

Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.

SIGHT UNSOUND

An enquiry into our relationship with our perceived reality.

An exegesis presented in partial fulfillment of the requirements for the degree of

Master of Fine Arts

at Massey University, Wellington,
New Zealand.

Jessica Chubb

2013

ABSTRACT

There is an overwhelming potential for letting the mind flood with what is, as opposed to what is visible. This research investigates that space: those points where our engineering sees no purpose in telling us what's there: speaking to our senses' perimeter of visibility. This thesis is an in depth questioning of; the nature of seeing and its fragile relationship to the external world; the position photography plays in aiding and extending corporeal vision; and an experimentation with the photograph's function as an instrument of critique on perception. The questions asked within this work also offer grounds for reflexivity and consideration of our sensitive interaction with the world.

ACKNOWLEDGEMENTS

To my supervisors Anne Noble and Caroline McQuarrie,
for their ever enthusiastic encouragement of my ideas and experiments.

To Wayne Barrar, Jane Wilcox and particularly Shaun Waugh
for their technical assistance in making my darkroom quests achievable.

To my parents Michelle and Kevin Chubb
for their constant support of every kind.

To Shaun Swan, for being a lovely face to stare at for hours on end.

And to my fellow MFA students,
especially my photographic comrades; Jonathan Kay, Melissa Irving and Ryan McCauley,
who fought beside me in the battles of MFA 2012/13.

CONTENTS

ABSTRACT	ii
ACKNOWLEDGMENTS	iii
INTRODUCTION	1
THE OBSERVER IN FIRST POSITION	4
Just looking	
THOMAS A CLARK	13
Exeter	
PHOTOGRAPHY AND VISION	14
Extending the mind's eye	
IN THE DARK	23
Photography and science	
PHOTOGRAPHS ON PHOTOGRAPHY	35
THE OBSERVER IN SECOND POSITION	42
A reflection on my final work	
IMAGE LIST	54
REFERENCE LIST	56
BIBLIOGRAPHY	58



Fig.1 Image by author. *Right: Chubb_Jess_OD_9803_1_redfree*, 2012.

INTRODUCTION

At first, it appears that nothing could be easier than seeing. We just point our eyes where we want them to go, and gather in whatever there is to see. Nothing could be less in need of explanation. The world is flooded with light, and everything is available to be seen. We can see people, pictures, landscapes, and whatever else we need to see, and with the help of science we can see galaxies and viruses and the insides of our own bodies. Seeing does not interfere with the world or take anything from it, and it does not hurt or damage anything. Seeing is detached and efficient and rational. Unlike the stomach or the heart, eyes are our own to command: they obey every desire and thought.

Each one of those ideas is completely wrong.

(Elkins, 1996)

This is how art critic and theorist James Elkins introduced his book *The Object Stares Back* (1996). Within this statement Elkins is saying that seeing is undeniably flawed and untrustworthy, “[i]t is immensely troubled, cousin to blindness and sexuality, and caught up in the threads of the unconscious.” It is in this conflict of function and failure that the overriding investigation of this thesis takes place.

From the beginning of the nineteenth century the responsibility of perception was changing. Science aimed increasingly at “an interrogation of the makeup of the human subject, rather than of the mechanics of light and optical transmission” (Crary, 1992). Our capacity to interrogate our own constructs of self revolutionised our way of behaving. This is an ability born from our evolution; to understand, to question and to explore the boundaries and the constructs of the human experience.

What started off for me as a broad enthusiasm for, and investigation into, how we operate, has turned into altogether something more extraordinary. Whether it is by psychological or physiological inclination – we tend not to accept our limits as fallibility, but as truth. Those limitations are our borders or guidelines of what we typically comprehend as all there is, and the measure we hold for truthful representation. We cannot see the world the way it is, we can see it in the ways that past experience tells us we need to. There is an overwhelming pregnant potential for letting the mind flood with what is, as opposed to what is visible. This

thesis is investigating that space: those points where our engineering sees no purpose I n telling us what's there: speaking to our senses' perimeter of visibility. As Aldous Huxley aptly puts it, "There are things known and there are things unknown, and in between are the doors of perception" (Huxley, 2010).

By challenging photography and its temperamental relationship to 'the real' I aim to create works that investigate our relationship with our perceived reality mediated by the constraints and limitations of our perceptual system.

The subject of vision crosses varied disciplines, and throughout this thesis I have drawn on theorists and practitioners in fields of psychology, neuroscience, optics, chemistry, philosophy and photography. As Elkins contributes "Vision is too close to our lives to be left languishing in its opaque disciplines" (Elkins, 1996). I will draw on scientific knowledge in the field of vision, as well as philosophical and theoretical considerations of the subjective experience of sight, in experience and in representation. I will use photography as a medium through which to question our seen and mediated reality, and examine its capacity for interpreting the external world.

In the first chapter *The Observer in First Position*, I discuss the fundamentals of vision and its vulnerable relationship to the external environment. I present and discuss early work I created in response to scientific research with particular reference to the hierarchal strategies of visual perception. It is also in this chapter which I establish the important link between the mechanical eye of photography and the corporeal eye of the photographer.

The second chapter reveals photography's role as an extension of the eye, and importantly, in allowing unconventional interpretations of our visual reality. I discuss artworks that engage and experiment with perception in the processes of camera-less photography, and will examine the significance this alternative process holds for the meaning of the image intrinsically and to the viewer.

In *The Dark: Photography and Science* I outline the important and tumultuous relationship between art and science and discuss two artists who have thrived off the interconnectedness of these two disciplines; Berenice Abbott and Andrew Wright. I will also discuss in this chapter, my move into the darkroom, and the experience of testing and experimentation within the exhibiting space.

It is within the chapter *Photographs on Photography* that I delve deeply into the theory which most informed my final work. James Elkins surfaces again in discussion about his quest to find a visual metaphor of the medium of photography. Alfred Stieglitz's *Equivalents* series and Ugo Mulas' *Verifications*, also provide relevant dialogue about the functions of photography and subject matter.

In my final chapter I reflect on the functions of my work. I discuss the variety of works and the individual drive behind creating them. Each 'type' draws from different questions about how we see, but collectively they provide a conversation about the many ways we are "blind to our blindness" (Elkins, 1996).

THE OBSERVER IN FIRST POSITION

Just Looking

The eye opens and the light comes in

(Gregory, 1977).

Richard Gregory, in his book on the psychology of seeing, tells us that two and a half millennia ago esteemed Greek philosophers thought that light shot out of the eyes to touch objects as probing fingers (Gregory, 1997). These were the trusted beliefs of mathematicians and philosophers of which many others of their ideas we still believe to be true. Although the physical idea of this is clearly untrue, the principle of an active and aggressive act of seeing is hugely relevant to current scientific, psychological and artistic studies of perception. We are not cameras, boxes of trapped darkness waiting for a pinhole of light to reveal the world. Vision and perception are an active, creative understanding of our surroundings. As Rudolph Arnheim states, “When we observe something, we reach for it” (Grundmann & Arnheim, 2001).

There is a tendency to think of ourselves as separate from our more primitive counterparts. We can feel as if we are extra-terrestrials here and study and observe the way things are as objective beings. Science in the past century has offered us up for examination in a way that it never has before. More than ever we are thirsty for information on why we are the way we are, and in that question, is the finding of ourselves in the working unit of things of this world. Recently, scientist and founder of *Lottolab*¹, Beau Lotto, discussed three important points at a lecture centred around human visual perception. His observations were: “no one is an outside observer of nature”, “each of us is defined by our ecology”, and lastly “ecology is necessarily relative, historical and empirical” (Lotto, 2009). His aim in translating these points is that people understand that we are defined in the interaction between ourselves and our environment, and that the characteristics of that interaction are determined in both our previous experience and in our experimental nature. However, our physical presence and impact may not be wholly the interaction Lotto is speaking of. John Berger contributes the idea that we are a part of the visible world and “[i]t is seeing which establishes our place in the surrounding world” (Berger, 1972).

¹ A hybrid art studio and science lab focused on producing visual based projects about the brain’s visual system

While our senses are our only direct access to our physical environment, raw sensory information alone is meaningless (Rose, 2009), particularly in relationship to the way we see. We receive a comprehensive amount of visual data consistently from the external world through the means of light waves of varying distances interacting with the external world and thus falling onto our eye. Lotto explains, “There is no inherent meaning in information. It’s what we do with that information that matters”(Lotto, 2009). The act of seeing itself is an act of learning. Studies of perception development have proved that what we see, and what we accept as reality is a reconstruction of information by the brain based on the information we scan from our environment, and the prior knowledge we have about the things that make up our experience. Where the truly fascinating part begins is in the fact that the information we take from our environment is not complete. We physically create our visual perception continuously. And this is not, as Kandel confirms, “absolutely faithful to the external reality”(Rose, 2009).

One of the most important characteristics about the visual perceptual system is its hierarchal strategies. There are selective processes that the brain uses to create our perception of the outside world that prioritizes visual information. Firstly, we can see this hierarchal process of vision working in the initial response pattern we have to our environment. The immediacy of the process of vision complicates how we might imagine this happening, but there are different stages of visual perception that happen at different levels of complexity within the brain. For instance, recognizing shape, colour and edges happens initially at the outset of looking, while recognition and orientation happen later in the fairly instantaneous process (Rose, 2009).

Disregarding unimportant information is one of the significant things that our visual system has to do. As Ted Adelson, scientist at MIT works in machine vision trying to make robots replicate the function of human vision. One of the major hurdles of his job is understanding how the brain prioritizes this information. He states: “The brain is designed to pull out the information that is stable and important and meaningful, and to throw away the information that is accidental” (Rose, 2009). This is the key idea underpinning the reason for why seeing shadow doesn’t distort the visual reading of an actual object and is also important in understanding the hierarchal process of visualization.

