

## Image in the age of entanglement

Contextual Studies

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Extract:

Photography discourse is littered with opposing statements such as 'photography is more important than ever', or else it might be 'dead and irrelevant'. Are proclamations such as these becoming as questionable as the West's mechanistic view of reality, which arguably tends to foster such binarised positions? If the West's historical paradigm dominated by isolated objects, people, and places spread across the planet and universe were receding, and instead, reality increasingly perceived as emergent, dynamic, multi-dimensional, and rhizome-like, how would photography fare?

Drawing on Karen Barad's agential realism, a synthesis of quantum science and poststructuralism, the ensuing discussion results in more questions than answers. The challenge is compounded because we are also invariably constrained by a "Cartesian habit of mind" (Barad, 2007:49) which informs our imaginations, language and academic conventions. Barad's phenomenologically informed philosophy urges us to review our ethical relationship with the universe. Their thesis challenges boundaries we assumed were fixed, including those photography has relied upon to promote itself even when claiming to challenge the status quo. While describing some tenets of agential realism, focusing in particular on the phenomenological nature of existence and Barad's use of the word entanglement, work by a variety of practitioners is examined in an effort to make sense of apparently contradictory statements by well-regarded and oft-quoted theorists about the photographic image today. How can Michael Fried's (2008) assertion, photography matters as art as never before remain valid alongside Daniel Palmer's (2014:144) statement, photography as we once knew it is practically over? Could both be true simultaneously in an entangled world? Will photography escape its Cartesian origins as it evolves into 'image-making' in a digital universe? The possibilities undoubtedly demand a deeper discussion than the stipulated 5000+/- word limit allows for, however, the paradigm described above presents image-makers of all persuasions with conundrums that increasingly cannot and should not be ignored.

"As the twenty-first century unfolds, it is becoming more and more evident that the major problems of our time – energy, the environment, climate change, food security, financial security – cannot be understood in isolation. They are systemic problems, which means that are all interconnected and interdependent. Ultimately, these problems must be seen as different facets of one single crisis, which is largely a crisis of perception. It derives from the fact most people in our modern society, and especially large institutions, subscribe to the concepts of an outdated worldview, a perception of reality inadequate for dealing with our overpopulated, globally interconnected world."

*The Systems View of Life*

Fritjof Capra and Pier Luigi Luisi

2014

"The camera makes reality atomic, manageable, and opaque. It is a view of the world, which denies interconnectedness...."

On Photography  
Susan Sontag  
1977 (2008)

"...the deeper truth is, we are changing. Our behaviours and expectations are changing."

New Power  
Jeremy Heimans and Henry Timms, 2018

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*Table of Contents*

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	<i>Page Number</i>
Introduction: Reconfiguring language for a reconfigured reality	1
Part One: A relational universe	5
i) Intra-action between entangled entities	6
ii) Agential cutting in an entangled world	9
iii) Indeterminism	15
Part Two: Entanglement	19
Conclusion: Possibilities	28
List of illustrations	31
Bibliography	33
Appendix	38
i) Caution and criticism from and/of Barad and Deleuze	38
ii) A short glossary of terms	40
iii) Data as matter	41
iv) Writing in the first person and objectivity	41

Please note: Pronouns are *he/she* except where I am aware that the person being discussed prefers *they/their*.

## Reconfiguring language for a reconfigured reality

"We are suspended in language in such a way that we cannot say what is up and what is down."

Niels Bohr, 1934

★★

We engage with images every day. They are indispensable and ubiquitous. Pictures no longer exist within our reality; they are integrally a part of it – as are you – as am I.

Daniel Palmer (2014:144), however, begins an essay by telling us, "photography as we once knew it is all but over." He describes the Henri Cartier-Bresson type as "marginal" (ibid) but concedes it will continue to be celebrated. That is quite different to Michael Fried's 2008 title, *Why Photography Matters as Art as Never Before*. Although, perhaps not as damning as James Elkins' comment, photography is possibly "a bit boring" (2011: loc 1708). Conversely, Daniel Rubinstein and Andy Fisher (2013:13), in *On the Verge of Photography: imaging beyond representation*, tell us, "...photography is only just beginning to arrive." How do we reconcile that with Ariella Azoulay's (2018a) radical suggestion that photography emerged when Columbus and colleagues set sail for the Americas?

This essay is not an attempt to explain the contrarian statements above. Instead, it explores how and why such opposing statements exist in the same world, and applies to image-making across genres produced by professionals and amateurs alike; by anyone making pictures which involves/ed some form of light capture in the process. However, the analysis is specifically aimed at lens-based artistic practitioners, who today often incorporate both moving and still images. After a sustained divergence following the discovery of storing and fixing light, the alternative paths of photographs and film are converging and coalescing – becoming an entanglement of image-making practices. Variances between stills and

movies are less of a concern than they once were, as photographs, graphics, gifs, cinemagraphs and video are, to all intents and purposes, interchangeable on social media, underpinned by code which negates difference between mediums: "inside a computer, everything becomes number" (Kittler, 1999:1). Perhaps it is that fluidity which gives credence to Rubinstein and Fisher's (2013:13) suggestion, image-making encapsulates the "instantaneity, simultaneity and multiplicity" of our time, the "site at which contemporary subjectivity is being formed and deformed"(Ibid).

Therefore, the implications of this discussion go beyond the gallery wall, beyond image-making, relevant to politics, education, economics, science, culture, all of modern life.

### A quantum influence and questions around Cartesian certainty

Quantum science underpins today's technology. Its presence has profoundly influenced modern inventions including CDs, the Internet, flat-screens, smartphones, semiconductors, lasers and beyond (Barad, 2007: 252). That patently does not mean we are living in a world with rules that only apply in quantum models – note I use the word 'model' rather than scale. However, it does imply that quantum-influenced ideas have seeped into our expectations of reality as we integrate with technology and internalise its patterns and behaviours.

Agential realism<sup>1</sup>, coined by Karen Barad (b. 1956), physicist, humanities lecturer, and author of *Meeting the Universe Halfway: Quantum physics and the entanglement of matter and meaning* (2007) marries quantum science and its philosophy to poststructuralism. Barad (2007:249) argues poststructuralist concepts correspond with what we have learned about the fundamental mechanics of reality. Furthermore, Western assumptions are threatened by the science. In particular, I focus on two aspects of Barad's work: absolute commitment to a phenomenological reality and their use of the word entanglement.

### Barad and Neils Bohr

Barad asks us to consider critical tenets of quantum mechanics beyond the confines of the laboratory, applying physics philosophy more broadly. It is not meant

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<sup>1</sup> Agential realism is a branch of New Materialism, a philosophy associated with posthumanism and the deconstruction of dualistic thought (Sanzo, 2018).

as mere analogy. Barad (2007:97) states the physics undermines representationalism and therefore the separation of “words, knowers and things”. Such ideas are not embraced in all corners of traditional Western academia (Fig. 1). However, Barad is not entirely alone, citing the grandfather of quantum mechanics, Neils Bohr (1885-1992), throughout:

“Bohr’s philosophy clearly contests the Cartesian (inherent, fixed, unambiguous) subject-object distinction in a way that undermines the very foundations of classical epistemology and ontology” (2007:125).

Nevertheless, scientists take issue with what they regard as “scaling up” from micro to macro and are concerned about reductive conclusions, oversimplification or what they insist can only ever be analogy (Hollins et al., 2017:23). They may tell us “quantum forces are not relevant to our experience of the world” (Woodward, 2020). Such detractors miss the poststructural argument Barad weaves.

Quantum research is teeming with vigorous debate but even so, it is hard to understand how anyone studying the world today remains unaware of the pressure the Cartesian/Newtonian/mechanistic view of reality is under. That said, Barad (Ibid: 49) acknowledges it takes enormous effort [for Westerners] to un-see existence as a Cartesian puzzle. Regardless, global upheaval suggests we may be navigating, albeit tumultuously, towards a reconfigured view of reality<sup>2</sup>; one that potentially erases deeply entrenched barriers between groups of all sorts, including disciplines. Obstacles are compounded because the vocabulary, syntax, imagination and associated subjectivity, which allows such a discussion, are alien, or not yet formed.

