

THE NUCLEARSCAPES OF THE BLACKWATER ESTUARY AND
FOULNESS ISLAND:
Towards an Interscalar Curatorial Practice

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Abstract

Starting with the premise that contemporary art contributes to academic and public discourse in the field of nuclear culture, my practice-based PhD research project develops an interscalar curatorial practice, taking Essex's nucleascapes—namely the Blackwater Estuary and Foulness Island—as a starting point to understand the county's role in Britain's nuclear story. I seek to explore how the curatorial can engage with the complex context of the county's nucleascapes and in turn contribute to new knowledge around and through curatorial practice. In addition, this project aims to be a generative point of departure to consider the contested discussions around the UK's civil and military nuclear industries..

During the project I worked with artists and others to explore Essex's nuclear legacy, as well as its present and future entanglements with the nuclear. The result are curatorial situations which advocate for an expanded understanding of the curatorial, working with artists to make work public in responsive and discursive ways. The written thesis critically contextualises my approach and the associated projects within an interdisciplinary framework drawing from sociology, anthropology, visual art, cultural and curatorial studies, while focussing on nuclear landscapes, the curatorial, contemporary art practice and nuclear colonialism.

Table of Contents

Acknowledgements	2
Abstract	3
List of Figures	6
List of Appendices	7
Introduction	8
Essex's Nuclear Story.....	10
Nuclear Culture, Contemporary Art and Curating.....	10
Practice: Public Programming, or the act of making-public.....	11
Research Questions.....	11
Reflections on Method and Positionality.....	12
Chapter One: An Essex Nuclear Story	15
Britain's Nuclear Pursuit.....	15
Essex's Nuclear Stories: Landscapes, Taskscapes, Nucleascapes.....	17
Foulness Island.....	29
The Blackwater Estuary.....	33
Subterranean Nuclear Infrastructures.....	40
The Nuclear and its Inherent Coloniality.....	41
Chapter Two: Nuclear Culture, Contemporary Art and Curating	47
Nuclear Culture, what is it?.....	48
Contemporary Art's Disaster Response.....	49
The Nuclear's Bedfellow: Photography.....	53
Back to the UK.....	55
Curating the Nuclear.....	57
Chapter Three: (Interscalar) Curatorial Practice	73
Towards an Interscalar Curatorial Practice.....	74
Interscalar as Concept and Practice.....	78
The Old Waterworks and the Focus on Artists' Research and Development.....	89
How to Make a Bomb with Gabriella Hirst.....	97
Propagation: Workshops, Cuttings and Grafting.....	98
Grafting.....	99
Cuttings.....	99
Installation at The Old Waterworks.....	101
An English Garden, Estuary 2021.....	103
Tip of the Iceberg, Focal Point Gallery, Sub Rosa.....	109
How to Make a Bomb Performative Lecture and Workshop at Focal Point Gallery.....	111
The Rose Garden Conference, Saturday 23 October 2021.....	113
How to Make a Bomb workshop with Radar at Loughborough University, and the project as it stands.....	114
Leaky Transmissions with Nastassja Simensky.....	115
The Long Count.....	120
Workshop: Spectral Images: Experimental Tools for Fieldwork.....	122
Conclusion	125
Bibliography	129

Appendices.....	143
Appendix one: Field reports from the Blackwater Estuary.....	143
Appendix two: Marginal Anthropocenes: Heritage and Sustainability in Peripheral Spaces. Workshop indefinitely cancelled due to COVID.....	151
Appendix three: How to Make a Bomb Proposal for Estuary Festival.....	153
Appendix four: The Old Waterworks Public Statement: Censorship of An English Garden.....	158
Appendix five: Nuclear Culture Research Group Open Letter: The Name of the Atom Bomb Rose.....	161
Appendix six: Nastassja Simensky, The Long Count, The Old Waterworks, Saturday 30- Sunday 31 July 2022.....	166
Appendix seven: Practice Dossier.....	167

List of Figures

Figure 1: Map showing most of Essex, including Southend-on-Sea, Foulness Island and the Blackwater Estuary nearby Bradwell-on-Sea. Google Maps, 2023.

Figure 2: 'DANGER: MOD FIRING RANGE', warning sign found on Foulness Island during fieldwork, 5 August 2019. Photo courtesy the author.

Figure 3: Walking the Broomway with artist and curator James Ravinet. Led by local guides Brian and Toni Dawson. 29 June 2019. Photograph courtesy the author.

Figure 4: the Foulness Island Atomic Weapons Research Establishment gates, August 2019. Photograph courtesy of the author.

Figure 4: Tea at the Foulness Island Heritage Centre with artist Gabriella Hirst, 5 August 2019. Photograph courtesy the author.

Figure 5: Bradwell A reactor buildings with the aluminium 'weather envelope' in construction to encase them. Photograph courtesy the author.

Figure 6: Photograph of the 1986 protests at Bradwell against proposed nuclear storage. Photograph courtesy Burnham Museum.

Figure 7: The Old Waterwork library. Photograph courtesy Anna Lukala.

Figure 8: *Rosa floribunda* 'Atom Bomb' at The Old Waterworks. Photograph courtesy the author.

Figure 9: Structure at the Old Waterworks that housed the 'Atom Bomb' roses, designed by Gabriella Hirst and Cristina Morbi, fabricated by Daturque Studio. Photograph courtesy Anna Lukala.

Figure 10: Gabriella Hirst, *An English Garden*, 2021, Gunners Park, Shoeburyness, Essex. Photograph courtesy Connor Turansky.

Figure 11: Gabriella Hirst and Warren Harper, *An English Garden* publication, 2021. Photograph courtesy Design Print Bind.

Figure 12: One of the plaques featured in *An English Garden*, 2021. Photograph courtesy Anna Lukala.

Figure 13: Gabriella Hirst, *How to Make a Bomb: Sub Rosa*, 2021, in *Tip of the Iceberg* at Focal Point Gallery. Photograph courtesy Anna Lukala.

Figure 14: the exterior of Focal Point Gallery during *Tip of the Iceberg*. Photograph courtesy Anna Lukala.

Figure 15: photograph from research trip on the Blackwater Estuary with Nastassja Simensky. Photograph courtesy the author.

Figure 16: photograph from research trip on the Blackwater Estuary with Nastassja Simensky. Photograph courtesy the author.

Figure 17: Nastassja Simensky, *The Long Count*, The Old Waterworks, 30-31 July 2022. Photograph courtesy the author.

Figure 18: *Spectral Images: Experimental Tools for Fieldwork* invite poster. Designed by Molly

Dyson.

Figure 19: SSTV image produced during the workshop, 2022. Image courtesy Laura Trevail.

List of Appendices

Appendix one: Field reports from the Blackwater Estuary

Appendix two: Marginal Anthropocenes: Heritage and Sustainability in Peripheral Spaces.

Workshop indefinitely cancelled due to COVID

Appendix three: *How to Make a Bomb* Proposal for Estuary Festival

Appendix four: The Old Waterworks Public Statement: Censorship of *An English Garden*

Appendix five: Nuclear Culture Research Group Open Letter: The Name of the Atom Bomb Rose

Appendix six: Nastassja Simensky, *The Long Count*, The Old Waterworks, 30-31 July 2022

Appendix seven: Practice Dossier

Introduction

‘To listen to and tell a rush of stories is a method.’ — Anna Tsing¹

This PhD project starts with my home county of Essex, where I have spent the majority of my life. From here my research travels through various other localities, considering place in relation to contemporary art, nuclear culture, curatorial practice and their associated discourses. My project seeks to consider Essex within Britain’s nuclear weapons and power production projects, asking how curatorial practice and contemporary art can contribute to one’s understanding of this story and how it pertains to a broader understanding of the ways ‘the nuclear’ manifests. This project is a means to engage with one’s context anew. Many artists² based or from Essex explicitly defy, interrogate, and critique the preconceived notion or stereotypes³ of the county, and Essex is where gallery, curatorial and artistic programmes have been developed and books published in order to do the same.⁴ This project contributes to the broadening of one’s perception of the county, beyond the decades of flattening and reductive stereotypes thrown at it and the people who live there.

By its very nature curatorial practice is inherently collaborative, be this with people or discrete objects, sites or other living things. Although PhDs are reliant upon the notion of individual authorship and one’s contribution to new knowledge, it must also be acknowledged that this project includes the collaboration with and contributions of many.⁵ To make artwork public and put it into the world it takes lots of support, conversations and expertise. One could say that this PhD is made by many.⁶ To work within this context as a curator strong relations are imperative, particularly with

¹ Tsing, Anna L. *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins*, 2015, p.37

² There is a long list of artists working to challenge the stereotypes levelled at the people of Essex, one body of work of note is by artist Elsa James, who, through her work, has been interrogating what it means to be Black in Essex. See her website portfolio here: <https://www.elsajames.com/portfolio> Accessed 23 April 2023

³ Essex stereotypes are ‘Essex girl’ and ‘Essex man’. ‘Essex girl’, which is a pejorative stereotype that according to the Oxford English Dictionary is ‘a contemptuous term applied (usually *jocular*) to a type of young woman, supposedly to be found in and around Essex, and variously characterized as unintelligent, promiscuous, and materialistic’. Campaigns have been launched to remove this definition from the dictionary, which have been successful in the Oxford Advanced Learner’s Dictionary. See

<https://www.theguardian.com/uk-news/2020/dec/05/essex-girl-removed-from-dictionary-following-campaign> Accessed 25 April 2023. ‘Essex Man’ was coined by Sunday Telegraph journalist Simon Heffer in 1990, describing them as ‘young, industrious, mildly brutish and culturally barren’ and their political views as ‘breathtakingly rightwing’, see <https://www.theguardian.com/news/2019/jun/27/the-invention-of-essex-how-a-county-became-a-caricature> Accessed 25 April 2023.

⁴ *Radical Essex* was a programme led by Focal Point Gallery that sought to re-examine the county in relation to radicalism in thought, lifestyle, politics and architecture, see Dixon, Hayley, and Joe Hill, eds. *Radical Essex*. Southend-on-Sea, Essex, United Kingdom: Focal Point Gallery, 2018. See also Darley, Gillian. *Excellent Essex: In Praise of England’s Most Misunderstood County*. Exeter: Old Street, 2019; and Burrows, Tim. *The Invention of Essex: The Making of an English County*. London: Profile Books, 2023.

⁵ Throughout this written thesis I will use the footnotes to cite those I am thinking-with and learning from. This space is also a way to diverge and provide further contextual or tangential information or discussion. To begin thinking about footnotes as a set of relations, obligations and conversations with a diversity of readers I am indebted to Max Liboiron, whose writing really foregrounded the importance of this to me. This as a practice is something I hope to account for, develop and work on throughout my writing moving forward beyond this PhD. See Liboiron, Max. *Pollution Is Colonialism*. Durham: Duke University Press, 2021.

In addition, in the footnotes there will also be links throughout that take the reader to areas of my practice dossier to provide them with contextual links to the practice-based parts of this project.

⁶ ‘Made by many’ is a phrase artist Kathrin Böhm uses, and whose deeply collaborative practice is exemplary and undoubtedly a point of reference and strong influence. See Noord, Gerrie van, Paul O’Neill, and Mick Wilson, eds.

the artists one is working with. This curatorial research project consists of the research within this written thesis as well as a practice-based portion, which is the result of working with artists to research, develop and make new work. This process occurred in site-specific contexts on research trips as well as within the framework of workshops, exhibitions, installations, publishing and other forms of public engagement and dissemination. These moments of making the projects public in various ways happened primarily with The Old Waterworks, during which time I was director, and through the network of arts organisations we worked with during that period. There are also more tangential practice-based activities that the written thesis draws on that shows the web of relations and depth of research around contemporary art and nuclear culture. Both the practice-based aspects and this body of writing are intended to sit independently from, as well as inform, one another. All of this together, I argue, constitutes an in-depth and long-term process of curatorial engagement with Essex, nuclear culture and contemporary art, and curatorial practice.

This written thesis is set out in three chapters: Essex's Nuclear Story; Nuclear Culture, Contemporary Art and Curating; and (Interscalar)⁷ Curatorial Practice. Each chapter acts as a strand of enquiry, to situate the project within the various contexts it traverses. First, the project is located geographically before moving through nuclear culture and its relation to contemporary art and curating, then further into the curatorial, my proposition of an interscalar curatorial approach and elaboration on the work with artists and the outcomes of my curatorial propositions. The strands each chapter follows, when combined and considered holistically, demonstrates a project that not only explores the local context of Essex's nuclear story, but also situates this within a global nuclear context, as well as within contemporary art and its contribution to nuclear culture, and how curatorial practice is a distinct means to think about the nuclear via the reflection on and commissioning of contemporary art.