Shown in fig.2 is a test created to illustrate this theory. On the checkerboard, points “A” and “B” are exactly the same shade of grey. Adelson further explains this phenomenon saying,

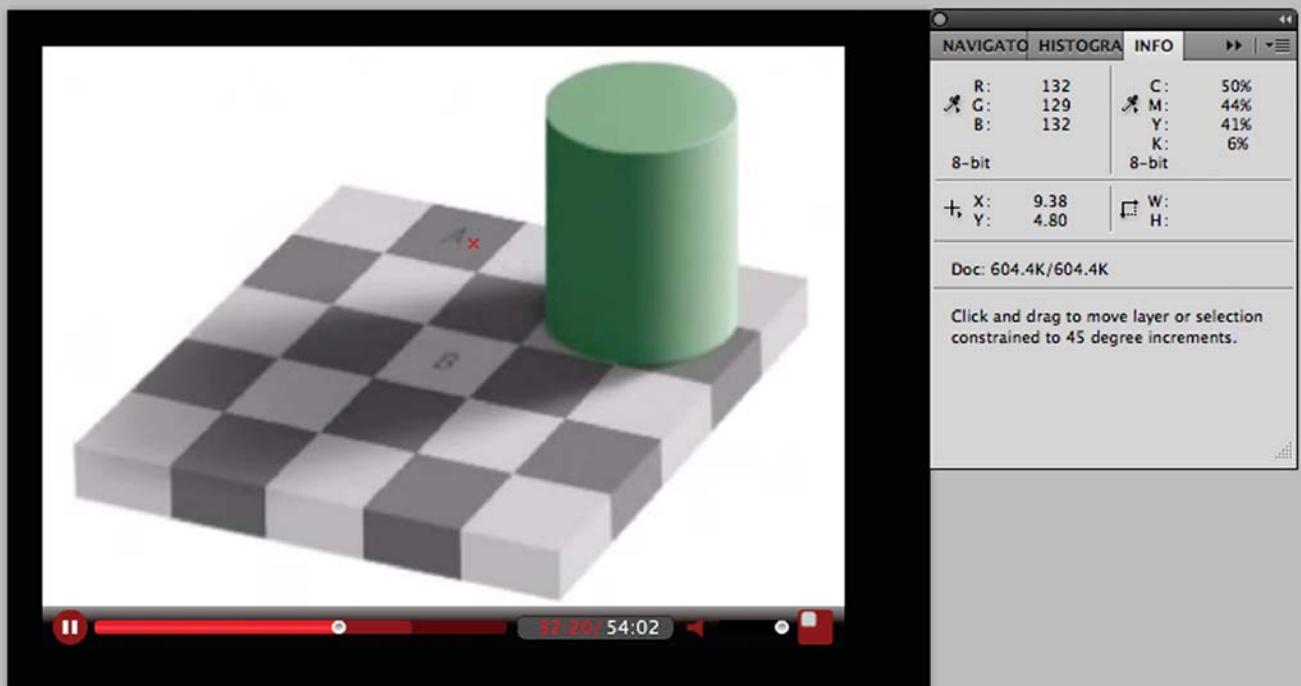


Fig.2 Image by author. *Adelson's Example Part One*, 2012.

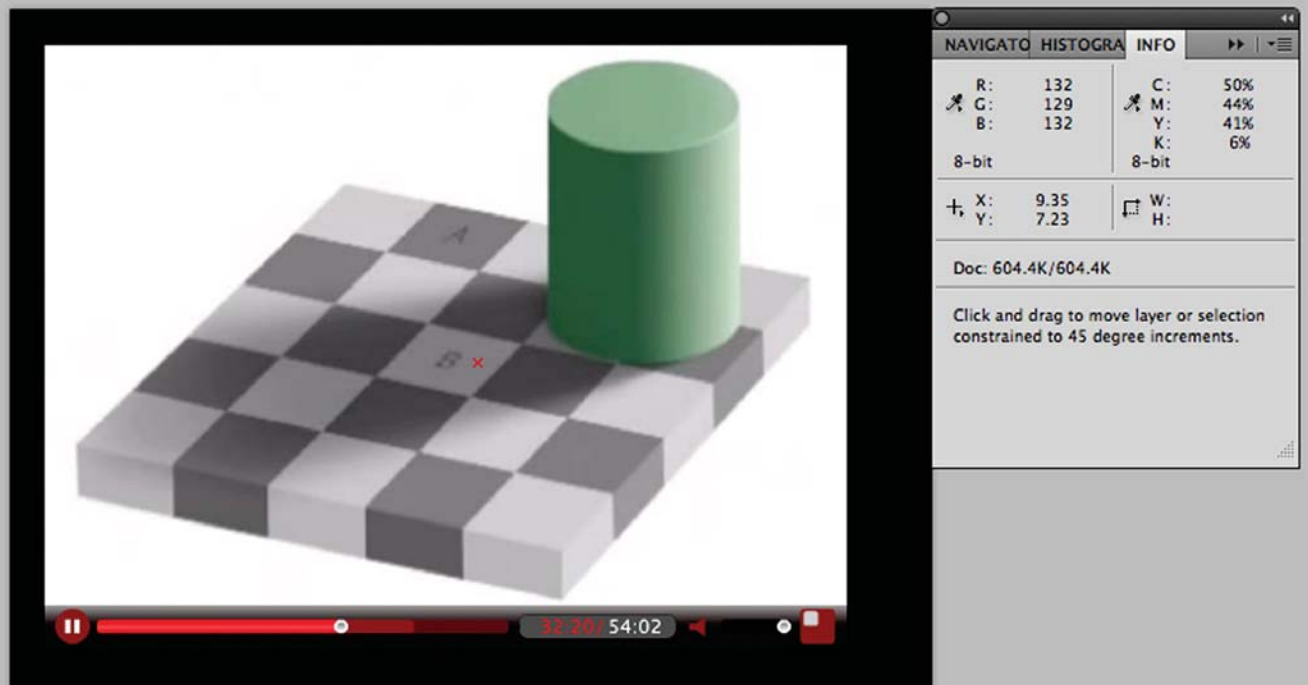


Fig.2.5 Image by author. *Adelson's Example Part Two*, 2012.

“It seems like a failure. But it’s not the perceptual systems job to tell you about ink on a page, its to tell you about what’s out there in the world” (Rose, 2009). This function is built into your visual system to tell you about the checkerboard, not about the shadow. What is exceptional about this illustration, is that the knowing of the fact (that the two points are in fact the same grey), changes nothing in our ability to see it. This proves how deeply engrained the hierarchal codes of vision are. As I mentioned previously, vision is a learned tool, but clearly there are limits to what we can make this tool learn.

Listening to Adelson’s explanation of the shadow on the checkerboard, reminded me of one of the first instructions given to me when I started my study in photography: “Find mid-grey.” We were told that finding this grey point would help us find the correct exposure settings for the lighting conditions we wanted to photograph. We were told to find a mid tone grey that was neither in shadow or in highlight and, that by doing so, we would be able to capture an accurately exposed photograph where we would get maximum information in the highlights and shadows.

I found it a fascinating thought that shadow, a vitally important factor in photography, is such a scientifically illusory space. One in which our own brains seem to fail to accurately comprehend. We can see in Adelson’s example that the way we see compromises actuality for practicality, shifting dramatically perceived lightness of an image without any real life adjustment. You can see my skepticism showing in fig.2 where I have actually taken a reading of the colour make-up in the computer programme Photoshop, to check that points A and B are actually identical.

In *The Object Stares Back*, James Elkins (1996) speaks to the unconscious behavior of our visual process and suggests the unknowingness of our visual fallibilities is crucial in, what he calls ‘ordinary seeing’. “We are blind to certain things and blind to our blindness [...] Those twin blindnesses are necessary for ordinary seeing: we need to be continuously partially blind in order so see” (Elkins, 1996). This suggestion of blindness, happening together with seeing, is a way of speaking to the hierarchy of vision. Elkins divulges at length the ways in which we are blind to the world around us; commenting on our physiological limitations as well as our psychological inclinations to focus or ignore to our own end. “Blindness is like a weed that grows in the very center of vision, and its roots are everywhere”(Elkins, 1996).

These scientific and philosophical theories of hierarchal vision are fundamental to how we see, and how we don't. How these theories find relevance in my inquiry is in the question, not only of our hierarchal mediation of reality, but in how these theories of perception can be highlighted or discussed through the medium of photography, or, moreover, how can photography engage these theories to make aware the part hierarchy plays in perceptual experience and in perceived memories.

This area of discussion reveals there is a huge similarity between visual perception and the medium of photography itself. Vision is hierarchal; and the act of photographing is literally orchestrating your own hierarchy within the frame. I created works in response to these theories, and through them set about questioning photography's own characteristics of hierarchal vision and our own way of reading the photographic image.

Seen in fig.4 and fig.6 are two very different yet iconic images of photographic history. Both have had comprehensive academic discussion around key ideas of the functions of photography, both representing examples of 'straight photography'² and both with a singular protagonist of importance. In two different ways I have presented these works to be viewed without their heroes (fig.3 and fig.5), with the purpose of joining the discussion of hierarchal vision with the practice and medium of photographic capture.

In my work shown in fig.4, I have sourced one of the most reproduced photographs of all time, *Migrant Mother* by Dorothea Lange. Covering lead role of the mother is a structure I formed, sourced from the background of the same image. I wanted to explore what would happen to the image, and to the reading of the image, without her. How the emotion of the image would change, and what the structure I had imposed on it would do to the overall meaning of the image.

Cameras are still imagined, despite their increasing complexity, as machines of logic and light. The pinhole camera, the camera obscura, the diagrammed eye with its inverted retinal image, and the Euclidean ray diagram, are all metaphors of the ease with which photographs are thought to capture accurate images of the world (Elkins, 2011).

In Elkins' book *What Photography Is* (2011), which will be discussed more thoroughly in chapter four, he attempts to deduce the meaning of photography in its many fallible

² 'Straight photography' in this case meaning a to photograph in documentary style without physical manipulation of any formal elements of the image.



Fig.3 Image by author. *Untitled*, 2012.

Fig.4 Dorothea Lange. *Migrant Mother*, 1936.

constructs. This quote from Elkins highlights an important attitude in the discussion of visual perception and photographic truth. A line is drawn here connecting the idea that the ‘accuracy’ of a photographic image is based on the idea that seeing itself is accurate in visually interpreting our surroundings. So it can be deduced that human sight is a type of ‘measuring stick’ of supposed photographic truth.

There are many ways that our vision is flawed: flawed in some ways that cannot be changed. And there are those ways in which the attribute itself, the subject of imperfection, defines our way of seeing. I touched earlier on the importance of past experience contributing to the formation of a percept, but known experience of what is happening in your environment is far from the only contributing factor in how we see. All of the things that shape the person we are distort how we see. As Elkin’s puts it “seeing is like hunting and like dreaming, and even like falling in love. It is entangled in the passions – jealousy, violence, possessiveness; and it is soaked in affect – in pleasure and displeasure, and in pain” (Elkins, 1996).

The possibility of a photograph acting as an objective study of life is a widely discussed point within photography theory. However, Anne Marsh argues “that every photographic ‘truth’ is an interpretation and that this interpretation is driven by desire, the desire of the operator, the subject being photographed and the viewer looking on” (Marsh, 2003). There is a tangible connection here between Elkin’s point of subjective seeing, and Marsh’s argument that the mediation of every photograph is “driven by desire” (Marsh, 2003).

The significant issue and question raised here is that if the very function of sight itself is so flawed in interpreting the external world, then what responsibility does photography have in ‘accurately’ representing it?



Fig.5 Image by author. *Untitled*, 2012.

Fig.6 Herni Cartier-Bresson. *Behind Saint Lazare Station, Paris, France*, 1932.

The roof and the gables
Accept light

Light is poured
Onto the hill shapes
Green distinguished from green
Grey from gold

A surface is anything
That answers the light
With texture and form

The eyes are hungry for what
The hands might reach and touch

Intelligence of the senses
Brought to light

The whole body of the water dancing

Thomas A Clark
Exeter 2004 from Wells & Standing (2005).

PHOTOGRAPHY & VISION

Extending the Mind's Eye

Understanding the laws of light; the way it travels and behaves, has allowed us to observe, record, create, and look farther and deeper into and around our world. One of Marshall McLuhan's theories on human behaviour is *The Extensions of Man*. In a nutshell he explains that every tool invented by humans is in some way an extension or aid of a human capability. The development of tools such as microscopes, telescopes, bifocals and 3D technology proves that we have a genuine and enthusiastic interest in extending our capabilities of vision (McLuhan, 2008). In science, art and curiosity we have been pursuing the extension of our visual capabilities beyond our necessity to survive, and into the domain of research and enquiry.