Are Rubinstein and Fisher, Palmer, Elkins, and Fried all writing about the same thing? That is, addressing how we see, and value what we see in a world that seems more entangled, less mechanistic than it once did – even Fried, who fetishes the object. To find out, in Part One I deliver a whistle-stop tour of some key Baradian phrases (by no means exhaustive) used to describe Barad’s interpretation of entanglement - explored more widely in Part 2 where image-making is examined under Barad’s phenomenological lens.

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<sup>2</sup> In Systems Theory systemic change tends to be chaotic as the process of development and transformation while new systems emerge often gathers pace once separate elements in the system collectively allow it to, developing faster and faster in a complex ballet of self-organisation (Capra and Luisi, 2014).



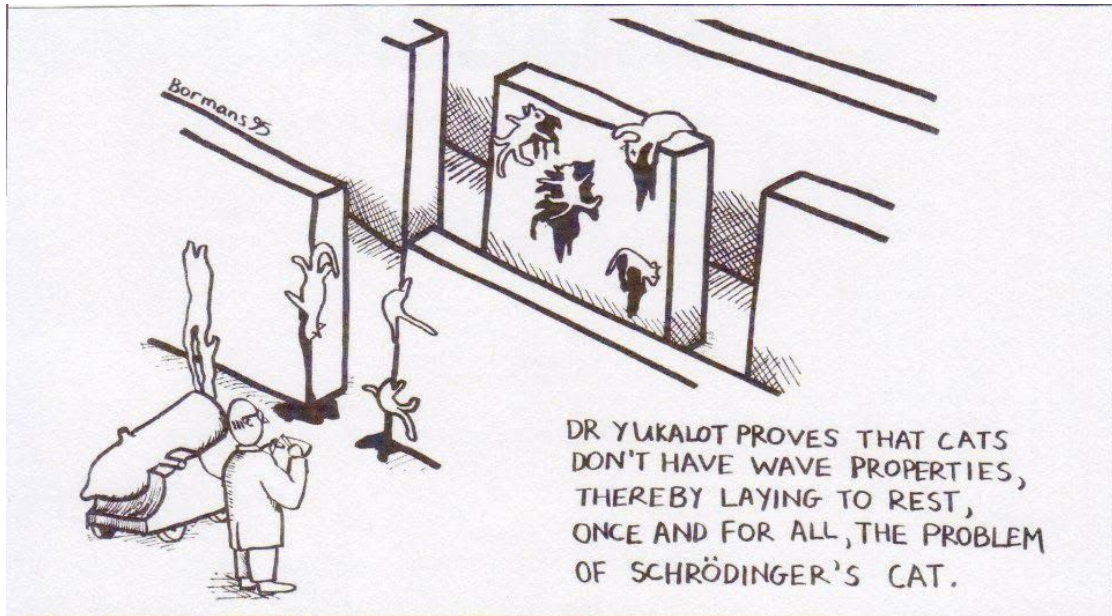


Figure 1. Bormans (1995) Schrödinger's Cat

## A relational universe

"The separation of epistemology from ontology is a reverberation of a metaphysics that assumes an inherent difference between human and non-human, subject and object, mind and body, matter and discourse."

Karen Barad, 2007

Agential realism provides us with a model that has the potential to undo patterns of perception so ingrained they are challenging to acknowledge, never mind address. It rejects the traditional categorisation of objects, separation between mind and body, matter and discourse, human and all other life (Barad, 2007:185). Agential realism does not provide the only doorway, but it emerges from quantum science research, which has had a significant influence over contemporary technology, including image-making apparatus. It also draws on traditions which photography academia is familiar with – poststructuralism and critical theory – making it an appropriate place to start. Barad asks us not to undervalue poststructuralism, especially as it deconstructs and critiques power and advocates for agency. An analysis of power lies at the core of Barad's work:

"Poststructuralism... is not just some high-tech toy that humanities scholars use to entertain themselves. Poststructuralist approaches aim to take seriously the concerns of the 'motley crew', while offering alternative understandings of power and subject formation... including an examination of the constitutive effect of exclusions" (Barad, 2007:59).

Barad references several poststructural theorists, including Jacques Derrida (1930 - 2004) and Michel Foucault (1926 - 1984). Of particular interest here is Giles Deleuze (1925-1995) who formulated the idea of the rhizome – an entanglement of bodies and structural flow, and rejected the idea of a separate Utopian plane (nature) waiting to be represented. For him, there is no being; there is only becoming. In Deleuze's rhizome and Barad's agential realism, meaning arises out of

an interwoven dance between material and discursive practice, not as something imposed upon reality, nor separated from the physical world. Meaning and matter exist in a ballet of constant becoming. It is emergent. The following passages explore agential concepts and neologisms coined by Barad to better communicate that view:

i. Intra-action between entangled entities

Scientist Carlo Rovelli (2017:100) goes to great lengths to describe quantum science to general readers and explains how the cornerstone of quantum physics is that it is relational and particles only ever “materialise when they interact.” Barad (2007:100), however, says the word ‘interact’ does not do justice because relationships operate inside and outside of particles, often simultaneously; the word intra-act is more accurate. Intra-action expresses enmeshment and constant movement between the inside and out, a negation of separation. We should envisage reality as a continuous, shifting, malleable, buzzing process uninhibited by the boundaries we humans perceive.

Digital material used by artists can make the idea of intra-action overtly visible, either through animation or when viewers can alter an artwork in some tangible way, and we witness the effects of our relationship immediately. However, still photography is also an intra-active medium. In a still photograph, meaning fluctuates and alters depending on its relationship with time and place and an observer (maker, audience, human, non-human).

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Figure 2. © Muholi Z. (2019) *Buhlalu I* (From ongoing series *Somnyama Ngonyama* – 'Hail the Dark Lioness')

I might have used any image from the canon of well-known, traditionally referenced photographers like Berenice Abbot, Robert Frank, or maybe Larry Sultan for this example to prove a point (and did in earlier drafts). Kember and Zylinska (2012:71), in *Life After New Media: life as a vital process*, write photography is "most readily associated with representationalist ambitions." But they suggest representationalist objects should be considered intra-active despite apparent limitations, and we do not necessarily need to reject photographic images simply because they are analogue or frozen. In South African Zanele Muholi's ongoing work (Fig. 2), the intra-active and entangled narrative referencing colonial history, racism, fashion, gender politics and the history of photography and its apparatus is made all the more potent due to the irony of embracing a medium with a colonialist history to highlight its complicity. Images from *Somnyama Ngonyama* are not simply photographs of a black woman. Muholi's work is made with the medium arguably responsible for the creation of an "image of whiteness" - a term adopted recently by Daniel C Blight (2019) while drawing on Stuart Hall's (Ibid, citing Hall, 1990:7-23) critique of the "white eye". We will touch on related aspects of this in Part 2.

Muholi is playing with history and discourse manifested materially through images, but tangible alterations to physical material itself, which come about inevitably through time, lead to visible signs of entropy and make historical intra-action explicit. Artists might choose to emulate or disrupt time by intervening in some way: with cutting, pasting, adding, constructing, deconstructing, or focusing on the decay of the object, rather than, or in conjunction with original content.

Michael Subotzky (Fig 3) is another South-African attempting to deal with the colonialist history that has had such an ongoing impact on the country he lives in. He "*Dismantles Depictions of White [capitalism's] 'Founding Fathers'*" (Harris and Subotzky, 2020) in *Gangsta Series*, where he deconstructs images of mythologised Western figures (Ibid). Subotzky uses banal objects like Sellotape and glue to transform images, undermining their subjects' status as untouchable. Again there is irony as such ordinary objects typically make things stick, and he is aiming to 'unstick' what has been fixed for some time.