I propose an interscalar curatorial practice, which attempts to articulate how curatorial and artists' practices operate in a way that attempts to hold incommensurate realities within the same conceptual frame. By incommensurate I mean things that are out of proportion to one another, or scales or contexts that are incomparable, such as local political concerns regarding the development of nuclear technologies and their impact on the surrounding community versus the global spread of radioactive materials due to nuclear weapons testing and extraction. These factors are of course interrelated, or can be, but the set of relations they set up cannot be compared, quantified or flattened, since their contexts are particular. I argue that curatorial and artistic practices can begin to elucidate the complexities of the nuclear and how instances of

Kathrin Böhm: Art on the Scale of Life. London: Sternberg Press, 2023.

⁷ The 'interscalar' draws from Gabrielle Hecht's conceptual framework of 'interscalar vehicles', which she explains are 'objects and modes of analysis that permit scholars and their subjects to move simultaneously through deep time and human time, through geological space and political space.' And although I will be discussing this in detail in the third chapter it is useful for the reader to keep this definition in mind. See 'Interscalar Vehicles for an African Anthropocene: On Waste, Temporality, and Violence'. *Cultural Anthropology* 33, no. 1 (22 February 2018): 109–41.

contemporary art's making public could be understood as an event of knowledge production, a moment where artists produce artwork that can hold complex and contested issues, contributing to or problematising the audience's understanding of these aforementioned concerns. My position as a curator throughout the process of these projects has been to situate them within critical contexts, facilitate the production of new social forms, and provide curatorial support in the development of the projects, such as the contextual and conceptual underpinnings, the securing and maintaining of partnerships, funding and project management.

Essex's Nuclear Story

When considering Britain's development of its nuclear arsenal and nuclear power production there are many points of entry one could take and numerous localities to start from. For me, that place is my home county of Essex in the United Kingdom; beginning with a place with a degree of familiarity, to see a place one might call home anew. It is also a good place to account for and consider how I am implicated within Britain's nuclear story. This first chapter introduces the reader to Essex's nuclear sites, particularly the Blackwater Estuary and Foulness Island. It also discusses how one might articulate these places via ideas around landscape, nuclearity and the activities that occur that constitute these, which I call the nuclearscape or nuclearscapes.⁸ I also consider the inherent coloniality of the nuclear military industrial complex.

Nuclear Culture, Contemporary Art and Curating

After setting the scene of where, geographically speaking, this project begins I will then turn to the notion of nuclear culture, contemporary art and curating, and how these areas intersect. I will draw on various nuclear-related contemporary art projects that provide a rich backdrop to my research and the ways in which this has been articulated through theory and practice. The chapter begins by discussing nuclear culture in broad terms. I then shift to nuclear-related art projects, such as artists working in this context, mapping out aspects of the nuclear and how they employ various artistic approaches. I then discuss curating, the significance of exhibitions in the promotion of nuclear technologies in the post-war period as well as contemporary art curators and their engagement with nuclear culture. These are constituted through forms such as publication, events, exhibitions and workshops. I argue that this chapter is important curatorial work (and advocacy work for the

⁸ I have found one other place in which 'nuclearscapes' are mentioned, however this is with no explicit qualification as to what a nuclearscape may be, the only mention of this term is in the title. One thing of note is how the paper is collaborative and attempts to integrate forms of art production within its framework. See Valentines-Álvarez, Jaume with Eric LoPresti 'The atom in the garden and the apocalyptic fungi: A tale on a global nuclearscape (with artworks and bird-songs)' in Diogo, Maria Paula, ed. *Gardens and Human Agency in the Anthropocene*. Routledge Environmental Humanities. London ; New York: Routledge, Taylor & Francis Group, 2019, pp. 180-200. Other terms, such as Ele Carpenter's articulation of the nuclear taskscape, also feed into the nuclearscape, which I elaborate upon in the first chapter.

curatorial) to situate and contextualise my project within the breadth of nuclear related projects within contemporary art practice.

(Interscalar) Curatorial Practice

The context set up in the prior two chapters provides the groundwork for the final chapter which discusses the curatorial within the disciplinary boundaries of curatorial studies. I draw on the burgeoning literature around the curatorial that has developed over the last thirty years or so, discussing the expanded notion of the curatorial. I propose a conceptual framework that I argue is generative in thinking-with the expanded field of the curatorial as well as localised super-complex contexts that are entangled within equally complex infrastructures, whose extractive logic has global implications. This concept of *the interscalar*, I argue, can be employed to approach curatorial work and develop a curatorial practice. Following on from this I will discuss the practice-based portion of this project, as well as the ways that new work has been produced in response to curatorial propositions and ongoing conversations.

Practice: Public Programming, or the act of making-public⁹

Accompanying the above chapters is documentation of the commissioned public programming, to account for the practice-based elements of the project. These aspects happened throughout the PhD and were programmed through and with The Old Waterworks (TOW), where I was director, alongside and as part of other larger arts festivals or exhibitions. Therefore the works operate in a network of other public activity, commissioned by various organisations, through the involvement of many arts workers, artists and supported by numerous funders, foregrounding the fact that to make art public it takes many. The initial point of departure for the practice-based portion of this project was with two artists, Gabriella Hirst and Nastassja Simensky, to respond to two separate sites in Essex that are pertinent to Britain's nuclear story, these were Foulness Island and the Blackwater Estuary, respectively.

Research Questions

The three chapters, and the practice-based aspects which accompany this written thesis via a practice dossier, attempt to account for and articulate my preoccupation with my home county's

⁹ Throughout this PhD process I have been using a miro board in order to visualise my research and document the outcomes of the practice. You can view this here: <https://miro.com/app/board/uXjVNQfgyq4=?moveToWidget=3458764570095672589&cot=14>. Accessed 15 November 2023.

nuclear stories. There are a number of research questions that have been key, these are:

1. How can the concept of the interscalar and the complex and interdisciplinary relations it infers inform a curatorial practice?
2. How can the resulting practice of an interscalar curatorial project offer insights into, and make sensible, the nuclear legacy and present of the Blackwater Estuary and Foulness Island, to understand further the complexities of the area through an analysis of its history, its contemporary politics and ecology and their complex inter-relationships?
3. How can curatorial and artistic practices engage the local community, other disciplines and practitioners in re-imagining the nuclear economy within a local and potentially international context?
4. How can the specific engagement through an interscalar approach contribute to the contemporary discourse around the anthropocene, where nuclear culture is arguably a key factor in the epoch's designation?

As a means to attempt to answer these I embarked on a long-term collaborative journey, working closely with artists Simensky and Hirst, who made work within the context of Essex, particularly through my activities as director of The Old Waterworks (TOW), in Southend-on-Sea, Essex, and the networks I was connected to during this role.

Reflections on Method and Positionality

Throughout the process of this PhD I have employed different methods to produce the research herein. This included both primary and secondary research methods. The former includes fieldwork within the localities specific to this project, such as trips to the Blackwater Estuary and Foulness Island, as well as visiting exhibitions and the analysis of artworks in person. The latter included desk research, which involved the reading and reflection upon various materials pertinent to artistic and curatorial practice relevant to my project and the analyses of artworks and exhibitions through secondary materials such as exhibition catalogues, photographic and video documentation, and curatorial statements. The process of selection of artworks and exhibitions featured within this written dissertation was determined through the identification of their relevance to my areas of research and therefore their relevance to the project as a whole. In particular, the examples selected were relative to nuclear culture and contemporary art or contributed to the arguments necessary to develop an expanded understanding of the curatorial.

The practice-based portion of the project was developed through initial independent research to identify artists whose work resonated with my work as a curator, that of the specific localities in

question as well as the various disciplinary trajectories the project takes. In order to determine the artists whose work was most fitting to inform the motivations of this project I began developing relationships with artists whose practice appeared to be an appropriate fit for the content and context of this project. In order to establish robust, long term relations it was necessary to focus on dialogical processes where the artists' research and practice resonated with my own. Ensuring there were adequate resonance and convergences to fulfil the needs and provide a critical context for the work in question, but additionally to make sure that the collaborative process was generative and complimentary to everyone's motivations. Additionally, permissions were established for any of the contextual materials within my appendices that required it.

Another dimension to note, particularly in order to identify one's stakes in this project and the means through which one is implicated, is to explicitly consider my positionality, or subject position in relation to this project. Throughout I have occupied various positions: as a person from Essex; a PhD researcher; a curator of the projects herein; and the director of the organisation through which much of the practice-based aspects of this project materialised. At times occupying multiple positions was challenging to negotiate, since they require different demands and expectations at various moments. In addition, occupying these varying roles also afforded me the opportunity to foster partnerships with various stakeholders invested in the project.

One of the main challenges presented by occupying multiple positions within the project's framework was the importance of attempting to simultaneously maintain a sense of distance for criticality whilst there being an inevitability of closeness. I had to ensure that the project was in line with the mission, vision and values of The Old Waterworks, which meant ensuring the artworks commissioned through and with TOW fell within the organisation's charitable objects, alongside responding to TOW's locality and commitment to artistic research and development. In addition, it was imperative to consider my role as a PhD researcher, the pursuit of the production of new knowledge this entails and the ethical considerations this raises. However, the above is prefaced by the fact I am from and very much a part of the context I am working within in Essex. My independent curatorial work prior to my time as director at TOW and the start of this PhD (which began in tandem) was my initial entry point and impetus in working within the contextual situation of South Essex and the nuclear, alongside the richness of work discussed herein. It was necessary for me to consider and attempt to hold together the expectations of all of these varying, leaky and amorphous positionalities.

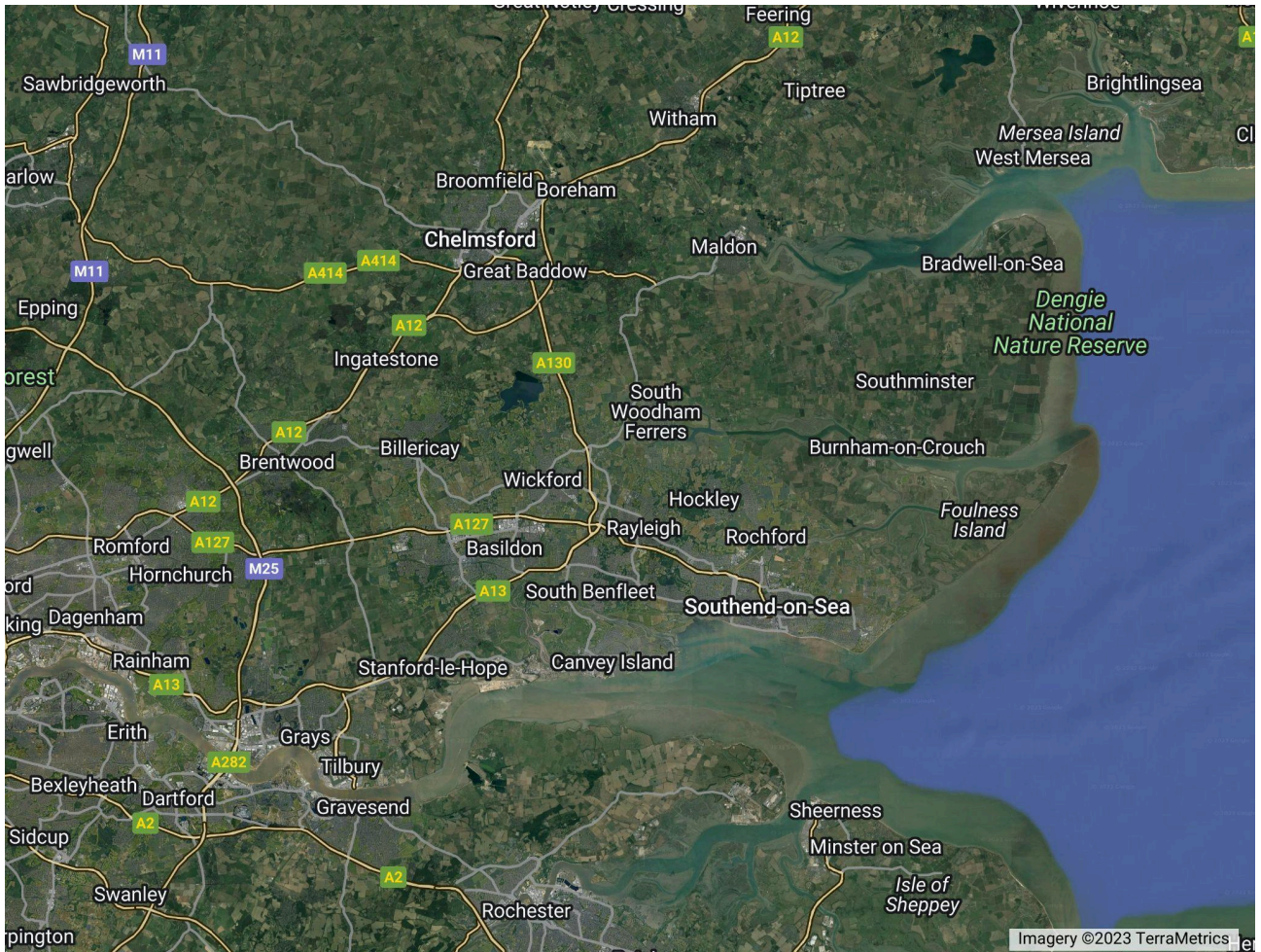


Figure 1: Map showing most of Essex, including Southend-on-Sea, Foulness Island and the Blackwater Estuary nearby Bradwell-on-Sea. Google Maps, 2023.