Anne Marsh (2003) explains the specific connection between camera and eye stating, "the camera itself is a prosthesis for the operator, one which extends and enhances both physical capabilities and psychological structures." Photography provides the opportunity to solidify visual manifestation of the external world in ways that our own visual perception cannot. This extension of sight refers to basic physical characteristics like zoom, focus etc., but more importantly offers an extension of interactivity with the external space: a way to record a visible reaction to an environment, independent of the body and in ways not internally recognised as visible.

It is in photography's opportunity to provide an 'alternative perspective' that I'd like to probe further at this point. What can we learn about our external reality through photographic processes that we cannot through our own visual perception? Among those who have pursued this question are the artists involved in the exhibition and book *Shadow Catchers*. The five artists involved use their practice of camera-less photography to interpret the presence of an external reality, in a way that is unlike the analogue of natural vision; the editor Martin Barnes explains, "transforming the world of objects into the world of visions" (2010).

In the chapter *Metamorphoses* Martin Barnes discusses the work of Floris Neustüss, and his process extending the practice of the photogram. His work communicates ideas around the body and external objects in, as Barnes describes it, "poetic dialogue between presence and

absence” (2010). Neusüss created the work, seen in fig.7, by laying photosensitive paper in his garden and exposing it to the natural forces of a thunderstorm. Lightning exposed the forms in the garden and the work reads of the distress of a volatile environment. In a sense the photographic paper has replaced the eyes. The paper looks up from the garden to the sky and visually absorbs the environment in a way the human eye never could. This is a solidified reaction to a real force and presence. It is showing us reality... but not as we see it.

Barnes offers the idea that “they might be better understood not primarily as photographic traces (although, in a physical sense, that is of course what they are) but rather as the realization of visions” (2010). He goes on to discuss the works in regard to Carl Jung’s theories of the archetype of the shadow, and the metaphors of such for repressed qualities in our subconscious. However, I read a different interpretation of “the realization of visions” in a different way. I see these works as a realisation of vision itself: not of a human vision but of seen reality independent of corporeal mediation. These aren’t reproductions of any form of mechanical sight, but rather direct quotations from present experience.

Neusüss describes his work as possessing a “decisive message, a certain action, a dealing with reality, not letting it appear as given but potentially variable” (Barnes, 2010). The attempt of his work to capture a potential variable reality is re-enforced by the ephemeral treatment of some of his works. Because these are chemical based works they change over time. Some of his works hold images that aren’t fully ‘fixed’, and so slowly disappear or disintegrate. This provides a far deeper connection to the experience of perception in regard to the temporality of the experiencing self, as well as the remembering self.

The extensive camera-less photographic work made in the mid-late nineteenth century at the outset of photography was largely based on recording images of nature as well as the quest for scientific discovery of ‘invisible’ matter (Keller, 2008). William Henry Fox Talbot, inventor of photography’s Calotype process³ and botanist, used photogram techniques extensively in fixing images of various plant life to paper: example shown in fig.8. Talbot has been credited for his ability to make “images for the botanist, historian, traveller, and artist” (Daniel, 2000).

Throughout the nineteenth century various technologies were invented within the field of ‘photographic writing’. Techniques that provided a “revelation of forces operating beneath and beyond the threshold of human perception”(Keller, 2008). Photography was not only

³ The Calotype process distinctly uses paper coated with silver iodide: this is the process which became the basis for modern photography due to its ease and capability for copy making.



Fig.7 Floris Neusüss. *Gewitterbild*, Kassel, 1984

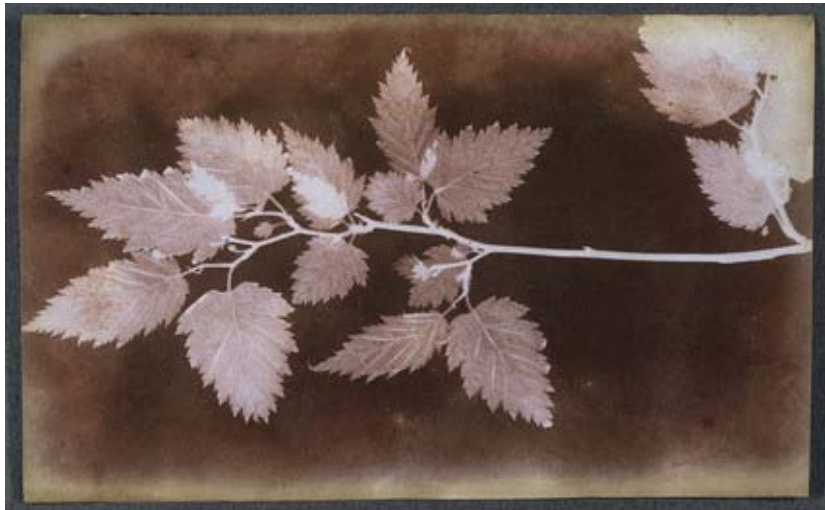


Fig.8 William Henry Fox Talbot. *Untitled*, c. 1839

Fig.9 Etienne Leopold Trouvelot. *Electric effluvia on the surface and circumference of a coin*, c. 1988.

documenting scientific experiments but also becoming an important tool to accumulate information the human eye couldn't. Among these scientific uses was the study of electricity and magnetism. By passing electrical currents through light sensitive paper with an object placed on top, an image is formed tracing the electromagnetic fields of the object (fig.9). The photographic work that resulted from these experiments "provided irrefutable testimony of imperceptible phenomena for which there otherwise might have been no witness"(Keller, 2008). This led to, as art theorist Corey Keller states, a "radical reconsideration of how the world around us was perceived and understood." The presence of things unseen was, from this point, something that photography and its processes would contribute to discovering.

Artist Marie-Jeanne Musiol has worked at creating photographic prints of electromagnetized fields of biological bodies over the last seven years. Her 'specimens' "explore magnetic fields as carriers of information emblematic of a holographic universe" (Ouellette, 2012). Fig.10 and fig.11 show her small but powerful works that translate the scientific magic of photography.

In these three photographers work, (Neussus' garden lightning fig.7, Talbot's plant life fig.8, and Musiol's specimens fig.11), one can see the continuing thread of photographic inquiry into the fundamental conversation of visual perception over the span of over a hundred and fifty years - one which I hope my own work will contribute to and extend in the years to come. Importantly, these artists all turned to the natural environment to present a different impression of the biological forces of the world. In considering, for example, the electromagnetic fields of Musiol's 'specimens', we can see a presence of activity completely invisible to the human eye. This sparks imagination into what living things surround us and begs a contemplation of the complexities of natural phenomena beyond our visibility.

The term 'metaphysics of light' interested me while researching the concepts of Floris Neussus's work. It was in response to this interaction of presence and absence in an unknown space that culminated in my *Dark Portrait* image, a portrait of a man that I had presented as a print so dark that he only hung to the image in dark grey tones (fig.12). There was a strong emotive and primal quality to the relationship between viewer and image. The theory, and fundamental personality of near darkness also intrigued me to push this idea further.



Fig.10 Marie-Jeanne Musiol. *Bodies of light* installation, Montreal, 1997

Fig.11 Marie-Jeanne Musiol. *Cranesbill*, c.1997

<http://www.musiol.ca/2-3-en.php>

From this point, it was illumination, an observable property and effect of light, that was the framework for my theoretical and practical research. I wanted to explore the metaphysical implications of light and dark, and experience the responsiveness of the eye to a light deprived photographic subject. Upon reflection, with regard to Neusüss work I was searching to create this 'variable reality', but not in the same sense. This work has a very real presence in a room with a viewer. The variable reality happens in the reading of the image itself, as a print on the wall in contest with our visual capabilities.



Fig.13 Berenice Abbot. *Light and Shadow*, c. 1958

IN THE DARK

Photography & Science

Don't think of science as a thing. Science is not a thing. It's a verb. It's a way of thinking about things. It's a way of looking for natural explanations for all phenomena
(Shermer, 2006).

As a student and lover of photography, I have become familiar with its history and its issues. I cannot claim to know every inch of it completely, what is clear though is that it seems to have two mothers. Art and science birthed photography into a time of a technological boom, and its contribution was amongst the most influential of all these technologies (Keller, 2008).

The camera itself, and the process of photographing are rooted in scientific theory made possible by great creative minds. From the outset photography's great multifarious purposes was at once its biggest asset and hindrance. It has been pulled by artists towards being a tool of fantasy (Marsh, 2003), argued against its validity as an art form, and forever burdened by its grounding in realistic representation. It was, as Anne Marsh states, "a serious tool in the service of science and a major component of the entertainment industry" (2003).

Berenice Abbott is credited with making a body of work significant in enhancing the link between photography and science. The success that Abbott had in her scientific photographs was a result of her quest to "understand or appreciate the knowledge which thus controls daily life" (Hilsabeck, 2012). Her recent exhibition *Photography and Science: An Essential Unity* (September 2012), makes visible some of the abstract scientific concepts of modern and fundamental physics (fig.13). In her work she aims to capture scientific certainty. These are not unpredictable events of happenstance. "Abbott's photographs depict a reality that is patterned, full of orderly progressions and measurable angles, predictable movements and predictable outcomes, one that is seemingly very different than what we experience at street-level" (Hilsabeck, 2012).

Due to the physical anatomy of the eye the 'visual resolution' or sharpness is only very good at the centre of the gaze... exactly where you're looking at. That is where the most photo-receptors are; in the centre of your retina. This is where the cells are that are most responsive

to colour and detail (called cones), while the cells in the peripheral eye are more concentrated with cells responding to basic light and dark (rods). You can see this working in an almost pitch black room where you will see objects more brightly in your peripheral vision than in the centre of your gaze. This is also why as the environment may get darker, colours do not also do so initially. Firstly, they appear to desaturate, as the colour receptors need more light to interpret the information (Gregory, 1997).

Johann Wolfgang von Goethe famously studied the nature of colour and light and the act of perception, culminating in his *Theory of Colours* in 1810. At one point in his experimentation Goethe employed the camera obscura as a site for his optical testing. “The sun being suffered to shine through this on a white surface, let the spectator from some little distance fix his eyes on this bright circle thus admitted” (Crary, 1996). Goethe wrote extensively and enthusiastically on the effect of what is now referred to as *afterimage*. “The colored circles that seem to float, undulate, and undergo a sequence of chromatic transformations have no correlative either within or without the dark room” (Crary, 1996).

Author of *Techniques of the observer*, Jonathan Crary (1996) wrote of Goethe’s fascination with afterimage and his explanation of them as “physiological colors belonging entirely to the body of the observer.” This experience presented an exciting opportunity to be the “active producer of optical experience”, where the corporeal functions of vision create a phenomenological presence of colour and light visible in your surroundings.

Andrew Wright’s contemporary photographic practice primarily concerns itself with challenging our systems of visual perception and the mechanics of light and photography. Specifically in his series *Coronae, 2011* Wright has drawn together an isolated visual experience for the viewer which connects beautifully to the ideas of after-image discussed by Goethe. Looking at Wright’s image (fig.14) and reading Goethe’s romantic prose; the experience of afterimage is loud and visual. They speak to something otherworldly and deeply psychological. They are, as one critic⁴ referred to them “darkly beautiful”, and all consuming to the viewer.