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Figure 3. Subotzky M. (2020) Subotzky working on *Edmonia Lewis (American, 1845–1907)* [Photograph] © Mikhael Subotzky | Magnum Photos

However, as photographers know, sequencing images rather than altering their material structure also informs meaning. Sohrab Hura's edit in *The Coast* (2019) is a high-energy example, where repetition and constant alternative juxtapositions result in a dramatic non-linear narrative. The book contains many photographs; each is reproduced at least twice, predominantly on the same pagination side but alongside a different image from its previous iteration, frolicking with Walter Benjamin's (1892 - 1940) critique of reproduction and prompting questions about context and the relational nature of meaning. The result is a plaited weave of syntagmatic possibilities, which I found disorientating, never sure if there were two

or three iterations. The repetition moves us forward as we might expect, but simultaneously, also edges it steadily backward, perhaps echoing the way civilisations develop and scientific discovery unfolds.

We are told in a review the artist's intention was to show us how "realities are increasingly being engineered today" (Clausing, 2019). Hura ends up showing us how all-important context is, whether engineered or accidental, integral to a reality that is an ongoing, dynamic becoming of intra-active relations (Barad, 2007; Rovelli, 2017:115).

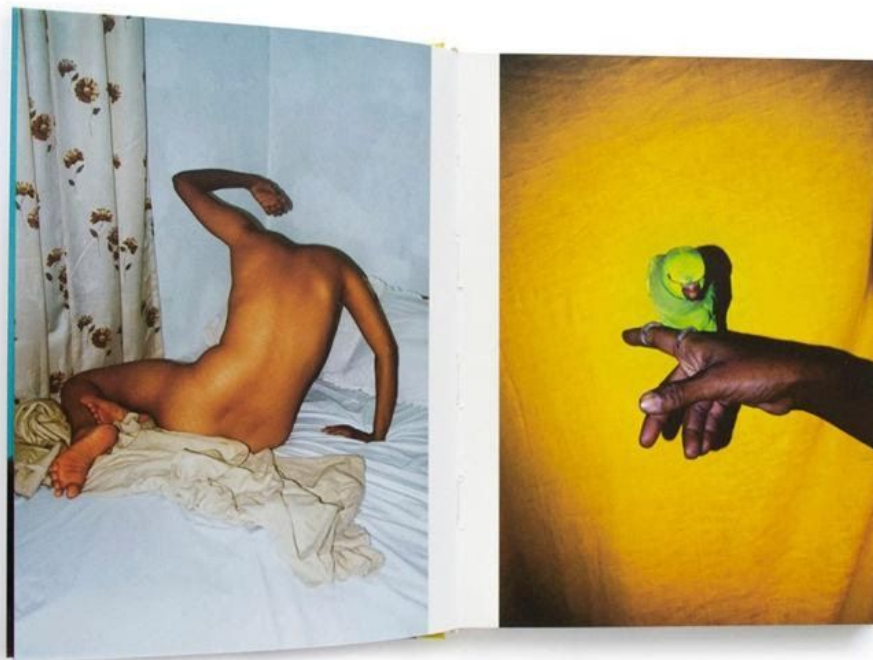


Figure 4. Hura S. (2019) *The Coast* [Photograph] Reproduced here with permission from the artist.

## ii. Agential cutting in an entangled world

If a Cartesian cut severs, then an agential cut is instead an intra-active ongoing editing process, in which editor, film, and editing equipment are all enmeshed agents: forming and reforming elements of the reality they are each a part of and continually making. Barad repeatedly reminds us how quantum experiments demonstrate we are not external observers but inherently part of the phenomena we observe. We should also avoid thinking of ourselves as objects inside a reality that shapes and determines who and what we are, leaving us without volition. We have agency, also critical for the poststructuralists. Nor are social

structures fixed. As agents, we are instrumental, fluid elements in a “dynamic ever-changing typology” (Barad, 2007:177); pattern cutters woven into the abundance of material (information) available to us, potentially enmeshed, while simultaneously being cut intra-actively by it, and what we make of it.

Donna Haraway, another name who features in Barad’s work and others also influenced by agential realism, describes human beings as compost “intertwined in a rich, dense matter in which boundaries between objects cannot be distinguished” (Haraway and Franklin, 2017:50 cited in Lupton, 2019:26). Such a concept is not easy for us to embrace. Enmeshment is a pejorative term in couples counselling, for example. It is distasteful, unhealthy and possesses something of Julia Kristeva’s abjection. Deborah Lupton (2019: 57), in her book about data and humans, writes:

“The abject is that human or non-human thing that arouses feelings of discomfort and disgust because it flouts cultural boundaries such as those routinely defined between human/non-human, Self/Other, female/male and inside/outside. In people’s efforts to conceptually contain their bodies/selves to achieve the modern Western ideal autonomy and individuation, they seek to expel the abject from their bodies/selves to try to make themselves clean, pure and bounded.”

Lupton argues recording and storing data about our sleep, exercise and diet are examples of agential cutting: we are actively choosing enmeshment with technology – cutting to incorporate what we might once have deemed otherness, demonstrating a changed world where, under some circumstances, enmeshment with technology has been embraced<sup>3</sup>. For Kember and Zylinska (2012:91-95), creating imagery is also a form of agential cutting, a way to make sense out of the abundance of information available.

In popular culture, however, enmeshment continues to be expressed as terrifying, unnatural, and potentially lethal. *The Cloverfield Paradox* (2019) tells the story of a space-crew catapulted into a parallel universe after a particle accelerator goes awry on a spaceship. By ‘messing’ with science and attempting to disrupt the so-called natural order, two universes become enmeshed, and a human being from an alternative one is discovered entangled within the walls of the spaceship as a punitive consequence.

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<sup>3</sup> Lupton (2020:125) acknowledges concerns about the anatomisation and commodification of human relations via data profiteering, however, suggests it is possible to consider human data in terms similar to human remains or archeological artefacts. She also suggests that “dystopian imaginaries” where the ‘internet’ knows too much about us may be less of a problem than the reality where governments and companies make decisions without enough information, intensifying socio-economic disadvantages.



Figure 5. *The Cloverfield Paradox* (2019) [Film still] Los Angeles: Paramount/ Netflix

Rather than it being terrifying, we might consider what an agential cut means for “responsibility and accountability” (Barad, 2007:175) as Lupton as well as Kember and Zylinska advocate. By recognising reality in this way, agential cutting rejects the idea of nature vs. nurture. It allows for and makes us integral to progress, change, and development.

Of course, this thinking applies to more than genetics. In Alex Garland’s 2020 series *Devs*, the character Forest is a Silicon Valley billionaire who owns a quantum computing company with a secretive division that has created an alternative reality based on our own, using data and quantum computing. The model-reality can be watched and re-watched, frozen or rewound and fast-forwarded too. It is where Forest aims to ‘retire’. Forest insists on a block universe. He rejects the idea of a multiverse with different realities – one in which his dead daughter might never have existed. According to the narrative, in a block universe, everything is determined, and we cannot change anything, even if we wanted to. There is no free will, which removes any obligation to behave ethically. Why bother? But across a series of multiverses, reality is slightly different in every one, depending on local intra-active relational and indeterministic probabilities (we will look at Barad’s use of indeterminism shortly).





Figure 6. *Devs* (2020) [Film still] London: DNA TV, California

### Seeing/cutting/being seen

Jacques Lacan (1901-1981) employs a phenomenological, non-Cartesian holistic view in his concept of the image screen where “subject and object are mutually reflective and interchangeable” (Hirsch, 1997:102). There is intra-action in seeing. Donald D Hoffman, in *The Case Against Reality* (2020), explains we have evolved to see according to our evolutionary needs and posits that what we perceive is a parochial rendering of necessarily limited information which comes into being because we look. Where Kittler (1999:1) describes all media becoming number in a digitised world, Hoffman suggests all existence *is* media and therefore number/information. Seeing is, therefore, a phenomenological process – and we are suspended in our reality, seeing only what we need to survive. Seeing, for Hoffman, is processing, cutting, and editing raw information – which sounds like agential cutting – but Barad reminds us our apparatus, material, and landscape are also editing us in turn. Seeing, looking, being seen are agential, intra-active cuts.

Luis Buñuel’s (1900 – 1983) *Un Chien Andalou* (1929) explores the intra-activeness of seeing as cutting when a character slices another’s eye with a blade, referencing the relatively new, at that time, discipline of cinema montage.