Chapter One: An Essex Nuclear Story

Throughout this chapter I will unpack some of Essex's nuclear stories, charting the history of two sites in particular: Foulness Island and the Blackwater Estuary. Before doing so I discuss conceptualisations of land and the notion of nuclearity. I then propose the term of nucleascapes to discuss the amorphous, ubiquitous and complex sites impacted by the nuclear military industrial complex. After which I reflect upon pertinent concerns around the nuclear that may inform one's understanding of Britain's nuclear state pursuance, such as the nuclear's inherent coloniality.

Britain's Nuclear Pursuit

By the late 1950s Britain's nuclear military infrastructure and weapons programme were well underway and by 17 October 1956 the UK became the first nation in the world to export power from a nuclear generating plant to a national grid.¹⁰ A year later construction began on Bradwell Nuclear Power Station, and by 1962 the power station was generating electricity. It would do so until 2002 when the decommissioning process commenced and is still ongoing. Needless to say, the county has had a lengthy relationship to the nuclear industry. To understand this complex entanglement it is useful to think about it in relation to the processes and associated projects that made it possible, namely the nuclear super-power ambitions of Britain and nuclear colonialism. The Blackwater Estuary and Foulness Island demonstrate how the varying issues around the nuclear play out. They also operate as points of departure to move out from, mapping the scars in the landscape brought about by bomb building, bombs, mining, power generation and waste management. The nuclear is all encompassing, borders are meaningless to radioactive fallout, the infrastructures of the nuclear such as mining, the military, energy production and distribution and storage traverse county, country, and continental boundaries. Hence, the mutability of nucleascapes, which can be taken up as analytical tools to consider the nuclearity of a particular place, to be collapsed or opened up in order to be applicable and understood within a particular context. Tied up within all of this are many other aspects that make up a part and facilitate the infrastructures that support the ongoing functioning and progression of nuclear industries, such as the universities and institutes, and the research, development and knowledge economies integral to the ongoingness of nuclear related activity. What we may start to see here is that predetermined boundaries that demarcate a nucleascape are arguably arbitrary or subjective impositions, and that such places are created out of the multiple understandings and engagements one has with the world around them, in a similar way to how anthropologist Barbard Bender writes about landscape,¹¹ and these understandings differ depending on the agent perceiving them.

¹⁰ Butler, S A and Bud, R, 2017, United Kingdom Short Country Report, in History of Nuclear Energy and Society (HoNESt) Consortium Deliverable N° 3.6.

¹¹ Bender, Barbara. 'Time and Landscape'. *Current Anthropology* 43, no. S4 (2002): 103–12. <https://doi.org/10.1086/339561>. p.103.

Nuclearscapes may exist in many forms through differing ways of knowing and engaging. Critical theorist and filmmaker Elizabeth Povinelli's writing of her time with Betty Bilawag and Gracie Binbin around the Top End of the Northern Territory is helpful in thinking about this. Here one can learn how integral context is, how the particularities of a place are incredibly important in that they all feed into, inform and rely upon one another in many ways. Povinelli explains how different arrangements of existence show themselves through manifestations: 'when something not merely appears to something or someone else but discloses itself as comment on the coordination, orientation, and obligation of local existents and makes a demand on persons to actively and properly respond.'¹² This coordination, orientation and response is exemplified in Povinelli's comments on her walking on the beach with Binbin and Bilawag amongst oysters: 'But humans are hardly the only or most important existences in these practices of materialising attention. Binbin and Bilawag knew the other forms of existence were also constantly assessing them—the weight of their and my feet in the thin, slippery mud hiding the razor edges of oysters makes the point well enough. The mud, the oyster, and the weight of my body dynamically interpret each other in such a way that they produce a specific effect.'¹³ This indicates the importance of land and its relations to different arrangements of existence, acknowledging the breadth of ways to know and engage with a context. It also decentres the human, reminding us that humans' assumed central positionality is just that, an assumption.

The nuclear industry (civil and military) in Britain is distributed across the country with varying reasons as to why certain areas of land were developed to accommodate its infrastructure. Other key parts of the industry move beyond the country's borders, with uranium mining at the beginning of the cycle occurring elsewhere, as well as nuclear weapons testing. Arguably, it is no accident that the messier parts of the nuclear industry occur beyond Britain's border, such as NIMBYism¹⁴ is unsurprising. Initial nuclear weapons developments in Britain immediately after the Second World War (WWII) tended to be former government sites, as places already under government control would circumnavigate any potentially lengthy negotiations about land acquisition; the post-war imperative to develop an atomic bomb as quickly as possible being the primary reason to avoid such negotiations. After WWII Britain's priority was to have its own nuclear weapons programme to ensure—with its empire receding—a seat at the table, alongside other nuclear states like the USSR and the USA. The criteria for the location of civil nuclear power stations during the 1950s were different from the weapon's related sites. They needed to have large quantities of cooling water readily available, for this reason all the Magnox power stations—excluding Trawsfynydd in Gwynedd, which obtained its cooling waters from an adjacent lake—were built in coastal locations. There were other factors that needed to be considered too, such as the need for a large, stable

¹² Povinelli, Elizabeth A. *Geontologies: A Requiem to Late Liberalism*. Durham: Duke University Press, 2016. p.58

¹³ Ibid. p.60

¹⁴ NIMBY is an acronym for 'not in my back yard'.

level site and access to the national grid initially for construction. Access for construction traffic was also important, as well as the consideration of possible local planning objections by amenity societies such as the Council for British Archaeology. For Bradwell A the choice of location was made due to the area being on a wartime airfield as well as being considered as energy deficient.¹⁵

Essex's Nuclear Stories: Landscapes, Taskscapes, Nuclearscapes

Essex can be understood as a microcosm of Britain's nuclear developments, particularly in the civil and military contexts, due to the nuclear installations within the county historically—that are still evident today—and the proposed developments within the region. I argue that a generative way to frame and think with this super-complex context is through its nuclearscapes. I will now draw on existing literature and concepts around landscape, nuclear landscapes, and nuclear culture. These concerns together make up the nuclearscape. The nuclearscape traverses land's surface, the subterranean and the skies. Its focus can shift to the dispersal of radioactive fallout of a nuclear disaster across continents or hone in on the source of said disaster and its immediate surroundings. The nuclearscape is an interconnected mesh of infrastructure, landscapes, taskscapes, land, sea, intertidal zones, air flows, ecosystems and economies of the nuclear military industrial complex. Here I will define 'nuclearscape' as a way to attune to the nuclear, demonstrating what can, should or could be contained within this term. 'Nuclearscape' encapsulates all the facets of the nuclear military industrial complex whilst acknowledging its inextricable link to place and the unique impacts distinct localities experience. 'Military industrial complex' was used by US President Dwight D Eisenhower in 1961 to describe the intertwined relationship between the nation's military and the industries that supply it. The intertwined relationship between a military nuclear weapons programme and civil nuclear power could therefore be understood as the nuclear military industrial complex.¹⁶ It is the networks and infrastructures of institutions that play a role in the production of nuclear weapons and their intertwined relationship with nuclear power production, research, their supply chains, and other applications of nuclear technologies, like in medicine. Nuclearscapes are a consequence of the nuclear military industrial complex.

Landscapes are stories, they tell us of those that have dwelled within and shaped the land, and those that have passed through and played a role in the land's ongoing formation. Landscapes are created out of multiple understandings and engagements (what Tim Ingold calls 'taskscapes'¹⁷)

¹⁵ Cocroft, Wayne. 'Strategy on the Historic Industrial Environment Report England's Atomic Age Desk Top Investigation and Assessment'. Research Department Reports. Historic England, 2006. p.20-22.

¹⁶ Carpenter, Ele, ed. *The Nuclear Culture Source Book*. London: Black Dog Publishing, 2016. p.190

¹⁷ It is helpful to understand and expand landscape through what anthropologist Tim Ingold calls the 'taskscape'. For Ingold the landscape is that which is known by those that dwell within or pass through it and that the best way to understand landscape is in relation to the 'taskscape'. What makes up the taskscape are the tasks, activities, movements, events and experiences that propel the process of social life for those that dwell within a particular

that one has with the world around them, which are conjured individually by each agent who realises a unique amalgamation of forms, objects, shapes and textures of their surroundings. These individual insights are recordings that become entangled with other recordings, they are always in process, polyvalent and multivocal.¹⁸ The amalgamation of all of this contributes to shaping the materiality of the landscape, determining its form. Its form is not fixed but mutable, which is arguably why scholar W. J. T. Mitchell in *Landscape and Power* seeks to change landscape from a noun to a verb.¹⁹ There are innumerable situated knowledges and diverse ways of knowing and relating to land that are established and embedded within particular contexts, such as the broad and diverse Indigenous communities across the world, who have extremely deep connections with the land, where land is not simply a resource but part of the very fabric of one's existence. I want to stress the importance of this acknowledgement as it shows a way of being-with and conceiving one's relation to land that is not set up on an extractive logic.²⁰

The nuclearscape is a way to think about the nuclear and land, how the nuclear's impact is variable and unevenly distributed depending on locality, the relative colonial and nation building projects they are embroiled within and the nuclear military industrial complex's identification of the land in question as useful, whether that is for the mining of uranium, the testing of bombs or sites of radioactive waste storage. One can hone in on the specific locality of a nuclearscape (like Foulness Island or the Monte Bello Islands) or identify how these places intersect and relate to one another. One could think of a place like Foulness or Monte Bello as nuclearscapes in a hyper-localised way or consider them together along with the routes and means of travel used to connect them via the pursuit of testing nuclear weapons. Like a globally interconnected nuclearscape traversing networks of travel punctuated by places utilised for the furtherance of nuclear technologies or treated like the complex's dustbin. A matryoshka doll of sorts, a constellation, where nuclearscapes do not necessarily nest neatly within one another but rather they shapeshift, operating on and moving through different scales of the nuclear. Not only does the nuclearscape operate on different scales in terms of locality, but it also considers the taskscapes, those activities that happen in, on and through the landscape. Curator Ele Carpenter articulates the ways that the nuclear operates across different proximities and scales and how 'the wider nuclear

landscape. This can be one's daily commute to work, the trip to the supermarket, or the building of a massive nuclear power station. These are the unending and super-complex interactions between innumerable agents dwelling in or passing through a landscape, the taskscape is inherently social and interactive—like the landscape, the taskscape is multivocal. See Ingold, Tim. 'The Temporality of the Landscape'. *World Archaeology* 25, no. 2 (October 1993): 152–74.

¹⁸ There are extensive studies on landscape, the general consensus being that a landscape is called as such due to it being changed some way due to human/cultural activity; such extensive study that there are numerous fields that have emerged to accommodate this such as Landscape Studies and Landscape Architecture, as well as journals such as *Landscape Research*. For some examples see Bender, Barbara. 2002. 'Time and Landscape'. *Current Anthropology* 43 (S4): S103–12.; Ingold, Tim. 1993. 'The Temporality of the Landscape'. *World Archaeology* 25 (2): 152–74; Mitchell, W. J. T., ed. 1994. *Landscape and Power*. Chicago: University of Chicago Press; Lippard, Lucy R. 1997. *The Lure of the Local: Senses of Place in a Multicentered Society*. New York: New Press; Stilgoe, John R. 2018. *What Is Landscape?* Cambridge, Massachusetts: MIT Press.

¹⁹ Mitchell, W. J. T., ed. *Landscape and Power*. Chicago: University of Chicago Press, 1994.