There is an uncanny feeling when a darkened doorway becomes a roomful of eyes and every shadow seems to grow a face [...] Each object has a presence, a face of its own. The world is full of eyes (Elkins, 1996).

⁴ Director MOCCA David Liss (2011).

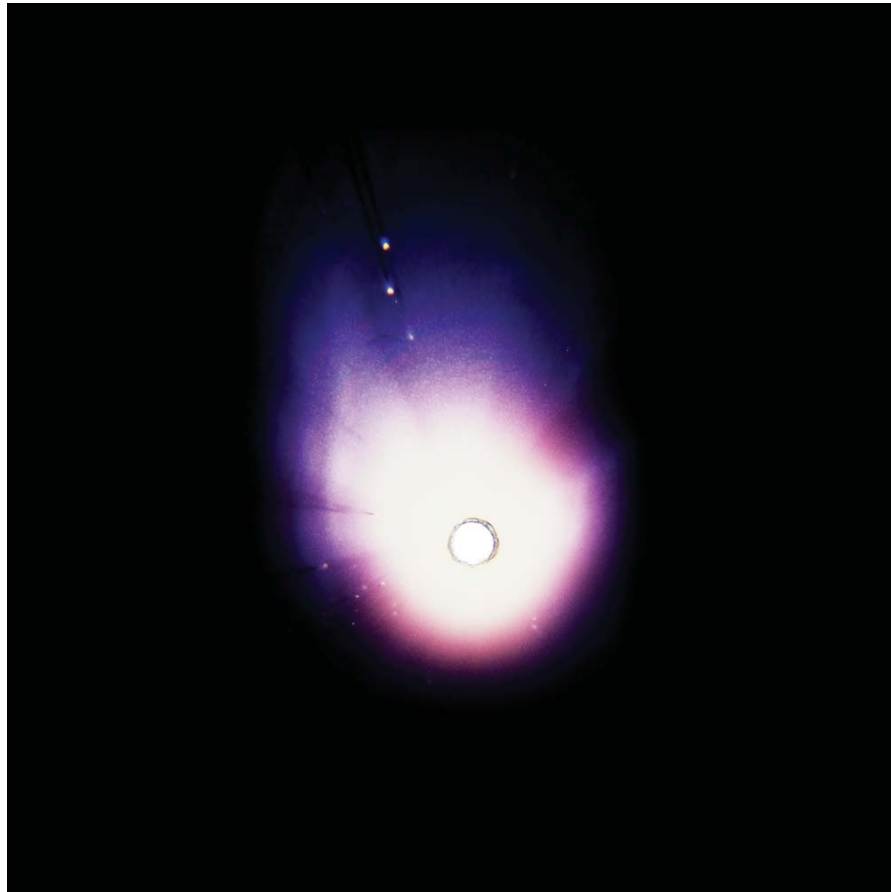


Fig.14 Andrew Wright. *Coronae*, 2011

Fig.15 Andrew Wright. *Installation of Coronae*, 2011

Fig.16-Fig.21 show experimental images made in extending my investigation into illumination. They were all produced in the darkroom and have been scanned. Originals vary slightly due to the scanning process.

My decision to work in the darkroom after my initial digital test works, was a revelation. To literally handle the light, and be a physical part of the work, provided an opportunity to experience the issues of light with my own vision. I became a working part in the concept of the image. In making work that was investigating our own relationship with darkness, I have had to shoot, process and print in near darkness, exposing for images barely seen in lit conditions.

I think while there is perhaps a very dry message at the surface of this work, there is an evocative undertone which aims to provide intrigue. There is always magic in creating work in the darkroom: a magic as simple as seeing an image appear on paper in the developing tray. The way these (dark) prints behaved was unlike any previous experience I'd had (on purpose). I'd sit with the image exposing at the enlarger, anywhere from five to fifteen minutes - that act in itself felt strange. More often than not I'd busy myself with other things, but sometimes I'd just stare at it, perhaps at the portraits the most. I'd stare at them sitting there under the light, thinking about what was happening to that surface, and the chemicals working in it. When the light would 'pop' off an after-image would hang on my eye for a moment, I remember that clearly. In the developing tray though... that was where the magic happened, from white emerged the face that quickly turned deeper and deeper to black. Within seconds the page that held this face showed me him and then took him away. It would be another seven to ten minutes before I'd get to see if he was there at all.

While I strongly believe that the use of film and darkroom processes in my work provide a crucial link to photographic history, the challenge of this was in part its lure for me. It was frustratingly temperamental and complicated and at the same time had such a powerful command when I found that point where a flutter of an image was present and illusive enough. I have experimented greatly with various ways to create these works, balanced on the edge of visual comprehension. By photographing these subjects using long shutter-speeds, using various development times and exposing the enlarged image for extended periods of time, I have followed the manual process of light turning to image. In the case of my dark works, I have seen the process from light capture, to dark processing, to light presentation.

Aside from the emotional and primal reactions to being in a dark environment, there are things that happen within us that we cannot control. The hormone Melatonin is released in the body in response to darkness and is suppressed by the light. Every night, this occurs and is called the ‘dim-light melatonin onset’ (Lewy, 2002). What this hormone does is promote drowsiness and lower body temperature. Independently this is an interesting fact about how we work, but more importantly is this fact in consideration of the maker and the viewer. With those shots made in the dark, processed in the dark and printed in a dark space, visual impairment was not the only challenge. Throughout the whole image’s creation, my eyes are fighting to find light and the melatonin hormone is telling my body to sleep. While I do not intend nor expect the corporeal experience of making these images to immediately leap from the surface, I do find my side of the story very important in the making of the work.

It is in that space between art and science that photography thrives alongside vision. Both are steeped in complex constructs of fact, and in wonderful flawed subjective experience.



Fig.16 Image by Author. *Untitled*, 2012.



Fig.17 Image by Author. *Untitled*, 2012.



Fig.18 Image by Author. *Untitled*, 2012.

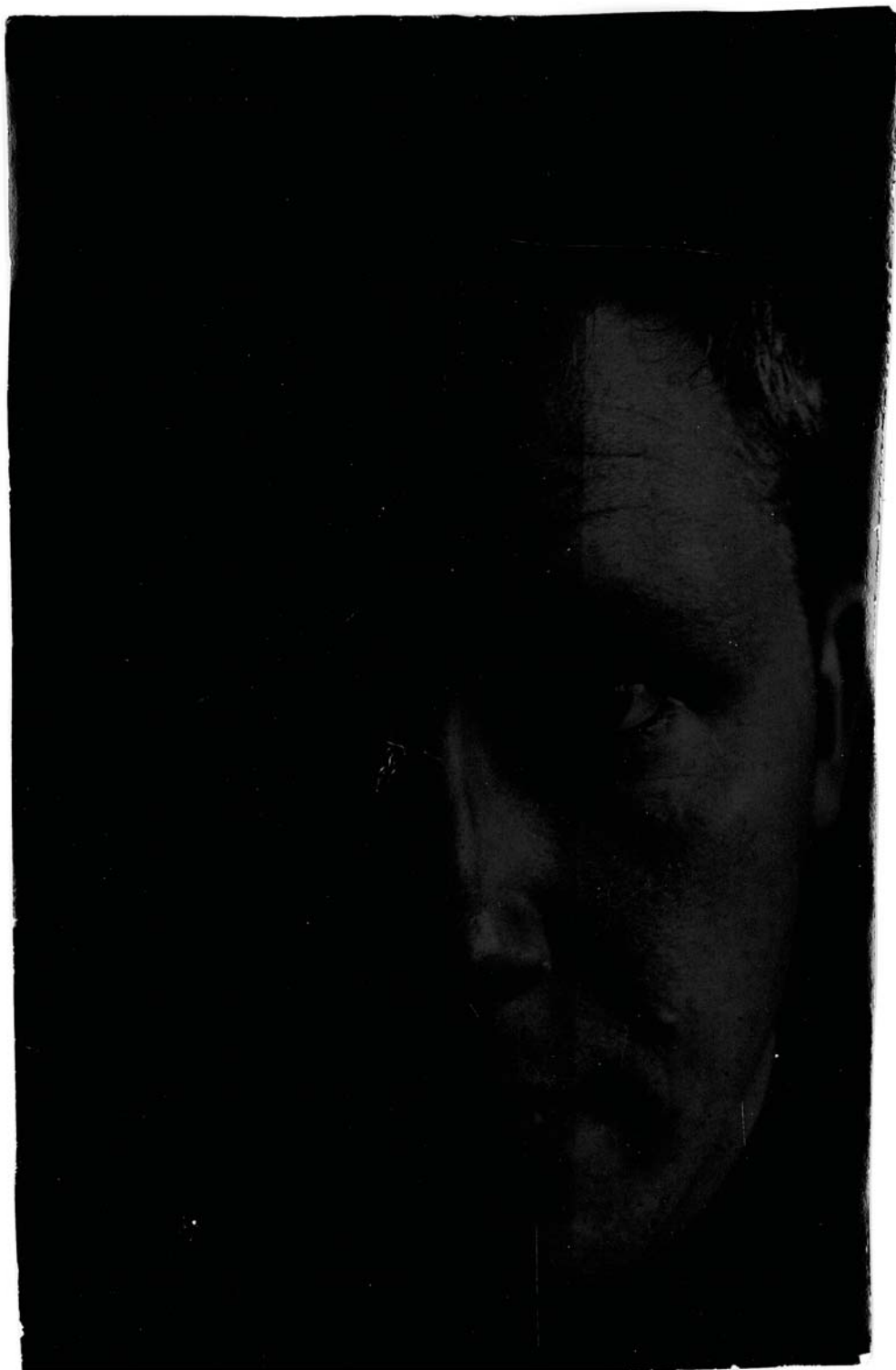


Fig.19 Image by Author. *Untitled*, 2012.



Fig.20 Image by Author. *Untitled*, 2012.



Fig.21 Image by Author. *Untitled*, 2012.