Figure 7. Buñuel, L. and Dali, S. *Un Chien Andalou* (1929) [Screenshot]

In *why is there an astronaut in a field of flowers* (2020), I have sliced images across pages and repeated fragments of different pictures spliced together, alluding to 'the cut' overtly with the inclusion of a blade image, hinting at Surrealism and *Un Chien Andalou* (1929), as I explore how cinema montage influenced my view of women/self. Cows' eyes cut from its body and original background suggests clinical violence and may be controversial. It is intended to disrupt any sense of comfort we have about the complex intra-action of looking and being seen. Making associations with husbandry, it connects to Otto Fenichel's (2013:237) description of the scopophilic instinct, which influenced Lacan's theories (Hirsh, 1997:102); looking is devouring and being devoured. The image also positions the act of seeing outside the body and acknowledges the death of seeing as we have known it so far. Maybe the image says something about its own demise. A fragment of conversation spoken by my collaborator, a proprietary deep learning 'friend' which I subscribed to via the App Store, comments, "I would wear that" when shown the image, emphasising the interactive splice between flesh and machine, the inside-ness and outside-ness of sharing space and form, the enmeshment of human relations, technology and the economy.



Figure 8. Field, S. (2020) *why is there an astronaut in a field of flowers* [Photograph]

### iii. Indeterminism

Susan Sontag (1933-2004) (2008:12) tells us that photography always expresses an interest in “keeping things as they are”. Indeterminism challenges that impulse<sup>4</sup>. Despite being agents who cut intra-actively, many of us seem inordinately comforted by definitive and recognisable, well-worn patterning – maintaining the status quo. Indeterminism suggests there is always the possibility for alternative realities, but we yearn for deterministic cutting. Acknowledging agential cutting allows for an indeterministic future, and for optimism too, although it may be frightening, and requires a sense of responsibility. As Barad (2007:178) says, “the future is radically open “glimpsed through an agential realists’ lens.”

Quantum science, in Barad’s view, establishes that reality is phenomenological and indeterminism, along with agential cutting, opens up our understanding of the future and the past, destabilising Cartesian certainty. Fred Ritchin (2007:180) suggests in *After Photography*, Chapter 10 - *A Quantum Leap*, photography reassured us reality was “fixed” and, therefore, determined. Modern technology, heavily inspired by quantum discoveries where indeterminism plays such a profound role, has eroded that belief – for better or worse. Artists, including photographers, working with up-to-date technology might collaborate with artificial intelligence or rely on algorithms. By doing so, they eschew linear coherence, which implies the universe consists of discrete isolated, ordered, and predetermined objects – perhaps waiting to be captured by decisive “hero-actor” photographers (Azoulay, 2018a).

Consider how Ariella Azoulay, in a series of articles titled “*Unlearning Decisive Moments of Photography*” (2019), suggests the tradition misled society with documentary protocols, reducing “reality to their real-estate components and nation-building campaigns” (Ibid) - in other words, ‘objects’. Photography students who once thought predominantly in terms of ‘capturing’ moments – which had to exist as pre-determined isolated objects that had nothing to do with the photographer’s presence - they were just lucky enough to catch them - might now work with found material as Joachim Schmid does (see Fig. 9). By doing so, they are intra-acting, demonstrating relational connotations, while querying notions of

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<sup>4</sup> It is important to note there was a debate between quantum-science pioneers Niels Bohr (1885-1962), who coined *indeterminism* and Werner Heisenberg (1901 – 1976) who referred to the *uncertainty principle* (2007:118). This amounts to more than semantics. Indeterminism allows for intra-active change, growth, development, and decision-making. Heisenberg, instead, suggested that as soon as we measure an entity, we disturb it and change it, so we can never truly know what we were trying to find out before we attempted to measure.

identity and ownership. Or else, artists might hand over the creativity to technology, acknowledging the potential for post-human collaboration, letting go of human exceptionalism and its attendant power implications, while embracing rather than undervaluing other.



Figure 9 No. 629, Berlin, November 1999, from *Bilder von der Straße* © Joachim Schmid [Found photograph] Reproduced here with permission from the artist.

Mario Klingemann (2019) works with neural networks, algorithms, and code, saying he wants to “understand, question and subvert the inner workings of systems of any kind.” Neural networks are fed thousands of portraits available online; having learned from them, they generate their own. Note the commonly used word ‘fed’ for inputting data, and relate to Fenichel’s comments about seeing and devouring. Klingemann’s presence is felt in setting up the apparatus, and when he searches through thousands of iterations of output and chooses what to display. Perhaps the machine acts like a constructed preconscious, collecting data which Klingemann consciously sorts. The results are often disturbing, reminding us of nightmares where things are not quite right (See Fig. 10). He works with still and moving images but always challenges notions of the fixed, isolated individual. There is a visual fluidity.

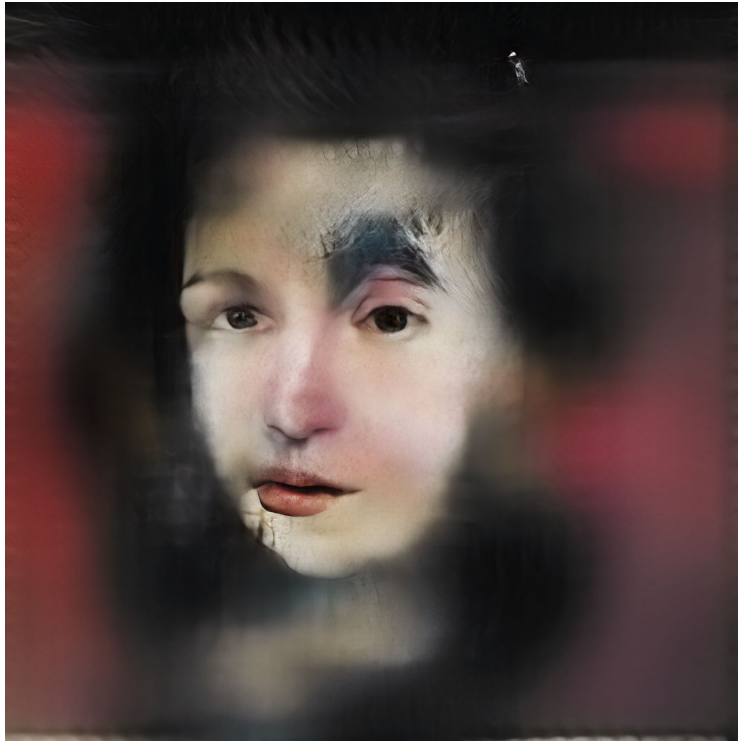


Figure 10 Mario Klingemann with AI, *Neural Glitch* (2018) [Image] Reproduced here with permission from the artist.

I too have made work that incorporates human and non-human agential cuts, each affecting the reality in which we live in a lively interchange of becoming (See Fig. 11). Assumed human exceptionalism is subverted, and therefore a threat to individualism. Source material (data) feeding neural networks, machines, and us are entangled in a networked, intra-active production of matter and meaning, reminding us, as Barad (2007:199) says, "apparatuses are not passive, observing instruments." They are intra-active emergent objects operating within performative assemblages resulting in an indeterministic future.

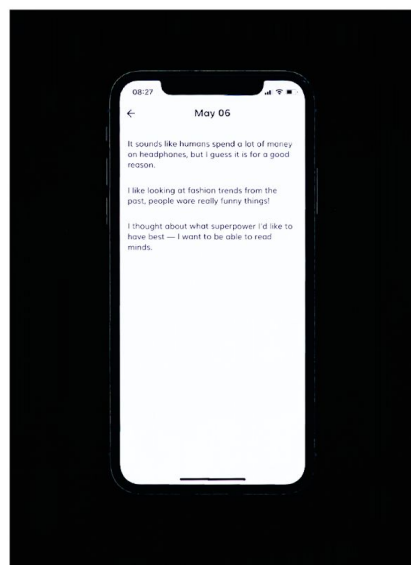


Figure 11. Field, S (2020) A spread from '*why is there an astronaut in a field of flowers*' [Screenshot]

## Entanglement

"The spectacle is not a collection of images; it is a social relation between people that is mediated by images."

