining table – the table the sisters walked around whilst reading aloud to each other from their works. Other scenes necessitated a fixed view to enable the illusion of disappearance, which a rotating view of the room would have undermined. In a site laden with historical resonance, our actions have both connected with the past and recorded a new layer.

### The Shadow Realm

Throughout history, there have been interesting and divergent ideas about the shadow (Plato, Descartes, Stoichita, et al.) and differing views of what a shadow reveals. A shadow can mark a determined reality: “It is through a shadow that a being is determined, where his identity is defined” [13]. It can also open up a mysterious space: “There are many more enigmas in the shadow of a man who walks in the sun, than in all religions of the past, present and future” [14].

The shadow realm suggests both substance and outline. It can reveal the world for what it is, and it can surprise us with an unexpected glimpse of a positive world turned negative. This shifting dichotomy is what makes this territory such a rich and fascinating world for us to inhabit as artists. We are drawn to the shadow as a recurrent motif in our collaborative practice because of its ability to act as a source of wonder. It enables us to oscillate between these shifting and polarized viewpoints:

For is the soul, in turn, nothing but yet another representation – a butterfly, a shadow? [15]

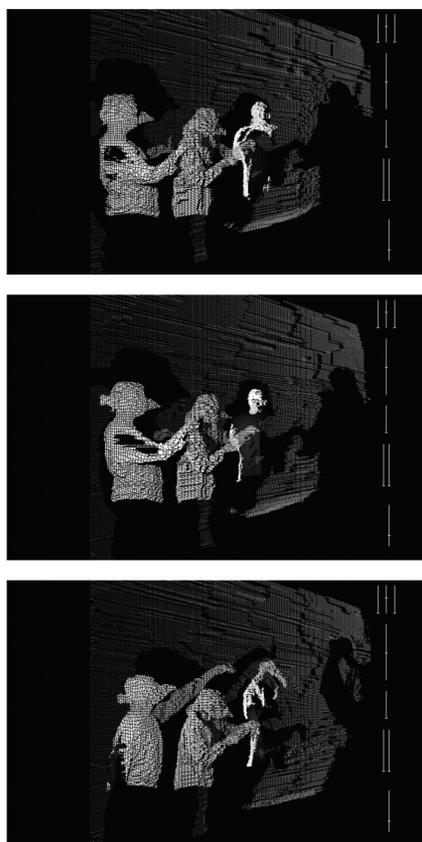


Figure 6. *Shadow Worlds | Writers' Rooms [Brontë Parsonage] Dining Room* (video capture from Kinect scanner), 2011. Projection dimensions variable. Using infrared light to capture short sequential narratives offered new possibilities for creating a shadow play using depth algorithms, distance, and a variety of materials and props – some visible and others invisible. This playful approach expanded narrative possibilities through a series of carefully crafted illusions. © 2011 Brass Art. Photo © 2011 Brass Art and Spencer Roberts.

### The Wonder of Vision

In capturing the “mise en abyme,” we wanted to reveal the whole scene, the entire improvised performance, including the photographer [16], the Kinect director [17], the museum curator, and surrounding artifacts using two distinct time-based technologies. As Descartes wrote: “What do I see . . . but hats and cloaks, which can cover ghosts or dummies who move only by means of springs?” [18]. What is interesting and disorienting about the process is that the shadows cast by our figures (both disguised and simply “being”) and seen by the lasers are entirely unseen by us during the process. They are also different to those captured by the lens of the medium-format camera. The two approaches we have used offer different perceptions of the space. The photographs allude to “a scene unseen” outside the frame (Figure 7). The video reveals that scene but simultaneously records “an unseen shadow realm.” The juxtaposition of the works might lead the viewer to question their perception of the space, just as Descartes questioned his perception of an ordinary view.



Figure 7. *Shadow Worlds | Writers' Rooms [Brontë Parsonage] No. 3*, 2011. Digital print on Hahnemühle Photo Rag, 70cm x 1m. This photograph was captured in the alcove of Mr. Brontë's Study. It reveals an intimate yet ambiguous relationship and demonstrates how the interior architecture of the site distorted and contained the cast-shadow realm. © 2011 Brass Art. Photo © 2011 Brass Art and Simon Pantling.