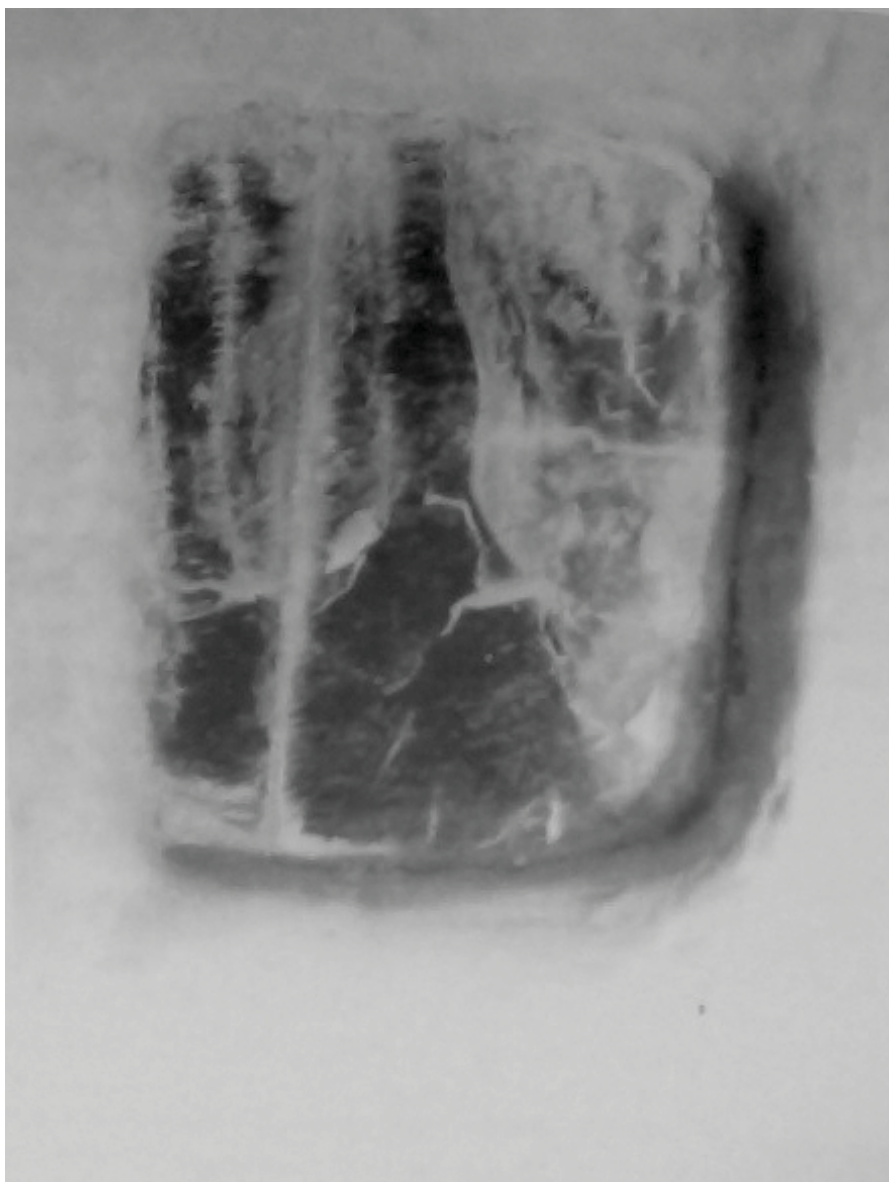


Fig.21 Anonymous photographer. *A Selenite Window*, c.1927.

PHOTOGRAPHS ON PHOTOGRAPHY

Around the edges of every photograph, on each side of the thing that is named in the photograph's title, that thing at which the camera was putatively pointed, is a seeping cessation of meaning
(Elkins, 2011).

Within James Elkin's *What Photography Is* (2011), in the chapter *Selenite, Ice, Salt*, three imperfect metaphors are offered up for discussion on the imperfect medium of photography itself. Elkins' first two photographic metaphors *Selenite* and *Ice* have particular relevance in my discussion of perception and photography with specific focus on the issue of the imperfect nature of vision that photography provides as a working medium.

Elkins' first 'photograph of photography' is of a selenite window taken by an anonymous photographer c.1927 (fig.21). In this metaphor, it is the window itself rather than the image of it, which Elkins uses to aid his discussion. Elkins explains, "seen through the window, the world would look like ill-fitted pieces of mosaic crushed together [...] into a nearly indecipherable pattern" (2011). His meaning of photography found in this metaphor was in the "promise" of an accurate perspective on the world, while in actuality, it held barely a resemblance to what was actually out there.

I found this argument deeply interesting and connected not only to a photographic epistemology, but also to seeing itself. It immediately linked in my mind to the scientific discoveries made by Pawan Sinha from MIT, one of the lead scientists looking into the research of fundamental construction of vision. In 2003, Sinha spearheaded project *Prakash* in which he worked with children who have treatable blindness, for example a dense cataract. His team restores vision to children and follows the progress and stages of vision throughout their journey to full functioning sight. His key finding through this project was the extent to which their ability to organise visual information was learned. Once sight had been restored and they were asked if they recognised what an object was, they wouldn't know, but more importantly they couldn't identify where the object ended and the background began. They saw every point of colour and lamination as separate, in Sinha's words "The world to them is a patchwork of different colours and brightness." (Rose, 2009)

Perhaps the *Selenite* window not only serves Elkins as a useful metaphor for the photographic medium, but also in its relationship with sight itself in its infant state. A conclusion could be drawn here which connects photography to vision in that photography is the unlearned eye: one which tries to see the world as it is, but is hindered so greatly by its intermediary problems of perception, that all it comprehends is a “flattened object in which wrecked reminders of the world are lodged”(Elkins, 2011).

Elkins second metaphor *Ice* provided a basis on which my final experimentation for this thesis really came into being. Elkins discusses the metaphor of black lake ice applying to photography on many levels, but has much to do with fractured layers of distance between viewer and subject; “So I thought that looking into a photograph is like standing on black lake ice and looking down into the water beneath it” (2011). Elkins speaks at length about the surface of the image and its ‘optical feel’, claiming it is most often ignored in photographic theory, seen through like the surface of black lake ice.

The light of my eye is lost in the darkness on its way to the object. I can try to look *through* the water, and see the bottom, but its hopeless... There is no foothold, no certainty, no object. [...] The pane, and the world beyond the pane, fused. [...] Five layers, therefore, between invisible water and invisible air (Elkins, 2011).

The layers, between moving water and the still air above, speak beautifully about the unseen and crucial mediation between photographer and subject, as well as the viewer and photographed subject. With the works I began to create, I felt this same ‘layered distance’ between myself as a viewer, and the subjects I was shrouding in darkness. The subjects felt as if they were sinking into the darkness, becoming invisible: as though falling from the surface of Elkins ‘black lake ice’ and into the un-graspable darkness.

In his concluding statements of the chapter *Selenite, Ice, Salt* Elkins cast them as his “trinity of failed photographic windows”(2011). He considered looking for more photographic models and offered up several photographic practitioners whose work would have contributed to his purpose, but he explained he would be finding the same thing over and over, “These are all failed looks into or through something. In them, the world is fractured, folded, faint, undependable, invisible, more or less ruined” (Elkins, 2011).

Elkins accepts photography’s use as a means to create images of the social, emotional and political but asks:



Fig.22 Anonymous photographer. *Black Lake Ice, Lake Bonney, Antarctica*, c. 2005.

Where, exactly, is the photograph itself in all this romance and novelization? Where is the visual incident, the detail, the light, shade, shadow, depth, anything at all that would convince me these had to be photographs, and not film stills, paintings, memories, or hallucinations? And where, for that matter, is the matter of photography, the ground-level proof they are photographs? (Elkins, 2011)

In investigating the role of subject matter in photography, and upon reflection of Elkins' discussion of a photograph's capacity to reflect and critique photography, I found aid in one of my biggest obstacles. Crucial and problematic throughout my year of photographic experimentation was subject matter. In attempting to question and investigate photographic and corporeal perception I was going to have to point my camera at something. With renewed vigor, I went back to one of the most renowned photographic masters; Alfred Stieglitz.

Between 1925 and 1934 Stieglitz famously created a series of images entitled *Equivalents*. Distinctly abstract for the time, the works pioneered a new artistic function of photography. The work was born out of a response to literary and art critic Waldo Frank who accredited the success of Stieglitz's work to the "hypnotism he holds over his sitters" (Krauss, 1979). Stieglitz's mission was to prove that his photographs were not effective purely in the interaction with people or in the privilege of access to location, but that there could be great meaning created, devoid of complex, staged or controlled subject matter. "Clouds were there for everyone... free" (Krauss, 1979).

The photographs of the *Equivalents* series (one of which pictured fig.23) are evocative in their suggestion of freedom. They have been likened to musical expression (Krauss, 1979), and have a fluidity and tonal quality that exudes emotion purely from the natural form of the image. The lack of specificity in time, location and in some works, orientation, make them truly abstract and truly "equivalent to what was expressed" (Krauss, 1979).

Another photographer who has turned his camera to the sky, in order to focus on the medium itself is Ugo Mulas. As a part of his series named *Verifications* Mulas produced one film of pure sky. Mulas explains, "A clear cloudless sky without any landmark is an absurdity or a paradox" (Mulas, 1969). The series of works for *Verifications* made photography the subject and aimed to discover the intrinsic significance of the operations of photography.



Fig.23 Alfred Stieglitz. *Equivalent*, 1930.

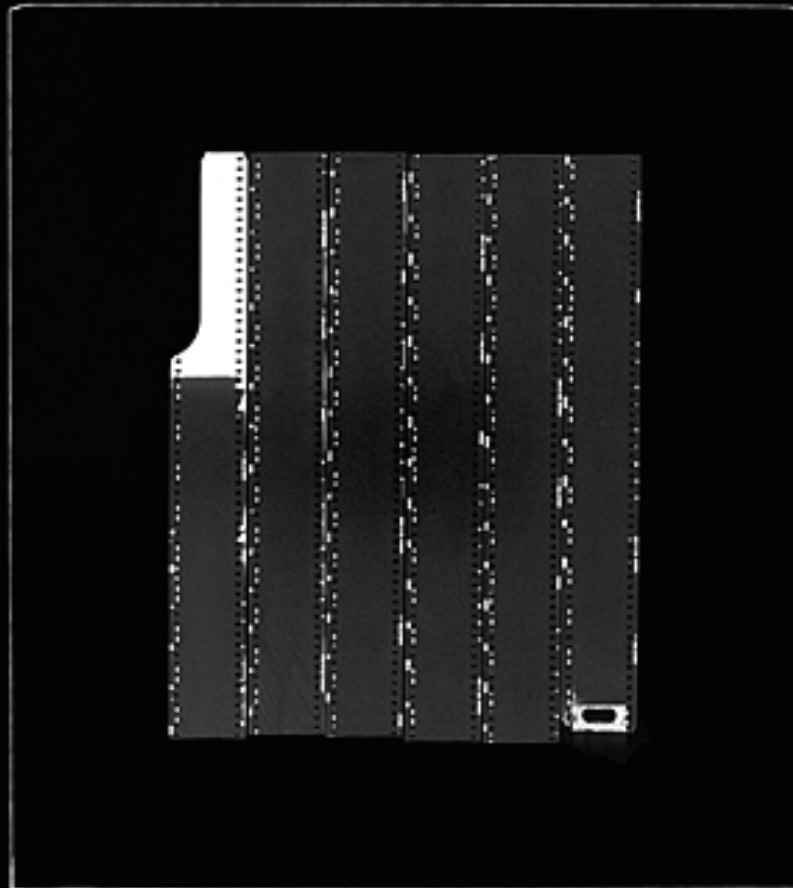


Fig.24 Ugo Mulas. *Omage to Niepce*, c. 1969.

Fig.24 shows Mulas' photograph titled *Homage to Niepce*, his first in the series. This image of photography's basic element, film, is described as a "token of gratitude, a way of rendering unto Niepce that which is Niepce's" (Mulas, 1969). The film had been processed but unexposed, leaving the frames transparent, representing "36 opportunities lost, or rather, 36 opportunities refused." This work offers contemplative ground for the process of photographing and the photographic process to be explored and questioned. It becomes a portrait of photography unlike any discussed so far, it is abrupt in its honest confrontation of the way that photography works - it represents nothing but itself.