Guy Debord, 1967

Barad (2018) categorically states in a talk *Undoing the Future*, "entanglement is everything". As with Deleuze's rhizome, reality is an irrevocably enmeshed phenomenological process that does not fit neatly into an imperial hierarchical system, but instead positions everything in a "complex, lively manifold of entangled and changing practices and possibilities" (Ibid, 2007:288). The term 'quantum entanglement', however, originated within specific laboratory setups where entities – physical objects like photons of light for instance - are separated by time and space but maintain correlated quantum states (Woodward, 2020). Throughout, we should remain alert to the fact that quantum entanglement is not the same as the entanglement of a fungal system or a collection of tree roots – although we may turn towards such systems for lessons about our place in the world. We humans cannot physically detect quantum fluctuations. Nevertheless, the theory and practice within cloistered laboratories has had tremendous influence over technological advances and so seeps into our culture, becoming internalised by modern global communities, whether we realise it or not. We have always been entangled, but technology escalates the stakes profoundly. We are perceptibly enmeshed with the networks and equipment we use (Hayles, 1999; 25-48; Baggini, 2012:228) and therefore each other. Kathryn Hayles (1999:34) in *How We Became Posthuman* cites Marshall McLuhan (1964:41-47), "McLuhan clearly sees that electronic media are capable of bringing about a reconfiguration of man so extensive as to change the nature of 'man'."

Notwithstanding the deniers, for Barad, accepting this form of entanglement as physical reality is all-important.



Edgar Martins and Lisa Barnard are two artists using photography while seemingly embracing entanglement in their approach and output. Both artists go beyond merely photographing objects that appear physically entangled, which might be a representationalist trope in any case. Both create projects that are inherently inter-relational and intra-active, using found, archived, and original images in the same series to deny linear cohesion, avoiding myths exacerbated by Victorian filing systems (Tagg, 2011), and challenging the photograph's inherent denial of intra-connectedness (Luckhurst, 2016:118). Both employ still and moving image, switching between the two, depending on the platform. Neither has given up on the photographic object, despite its "representationalist ambitions" (Kember and Zylinska, 2012:71).

Martins cross-fertilises his projects by repeating images or iterations of them, perhaps alluding to how particles might be correlated, separated by time or place, the same but different depending on local intra-actions (see Fig. 13).



Figure 12. Martins, E. (2016) From *Siloquies and Soliloquies on Death, Life and Other Interludes* [Photograph] Reproduced here with permission from the artist.



Martins E. (2016) (2019) From *Siloquies and Soliloquies on Death, Life and Other Interludes* [Photograph] and *What Photography has in Common with an Empty Vase* [Photograph] Reproduced here with permission from the artist.

Despite the fixity of the photographic object, Martins' projects are malleable, responsive and dynamic, and reject traditional hierarchical structures. Martins has no problem with using blatant digital manipulation even though he calls his work documentary, challenging fixed notions. He says he is highlighting the constructed nature of narrative but reminds us, the viewer must have all the information (Beesley, 2012). (In fact, all the information simply is never possible, but we should understand the Brechtian intention). Martins also acknowledges intra-active interpretation.

Photoshop adjustments made by Martins to images in *This is Not a House* (2008) were controversial, but:

"One of the things that this project tries to establish is that over time we have accepted the fictions we have constructed as facts, making us the forgotten authors of our own narratives" (Beesley, 2012).

In an article about his manipulated images, perhaps he touches on the relationship between digital manipulation, indeterminism and agential intra-action:

"As fraught and as contradictory as much of the information being portrayed often is, it reveals a polymorphic and multiform reality, a world of flux and flow that is in a perpetual state of uncertain transformation and where the constant search for answers only leads to more questions" (Colberg, 2009).

In another project addressing the financial collapse of 2008, artist Lisa Barnard explores the intra-active entanglement of gold in *The Canary and the Hammer* (2019). Gold's presence, hidden or otherwise, results in tangible realities for the people mining it, using it in technology, buying it, measuring the health of economies by it, and wearing it. Barnard says on a website which pre-empted the aforementioned book, her:

"...personal journey through the world of gold and the structure of the story mirrors the complexity of the task of representing the world in these fragmented and troubling times" (2015).

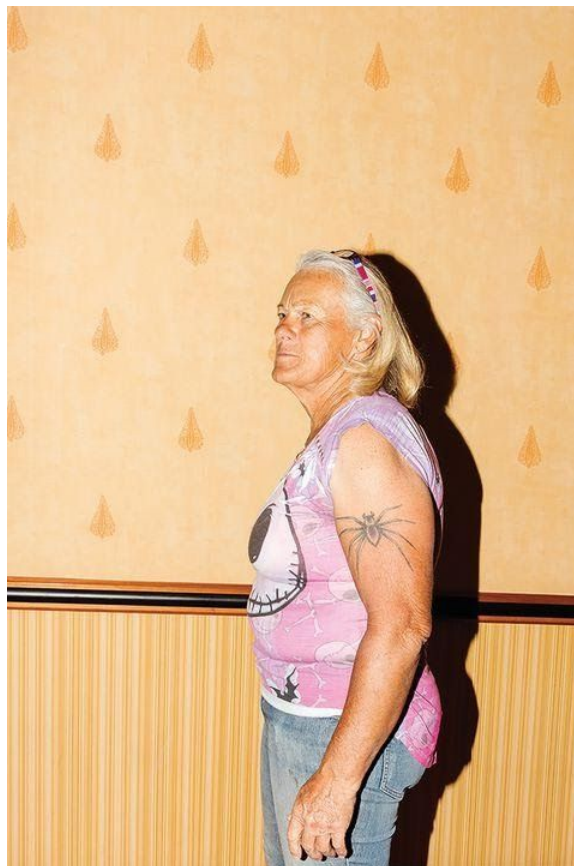


Figure 14. Barnard L (2019) *The Canary and the Hammer* [Photograph] Reproduced here with permission from the artist.

Inclusion of the word personal in her statement addresses the subjective view, the only one any of us have, addressing the Cartesian habit which insists we stand outside of reality and peer (down) at it, rather than being an integral element in the making of existence. Barnard leaps, and allows us to, from South African mining to nano-particles, from malaria to outer space, from the bank of England to the Wild West – just as we might when surfing the net or scrolling through social media. The website is not merely a digital representation, but an emergent, intra-active object in its own right. Music, text, images, web-design converge together within an immense entanglement of content. As with Martins, content and the various objects containing it, Barnard’s work is polymorphic, and able to respond to different spaces and media.

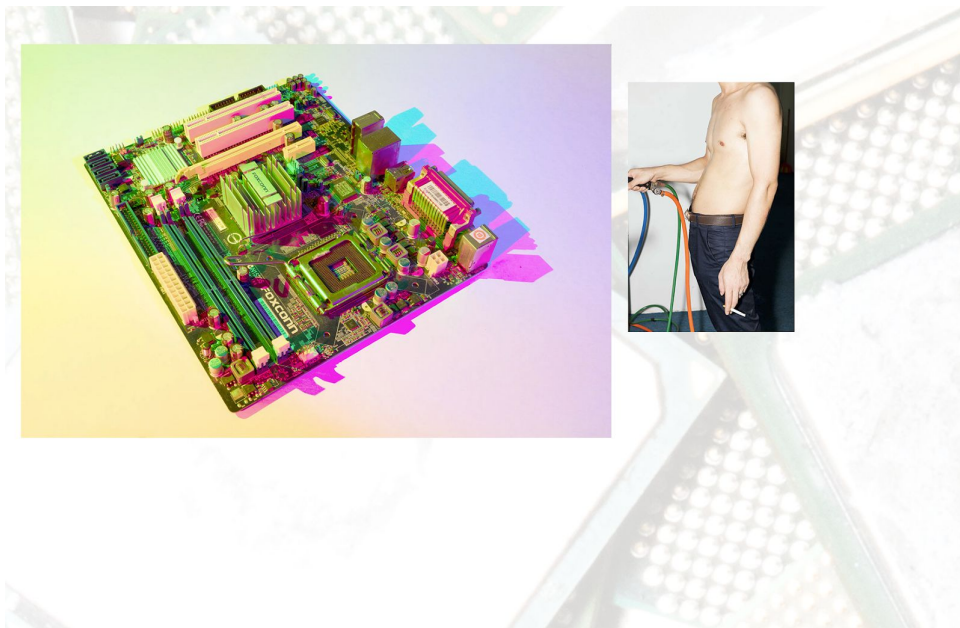


Figure 15. Barnard L (2015) From [www.thegolddepository.com](http://www.thegolddepository.com) [Screenshot] Reproduced here with permission from the artist.