### A Shadow Play for the Brontës

When we show the clips of us working within the Brontë Parsonage, we are aware of a rapt attention within the audience. Whether this is the result of a perceived hauntology within the space or whether it is the surprising ability of new technologies to simply reveal what we cannot see, it is fascinating to us. It was this willing suspension of disbelief that first drew us to pre-cinematic spectacle as an important area for research within our own practice.

In approaching this new project, *Shadow Worlds | Writers' Rooms*, and in particular the Brontës' world, we were drawn to the Glass Town Country of the Brontës' childhood. This deliberately playful world is one that intrigued us. Play is at the heart of our own collaborative practice – a way of exploring possible futures and alternative pasts. Literature is an important source of inspiration for us, and our engagement with the parsonage as a site where narratives were imagined, acted-out, written, and inscribed in time presented not only a resonant site, but also a site where shadows could be “revealed” and re-written.

It is important to make clear that we had no desire to re-tell the life story of the Brontës, nor the plot of any of their novels. Rather, we wanted to inhabit their creative space and allow it to influence us in unexpected ways. The constraints and possibilities afforded by the interior architecture distorted and contained the shadows. We were aware of inhibitions of physical action coupled with an unbounded imagination. New dynamics between characters and sequential narratives emerged alongside our shape shifting and digital disappearances. In this sense, the space itself acted as a shadow, casting an echo of its past into our present. In turn, we created something in the present sutured together with the past. This is the final point to make: The uncanny pervades time, slipping forwards and backwards, unraveling the past and creating the future. Light slips secretly between us and those who came before us. Like an agent of wonder, it reveals a mysterious realm.

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3. The Whitworth Gallery ([www.whitworth.manchester.ac.uk/](http://www.whitworth.manchester.ac.uk/)) and Manchester Museum ([www.museum.manchester.ac.uk/](http://www.museum.manchester.ac.uk/)) are both part of Manchester University. The commission by The Whitworth for the international group exhibition *Dark Matters: Shadow Technology Art* ([www.whitworth.manchester.ac.uk/whatson/exhibition/darkmatters](http://www.whitworth.manchester.ac.uk/whatson/exhibition/darkmatters)) gave Brass Art a unique opportunity to gain access to the museum stores and the expertise of individual curators. *Still Life No. 1* was supported by the Association of Art Historians, the University of Huddersfield, Ogle Models and Prototypes Ltd, and Huntsmen. [darkmattersart.com](http://darkmattersart.com)
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6. Digital Doubles, [www.digitaldoubles.org](http://www.digitaldoubles.org).
7. Scanning at Manchester Metropolitan University, School of Engineering, United Kingdom. 3D body scanning supported by Wicks and Wilson Ltd., United Kingdom.
8. 3D data were repaired at Liverpool National Museum's Conservation Technologies Department and printed at Ogle Models Ltd., United Kingdom, with sponsorship from Huntsmen.
9. The circular table for *Still Life No. 1* with motorized revolving light was designed by theater engineer Andy Plant. This enabled Brass Art to move away from the garden model railway sets, which had facilitated linear light locomotion in previous installations (*Moments of Death* and *Revival*) and return the audience's focus to the shadow play.
10. S. Greenblatt, "Resonance and Wonder," *Bulletin of the American Academy of Arts and Sciences* Vol. 43, No. 4, 11-34 (January 1990).
11. The Brontë Parsonage was the family home from 1820 to 1861. Charlotte's novel *Jane Eyre* (1847), Emily's *Wuthering Heights* (1847), and Anne's *The Tenant of Wildfell Hall* (1848) were written in this house. The Brontës, who published under the pseudonyms of Currer, Ellis, and Acton Bell, were acknowledged at the time for their directness and powerful emotional energy, qualities which were sometimes interpreted by the critics as "coarse" and "brutal." [www.bronte.info/](http://www.bronte.info/)
12. In 2009, we researched the potential of using Lidar scanning for a commission at the Lyric Theatre, Hammersmith, London, to capture both the outside of the building during its architectural transformation and performances that took place within its interior. Our aim had been to composite these viewpoints and to focus on the negative spaces within the process – in other words, focus on what was most often unseen. A colleague, Spencer Roberts, working with the Kinect, was interested in how we envisaged using the technology to explore the shadows created in the captured data, and a collaboration was formed.
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