My fascination with Elkins, Stieglitz and Mulas, stems from my own intention to create works concerned with an internal critique on the photographic medium. I want my work to speak of and question the medium in which they were created in the evocative way of Stieglitz's *Equivalence*, in the respectful way Mulas paid to the origins of photography, and in a way where Elkins could find 'photography' in the overall reading of my work.

THE OBSERVER IN SECOND POSITION

A Reflection On my Final Work

And so looking has a force: it tears, it is sharp, it is an acid. In the end, it corrodes the object and observer until they are lost in the field of vision. I once was solid, and now I am dissolved: that is the voice of seeing
(Elkins, 1996).

Illumination serves as an intermediary element between a person and their environment. In my work, darkness or lightness lies on the surface as a barrier between viewer and image. In presenting my work, I thought it vital that the space have enhanced 'optimal' lighting so that the interaction of viewer and photograph left no contest with the environmental lighting. The responsibility of seeing lies, as much as possible, in the eye's conversation with the constraints of the image.

I found my way into this project by following my curiosity about science; my first question was in finding out how we see. In this question I found out exciting scientific theory that informed my work directly, particularly in the initial stages. My initial reasoning for photographing a figure in the dark was because of the pattern seeking characteristic of vision, and the strong and isolated visual function of facial recognition. We are exceptionally good at finding and making faces, even out of abstract form or in near darkness (Rose, 2009).

As discussed earlier, it was James Elkins' 'black lake ice' metaphor that really attributed an exciting level of meaning to me in my dark portrait images. Although I had made a digital dark portrait work previously, this was in response to something wholly different. The intention of this work was to barely fix an image of a figure suspended in the dark, submerging or emerging into visibility. The dark tonal qualities distance the subject and viewer in a way that spoke of the mediated space of the photographic medium (fig. 25).

This image achieves the evocative sense I was striving to create in my work. With the matt surface, and life size scale, the viewer is able to have an interaction with the figure on a level where the photograph seems to hold him hostage in the dark. Where they are in the space with the viewer as an equal counterpart. This work aims to translate the experience of being in the dark, to provide an *Equivalent* experience for the viewer.

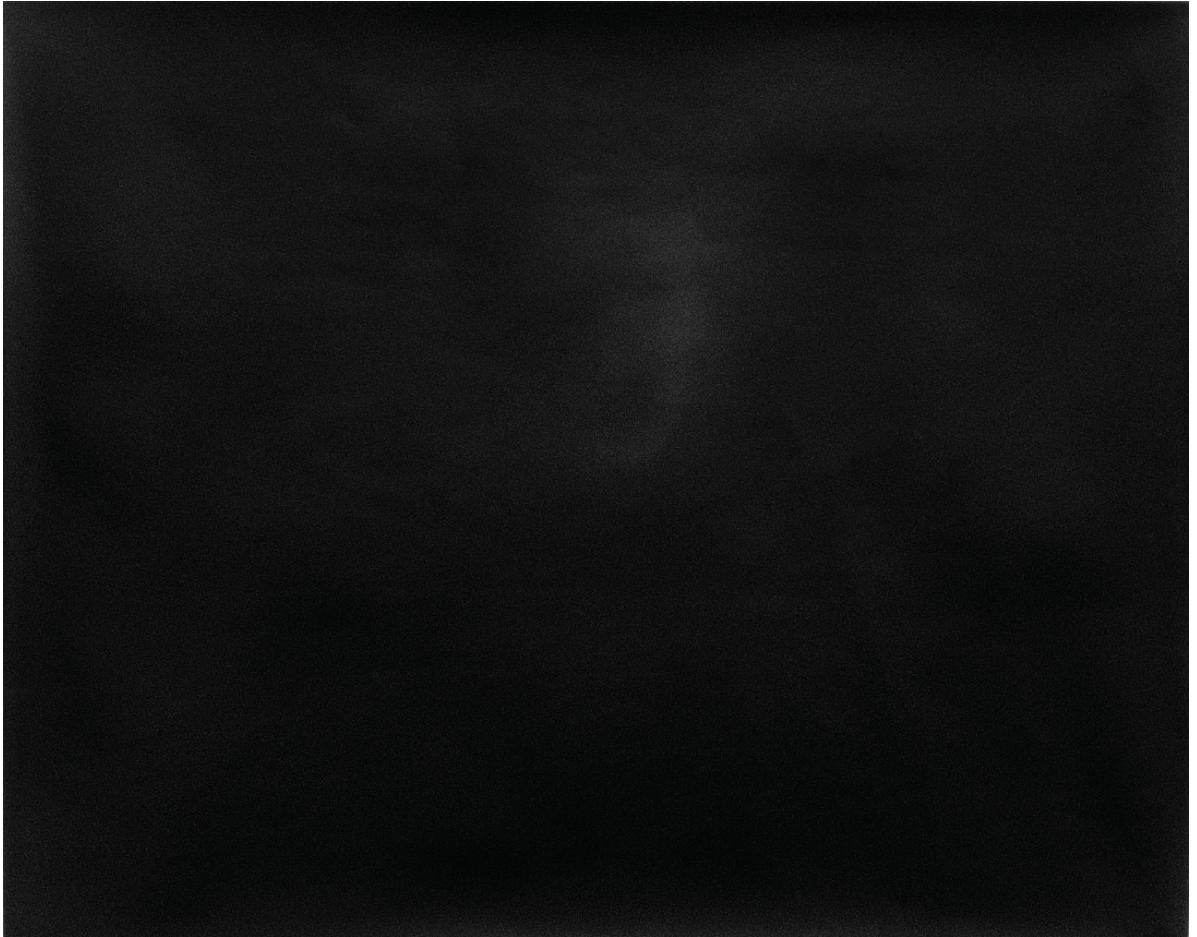


Fig.25 Documentation by Author. *Untitled*, 2012.

Following scientific theories and philosophical ideas of seeing, like so many have done before, I turned my camera to my environment. I was looking at the world as an observer: albeit one with a fresh perspective on the way the human eye sees the world, finding simple subjects that would provide important references to my discussion around photography and vision.

In his chapter *Images of Nothing* photographic theorist Ralph Gibson writes “The act of photographic perception is often most evident in a picture of a banal object, for here beauty adheres to the photographic object, more than to the original subject” (2006). I wanted the ‘normalness’ of subject matter in the observational works to make way for the photograph as a production of photography. In the way of Stieglitz’s clouds, these subjects (moon, sky, plant life) are free to be observed by anyone, they are non-specific to time or place.

In looking up, to the sky with moon, clouds or sun, I also had in mind that I was photographing the space that is the source of all light and life (fig.26 and fig.27). The sun brings the light and the moon and clouds sit in the sky bouncing even more light back at us. The sky for us is light play and has always been a space of habitual contemplation.

James Elkins draws the link importantly between photography and seeing stating “but for me photography is essentially not about art, society, or representation: I find seeing is essentially solitary, and photography is one of the emblems of that solitude” (2011). Again, Elkins’ words provided key inspiration in the creation of my work. The idea of the solitary experience of sight resonated within my thinking for my next work. I photographed small constructed cubes, in light materials and dark with the aim of creating photographs that would present an empty space filled only with light in its most intense and in its most fragile (fig.28 and fig.29). They would provide between them the spectrum of our limitations of perceiving light. Both are technically present on the paper, but one is so white it is beyond our capability to see fully, and one is so dark that only the mere outline is visible.

These photographic spaces aim to create a psychological space to question our interaction with light and darkness. The words of Elkins again go through my head:

You see into it as if into a thick deep darkness: you do not see a black surface like the wall of a room at night, but a place where light becomes weak, where it loses energy, slows, and dies in some viscous depth (Elkins, 2011).

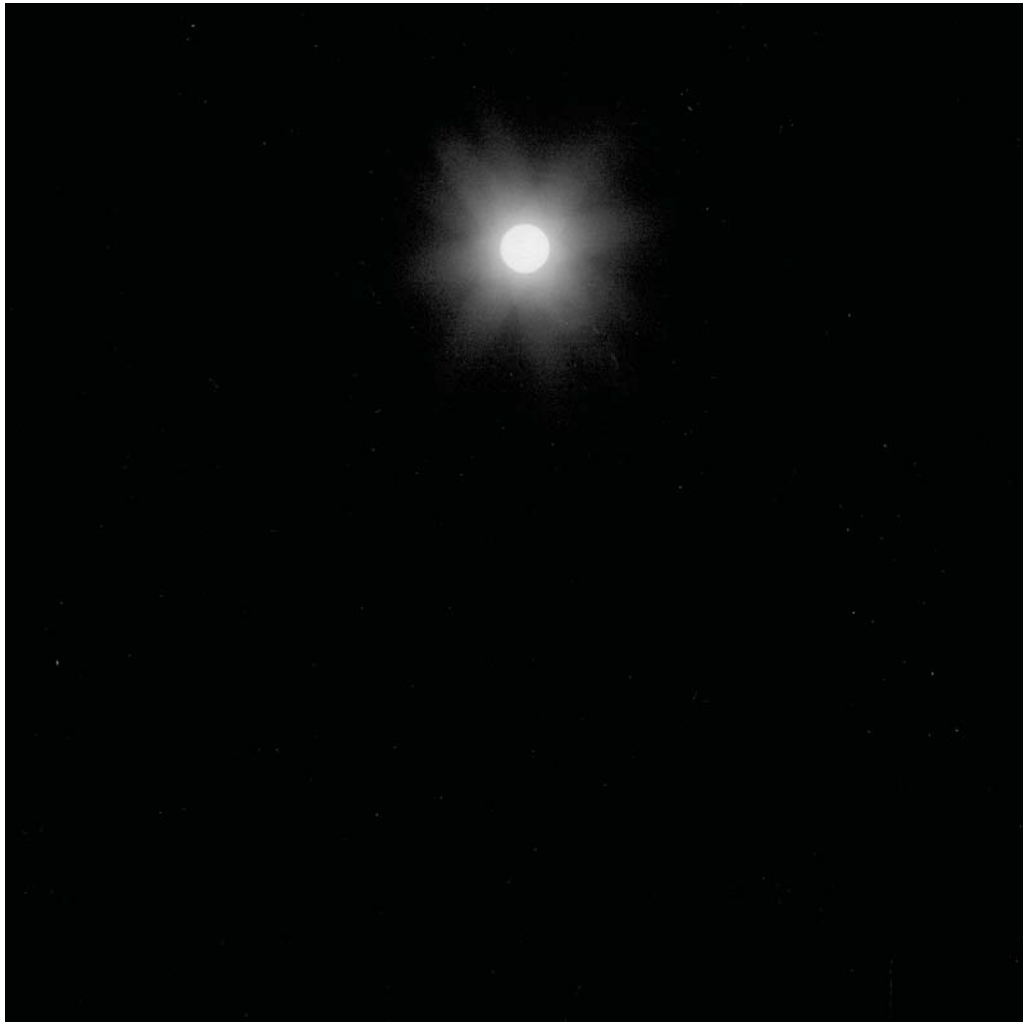


Fig.26 Image by Author. *Untitled*, 2012.

Fig.27 Image by Author. *Untitled*, 2012.