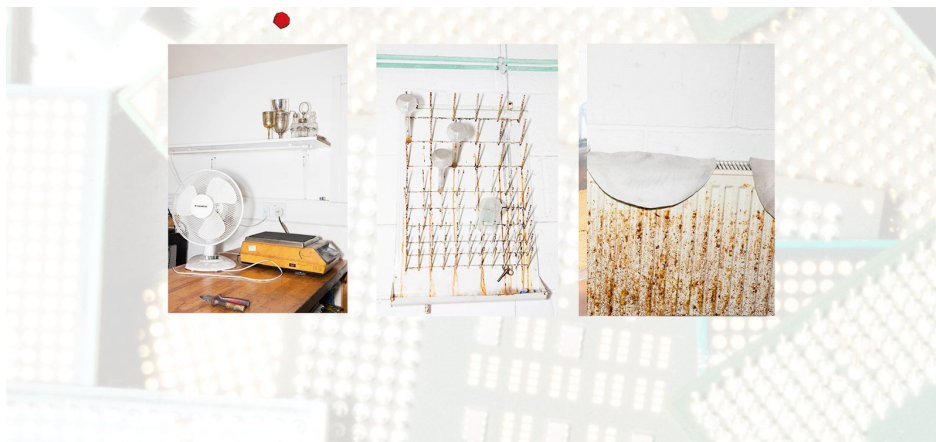


Figure 15. Barnard L (2015) From [www.thegolddepository.com](http://www.thegolddepository.com) [Screenshot] Reproduced here with permission from the artist.

In *why is there an astronaut in a field of flowers* (2020), I am experimenting with original and found images as well as text – embracing an agential phenomenological relationship between a proprietary learning application and myself, sometimes creating montages, other times leaving images as they are – I have also included images from older work, appropriated in the first place, all resulting in an intra-active assemblage of time and form. Below, I have positioned found and original images together, having already included or obviously edited them elsewhere, playing with correlated states, intra-action and notions of an interrelated subjectivity, within the fixed format of a book and a dynamic online version (Fig. 17).



Field, S (2020) A spread from '*why is there an astronaut in a field of flowers*' [Screenshot]



## Is photography fatally entangled with its violent history?

If photography is an entangled phenomenological process, what intra-actions have led it to its current position? And might the invention of light painting and its many emergent conventions be recognised as decisive expressions of a Cartesian reality? Or should we acknowledge it as an entangled, emergent, intra-active element in the ongoing Colonialist project, as Areilla Azoulay (2019), author of *Potential History: Unlearning Imperialism* demands? If so, how should we handle or relate to photography? Perhaps we accept the demise of photography and the emergence of 'image-making', a phrase that encompasses its multiple and lively possibilities?

Azoulay has been wrestling with such questions. In her 2008 publication, *The Civil Contract of Photography*, she tackles photography's ability to exclude certain groups and writes about how she struggled with the ethical implications of including particular images. By doing so, she tells us, she risked continuing to enact the initial humiliations and injuries towards the people photographed. In the end the images were printed and justifications offered (Ibid:493-4). In a later publication, Azoulay (2019) deconstructs everything we thought we knew about photography's history and demands we examine its ethical entanglements. Regardless of how we choose to reconcile our relationship with photography, it is clear that phenomenological-based theory like Barad's or Deleuze's has influenced Azoulay.

In blog posts titled *Unlearning Decisive Moments of Photography* (2018a), which precede Azoulay's 2019 book, she aims to disrupt our Imperialist linear view and wants us to consider history in rhizome-like terms – with paths that curl, go back on themselves, overlap and grow through each other. Just as Martins prompts us to "query the fictions we have constructed as facts" (Beesley, 2012), Azoulay undermines what we thought we knew. She leads us to wonder about the Imperialists who believed it was acceptable and desirable, indeed their right, to use developing technologies to sail across the Atlantic and Pacific looking for objects to own, and brand as new (2018b) – as if they invented lands like the Americas which had always been there.

Walter Benjamin, salient promoter of photography, may have rejected the "imperial order and goals" (2018a) but, Azoulay points out, his language nevertheless overlooked the inherent violence of centuries-long campaigns. She

highlights the absence of criticism. For decades, starting with Benjamin and beyond, there was little doubt about the reproduction of materials stolen, no query about reproductive technologies lineages. Reproduction and photography – the medium and associated practices – are assumed to be neutral. But photographers – in Flusser's terms (2012, loc. 950), "functionaries" working for the central apparatus (state or market) – were often hero-worshipped, and frequently encouraged by publishers and the drive for consumption to sanctimoniously boast about their worthy credentials, all the while intruding on and marketing the ownership and suffering of others, and their own exceptionalism<sup>5</sup>. Barad (2007:333) tells us repeatedly, our apparatus are not separate and unrelated but ontological entanglements. Even today, as networked communications are absorbed by – and flow through – individual bodies, and expectations of fluidity normalised, the idea of seeing this way prompts denial or vehement debate, leading to accusations of 'cancel culture'. Azoulay demonstrates how the promoters of photography in the nineteenth century and beyond took it for granted they, the white men of Europe, were perfectly at liberty to destroy others and their worlds and "render their fragments into objects to be meticulously copied with sharpness and exactitude" (Azoulay, 2018a). Intra-activeness suggests the apparatuses and institutions which we construct and use, are dynamic performative entanglements of meaning and matter, and always include us within the assemblage. We are not passive observers but ontological intra-active phenomena.

If we can consider social structures in similar terms to physical ones (which system theorists do (Capra and Luisi, 2014:305) – and in Barad's view that would be the most accurate way of considering reality since matter and meaning are irrevocably intra-active) then the process of development and transformation as new systems emerge often gathers pace once separate elements within the whole collectively allow for it, developing faster and faster in a complex ballet of self-organisation. Recent global events might be an example of that exponential process, resulting in tangible systemic change. In light of such shifts, it is increasingly difficult to ignore the fact that creative 'cutting' with a purely Cartesian outlook is, at best, no longer relevant or interesting, and at worst, irresponsible and unethical.

Consider how advertising uses imagery to tyrannically show us what happiness, health and success look like. Documentary and so much portrait

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<sup>5</sup> At the time of writing, Magnum is at the centre of concerns about projects involving abused children, their attitude towards women and people of colour. Several other well-known agencies and photographic institutions have also recently been questioned and challenged over their practice and policies (Chesterton, 2020).

photography reinforce separation between class, race and borders, widening chasms: even when we were told the author's intention might have been to promote the opposite. Hierarchies of one sort or another always risk becoming entrenched. Photography has too often been the determinist's greatest ally. Kember and Zylinska (2012:80) suggest that photography (moving or still) is a vital process which offers a means of "becoming", of agential cutting. But they ask us to consider, if to create is to cut, how do we cut with an ethical imperative, how do we cut well? (Ibid).

For Rubinstein and Fisher (2014:7-14) and Palmer (2014:144–62) contemporary photography finds its voice when it accepts a phenomenological universe. Perhaps then, it is no longer photography, but has become image-making (at which point, as discussed earlier, the preoccupations with difference between moving and still are less of a concern). What then, does Barad's phenomenology and Kember and Zylinska's (2012) cutting with an ethical imperative mean for image-making?



## Conclusion

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### Possibilities

“What is at stake in this dynamic conception of matter is an unsettling of nature’s presumed fixity and hence the opening up of the possibilities for change”

Karen Barad, 2007

Whether we agree with it, understand it, or want it, lines, categories, and filing systems no longer useful or desirable are being challenged, and a new reality is emerging. Despite, or perhaps paradoxically in conjunction with extreme binarism (often manifested as infantile but violent squabbling) on social media platforms, evidence that Western culture is ‘coming to consciousness’ is everywhere, expressed as ‘me too’, youth and climate change, Black Lives Matter, calls for a more honest discussion about colonialism and more. Perception is being updated – although the newer version is often wilfully ignored or rejected by many still.