²⁰ Here I am reminded of Max Liboiron's thoughts on land in the introduction of *Pollution is colonialism*, where Liboiron foregrounds anticolonial land relations and also discusses the nuances between land and Land. See Liboiron, Max. *Pollution Is Colonialism*. Durham: Duke University Press, 2021. pp.6-8.

landscape includes the psychic power of the sublime apocalypse and the intimacy of the uncanny haunting, but the nuclear taskscape focuses on the mid-ground of human everyday intersections with the nuclear. These are the spaces we work in and travel through, the location for food production, and nuclear sites.²¹ Nuclearscapes are ways to hold together apparently disparate and diverse elements of or interactions with the nuclear, they are mutable.

What makes something nuclear, then? This categorisation, itself mutable in character, is explored in detail through Gabrielle Hecht's investigation of nuclear things and the category of 'nuclearity' that denotes the reasons why and how things are designated nuclear. Hecht explains:

Nuclearity . . . is a contested technopolitical category. It shifts in time and space. Its parameters depend on history and geography, science and technology, bodies and politics, radiation and race, states and capitalism. Nuclearity is not so much an essential property of things as it is a property *distributed among* things. Radiation matters, but its presence does not suffice to turn mines into nuclear workplaces. After all, as the nuclear industry is quick to point out, people absorb radiation all the time by eating bananas, or sunbathing, or flying over the North Pole. For a workplace to fall under the purview of agencies that monitor and limit exposure, the radiation must be man-made rather than "natural." But is radiation emitted by underground rocks natural (as mine operators sometimes argued), or man-made (as occupational health advocates maintained)?²²

What this shows is the ontological problems as well as colonial powers still at play regarding the nuclear, demonstrating how it traverses disciplinary boundaries, time and space. Hecht has worked extensively to ascertain what, how and why certain things are considered nuclear and why others may not be. It is this contested technopolitical category of nuclearity that is the sliding scale of what falls in- or outside of the classification of being nuclear. The explanation from Hecht above acknowledges how nuclearity's parameters are dependent upon many contributing factors, and how these factors may not have equal weighting, or their purported importance may shift. One fundamental aspect being whose nuclear story gets to be told and by whom.

Geographers Laura Pitkanen and Matthew Farish (2018) consider nuclearity in relation to landscape, charting geographic literature on nuclear topics, foregrounding the spatial characteristics of nuclearity and how it operates, and emphasising further the contested and shifting parameters of nuclearity through the lens of nuclear landscapes:

As Gabrielle Hecht's definition suggests, nuclearity - 'how places, objects, or hazards get designated as "nuclear"' - is *profoundly spatial* in its uneven distribution and consequences (Hecht, 2012: 4, 14) [my emphasis]. Likewise, the traces of nuclear initiatives are in some instances patently evident, but in other cases they are elusive, concealed, or almost unfathomable in their extent across time and space.²³

²¹ Carpenter, Ele, *Nuclear Taskscape: the radioactive midground*, unpublished, 2018.

²² Hecht, Gabrielle. *Being Nuclear: Africans and the Global Uranium Trade*. Johannesburg: Wits University Press, 2012. p.14.

²³ Pitkanen, Laura, and Matthew Farish. 'Nuclear Landscapes'. *Progress in Human Geography* 42, no. 6 (December 2018): 862–80. <https://doi.org/10.1177/0309132517725808>. p.862.

This unevenness and the question of who becomes the narrator of the world's nuclear stories is reiterated by a further observation regarding the emergence of nuclear landscapes and how they are not necessarily self-evident. One may have to look hard for the nuclear military-industrial complex's infrastructure to reveal itself, after all radiation cannot be sensed by humans and therefore nuclear landscapes may appear like any other. A way to help make this apparent is to consider that which happens 'on the ground' within a particular locality to bring the characteristics of nuclearity to the surface, whether that is lorries transporting nuclear waste, tailings from uranium mines or the remnants left behind from a decommissioned nuclear power station. These activities facilitate a shift away from the passivity that landscapes may suggest, where things are *viewed* at a distance and where the visual is the primary sense employed. What is required is an extension beyond *visuality*,²⁴ instigating a more active engagement with one's surroundings, where one operates within the particular context in question and does not sit outside of it—one is not on the outside looking in, but rather experiencing the breadth of one's senses and being in the world, via smell, touch, sight, sounds.

The nuclear stories and their relative localities hold a multiplicity of narratives. The historic links between apparently disparate geographies, and the implications of these links are crucial to grasping the uneven distribution and consequences that Hecht, Pitkanen and Farish have explored. Moreover, the nuclear industry and state's use of land and resources are arguably a continuation of colonialism and extractive capitalism, exploiting the colonial geographies established prior to the nuclear industry's beginnings, extracting resources and testing bombs in current or former colonies. Britain is a case in point, where uranium for its civil nuclear power stations and the production of plutonium coming from mines in Canada (among other places) and the testing of its nuclear weapons at the Monte Bello Islands, Emu Field and Maralinga in Australia. The formation of nuclearscapes are embedded within and reliant upon colonial, exploitative and extractive practices. This in turn determines the disparities that these practices engender, such as who suffers with the impact of nuclear weapons testing (or the bombing of Indigenous lands), or the levels of risk²⁵ (perceived or otherwise) living nearby a nuclear power station or the indefinite storage of nuclear waste.

The logic of extractivism which often results in ill-health amongst its workers and local communities continues today, and it continues to disproportionately affect those who are, or are perceived to be,

²⁴ After all, W. J. T. Mitchell reminds us that there are no visual media! See Mitchell, W. J.T. 'There Are No Visual Media'. *Journal of Visual Culture* 4, no. 2 (August 2005): pp.257–66.

²⁵ For work on risk perception featuring narrative interviews from Bradwell residents see Parkhill, K.A., K.L. Henwood, N.F. Pidgeon, and P. Simmons. 'Laughing It off? Humour, Affect and Emotion Work in Communities Living with Nuclear Risk1: Laughing It Off?' *The British Journal of Sociology* 62, no. 2 (June 2011): 324–46. See also Parkhill, Karen A, Nick F Pidgeon, Karen L Henwood, Peter Simmons, and Dan Venables. 'From the Familiar to the Extraordinary: Local Residents' Perceptions of Risk When Living with Nuclear Power in the UK'. *Transactions of the Institute of British Geographers* 35, no. 1 (2010): 39–58.

on the periphery. The disparities of nuclearity are demonstrated in where nuclear installations are built, where nuclear weapons are tested and ultimately who these impact. Geographers Andrew Blowers and Pieter Leroy call these 'peripheral communities' and its use was intended in the context of undesirable places—such as power stations or waste storage facilities—that arguably have to be situated somewhere whilst presenting risks to local communities, their environment and health. Hazardous activities include infrastructural works, power stations, industrial chemicals or waste facilities, and such activities have come to be called 'locally unwanted land uses' (LULUs).²⁶ Blowers asserts that 'nuclear facilities, including power stations but especially those activities concerned with the decommissioning, clean-up and waste management, are, perhaps, the classic case of such LULUs.' Peripheral communities, Blowers continues, 'can be described as geographically remote, economically marginal, politically powerless and socially homogeneous.'²⁷ Once an area is designated for use within the nuclear industries it tends to be 'locked in' to such uses. Peripheral communities are often marginalised and at the mercy of the industries imposed upon them, in some instances this might mean new jobs for the short term but at the expense of an irrevocably changed home and perhaps a risk to one's health.

The location of these facilities and their associated nuclearity not only fall on spatial lines but can also be racial, such as in the settler-colonial contexts that have helped furnish Britain with the uranium ore for fissile material or land for nuclear testing. Writer Lou Cornum provides an example of this in their text *The Irradiated International*. Cornum begins by telling the reader about a trip a group of Dene elders from Northwest Canada made to Hiroshima in 1998, to meet with descendants and survivors of the atomic bomb dropped on the city in 1945. Cornum continues:

Some of the uranium used to kill more than 200,000 people in Japan had been mined and transported by Dene men, many of whom died years later from radiation-related disease. The six Dene elders came from where the earth had been torn up to the place where earth and sky were ripped apart like never before. They came to Hiroshima to apologize and to recognize the shared radioactive reality between people touched by the detonation of the bomb and those who unwittingly touched the materials that would make such a weapon. Nobody from the Canadian government was present, none among those who had exploited the miner's bodies and their home lands and willingly aided the construction of the atomic bomb ever made the journey.²⁸

This example demonstrates a lack of transparency with regards to disclosing pertinent information to those working the mines and extracting the materials for the bomb. Cornum calls those that have been impacted by nuclear weapons— 'a diffuse collective of families, communities, enemies and strangers'—the irradiated international. One could extend this further and consider all of those

²⁶ Blowers, Andrew. *The Legacy of Nuclear Power*. London ; New York: Routledge, Taylor & Francis Group, earthscan from Routledge, 2017. pp.6-7.

²⁷ See Blowers, Andrew, and Pieter Leroy. 'Power, Politics and Environmental Inequality: A Theoretical and Empirical Analysis of the Process of "Peripheralisation"'. *Environmental Politics* 3, no. 2 (June 1994): 197–228. <https://doi.org/10.1080/09644019408414139>, 1994 p.198; and Blowers, 2017 pp.6-7.

²⁸ Cornum, Lou. 'The Irradiated International', 2018, <https://datasociety.net/wp-content/uploads/2018/06/ii-web.pdf>. Accessed 8 November 2023.

impacted by the nuclear military-industrial complex as part of this diffuse collective, which is of course alluded to by Cornum. Cornum has foregrounded two nodes among many, many others.²⁹

What is shown here is the uneven distribution of impacts of the nuclear, and with colonialism and capitalism as bedfellows this is unsurprising. To avoid the nuclear being understood in flattening and universalising ways, much like critiques of ‘the Anthropocene’,³⁰ one must think about the nuclear holistically. To consider the nuclear holistically is not to say without nuance or complexity but by acknowledging the uneven distribution of nuclearity across the whole cycle such as who benefits more or less from the power produced and weapons made, and who, where and what is disproportionately impacted by these same forces. One can trace the innumerable ways the nuclear permeates societies, ecologies, geographies, economies. The nuclear and the Anthropocene are entangled, particularly in light of the tracing of radionuclides as a means of determining a geological marker for the Anthropocene³¹ where recent proposals for Crawford Lake in Ontario, Canada, as a marker have been put forward. This is due to radionuclides found in the lake’s sediment, which further foregrounds the entanglements of the global nuclearscape and brings closer the relationship between nuclear weapons testing, the radioactive fallout, and this apparent new epoch’s designation.³²

For Pitkanen and Farish (2018) the interpretive conclusions that came out of their research on nuclear landscapes were twofold: ‘[f]irst, it is futile to separate imaginative or affective realms from contaminated land, water, air and bodies of, say, Bikini Atoll or Chernobyl. Second, it is similarly ineffective to halt consideration at the shoreline of a shattered island or at a barbed-wire fence.’³³ How one perceives, thinks or relates imaginatively or affectively to nuclear landscapes are tied up with the lands designated or understood as such, both of these factors shape one’s understanding. This is irregardless to whether these perceptions hold up empirically, they are part of the nuclear taskscape³⁴ and hence the landscape—*a landscape is the embodied form of the taskscape*.³⁵ This interplay between landscape and taskscapes (and all the other aforementioned complex relations this infers) in this nuclear context can be understood as the nuclearscape. Nuclearscapes are a means to describe super-complex spaces that incorporate the stories of those who have been

²⁹ Ibid.

³⁰ See Yusoff, Kathryn. *Billion Black Anthropocenes or None*. Minneapolis: University of Minnesota Press, 2018.

³¹ The Anthropocene Curriculum project at Haus der Kulturen der Welt (HKW, Berlin) have categorised different possible anthropogenic markers of the Anthropocene, ‘Nuclear Anthropocene’ being one of them. See <https://www.anthropocene-curriculum.org/anthropogenic-markers/nuclear-anthropocene>. Accessed 23 April 2023. Ele Carpenter also has a ‘Nuclear Anthropocene’ chapter in Carpenter, Ele, ed. *The Nuclear Culture Source Book*. London: Black Dog Publishing, 2016 pp.13-46.

³² McCarthy, Francine Mg, R. Timothy Patterson, Martin J Head, Nicholas L Riddick, Brian F Cumming, Paul B Hamilton, Michael Fj Pisaric, et al. ‘The Varved Succession of Crawford Lake, Milton, Ontario, Canada as a Candidate Global Boundary Stratotype Section and Point for the Anthropocene Series’. *The Anthropocene Review* 10, no. 1 (April 2023): 146–76. <https://doi.org/10.1177/20530196221149281>.

³³ Pitkanen and Farish, 2018 p.863.