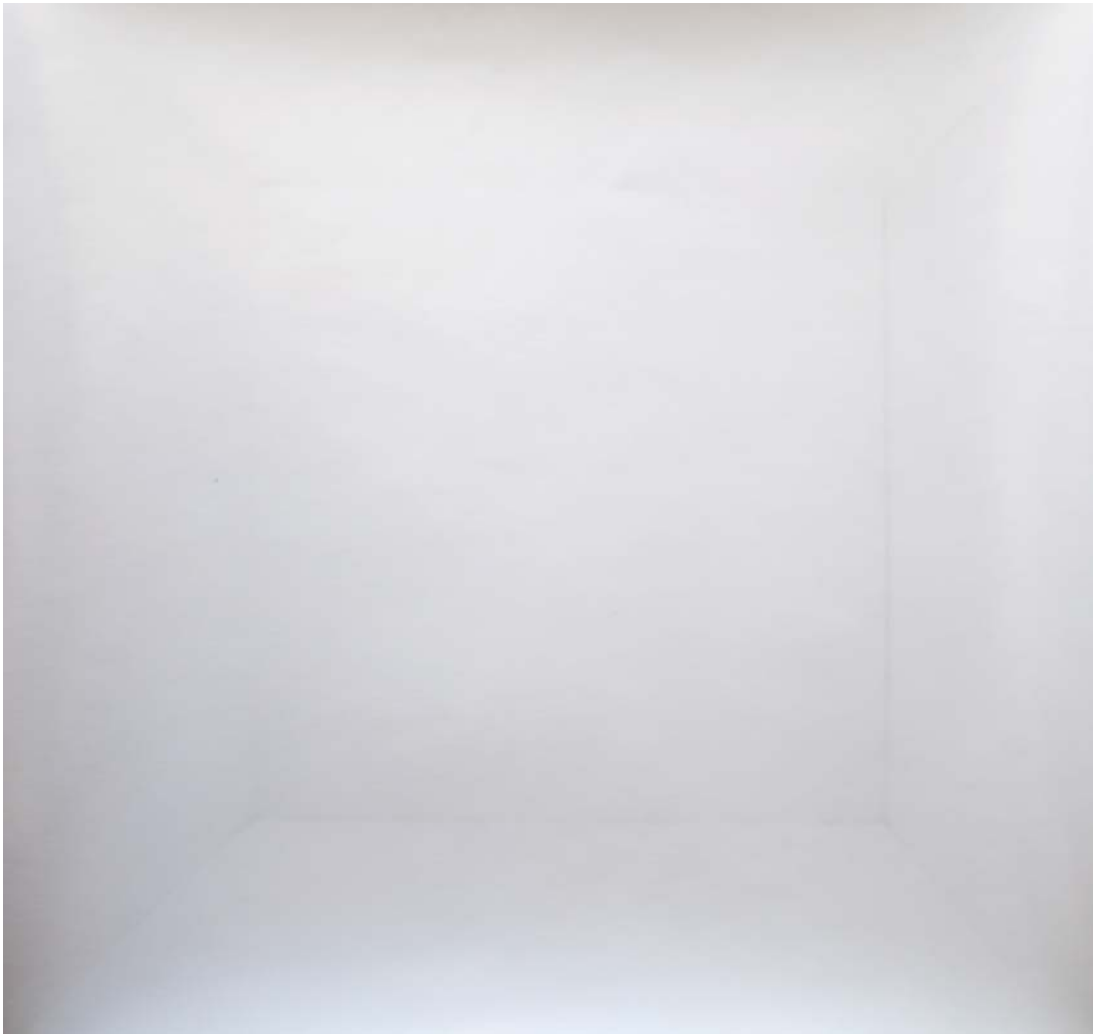


Fig.28 Documentation by Author. *Untitled*, 2012.



Fig.29 Documentation by Author. *Untitled*, 2012.

From the departure point of the illuminated spaces I created a new work conceptualized by combining scientific theory with key ideas from the epistemology of photography. In fig. 30, appearing obscurely within the dark solitary space, a plant cutting emerges. With this work I have paid homage to the work of early photography in both science and the arts. By creating this double exposed print I have isolated a percept held in the solitary space. This singling out of a subject or object for observation was done in a conscious effort to reference; firstly the hierarchy and constructive nature of vision, and secondly the processes of scientific investigation in the infancy of photography. Having this image work with, again, the intermediary layer of darkness further discusses the distance at which we stand from the knowledge of our own constructs of visual perception.

Examining the important relationship between roles of observer, photographer and photograph has resulted in a series of experimental works that interrogate perception in different ways. Working together as a body of images, examining the relationship of physiological, philosophical, and photographic questions of perception; these photographs are, at their most basic, observations of the world, made within our own fallible constructs of perception.

Throughout this thesis my practice has fed off the information found in various research avenues. My enquiry into how we see has become an in depth questioning of; the nature of seeing and its fragile relationship to the external world; the position photography plays in aiding and extending corporeal vision; and an experimentation with the photograph's function as an instrument of critique on perception. The questions asked here are very much for the sake of questioning. They are intrinsically unanswerable questions manifested in artworks. They offer grounds for reflexivity, and consideration of our sensitive interaction with the world.



Fig.30 Documentation by Author. *Untitled*, 2012.



Fig.31 Documentation by Author. *Untitled*, 2013.



Fig.32 Documentation by Author. *Untitled*, 2013.

IMAGE LIST

Figure 1 Image by author. *Right: Chubb_Jess_OD_9803_1_redfree*, 2012.

Figure 2 Image by author. *Adelson's Example Part One*, 2012.

Source image from: Rose, C. Filmed November 24, 2009. Posted December 2009.

Charlie Rose Brain Series: The Perceiving Brain. Charlie Rose Science and Health.

Retrieved from: <http://www.charlierose.com>

Figure 2.5 Image by author. *Adelson's Example Part Two*, 2012.

Source image from: Rose, C. Filmed November 24, 2009. Posted December 2009.

Charlie Rose Brain Series: The Perceiving Brain. Charlie Rose Science and Health.

Retrieved from: <http://www.charlierose.com>

Figure 3 Image by author. *Untitled*, 2012.

Figure 4 Dorothea Lange. *Migrant Mother*, 1936.

From: http://masters-of-photography.com/L/lange/lange_migrant_mother.html

Figure 5 Image by author. *Untitled*, 2012.

Figure 6 Herni Cartier-Bresson. *Behind Saint Lazare Station, Paris, France*, 1932.

From: http://www.masters-of-photography.com/images/full/cartier-bresson/cartier-bresson_9.jpg

Figure 7 Floris Neusüss. *Gewitterbild, Kassel*, 1984

From: <http://www.vam.ac.uk/users/node?page=219>

Figure 8 William Henry Fox Talbot. *Untitled*, c. 1839

From: Batchen, G. (2008). *William Henry Fox Talbot*. London ; New York: Phaidon.

Figure 9 Etienne Leopold Trouvelot. *Electric effluvia on the surface and circumference of a coin*, c. 1888

From: Keller, C. (2008). *Brought to light : photography and the invisible, 1840-1900*. San Francisco New Haven: San Francisco Museum of Modern Art ; In association with Yale University Press.

Figure 10 Marie-Jeanne Musiol. *Bodies of light installation, Montreal*, 1997.

From: <http://www.musiol.ca/2-3-en.php>

Figure 11 Marie-Jeanne Musiol. *Cranesbill*, c.1997

From: <http://www.musiol.ca/2-3-en.php>

Figure 12 Image by Author. *Untitled*, 2012.

Figure 13 Berenice Abbot. *Light and Shadow*, c. 1958

From: <http://www.newscientist.com/gallery/berenice-abbott/2>

Figure 14 Andrew Wright. *Coronae*, 2011

From: <http://www.andrewwright.ca/#/coronae/>

Figure 15 Andrew Wright. *Installation of Coronae*, 2011

From: <http://www.andrewwright.ca/#/coronae/>

Figure 16 Image by Author. *Untitled*, 2012.

Figure 17 Image by Author. *Untitled*, 2012.

Figure 18 Image by Author. *Untitled*, 2012.

Figure 19 Image by Author. *Untitled*, 2012.

Figure 20 Image by Author. *Untitled*, 2012.

Figure 21 Anonymous photographer. *A Selenite Window*, c.1927.

From: Elkins, J. (2011). *What photography is*. New York: Routledge.

Figure 22 Anonymous photographer. *Black Lake Ice, Lake Bonney, Antarctica*, c.

2005. From: Elkins, J. (2011). *What photography is*. New York: Routledge.

Figure 23 Alfred Stieglitz. *Equivalent*, 1930.

From: [http://www.masters-of-](http://www.masters-of-photography.com/S/stieglitz/stieglitz_equivalent_1930_full.html)

[photography.com/S/stieglitz/stieglitz_equivalent_1930_full.html](http://www.masters-of-photography.com/S/stieglitz/stieglitz_equivalent_1930_full.html)

Figure 24 Ugo Mulas. *Omage to Niepce*, c. 1969.

From: <http://www.ugomulas.org/index.cgi?action=view&idramo=1090232183&lang=eng>

Figure 25 Documentation by Author. *Untitled*, 2012.

Figure 26 Documentation by Author. *Untitled*, 2012.

Figure 27 Documentation by Author. *Untitled*, 2012.

Figure 28 Documentation by Author. *Untitled*, 2012.

Figure 29 Documentation by Author. *Untitled*, 2012.

Figure 30 Documentation by Author. *Untitled*, 2012.

Figure 31 Documentation by Author. *Untitled*, 2013.

Figure 32 Documentation by Author. *Untitled*, 2013.

REFERENCE LIST

- Barnes, M. (2010). *Shadow catchers : camera-less photography*. London: Merrell.
- Berger, J. (1972). *Ways of seeing*. London: Penguin Books.
- Clark -POEM
- Crary, J. (1992). *Techniques of the observer : on vision and modernity in the nineteenth century*. 3 - 35. Cambridge, Mass.: MIT Press.
- Daniel, M. (2000). William Henry Fox Talbot (1800–1877) and the Invention of Photography. *Heilbrunn Timeline of Art History*, 2012
- Elkins, J. (1996). *The object stares back*. Florida: Harcourt Inc.
- Elkins, J. (2011). *What photography is*. New York: Routledge.
- Gibson, R. (2006). *Refractions : thoughts on aesthetics and photography* (1st ed.). Göttingen: Steidl / MEP.
- Gregory, R. (1997). *Eye and Brain: The Psychology of Seeing*. Princeton, N.J: Princeton University Press.
- Grundmann, U., & Arnheim, R. (2001, April). *The Intelligence of Vision: An Interview with Rudolf Arnheim*. Retrieved March 23, 2012, from Cabinet Magazine: <http://www.cabinetmagazine.org/issues/2/rudolfarnheim.php>
- Hilsabeck, G. (2012, Scientific Method : Berenice Abbott at MIT.
- Huxley, A. (2010). *The doors of perception : And heaven and hell*: Random House.
- Keller, C. (2008). *Brought to light : photography and the invisible, 1840-1900*. San Francisco New Haven: San Francisco Museum of Modern Art ; In association with Yale University Press.
- Krauss, R. (1979). Stieglitz/"Equivalents". *Essays in honor of Jay Leyda, Winter*(Vol. 11), 129-140.
- Lewy, L. H. A. J. (2002). *Hormones, brain and behavior*: Academic Press.
- Liss, D. (2011). Andrew Wright : Coroneae, 2011, 2012, from <http://www.andrewwright.ca/#/coroneae/>
- Lotto, B. Filmed July, 2009. Posted October, 2009. *Beau Lotto : optical illusions show how we see*. Ted Talks. Retrieved from http://www.ted.com/talks/beau_lotto_optical_illusions_show_how_we_see.html
- McLuhan, M. (2008). *Understanding media : the extensions of man*. New York: Routledge.
- Marsh, A. (2003). *The Darkroom: Photography and the Theatre of Desire*. Melbourne,

Australia: Macmillan.