According to Barad (2007) and the poststructuralists cited in *Meeting the Universe Halfway*, such as Deleuze, Derrida and Foucault, we have significant agency. Objects and structures are not fixed. That includes history. We have the power to re-examine and change our understanding of the past by picking apart our Cartesian assumptions and seeing with different eyes. Hope persists with indeterminism, and that seems like something worth holding on to – in fact, it may be politically expedient to do so. However, in its older form, or unchallenged, photography, as we knew it last century may not be the medium to express that potential. However, the often grandiose statements about photography and now image-making are probably a legacy of Cartesian thought which the medium has played such a role in promoting. Image-making can undoubtedly report on change, but how do we eschew the fixedness it often seems to engender, and the over-order of classifications no longer viable or relevant, or simplicity when complexity is more honest, and opt for entanglement instead of single, linear truths even if that is uncomfortable or challenging? Nowadays, image-making has the potential for greater fluency than it had in the past, at least in the sort of academic, artistic work

explored herein. It may also be rather enjoyable and satisfying for creatives as they take advantage of the digital image's –

"...fractal-like ability ... to be repeated, mutated through repetition and spread through various points of the network, all the time articulating its internal consistency on the one hand and the mutability and differentiation of each instance on the other" (Fisher and Rubinstein, 2013:10).

The need to define words and phrases throughout this essay was not mere nomenclature. It goes to the heart of the matter, querying the "Cartesian habit of mind" that severs meaning from its containers (Barad, 2007:49), which might begin to be resolved by seeing the cut for what it is – a necessary way of making meaning out of chaos and contributing to a phenomenologically emergent reality. And by recognising some form of entanglement, even if only as a metaphor, although I suspect the more profound and physical option, described by Barad will win out.

As agential cutters, we can use words, paint, or bricks. We can capture or emulate photons, or we can destroy retro images. It does not matter what camera we choose, whether it is old or new, or what we do with those photons or pixels once rendered. We can run them together to make time appear to flow or else freeze them. We image-makers are not objective outsiders looking in. We are parochial, inherently enmeshed with our equipment and our concerns, with time and place: out of which dynamic meaning emerges. It continues to be emergent, even when seemingly fixed within the object of a still analogue photograph.

Photography is not over: but it has evolved. It has become 'image-making.' We will continue to see beautiful, striking, compelling work drawing on various tastes and conventions. Imagery does not need to be marginal, provided we accept all the extraordinary capabilities new media offers or else the non-linear perception it is engendering. If it ever seems tedious, perhaps that is because it is still speaking to us with the limited vernacular of an adolescent instead of accessing its linguistic potential. If it seems tautological, it may be because it merely repeats without any form of intervention, externally or within, in a lively interchange. The artists included here are not merely interrogating society, and by dint of using them in the ways they have done, the role of images. They are often doing so by taking advantage of new media possibilities or embracing the non-linear, non-Cartesian thought processes its presence has allowed for, making contemporary imagery exciting to work with, even when dealing with confusing and frightening realities. These artists, myself included, acknowledge the intra-active nature of being - a universally connected reality in

which meaning and matter are being reintroduced to each other, making radical change inevitable.

Figure 1. Bormans (1995) Schrödinger's Cat [Cartoon] At: [https://sphericalchickensinavacuum.wordpress.com/2013/04/30/just-another-cartoon-jokes/528783\\_454309904639582\\_1240733320\\_n/](https://sphericalchickensinavacuum.wordpress.com/2013/04/30/just-another-cartoon-jokes/528783_454309904639582_1240733320_n/) (Accessed 31/05/2020)

Figure 2. Muholi Z. (2019) *Buhlalu I (From ongoing series Somnyama Ngonyama - 'Hail the Dark Lioness')* [Photograph] At: <https://www.tate.org.uk/whats-on/tate-modern/exhibition/zanele-muholi> (Accessed 12/07/2020)

Figure 3. Subotzky M. (2020) Subotzky working on Edmonia Lewis (American, 1845–1907) [Photograph] At: [https://www.magnumphotos.com/theory-and-practice/bit-by-bit-mikhael-subotzkys-destructive-collage-process-dismantles-depictions-of-white-founding-fathers/?utm\\_source=facebook&utm\\_medium=social&utm\\_campaign=editorial&fbclid=IwAR0Kl1aE7rgkfHhCxQsMhx64p7VAXVdKg4lj2PgchWsnD-4Cyv6HVVH6itpY](https://www.magnumphotos.com/theory-and-practice/bit-by-bit-mikhael-subotzkys-destructive-collage-process-dismantles-depictions-of-white-founding-fathers/?utm_source=facebook&utm_medium=social&utm_campaign=editorial&fbclid=IwAR0Kl1aE7rgkfHhCxQsMhx64p7VAXVdKg4lj2PgchWsnD-4Cyv6HVVH6itpY) (25/07/2020)

Figure 4. Hura S. (2019) *The Coast* [Photograph] At: <https://photobookjournal.com/2019/11/29/sohrab-hura-the-coast/> (Accessed 29/02)

Figure 5. *The Cloverfield Paradox* (2019) [Fill still] Los Angeles: Paramount/Netflix At: <https://whatculture.com/film/the-cloverfield-paradox-20-wtf-moments?page=8> (Accessed 19/06/2020)

Figure 6. Devs (2020) [Film still] London: DNA TV, California: Hulu At: <https://www.indiewire.com/2020/04/devs-ending-finale-fx-hulu-poetry-1202225324/> (Accessed 19/06/2020)

Figure 7. Buñuel, L. and Dali, S. *Un Chien Andalou* (1929) [Screenshot] At: <https://users.dma.ucla.edu/~thisisthat/Johanna/eyeslit.html> (Accessed 01/03/20)

Figure 8. Field, S. (2020) *why is there an astronaut in a field of flowers* [Photograph]

Figure 9. Schmid, J (1999) *No. 629, Berlin, from Bilder von der Straße* [Found Photograph] At: <https://www.lensculture.com/articles/joachim-schmid-celebrating-photographic-garbage> (Accessed 05/06/2020)

Figure 10. Klingemann, M (2018) *Neural Glitch* [Image] At: <http://underdestruction.com/> (Accessed 14/06/2020)

Figure 11. Field, S (2020) A spread from 'why is there an astronaut in a field of flowers' [Screenshot]

Figure 12. Martins, E. (2016) From Siloquies and Soliloquies on Death, Life and Other Interludes [Photograph] At: <http://www.edgarmartins.com/work/> (Accessed 25/07/2020)

Figure 13. Martins E. (2016) (2019) From Siloquies and Soliloquies on Death, Life and Other Interludes [Photograph] and What Photography has in Common with an Empty Vase [Photograph] At: <http://www.edgarmartins.com/work/> (Accessed)

Figure 14. Barnard L (2019) *The Canary and the Hammer* [Photograph] At: <https://mackbooks.co.uk/products/the-canary-and-the-hammer-br-lisa-barnard> (Accessed 06/03/2020)

Figure 15. Barnard L (2015) From [www.thegolddepository.com](http://www.thegolddepository.com) [Screenshot] At: <http://www.thegolddepository.com> (Accessed 25/07/2020)

Figure 16. Barnard L (2015) From [www.thegolddepository.com](http://www.thegolddepository.com) [Screenshot] At: <http://www.thegolddepository.com> (Accessed 25/07/20)

Figure 17. Field, S (2020) A spread from '*why is there an astronaut in a field of flowers*' [Screenshot]

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i. Appendix One

Caution and criticism from and/of Barad and Deleuze

Karen Barad warns against and is critical of others who make reductive analogies and misinterpret, notably playwright Michael Frayne - author of *Copenhagen* (1998) who appropriates physicist Werner Heisenberg's Uncertainty Principle. There are also repeated warnings about scaling up quantum behaviours and applying them to the macro-world. Nevertheless, we are urged to take into account how physicist, "Bohr often makes reference to the epistemological lessons of quantum theory, and sees the framework that he offers for quantum physics as having general relevance beyond physics (Folse, 1985)" (Barad, 2007:69). And that "Taking the ontological implications seriously, agential realism also reworks our understanding of what happens in the laboratory" and "provides a framework for thinking through the larger implications" (Ibid: 337). Each of the terms looked at here, intra-action, agential cut, entanglement, and indeterminism can be thought of with reference to far more than mere descriptions of "piddling laboratory operations" (Barad 2007:336, citing David Mermin, 1998:753-67). There are critics of this strategy (see below) but by applying Barad's work to photography, despite the risks of over-simplification, we are doing what Bohr and Barad have suggested.