³⁴ Carpenter, 2018.

³⁵ Ingold, Tim. ‘The Temporality of the Landscape’. *World Archaeology* 25, no. 2 (October 1993): 152–74. <https://doi.org/10.1080/00438243.1993.9980235>.

implicated in the nuclear military industrial complex, either directly or indirectly. They exist affectively and imaginatively, shifting perceptions and physical relations one might have with a particular place as well as how one might view or perceive such a place or understand the levels of nuclearity.

Nuclearscapes are nuanced and complex entanglements that encompass swathes of the earth (if not all the earth) as well as localised spaces whose boundaries are leaky or indeterminate. Everywhere there are nuclearscapes, or everywhere is a nuclearscape; since the detonation of the first nuclear bomb in the 1940s 'we are all geologically and biologically timestamped by this diffuse haze of fallout, which has irrevocably merged radiation with land and bodies.'³⁶ Radioactivity is so vast in its temporal and spatial characteristics that it feels at once ubiquitous but nowhere, its coverage is planetary but cannot be sensed by humans, it is as Timothy Morton claims a 'hyperobject'.³⁷ The hyperobject of radioactivity is one of the implications of the global nuclearscape, where fallout from disparate locations coalesce and are now part of us all. We must remember, however, that radioactivity is not necessarily the defining factor of nuclearity, and hence nuclearscapes; one can deduce from Hecht how nuclearity is a contested techno-political category and Farish and Pitkanen show that the contributing factors of nuclearity can be elusive, be they its psychic impact or its subterranean spread, for example. What is more, marginalised voices and peripheral communities can shift what might be framed or centred in the many nuclearscapes, from the localised to the global. These voices and communities demand an acknowledgement of the everydayness of living within a nuclear present. One must remember that not all nuclearscapes are made through the spectacle of the mushroom cloud and its aftermath. Many tell of the somewhat banal machinations of the nuclear industry's functioning, such as the transportation of nuclear waste; the slow, drawn-out decommissioning process; or the constant daily extraction of uranium ore.

I am calling nuclearscapes as such due to the activities of the nuclear military industrial complex, its infrastructures, contaminating consequences and nuclear related activities. There are other eventualities, stories, histories and possible futures that get swallowed up by this designation. The monolithic nature of the nuclear industry consumes and envelopes everything that surrounds it, as scholars Becky Alexis-Martin and Thom Davies above remind us.³⁸ Other stories tell us about nuclearscapes in a move away from the dominant narrative of the nuclear military industrial

³⁶ Alexis-Martin, Becky, and Thom Davies. 'Towards Nuclear Geography: Zones, Bodies, and Communities'. *Geography Compass* 11, no. 9 (September 2017): e12325. <https://doi.org/10.1111/gec3.12325>. p.1.

³⁷ Morton 'coined the term hyperobjects to refer to things that are massively distributed in time and space relative to humans. A hyperobject could be a black hole. A hyperobject could be the Lago Agrio oil field in Ecuador, or the Florida Everglades. A hyperobject could be the biosphere, or the Solar System. A hyperobject could be the sum total of all the nuclear materials on Earth; or just the plutonium, or the uranium. A hyperobject could be the very long-lasting product of direct human manufacture, such as Styrofoam or plastic bags, or the sum of all the whirring machinery of capitalism. Hyperobjects, then, are "hyper" in relation to some other entity, whether they are directly manufactured by humans or not.' See Morton, Timothy. *Hyperobjects: Philosophy and Ecology after the End of the World*. Posthumanities 27. Minneapolis: University of Minnesota Press, 2013 p.1.

³⁸ Alexis-Martin and Davies, 2017.

complex, decentring the preoccupation of their formation and ongoingness. Learning from those who have been directly impacted, these stories tell us of living with the nuclear or in spite of it. One only has to look to the over 2000 nuclear bombs tested across the world and the communities and environments this has impacted. Stories of black mists descending across lands and on peoples across the wide expanses of Australia in the 1950s and '60s due to the British Government's nuclear testing programme at Maralinga and Emu Field are a case in point.³⁹

In Essex, away from the dominant, top-down stories, we learn of peregrine falcons and their chicks that hatch on dormant reactor buildings, or the off-grid community that lives next door to nuclear power generation infrastructure but produce their own electricity, or the tending of one's land so one's crops can thrive while the fenced off territory next door is used to develop weapons to destroy someone else's land and kin. Many characteristics of nuclearscapes are also banal and extremely unremarkable. This is the everyday reality of those that have not succumbed to spectacular disaster. How can we map the stories of the everyday, 'slow violence'⁴⁰ of nuclearity that is characterised by the decommissioning process of a power station or the labour practices of uranium extraction and other related forms of nuclear activity without explicit reference to the spectacular violence of events like Hiroshima or Fukushima?⁴¹ Here one also needs to acknowledge that disciplines such as physics, medicine, and other activities like policy making and treaties conventions are all part of the nuclearscape but do not necessarily participate in the alarming regime of nuclear detonation or meltdown, and the stories and images produced.

smudge studio, an ongoing collaboration between artists Jamie Kruse and Elizabeth Ellsworth, are an excellent example of how artists engage with nuclearscapes and their more banal characteristics. The artists articulate aspects of the infrastructures of the nuclear and how these converge, overlap and intersect with other infrastructures and systems, such as the American Highway system and those that use it. Infrastructures that facilitate the nuclear industry such as roads and other transportation networks provide material traces of the nuclear on the land. They are integral to the proper functioning of the nuclear military industrial complex. In *Look Only at the Movement* (2012-2015) Ellsworth and Kruse attempt to contextualise the nuclear through movement, they demonstrate how by paying attention to a particular aspect of the nuclear's immense infrastructure one can start to gain a nuanced and deeper understanding of the nuclear

³⁹ See Tynan, Elizabeth. *Atomic Thunder: The Maralinga Story*. Sydney, NSW: NewSouth Publishing, 2016; and Lester, Karina, Lisa Radford, Yhonnie Scarce, David Sequeira, Patrice Sharkey, and Azza Zein. *The Image Is Not Nothing (Concrete Archives) Catalogue*. Edited by Lisa Radford. Adelaide: ACE Open and Person Books, 2021.

⁴⁰ 'Slow violence' is a term used by Rob Nixon to describe the deferred, gradual and attritional disproportionate impact of industrial capitalist production on both the environment and poor, disempowered, and often involuntarily displaced people. Examples Nixon outlines include climate change, toxic drift, deforestation, oil spills, and the environmental aftermath of war, which take place gradually and often invisibly and therefore are not addressed adequately, if at all. In this instance the slow violence of the processes that bookend the nuclear cycle which are often eclipsed by spectacular events are also included. See Nixon, Rob. *Slow Violence and the Environmentalism of the Poor*. 1. Harvard Univ. Press paperback ed. Cambridge, Mass.: Harvard Univ. Press, 2013.

⁴¹ Lawless, Katherine. 'Mapping the Atomic Unconscious: Postcolonial Capital in Nuclear Glow'. In *Materialism and the Critique of Energy*. Chicago: MCM Publishing, 2018.

complex, its differing scales and (un)surprising ubiquity. Through tracking nuclear waste's movement one is confronted by the banality of its circulation and the perplexities of dealing with it. If or until a final storage location is determined, the only thing to do is to move the waste around—smudge studio shows us that waste is a volatile event, and not a passive object.⁴²

We begin to understand that on some level many of us, if not all, are implicated in the nuclear cycle, and much of it is mundane and arguably unnoticeable without research and heightened attention. smudge studio shows how objects like nuclear waste are never static, they irradiate and their atomic structures change and shift, they are moved by people between sites, and they are buried and slowly leak. These movements operate on different scales, atomic, human and geologic; this shows us the 'sites and moments where the human and the geologic converge.'⁴³ What Ellsworth and Kruse do is foreground the fiction that nuclear waste goes away, it does not, much of it will need to be cared for or kept away from humans for thousands and thousands of years. Part of this is the circulation of the waste from one nuclear facility to another since a conclusive final destination (how 'conclusive' and 'final' any destination can be in this context is of course up for debate) for the United States' nuclear waste is lacking; much like the UK in this respect, although the UK is further behind with their progress. In *Look Only at the Movement* smudge studio articulate in a vivid way the materiality and movement of the nuclear industry's waste management networks in the United States through a two-channel video whose length of 171 minutes implores the viewer to notice the moments when the nuclearscape reveals itself.

Not only does *Look Only at the Movement* focus on the particularities of one aspect of the nuclear military industrial complex, it also shows how far its reach is. When one considers the extent of the movement of nuclear waste and their planetary implications, Morton's designation of radioactivity as a hyperobject is appropriate. Through focussing on how nuclear waste moves around the United States smudge studio have been able to open up the broader concerns this perpetual movement of nuclear waste points to, the risks of said movement and the continual problem with how and where nuclear waste is stored in perpetuity.

Radioactivity as a hyperobject is intimately linked with the global nuclearscape, as radioactivity's planetary spread in this sense is at once a cause and consequence of the nuclearscape. What one sees here through smudge studio are the nuclear landscapes, the subsequent taskscapes and the infrastructural frameworks that are ubiquitous and can be understood as part of the nuclearscape of the United States. The nuclearscape is the interplay between and combinations of nuclear landscapes, taskscapes and the associated infrastructures of the nuclear military-industrial complex, real, imaginary, or otherwise, which can include perceptions of risk relative to the nuclear.

⁴² Jacobs, Sara, Emily Gordon, and smudge studio. 'Smudge Studio by Sara Jacobs, Emily Gordon - BOMB Magazine'. BOMB Magazine, 2014. Accessed 8 November 2023 <https://bombmagazine.org/articles/smudge-studio/>.

⁴³ Ibid.

Therefore, I argue that articulating such complexity through the lens of nuclearscapes is a way to attempt to think about the nuclear holistically. Nuclearscapes are a means to hold together and speak of the dispersed nature of the nuclear and the ways its industries take form across the globe, through infrastructure, contamination or one's perception, and the ways these are understood, interrelated and manifest in a plethora of ways. For example, one can take Essex as a point of departure, with Essex's nuclearscapes encompassing and moving out from focal points such as Foulness Island or the Blackwater Estuary, which when followed may extend to disparate localities or areas of concern, depending upon the lines of enquiry taken up.

smudge studio's processes of defamiliarisation and heightened attention make the mundane and banal aspects of nuclear industries apparent, bringing the everydayness of the nuclear to the fore. They show that the focus on the movement of a particular type of vehicle and its cargo opens up innumerable discussions around the moral and ethical conundrums of managing and storing waste for millennia and relying upon future generations to solve the problems of those that have reaped the benefits of the waste packages that the present and future are stuck with. Here, smudge studio's nuclearscape is the networks that accommodate and make possible the movement of nuclear materials and the relations pulled into this. The nuclearscapes of Essex can be considered in the same way, where the somewhat banal or innocuousness of these places in my home county are far more than what they may appear. Where grand narratives of nuclear conquest and the deep-time of waste into tomorrow play out day by day and are not going anywhere, nor are the stories of extraction and devastation that the Essex nuclearscape is intimately related to.

The county of Essex can help trace the UK's nuclear story, its preoccupation with becoming a nuclear colonial power, and the inclusion of nuclear power in the UK's electricity generation and infrastructure. It is a microcosm of Britain's nuclear legacy, with evidence of the country's historic, present and future entanglements with the nuclear marked across it. Here the military, industrial, and personal stories one can tell coalesce, their convergences and divergences made apparent through the mapping of their purported distinct parts that inevitably overlap. By extension, Essex allows one to gain a broader understanding of how the nuclear military industrial complex has and does operate in the UK—and how these operations impact locales beyond the UK's shores—as well as how the nuclear military industrial complex might inform or impact the experiences of those that live with and alongside Essex's nuclear infrastructures.

The county has one of the longest coastlines across the UK due to its warren of rivulets and creeks along much of its marshlands, which incidentally might make it difficult to ascertain what is and is not part of the coastal territories along these intertidal zones. Essex is implicated in Britain's hopes of becoming a nuclear power as well as the utopian visions of a world powered by splitting the atom. Today the county is subject to the UK Government's renewed interest in a new nuclear

programme and hence considered within the proposed new fleet of nuclear power stations, an apparent 'nuclear renaissance' in the UK is perpetually on the cusp of arriving. But 'the nuclear' has never really left, since World War II the slow violence caused from devices constructed within the county, the impact of the nuclear industry's infrastructure on wildlife and land, and the risk and perceived risk to local people⁴⁴ have always been present in one way or another since Britain's pursuit of becoming a nuclear state. Across Essex, and the UK, there are historic and contemporary nuclear sites, as well as sites keen to propel the UK into a future where the application of nuclear technologies in power generation, the military and medical applications⁴⁵ remain commonplace. These sites chart the UK's aims to become a nuclear state that not only harnesses the atom for its weapons programmes but also to power the country's homes and industry. Dotted across Essex are secret nuclear bunkers, Underground Monitoring Posts, nuclear waste storage facilities, remnants of nuclear power's generation and the ghostly rumbling of new power stations, and places that were integral to Britain's weapons development, assembly, and testing.