Mulas, U. (1969). omage to Niepce. *Verifications*, 2012, from
<http://www.ugomulas.org/index.cgi?action=view&idramo=1090232974&lang=eng>

Ouellette, P. F. (2012). Marie-Jeanne Musiol, 2012, from
http://www.pfoac.com/artists/MJM_EN.htm

Rose, C. Filmed November 24, 2009. Posted December 2009. *Charlie Rose Brain Series: The Perceiving Brain*. Charlie Rose Science and Health. Retrieved from
<http://www.charlierose.com>

Wells, L., & Standing, S. (Eds.). (2005). *Surface : land/water and the visual arts*. Plymouth, U.K.:
University of Plymouth Press.

BIBLIOGRAPHY

- Abbott, B., Kurtz, R., Van Haaften, J., & Durant, J. (2012). *Documenting science* (1st ed.). Göttingen: Steidl.
- Ackerman, D. (1995). *A Natural History of the Senses*. New York: Vintage Books.
- Barnes, M. (2010). *Shadow catchers : camera-less photography*. London: Merrell.
- Barthes, R. (1981). *Chambre claire* (1st American ed.). New York: Hill and Wang.
- Batchen, G. (1997). *Burning with desire : the conception of photography*. Cambridge, Mass.: The MIT Press.
- Batchen, G. (2008). *William Henry Fox Talbot*. London ; New York: Phaidon.
- Bate, D. (2009). *Photography : the key concepts* (English ed.). Oxford ; New York: Berg.
- Berger, J. (1977). *Ways of Seeing*. London, England: Penguin Books.
- Brilliant, R. (1991). *Portraiture*. Cambridge, Mass.: Harvard University Press.
- Carter, R. (1998). *Mapping the Mind*. Los Angeles, California, USA: University of California Press.
- Cotton, C. (2009). *The photograph as contemporary art* (New ed.). London: Thames & Hudson.
- Crary, J. (1992). *Techniques of the observer : on vision and modernity in the nineteenth century*. 3 - 35. Cambridge, Mass.: MIT Press.
- Daniel, M. (2000). William Henry Fox Talbot (1800–1877) and the Invention of Photography. *Heilbrunn Timeline of Art History*, 2012
- Edgerton, S. Y., & Edgerton, S. Y. R. r. o. l. p. (2009). *The mirror, the window, and the telescope : how Renaissance linear perspective changed our vision of the universe*. Ithaca: Cornell University Press.
- Elkins, J. (1996). *The object stares back*. Florida: Harcourt Inc.
- Elkins, J. (2007). *Photography theory*. London: Routledge.
- Elkins, J. (2011). *What photography is*. New York: Routledge.
- Ennis, H. (2007). *Reveries : photography & mortality*. Canberra, Australia: National Portrait Gallery.
- Ess, B., & Cunningham, M. (2001). *I am not this body*. New York: Aperture.
- Ewing, W. A., & Herschdorfer, N. (2010). *reGeneration 2 : tomorrow's photographers today*. London: Thames & Hudson.

- Fried, M. (2008). *Why photography matters as art as never before*. New Haven: Yale University Press.
- Fuss, A., & Kellein, T. (1997). *Adam Fuss*. Cologne: Verlag der Buchhandlung Walther König.
- Gibson, R. (2006). *Refractions : thoughts on aesthetics and photography* (1st ed.). Göttingen: Steidl / MEP.
- Godman, L. (2003). *When light turns to dust*. Dunedin, N.Z. : Foto-synthesis Digital Pub.
- Gombrich, E. H. (1995). *Shadows : the depiction of cast shadows in western art*. London: National Gallery Publications : distributed by Yale University Press.
- Gregory, R. (1997). *Eye and Brain: The Psychology of Seeing*. Princeton, N.J: Princeton University Press.
- Groom, A. (2012). There's nothing to see here: Erasing the Monochrome. *e-flux*, 2012, from <http://www.e-flux.com/journal/there's-nothing-to-see-here-erasing-the-monochrome/>
- Grundberg, A. (2010). *Crisis of the real : writings on photography*. New York London: Aperture ; Thames & Hudson distributor.
- Grundmann, U., & Arnheim, R. (2001, April). *The Intelligence of Vision: An Interview with Rudolf Arnheim*. Retrieved March 23, 2012, from Cabinet Magazine: <http://www.cabinetmagazine.org/issues/2/rudolfarnheim.php>
- Hendrix, J., & Carman, C. H. (2010). *Renaissance theories of vision*. Surrey, U.K., England ; Burlington, Vt.: Ashgate.
- Hilsabeck, G. (2012, Scientific Method : Berenice Abbott at MIT.
- Hlobeczy, N. (2005). *A presence behind the lens : photography and reflections*. Prescott, Ariz.: Hohm Press.
- Honey. (2011, December 23). *Devorah Sperber*. Retrieved February 22, 2012, from Sweet Station: <http://sweet-station.com/blog/2011/12/devorah-sperber/>
- Hoogland Ivanow, M. (2008). *Far too close*. Göttingen London: Steidl ; Thames & Hudson distributor.
- Huxley, A. (2010). *The doors of perception : And heaven and hell*: Random House.
- Jäger, G., Krauss, R. H., & Reese, B. (2005). *Concrete photography = Konkrete Fotografie*. Bielefeld: Kerber.
- Keller, C. (2008). *Brought to light : photography and the invisible, 1840-1900*. San Francisco New Haven: San Francisco Museum of Modern Art ; In association with Yale University Press.
- Krauss, R. (1979). Stieglitz/"Equivalents". *Essays in honor of Jay Leyda, Winter*(Vol. 11), 129-140. <http://www.ugomulas.org/index.cgi?action=view&idramo=1090232974&lang=eng>
- Levey, M., & Lloyd, J. (1984). *Thinking in the photographic idiom : a book of perceptual exercises*. Englewood Cliffs, N.J.: Prentice-Hall.

- Lewy, L. H. A. J. (2002). *Hormones, brain and behavior*: Academic Press.
- Liss, D. (2011). Andrew Wright : Coroneae, 2011, 2012, from <http://www.andrewwright.ca/#/coroneae/>
- Lotto, B. Filmed July, 2009. Posted October, 2009. *Beau Lotto* : optical illusions show how we see. Ted Talks. Retrieved from http://www.ted.com/talks/beau_lotto_optical_illusions_show_how_we_see.html
- MacGregor, A. (2007). *Curiosity and enlightenment : collectors and collections from the sixteenth to the nineteenth century*. New Haven: Yale University Press.
- Mannoni, L., Nekes, W., & Warner, M. (2004). *Eyes, lies and illusions : the art of deception*. London Aldershot, Hampshire: Hayward Gallery Publishing ; Lund Humphries.
- McLuhan, M. (2008). *Understanding media : the extensions of man*. New York: Routledge.
- Marsh, A. (2003). *The Darkroom: Photography and the Theatre of Desire*. Melbourne, Australia: Macmillan.
- Modrak, R., & Anthes, B. (2011). *Reframing photography : theory and practice*. London New York: Routledge.
- Mulas, U. (1969). homage to Niepce. *Verifications*, 2012, from
- Nairne, S., & Howgate, S. (2006). *The portrait now*. London: National Portrait Gallery.
- Ouellette, P. F. (2012). Marie-Jeanne Musiol, 2012, from http://www.pfoac.com/artists/MJM_EN.htm
- Prosser, J. (2004). *Light in the dark room : photography and loss*. Minneapolis, MN: University of Minnesota Press.
- Ritchin, F. (2009). *After photography* (1st ed.). New York: W.W. Norton.
- Rose, C. Filmed November 24, 2009. Posted December 2009. *Charlie Rose Brain Series: The Perceiving Brain*. Charlie Rose Science and Health. Retrieved from <http://www.charlierose.com>
- Rose, C. Filmed September 5, 2011. Posted November 2011. *Charlie Rose Brain Series Episode Twelve: Creative Brain*. Charlie Rose Science and Health. Retrieved from <http://www.charlierose.com>
- Rothenstein, J. (2011). *The Redstone book of the eye : a compendium of visual surprise*. London: Square Peg.
- Rutenberg, L., & Leeson, R. (2009). *The English garden at night*. London: Thames & Hudson.
- Rutherford, E. (2009). *Silhouette : The art of the shadow*. New York: Rizzoli International Publications, Inc.
- Seckel, A. (2004). *Masters of Deception: Escher and the Artists of Optical Illusion*. New York: Sterling Publishing Co.

- Shermer, M. Filmed February, 2006. Posted November, 2006. Michael Shermer : Why people believe weird things. Ted Talks. Retrieved from http://www.ted.com/talks/michael_shermer_on_believing_strange_things.html
- Shields, D. (2010). *Reality hunger*. London: Penguin Books.
- Sollins, S., Dowling, S., Tatge, C., Shaffer, D., Art, I., & Public Broadcasting Service. (2003). Art 21 video recording : art in the twenty-first century. Seasons one and two. United States Alexandria, Va.: Art21 Inc. ; Distributed by PBS Home Video.
- Thompson, J. L. (2003). *Truth and photography : notes on looking and photographing*. Chicago: Ivan R. Dee.
- Travis, D. (2003). *At the edge of the light : thoughts on photography & photographers, talent & genius* (1st ed.). Boston: David R. Godine.
- Turner, P., & Badger, G. (1988). *Photo texts*. London: Travelling Light.
- Unna, U. S. K. (Ed.). (2009). *James Turrell : Geometry of light*. Ostfildern: Hatje Cantz Verlag.
- Weibel, P. o., Jansen, G., & Beitin, A. (2006). *Light art from artificial light : light as a medium in 20th and 21st Century Art*. Ostfildern London: Hatje Cantz ; Art Books International distributor.
- Wells, L., & Standing, S. (Eds.). (2005). *Surface : land/water and the visual arts*. Plymouth, U.K.: University of Plymouth Press.
- West, S. (2003). *Portraiture*. Oxford: Oxford University Press.



MASSEY UNIVERSITY
GRADUATE RESEARCH SCHOOL

Declaration Confirming Content of Digital Version of Thesis

I confirm that the content of the digital version of this thesis

Title: Sight Unsound: An enquiry into our relationship with our perceived reality.

is the final amended version following the examination process and is identical to this hard bound paper copy.

Have you included published articles/material from your thesis?

Yes / ☒ No

If yes, have you received copyright permission from the copyright holder (usually the publisher) to include this material with your thesis?

Yes / No

Student's Name: Jessica Chubb

Student's Signature:

Date: 29/03/13