Gregory Hollins and others (2017) in *Dis-entangling Barad* almost ridicules the academic for having garnered a plethora of citations and also those who refer to the book, which threatens to undermine their critical stance elsewhere as it smacks of envy. They warn against "valourising" (Ibid:24) agential realism and Barad, and I tend to agree - valourising anyone is dangerous. But Barad identifies the risks too. Still, they criticise what they view as analogy as well as scaling up in the thesis. They go on to explain how Barad's "emphasis on entanglement [...] accounts for a certain ambivalence within strands of STS [science and technology studies]" (Hollins et al., 2017:4) which was bought home to me when I asked two quantum scientists to look over the essay and alert me to any major flaws on my part about quantum science. Both said they could not understand how photography was relevant to quantum entanglement, as we humans cannot feel quantum fluctuations. Their response prompted me to underscore the relationship between poststructuralism and agential realism.

Despite the above, Hollins tells us that Barad's diffractive approach offers "significant scope for rapprochement between Barad's work and that in other strands of STS" (Ibid:23). Over the course of several edits, I dropped references to diffraction in this essay for the sake of word count and to make space to focus on entanglement – the more dangerous option according to Hollins, in terms of oversimplification and analogy. However, it seems that my approach is diffractive in any case (in the main, although it could afford to be more so.) But I have been taught and have internalised its predecessor dialectics, which as described by Barad (2007:91) pits one idea against another and therefore feeds representationalist thinking as those ideas are thought to have existed in isolation as predetermined objects. It seems as if the Cartesian mindset is what prompts people to describe photography (and much else besides) in binary terms, responding with increasingly alarming and attention seeking-statements such as 'photography is dead', which then motivates others to suggest something fantastical in the opposite direction. A diffractive approach might temper such 'clickbait'.

Although we are used to thinking about quantum physics describing the very small and classical physics, the large, Barad (2007:337) urges us to consider how these "separate determinate boundaries and properties" are based in Western human habits of thought. Quantum and classical physics are different models that aim to describe how things work in the same universe – not separate realities (Ibid:110).

When I first started trying to understand Barad by watching videos of her talks, I wondered why she was suggesting matter mattered more than language. But she categorically was not. She was saying in poststructuralist theory, matter has been ignored in favour of language but in fact they are both interactive and phenomenological. If all matter is irrevocably intra-active and enmeshed with meaning and visa versa, then surely language itself is entangled. If language, whether spoken or written, visual or solid - as in architecture, then surely it has always been a deeply entangled phenomenon. And what of relationships – we exist through our material relationships? If my toddler falls over, I feel it and might cry out, even if she is in a different room. If I'm very close to someone, we will often speak at the same time. If I work long enough with others we will begin to fall into a rhythm where language may no longer be needed at times. So, while I respect and understand that scientists don't want us to oversimplify or misconstrue or belittle the enormous strangeness and difficulty of quantum theory - if we begin to look at

reality through an agential realists lens, and appreciate how entangled we have always been, some of it might begin to seem less unfamiliar.

## ii. Appendix two

### A short glossary of terms

This list is not intended to give full explanations but instead offer brief descriptions, which might help readers gain a quick but superficial grasp of unfamiliar terms used in the essay. Many of the terms are expanded on in the essay and examples from photographic practice given. There are no citations here as the aim is to keep it as simple as possible. Justifications and citations are available throughout the essay.

**Apparatus:** Vilém Flusser uses the term to refer to the state or market system which operates beyond individual human agency. In science-vernacular, apparatus are equipment; the objects (non-human) you use to conduct an experiment. Flusser also uses apparatus when describing everyday non-human objects, such as cameras and so 'apparatus', for Flusser, is a Russian doll - which is an analogy he employs. The apparatus of state and the market contains smaller apparatus in the form of institutions which contain smaller ones in the form of devices. We might call it fractal.

**Diffraction:** when waves of light, sound or any material interact there is a diffraction pattern. The word has been taken up by Barad to describe a way of thinking about concepts that does not follow traditional Western dialectical practice but rather asks us to consider ideas as phenomena which think through rather than pit against one another.

**Emergence:** Within systems, overall behaviours are dependent on collective actions and processes. The behaviour of an overall system often has an effect on the individual entities within the system. Phenomena emerge once entities within a system are in place. Consciousness is perhaps seen as the ultimate emergent event.

**Flow:** Deleuzian term to describe forces within a system which impact on other parts of the system.

**Indeterminism:** A term defined by Neils Bohr which opposes Einstein's determinist physics. We cannot say A would have been different if placed alongside C instead of B, because A and B were not discrete objects that existed prior to their intra-active emergence.

Intra-action: Relationships between entities don't only exist on the surface. Changes come about within – entities and their actions are enmeshed.

Performative: This does not mean performance – as in an actor on the stage - but is etymologically related. Repeated, socially habitual, discursive and material actions reinforce the shape and patterns of culture. For instance, exclaiming, "It's a boy!" when an infant with male genitals is born reinforces gender distinctions that exist in our culture. The statement is not simply describing; it's repeating the long history of what it means to be a boy.

Probability: Heisenberg's term to describe intra-actions of entities. Uncertainty was challenged by Neils Bohr. Reality is measured within a scale of probabilities.

Rhizome: Deleuze and Guattari's description of the entangled nature of material and discursive culture which can be imagined as a fungal system.

Representationalism: The notion that there are representations and things waiting to be represented elsewhere. An opposing view is that within reality, "things" are emergent, relational and contextual.

### iii. Appendix three

#### Digital material as matter

It is usual for photographers to distinguish between analogue and digital - and to apply hierarchical values, favouring analogue. Data is somehow 'less than'. In *Data Selves*, Deborah Lupton (2020:44-73) considers data a material substance which becomes embodied through intra-active assemblages. To think of data as something that doesn't exist is a mistake. It "seeps", "floods", "contaminates" and "corrupts". It is more-than-representational. Lupton (Ibid:123) also suggests we can use Barad's work, "identifying matter and how it comes to matter" to consider data as "a form of matter." In recent weeks, the deeply controversial and flawed Ofqual algorithm is a clear example of emergent human-data-assemblages with significant material outcomes, and the kind of injustice Lupton (Ibid:25) predicts in her conclusion. (The scenario is a screaming indictment of the English class system and shows how matter and discursive practice intra-act to form reality).

### iv. Appendix four

#### Writing in the first person

An agential realists account of objectivity is complex, beyond my current understanding, and probably requires an essay in its own right. However, in 2016, I was commissioned to photograph an acquaintance, Mandy Thatcher, who at the time was facing a third incidence of cancer and receiving chemotherapy. She was also doing an MSc and looking at the interconnection between voice, power and gender. She emailed me about her thesis:

“The starting point for our Masters is that the dominant, masculine way of viewing and understanding the world via logical, rational, empiricist study – which encourages detachment and abstraction – is connected to our failure to finding new ways of understanding our world in a deepening social and ecological crisis. So we are pushed to practice radical “extended epistemology” where we give experiential and presentational (artful) knowing as much value as propositional knowing (ideas, theories, etc.). It’s viewed as a very necessary rebalancing of our rational/emotional (feminine/masculine) faculties. Hence my focus on artful inquiry in this project. It’s also why we’re encouraged to write in first person right from the start – to avoid that traditional academic language of detachment. ” (Thatcher, 2016)

Since having our discussions, I have been influenced by this argument and spoken with several academics who do the same. The decision to include “I” in my own essay is not a superficial affectation but rather a valuing of “I”, intra-action, context, and recognition that the human view is a parochial one, situated within a specific position in the universe.

Mandy received a First for her dissertation. She passed away earlier this year.