These aforementioned nuclear installations are primarily associated with civil and military nuclear uses, namely the generation of electricity and the military's nuclear weapons programmes. Additionally there are many other more inconspicuous aspects of the nuclear military industrial complex all around such as the transportation arteries that facilitate the movement of nuclear materials; their use in research and development and medical applications; the networks and institutes that facilitate the transfer of skills and knowledge within and across the industries involved with nuclear technology; as well as the nuclear's significance culturally in art, music and film. One could argue that nuclear industries are ubiquitous, where the infrastructures that allow them to operate are pervasive, albeit somewhat banal and commonplace, and its impact culturally permeates the global psyche.

My focus here is with the civil and military applications of nuclear technologies and their subsequent impact on and relation to the everyday. Generally, and in art projects particularly,⁴⁶ there is an oscillation between two diametrically opposing perceptions of the nuclear: the spectacle of the mushroom cloud and nuclear disasters on the one hand; and the imperceptibility of the atom and the invisibility of radiation on the other. The latter considering the intimate relation to bodies and the subsequent delay of effects, which are extremely difficult, if not impossible, to trace back to any definitive cause from a particular radioactive source. Accompanying these oppositions are also

⁴⁴ Parkhill, K.A., K.L. Henwood, N.F. Pidgeon, and P. Simmons. 'Laughing It off? Humour, Affect and Emotion Work in Communities Living with Nuclear Risk1: Laughing It Off?' *The British Journal of Sociology* 62, no. 2 (June 2011): 324–46. <https://doi.org/10.1111/j.1468-4446.2011.01367.x>; and Parkhill, Karen A, Nick F Pidgeon, Karen L Henwood, Peter Simmons, and Dan Venables. 'From the Familiar to the Extraordinary: Local Residents' Perceptions of Risk When Living with Nuclear Power in the UK'. *Transactions of the Institute of British Geographers* 35, no. 1 (2010): 39–58.

⁴⁵ Although my project does not focus on medicine it must be noted that the nuclear applications are prominent within this area, such as the research, development and application of radiation treatments for cancer, for example.

⁴⁶ Examples of nuclear culture arts projects and curatorial practice in relation to this will be covered in more detail in chapter two.

the extremities of time, from the 24,100 year half-life of plutonium to the explosion of the hydrogen bomb which occurs in about a millionth of a second. Many, not all, art projects have tended to be preoccupied with these polarities, my project's focus is on the relation of these polarities to the everydayness of living in the present of nuclear ubiquity, understood as the experiences of nuclear technologies on our daily lives, the space that curator Ele Carpenter calls the radioactive midground.⁴⁷ Now to turn to Essex and its nuclear stories. Below I elaborate on my home county's involvement in Britain's nuclear project.



Figure 2: 'DANGER: MOD FIRING RANGE', warning sign found on Foulness Island during field work, 5 August 2019.

Photo courtesy the author.

⁴⁷ Carpenter, 2018.

This remark should be read as an observation rather than a value judgement. I will discuss projects that traverse the broad spectrum of the nuclear in chapter two.

Foulness Island⁴⁸

Essex has 30 islands along its coastline and Foulness Island is the largest. The island sits on the north shores of the River Thames, where the river's mouth meets the North Sea, Foulness' north and north-west sides edge on to the rivers Crouch and Roach, respectively. Historian Ian Yearsley writes that Foulness Island is one of six islands that make up the so-called 'Essex Archipelago', the others being Havengore, New England, Potton, Rushley and Wallasea Islands.⁴⁹ Along Foulness' coast on the Maplin Sands there is ostensibly the 'most perilous path in Britain', the Broomway, which is over 600 years old and would have been the only access to Foulness Island until the military built a road in 1922. Most of the Broomway is a Byway Open to All Traffic, meaning it is a highway the general public can use for vehicular and all other kinds of traffic, but it is now used this way very rarely, and generally for walking tours since Foulness is now accessible via road onto the island. If one is to walk the Broomway then a good knowledge of the tides and navigation skills are of the utmost importance, and a guide who knows the walk well is highly recommended.



Figure 3: Walking the Broomway with artist and curator James Ravinet. Led by local guides Brian and Toni Dawson. 29 June 2019. Photograph courtesy the author.

For over 150 years Foulness Island has been involved in military operations in some form. The MOD range, of which Foulness Island is a part, covers over 9,300 acres with another 35,000 acres when the tide goes out, which consumes the Broomway, making the need for having a guide when

⁴⁸ <https://miro.com/app/board/uXjVNQfgvg4=?moveToWidget=3458764569642741277&cot=14>. Accessed 16 November 2023.

⁴⁹ Yearsley, Ian. *The Islands of Essex*. Romford: Ian Henry Publ, 1994. p.34.

walking it all the more important. Now the whole island is owned by the Ministry of Defence (MOD), who are also the landlord to all property, which includes around 100 dwellings housing over 200 private residents and seven working farms managing 7,000 acres between them.⁵⁰ There are also Sites of Scientific Interest (SSSI), Special Protection Area (SPA), Special Areas of Conservation (SAC) and Ramsar designations across the island.

Historian Wayne Cocroft has researched the nuclear operations of the UK including a particular focus of those on Foulness Island, including a joint report on the island's Atomic Weapons Research Establishment (AWRE) with fellow historian Sarah Newsome in 2009. They explain that in June 1947 part of the MOD's Shoeburyness range on Foulness Island was transferred from the Armaments Research Department (ARD) to Basic High Explosive Research (HER). HER was a specially created division for the British bomb project, which functioned as a secretive and autonomous section of ARD, and called HER to disguise its real function. It was later known as the Atomic Weapons Research Establishment (AWRE). Its formation was due to the passing of the McMahon Act in 1946 where the UK was denied access to US atomic work, so it decided to embark upon its own nuclear weapons programme. During this period both the weapons and civil research programmes would often work closely drawing on the UK's pool of scientific experts, which was relatively small.

After the transfer to HER a series of utilitarian, nondescript buildings and test structures were built, these would have been on the left-hand side as one drives on to the island. They include building X6⁵¹ where the assembly of the high explosive elements of Britain's first atomic bomb took place. Building X6 is a simple brick built structure like much of the atomic facilities of the late 1940s and early 1950s used for this purpose, due to a combination of post-war austerity and the urgency of bringing the atomic facilities into operation. In 2009 it was reported that most of X6's internal fittings had survived including a precision measuring table in the metrology room. Equipment like this would have been used to measure components before being assembled into experimental charges and other devices. It is unclear whether this table was in situ when devices for Britain's first atomic bomb were assembled, but Cocroft and Newsome do confirm the devices for *Operation Hurricane*, which were taken to the Monte Bello Islands to be detonated in 1952, were assembled in this building. Foulness Island is a significant part of Britain's nuclear weapons development and

⁵⁰ As landlords the MOD only has to give six months' notice to evict anyone on the island, even those that have lived and tended the land for many generations before the MOD's involvement. Arguably this causes some tension between Foulness' inhabitants and the MOD, with a clear separation between the two. Such a separation is made apparent in Foulness Island's Heritage Centre which focusses on domestic and farm life on the island, it can be visited on the first Sunday of every month between April and October—one must get permission to access the island any other time. The centre was open in 2003 after the Foulness Conservation & Archaeological Society (FCAS) converted the former Foulness Primary School into the Heritage Centre. The only access permitted is the main spine road that leads from the island's entrance to the centre, no deviation is permitted. From the centre the FCAS also give guided tours of part of the island by tractor.

⁵¹ <https://miro.com/app/board/uXjvNfqyg4=?moveToWidget=3458764569639525076&cot=14>. Accessed 17 November 2023.

nuclear colonial legacy which is still ongoing. *Operation Hurricane* and the subsequent nuclear weapons Britain detonated on Indigenous lands of so-called Australia between 1952 and 1963 are an uncomfortable reality of Britain's nuclear colonial project and one with lasting effects. Britain's nuclear testing was another claim to and disregard of the lands of Australia, not too dissimilar to the colonial projects that preceded it, where Indigenous community's land is taken from them, irregardless of the fact they have lived with and been custodians of it for millennia.



Figure 4: the Foulness Island Atomic Weapons Research Establishment gates, August 2019. Photograph courtesy of the author.

It was in 1954 where Foulness' ongoing future was sealed when UK Prime Minister Winston Churchill's cabinet decided to endorse the decision to proceed with the hydrogen bomb, which meant a substantial building programme on Foulness Island. The most momentous military-scientific developments for Britain after WWII, the atomic and hydrogen bombs, became intimately linked with Foulness Island. The activities at Foulness spanned the whole of the Cold War period, from the beginning of construction in 1947 to the withdrawal of AWRE in 1997, during which work was undertaken on all Britain's nuclear weapons and research into their effects. Facilities associated with the early pioneering stages of nuclear weapons development are very hard to come by, and Cocroft and Newsome confirm that the first structures associated with

Britain's nuclear weapons programme on Foulness Island are some of the earliest buildings that were built for the assembly and testing of nuclear weapons. Additionally, these buildings also pre-date by around two or three years other more widely known facilities such as Aldermaston in the UK, and the United States' Nevada Test Site.⁵²

In August 2019 I arranged a site visit to the island with artist Gabriella Hirst, to consider this context in relation to Hirst's ongoing project *How to Make a Bomb*. We were taking advantage of the limited access to the island, visiting the heritage centre on the first Sunday of the month, the only day each month between April and October that one can visit. This was followed by a tour around some of the island on a tractor sat atop hay bales. During the day we learnt about the community that have lived on Foulness Island and pre-date the military's involvement, saw hares (the first I have ever seen in Essex) as well as how the island's history, communities and ecology extends way beyond the nuclear but is nevertheless now implicated with and a significant part of Britain's pursuance in becoming a nuclear state.

Figure 4: Tea at the Foulness Island Heritage Centre with artist Gabriella Hirst, 5 August 2019. Photograph courtesy the



author.

⁵² See Cocroft 2006; Cocroft, Wayne. 'England's Atomic Age. Securing Its Architectural and Technological Legacy'. In *Kernkraftwerke : Denkmalewerte Und Erhaltungschancen / Nuclear Power Stations: Heritage Values and Preservation Perspectives*. Berlin: Hendrik Bäbler Verlag, 2019; and Cocroft and Newsome, 2009.

The Blackwater Estuary⁵³

The Blackwater Estuary is north of Foulness Island, beginning around the northern tip of the Dengie Peninsula. Like any estuarine landscape the Blackwater Estuary is complex, its interrelationships have planetary implications: migratory birds; the ebb and flow of the tide; the panning and selling of the well-known Maldon salt; and involvement in the nuclear military industrial complex. The estuary is home to one of the UK's first generation of nuclear power stations, Bradwell nuclear power station (Bradwell A); a proposed new nuclear programme, Bradwell B; a nuclear waste 'interim' storage facility; and the Othona Community, an off-grid community who produce much of their own electricity and take care of their own waste through a three-tiered reed bed sewage system. Here the arrangement of humans and non-humans, historical sites and important ecologies should be considered when thinking about and acting upon the planning and implementation of the infrastructure of nuclear power production and storage. Like Foulness Island the Blackwater Estuary has several designations, it is a biological SSSI, a Ramsar Wetland of International Importance and an SPA, 1099 hectares are also a National Nature Reserve.

Britain's civil nuclear infrastructure has taken a keen interest in the Blackwater Estuary, the now decommissioned Bradwell A sits on the estuary's southern shores, construction started in 1957 with electricity first being generated in 1962. Bradwell A has also seen its share of security breaches too, in 1966 twenty natural uranium rods were stolen,⁵⁴ and the rods were subsequently recovered by the police. Considerations were made in the 1950s and '60s to mitigate the impact of the civil nuclear industry's structures on the landscape, and Bradwell A was no different. There were 'different design solutions and philosophies . . . employed to blend these huge buildings into their local landscapes. At Bradwell [A], careful attention was paid to the facing materials, which included aluminium sheeting that weathers a dull grey, Leicester Lilac bricks, exposed natural aggregate gravel in the concrete panels, and its doorways and other openings were painted in maroon and olive greens. Glass panels also allowed an observer to almost see through the buildings that enclosed the heat exchanges.' Landscape architect and garden designer Sylvia Crowe described Bradwell's reactor buildings as 'huge, clean, light and floating almost like one of the clouds over the estuary.'⁵⁵ Perhaps a somewhat romanticised and naturalising description of the power station's mark on the landscape but nevertheless this foregrounds the hope that these nuclear facilities would blend in and not be considered out of place. A similar approach in terms of aluminium sheeting has also been adopted for the 'weather envelope' that covers the reactor buildings today, which will remain in place for several decades to come. This envelope was

⁵³ <https://miro.com/app/board/uXjvNQfgyg4=/?moveToWidget=3458764569699620406&cot=14>. Accessed 16 November 2023.

⁵⁴ Lovins, Amory. *Brittle Power: Energy Strategy for National Security*. Place of publication not identified, 1983. <https://archive.org/details/brittlepowerener00lovi>. p.146.

⁵⁵ Cocroft, 2019, p.81.

installed for the Care and Maintenance stage of the power station's decommissioning and is designed to withstand adverse weather conditions over the next one hundred years. It will likewise weather to a dull grey perhaps with the hope that Bradwell A may eventually recede into the skyline, rising like a cloud before final site clearance happens at the end of the twenty-first century or the beginning of the twenty-second.



Figure 5: Bradwell A reactor buildings with the aluminium 'weather envelope' in construction to encase them. Photograph courtesy the author.

During the 1980s there were protests that prevented proposals for nuclear waste to be stored on-site at Bradwell just below ground-level, however these historic objections seem to have not been taken up again in quite the same way with regards to the current storage arrangement. The Blackwater area is not only an actual repository for nuclear waste but is implicated within the extraction of matter from elsewhere, from the beginnings of the nuclear cycle and the extraction of uranium ore from mines in Australia, Canada, Democratic Republic of the Congo and Namibia,⁵⁶ which supplied uranium to UK power stations and weapons—a continuation of (nuclear) colonial practices. This creates massive changes to other places, considerable waste in the form of mine tailings and other byproducts, as well as impacting people, their communities, the environment,

⁵⁶ Butler and Bud, 2017.

and associated ecologies. And this is not to mention anything of the other natural resources needed to construct something like Bradwell A or B.



Figure 6: Photograph of the 1986 protests at Bradwell against proposed nuclear storage. Photograph courtesy Burnham Museum.

Bradwell A ceased generating electricity in 2002 and the decommissioning process began in earnest. In November 2018 the power station entered the aforementioned Care and Maintenance (C&M) stage, which is the phase where the site is kept in ‘a passively safe and secure state for a great number of years.’⁵⁷ The idea being that radiation levels will naturally decay over time and the process of final site clearance will be simpler and more cost effective, currently scheduled for Bradwell A at the end of the twenty-first century. Looking over from Mersea Island on the estuary’s north coast Bradwell A’s reactor buildings loom large, accompanying them the intermediate level waste (ILW) storage facility, housing waste from Dungeness and Sizewell nuclear power stations, which travel there by road and rail, as well as from Bradwell A itself. Low level waste (LLW) from Bradwell during decommissioning would have gone up to a LLW repository at Drigg in Cumbria. The estuary is ultimately related to and involved with, by association and unsurprisingly, the forms of violence Hecht discusses with respect to her case study in Gabon.⁵⁸ The ore from mines in

⁵⁷ Raish, Scott. ‘First of the UK’s Earliest Nuclear Sites to Be Sealed for a Period of “Care and Maintenance” - Cleaning up Our Nuclear Past: Faster, Safer and Sooner’, 2017. <https://nda.blog.gov.uk/2017/01/16/first-of-the-uks-earliest-nuclear-sites-to-be-sealed-for-a-period-of-care-and-maintenance/>.

⁵⁸ Hecht, Gabrielle. ‘Interscalar Vehicles for an African Anthropocene: On Waste, Temporality, and Violence’. *Cultural*

Australia, Canada, Democratic Republic of the Congo and Namibia may well have ended up within Bradwell's now decommissioned reactors. Spent fuel travelled to Sellafield to be stored above ground in out-dated water pools or on-site until the UK decides upon and builds a site for a Geological Disposal Facility (GDF). The task of the GDF is to find a community who may be willing to have the GDF in their backyard, seeking permission from them to dig deep underground to store nuclear waste for thousands of years within their communities; according to the Government's website it is the UK's largest ever environmental protection project.⁵⁹ Accompanying this already complex network of movement of discards and residue is the Fuel Element Debris (FED)⁶⁰ effluent that has been deposited into the Blackwater Estuary's waters.

Much of this only considers the UK's legacy waste, the stuff the UK already has. There is also the issue of further waste produced by the proposed fleet of new nuclear power stations, Bradwell B being one of them, and the problems that may arise. In a 2019 report on the crisis of nuclear waste worldwide energy consultant and policy adviser Pete Roche puts these problems in sharp relief when he lays out the length of time it will take until waste can actually be safe enough to handle and how long some wastes will sit above ground until such a time arrives:

The UK Government's Radioactive Waste Management Ltd. says the proposed new reactors for England and Wales will use high burn-up fuel (65 GW/tU) which will require a cooling period of up to 140 years before it could be emplaced in an underground repository – which could mean spent fuel stored on new reactor sites for up to 200 years (i.e. 140 years after the reactor closes). However by the judicious mixing of long-cooled and short-cooled Spent Fuel it's possible the duration of storage after the end of power station operation could be reduced to the order of 60 years before disposal (i.e. storage for 120 years).

In any case a Geological Disposal Facility (GDF) is not expected to be ready to receive waste until at least 2040. Waste from new reactors like Hinkley Point C are not expected to be emplaced in the GDF until after all our existing waste has been emplaced, which is expected to take around 90 years – until around 2130. So spent fuel from the UK's proposed new reactors could remain on site for at least the next 120 years.⁶¹

Roche further argues that the nuclear industry and the government are using inappropriate units of measurement to determine the impact of new nuclear's contribution to the UK's nuclear waste problem:

Anthropology 33, no. 1 (22 February 2018): 109–41. <https://doi.org/10.14506/ca33.1.05>.

⁵⁹ <https://www.gov.uk/government/publications/the-siting-process-for-a-geological-disposal-facility-gdf>. Accessed on 24 November 2023.

⁶⁰ FED consists mainly of Magnox metal and graphite, with small quantities of other metallic items. For the waste to be discharged into the estuary it undergoes treatment by dissolution. This involves dissolving the magnox metal within an acid solution to bring it within safe levels of radioactivity and then discharging the effluent into the estuary at high tide. FED discharge into the estuary ceased on 17 June 2017.

⁶¹ Alvarez, Robert, Ban Hideyuki, Miles Goldstick, Bernard Laponche, Pete Roche, and Bertrand Thuillier. 'The Global Crisis of Nuclear Waste'. Greenpeace France, 2019. Accessed 8 November. http://www.nuclearwasteadvisory.co.uk/wp-content/uploads/2019/02/REPORT_NUCLEAR_WASTE_CRISIS_ENG_BD.pdf.

The nuclear industry and government repeatedly claim that the volume of nuclear waste produced by new reactors will be small, approximately 10% of the volume of existing wastes; implying this additional amount will not make a significant difference to finding an underground dump for the wastes the UK's nuclear industry has already created. The use of volume as a measure of the impact of radioactive waste is, however, highly misleading. Volume is not the best measure to use to assess the likely impact of wastes and spent fuel from a new reactor programme, in terms of its management and disposal.

The 'high burn-up fuel' which Hinkley Point C is expected to use will be much more radioactive than the spent fuel produced by existing reactors. So rather than using volume as a yardstick, the amount of radioactivity in the waste, which affects how much space will be required in a deep geological repository, are more appropriate ways of measuring the impact of nuclear waste from new reactors.⁶²

Bradwell B is in an earlier stage of development in comparison to Hinkley Point C but it is these problems that will inevitably face the estuary in years to come, and with a GDF not being ready until 2040 at the very earliest the legacy waste that is already on site is set to stay there for the short and medium-term at the least. What this highlights is the complicated decision-making and logistical challenges nuclear waste presents, where decisions on problems that are not easily solved stretch across generations.

There is a counterpoint to the monolithic and imposing effect Bradwell A and the spectre of Bradwell B have on the estuary and that is the Othona Community. The community was founded in 1946 by chaplain Norman Motley as a means of reconciliation after WWII for those who may have perceived each other as enemies during the war. The Community's hopes were to promote a process of learning from one another that can occur through the sharing of a broad range of experiences, histories, views, attitudes and denominations. The Othona Community was established on the Blackwater Estuary mainly due to the Chapel of St. Peter-on-the-Wall, a seventh century chapel which sits on the shores of the estuary. Motley writes: 'the moment I entered the building I knew that we were home. There are times when one knows with a certitude deeper than purely rational processes and knowledge'.⁶³ The chapel was built by the Bishop of the East Saxons, St. Cedd on the site of a Roman fort, using the materials from the fort's remains. Much of the fort is now lost to the sea and its materials most likely scattered across the region to help build barns, houses and other structures in the area, since the fort would have offered up ideal building materials for local people over the centuries. The Roman fort was called Othona, and Motley's community use this namesake. The Othona Community are off-grid, they produce a vast majority of their electricity via renewable sources, have their own wind turbine as well as solar panels and any surplus energy needed is provided by a generator they have on-site. They also grow much of their own food and have visitors and community members frequent from across the world; although a Christian community they welcome people from all faiths or none.

The nuclear industry in the estuary and the Othona Community nearby provide an insightful

⁶² Ibid.

⁶³ Motley, Norman. *Much Ado About Something: A History of The Othona Community*. Othona, 2007. p.13.

juxtaposition of ways to think about the practices of energy production, consumption and any subsequent 'disposal' or storage requirements. Bradwell A and B are part of a national infrastructural project that feeds into the national grid, pursuing the modernist notions of progress and techno-utopian ideals. Anthropologist Joseph Masco discusses the building of bombs as a form of nation-building, calling it a 'national fetish' since it takes a nation-state to build them, and because the hierarchy of nation-states is mediated through the possession of the bomb.⁶⁴ Could the UK government's preoccupation with a 'nuclear renaissance' be down to the national fetish of which Masco puts forward? Is the commitment to new nuclear about more than producing 'carbon neutral' energy solutions but rather about maintaining the nation's nuclear capabilities to ensure its position as a nuclear nation-state? Granted such comments are speculative but not unfounded since this very question pertaining to the policies of civil and military nuclear sectors is the subject of research from the University of Sussex's Science Policy Research Unit.⁶⁵ The Othona Community, on the other hand, are responsive to their specific needs, the relations within their community, ensuring they have sufficient energy and food for their requirements, as much as possible, being responsive to the relations within the community. While building and developing their site for their human visitors they consider their relations to other species they live alongside, like the bats they make bat boxes for; the badgers that live under the Norman Motley building where people cook, eat and gather; the rare Shril Carder Bee that has been spotted in the area with measures put in place to help them thrive; or the biological processes and bacteria necessary for the functionality of the community to ensure human waste and food re-enters the environment safely through sewage systems, recycling and composting practices.

The nuclear power stations of the estuary and the Othona Community can be thought about in relation to Anna Tsing's theory on nonscalability. For Tsing nonscalability is defined in the negative, everything that is not scalable. The nuclear military industrial complex is designed and built on the premise of being scalable—expanding without the need to alter its fundamental design—where nuclear reactors create heat through fission, turning water into steam in order to propel turbines that subsequently produce electricity, this is then fed into the National Grid in the UK. Turbines, reactors, and the associated infrastructures are designed to work together in a particular way, and this can be scaled up or down to fit particular energy requirements; Bradwell A had two reactors, whereas somewhere like Pickering Nuclear Generating Station in Canada has eight. The environment that the nuclear power station sits need not concern itself with the complex human and non-human entanglements of the local ecology, the only thing it needs from this is sufficient cooling water and land; everything else it can build, and it builds at the expense of that which was there before it. Although the design is scalable it is not frictionless, the impact on that which sits

⁶⁴ Masco, Joseph. *The Nuclear Borderlands: The Manhattan Project in Post-Cold War New Mexico*. Princeton, N.J.: Princeton University Press, 2006. p.22.

⁶⁵ Cox, Emily, Phil Johnstone, and Andy Stirling. 'Understanding the Intensity of UK Policy Commitments to Nuclear Power: The Role of Perceived Imperatives to Maintain Military Nuclear Submarine Capabilities'. Working Paper. SPRU Working Paper Series. University of Sussex, 2016.

outside of the power station's needs and not important for its functionality are deemed irrelevant. I argue that the Othona Community in comparison responds to their environment in a more caring way. Of course some of the changes they make to the community would impact their local ecology, all action has a consequence or reaction, but within their ethical approach there is not an overarching logic of domination or erasure of others they live-with—it is a relation of compromises, where the community may shift, grow and thrive, whilst also hoping for and encouraging those they live alongside to do so as well, whether these are the earwigs in the bug hotels, the bacteria in their compost heaps or the bats in the boxes nearby. For a nuclear power station to be built the land it acquires becomes building foundations, concrete and tarmac, with land being remediated decades or centuries later. Such remediation will most likely return the site to a different state. By the very nature of such a monolithic building process most of the inhabitants (human and not human) of the nuclear power station's designated area will leave (by force or voluntarily) to make way for the necessary structures needed to produce nuclear energy.

Since many nuclear power stations need to be by water they are built by large bodies of water for cooling, and this is the case of Bradwell A (and B if it comes to fruition) where the Blackwater Estuary is this resource. Intertidal zones like the marshes and mudflats of the Blackwater Estuary are biodiverse, which its designations (SSSI, Ramsar and SPA) only reinforce. Not to mention the fishers, oyster farmers—the native oyster can be found here—and other humans that have lived by these waters for centuries. The interplay and relationships of these different agents are complex and infinitesimal, and one could argue that foisting another power station into the estuary which is built on a seven-metre-high platform above sea level might eliminate much of this, considering the further sea defences that will need to be built, alongside roads, pipes out to sea and its other infrastructural requirements. The Othona Community on the other hand are embedded and live-with all the other organisms surrounding them in a less disruptive way, counter to the scale of the nuclear industry's infrastructure which is more of an imposition.

Tsing reminds one that scalability spreads and leaves ruins, ruins like the Bradwell A reactors. Scalability is not frictionless, that which disavows the perceived streamlined and efficiency focussed aspects of a scalable project—uranium tailings from mines come to mind—are discarded and excluded almost as if they were never part of the process in the first place. Nuclear power programmes are built on the logic of colonial extractive expansionist practices, land, sea and the intertidal zone considered as a resource to be capitalised on, after all, scalable projects for Tsing come out of the logic of the plantation. The Blackwater Estuary shows a complex layering of stories, stories on different scales, from different people and different organisms, as well as the various environmental designations and implications around governance this entails, which in turn influences and shifts the way one may relate to and think-with a place.

Subterranean Nuclear Infrastructures

In addition to the more sprawling sites of Foulness Island and the Blackwater Estuary there are also smaller and even more localised aspects of the nuclear's past that are found across Essex and the whole of the UK. In 1952 a large underground bunker was constructed in Kelvedon Hatch, Essex. It was built approximately 38m below ground and would accommodate a few hundred military personnel and civilians in the event of a nuclear attack during the Cold War, now it is a privately owned tourist attraction. Other subterranean structures are also scattered across the UK, in 1956 1500 Underground Monitoring Posts (UGMP) were constructed as a direct consequence of a report that came out of a secret committee comprising of civil servants and members of the armed services. The committee assessed the potential danger of the hydrogen bomb, a new and more powerful weapon. The UGMP's were used by the Royal Observer Corps to monitor potential fallout in the event of a nuclear war. Geology permitting the UGMPs would have been buried at least 4m underground to protect the small control room from blast and radiation.⁶⁶ In Essex this includes Canvey Island, Leigh, Maldon, Bradwell-on-Sea, Foulness Island and Vange, just to name a few.

UGMPs would have been built as a direct consequence of the ensuing Cold War and the activities developing in the USSR and USA, as well as the UK's own nuclear weapons programme that was being developed in various locations, one being the Atomic Weapons Research Establishment (AWRE) on Foulness Island from 1947. The precursor to this was a weapons programme that Britain's research programme began known as 'Tube Alloys' (1940).⁶⁷ Here one sees the subterranean terraforming of the nuclear military-industrial complex and its ubiquity, how it carves into and under the surface, indicating how much of the infrastructure relating to the nuclear is somewhat hidden or inconspicuous and how nuclearscapes remain unseen (such subterranean characteristics are a common thread, since extractive practices necessary for the nuclear industry leave holes and scars, uranium mines and geologic repository either end of the fuel cycle also spring to mind). These disparate aspects of the Essex nuclearscape reinforces the problematics of attempting to ring-fence, contain and designate something as immutable. The nuclearscapes of Essex are a point of departure to think about the ways the nuclear industries exist within the county, but also how these nuclearscapes extend beyond county lines, blurring various designating boundaries or borders such as county, country or continent, or the civil and military nuclear sectors that tend to be thought about separately. Nuclearscapes are mutable.

⁶⁶ Clarke, Bob. "The Secret Taskscape: Implications for the Study of Cold War Activities." In *Forms of Dwelling: 20 Years of Taskscapes in Archaeology*, edited by Ulla Rajala and Philip Mills, 1st ed., 236–51. Oxbow Books, 2017.

⁶⁷ Butler and Bud, 2017.

The Nuclear and its Inherent Coloniality

There is a tension that develops when thinking through the connections of the nuclear and landscape, particularly when discussing this in relation to the nuclear colonial project and decolonisation. Both landscape and nuclear industries and their conceptual underpinnings were born out of colonial projects, so how are they rethought, reconfigured or reclaimed? Scholar Tiffany Kaewen Dang reminds us that 'landscape has the capacity not only to influence cultural perceptions of space, but also to transform space materially.' In order to make this point Dang draws on art historian W. J. T. Mitchell's (1994) argument that landscape has a 'double role': one to naturalise cultural constructions; and another to realise cultural relations.⁶⁸ It is within her 'Decolonizing Landscapes' essay where Dang considers what decolonising the discipline of landscape might look like. Dang argues that such rethinking risks sitting within 'metaphorical decolonizing discourses' which 'generally attempt to mitigate the effects of colonialism rather than strive for the complete abolition of colonial power structures, these moves ultimately serve to uphold rather than dismantle colonialism'.⁶⁹ Here, Dang is referencing Eve Tuck and K. Wayne Yang's 'Decolonization is not a metaphor' (2012), where they argue that decolonisation as a project has been distorted by what they call consciousness building projects. Writing from a North American settler-colonial context Tuck and Yang are clear on the role of decolonisation:

Decolonization brings about the repatriation of indigenous land and life; it is not a metaphor for other things we want to do to improve our societies and schools.⁷⁰

So, if this is the case, and given a completely denuclearised and decontaminated world is unattainable, what can decolonising (nuclear) landscapes truly look like? Can it only be a metaphorical decolonising discourse, which in turn does not or cannot lead to decolonisation? Tuck and Yang elaborate further:

When metaphor invades decolonization, it kills the very possibility of decolonization; it recenters whiteness, it resettles theory, it extends innocence to the settler, it entertains a settler future. Decolonize (a verb) and decolonization (a noun) cannot easily be grafted onto pre-existing discourses/frameworks, even if they are critical, even if they are anti-racist, even if they are justice frameworks.⁷¹

This foregrounds the problematics of metaphorical decolonising discourse, particularly in relation to settler-colonial contexts. Decolonisation is inextricably linked to and starts with land. As Tiffany Kaewen Dang explains:

⁶⁸ Dang, Tiffany Kaewen. 'Decolonizing Landscape'. *Landscape Research* 46, no. 7 (3 October 2021): 1004–16. <https://doi.org/10.1080/01426397.2021.1935820>. p.1009.

⁶⁹ Dang, 2021 p.1004.

⁷⁰ Tuck, Eve, and K. Wayne Yang. "Decolonization Is Not a Metaphor." *Decolonization: Indigeneity, Education & Society* 1, no. 1 (September 8, 2012). p.1.

⁷¹ *Ibid.* p.3.

Decolonization is most definitely *not* a metaphor, especially not in the context of landscape studies—a field primarily concerned with the study, design, and agency of land. If colonialism is about the control of land, then conversely, decolonization requires the complete subversion of the power(s) controlling that land. Decolonization starts with land.⁷²

This brings to the fore the consideration of landscape and its study in relation to decolonisation. Since landscape studies and the associated theoretical and practice-based frameworks directly pertain to land, and can therefore interrogate and help in land's relinquishment from colonial control more directly, the project of decolonisation within this context can arguably avoid the metaphorical trappings that the arts or the nuclear field are faced with; since it starts with land, and it is here where knowledge stems.⁷³

Tuck and Yang's warning should be heeded, and arguments have been made to complicate, extend and deepen their warning. In *Decolonising the University* (2018) editors Gurminder K. Bhambra, Dalia Gebrial and Keres Nişancıoğlu argue against reducing colonialism to a historically and geographically specific aspect of the colonial project, along with the particular articulations around the dispossession of land that this infers. They go on to suggest that to only hone in on this dimension of the colonial project would be to set aside elements that do not rest on settler projects, which would also exclude from view differentiated moments of colonialism as a global project: 'whereas dispossession might be the 'truth' of colonialism, it is not its entirety'.⁷⁴ Fundamentally this demonstrates how there are many colonialisms and therefore nuanced ways in which colonialism manifests, intersects and interacts with many peoples, cultures, relations to land, ecologies, systems of value and power structures. Britain's nuclear colonial legacy traverses many localities meaning its colonialisms are many. However, the acknowledgement of the multiplicity of colonialisms and the diversity of implications this infers should not disregard the specificity of the context in which one is working. Rather it should act as a means to avoid the assumed flattening or homogenising effects of colonial experiences.⁷⁵

A disproportionate amount of uranium is extracted from Indigenous lands and therefore the settler colonial dimension is pertinent and incredibly important. However in order to think about the nuclear holistically it is necessary to understand how it is implicated within the global project of colonialism in other ways, such as through education and research institutions which facilitate the

⁷² Dang, 2021, pp.1004-1005.

⁷³ c.f. Simpson, Leanne. 'Land as pedagogy' in *As We Have Always Done: Indigenous Freedom through Radical Resistance*. Indigenous Americas. Minneapolis London: University of Minnesota Press, 2017. Kimmerer, Robin Wall. *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge and the Teachings of Plants*. S.I.: Penguin Books, 2020.

⁷⁴ Bhambra, Gurminder K., Dalia Gebrial, and Keres Nişancıoğlu, eds. *Decolonising the University*. London: Pluto Press, 2018. p.5.

⁷⁵ I am very conscious of the overuse or promiscuous usage of decolonisation, and want to be mindful of this. See Max Liboiron's excellent analysis on colonialism, its intersection with Western culture and long term bedfellow capitalism. Liboiron, Max. *Pollution Is Colonialism*. Durham: Duke University Press, 2021 pp.25-27.

knowledge production necessary to pursue nuclear research and its outcomes; through the arts and how exhibition-making was a means of consolidation through World Fairs;⁷⁶ and the assumption to the access of land elsewhere. With this in mind it is imperative we think through the implications of this research and the structures that make this possible. This means decentering colonial discourses that ultimately contribute and lead to hegemonic epistemologies and the subsequent control of land. Such ways of knowing, of relating to the world and the structures of governance that facilitate this, marginalise, subsume, or compel the assimilation of others.

A curatorial research project that enters into the nuclear must consider the multiplicity of voices it inevitably contains and impacts, and in doing so question the power structures at play and what nuclear stories get told and by whom. It is also important in this context to consider one's own positionality. Being from Essex, UK, and based there most of my life, I have grown up within the context discussed herein. It is highly likely that the energy I have used in my childhood home was produced by power from Bradwell A nuclear power station. In a broader sense, I have benefitted from the extractive practices brought about by nuclear colonialism. This project and others I instigate seek to foster equitable relations, clearly acknowledging the complicated relationships one has with nucleascapes in their mutable forms. Granted, my implication within the nuclear stories of Essex, and in turn Britain's, is arguably obvious but cannot be left unstated.⁷⁷ It is irresponsible to not think about the complex, layered and inevitable ways one is implicated, since much that has facilitated the West's trajectory has been via extractive practices.

It is with this in mind that I highlight my position in relation to Britain's nuclear pursuits and my intention to make visible the connections that tell Britain's nuclear story and how it is premised on the exploitation of people and places beyond Britain's borders. It is important that this curatorial project helps to tell this story from my position, merely as an initial point of departure, whilst pointing to the interrelated stories and associated impacts that all stem from the same process: the extraction of resources for the furtherance of Britain as a nuclear state. Ultimately, there are many positionalities and many of which critique nuclear-state building projects, including this PhD project. My project seeks to discuss, open up and make space for divergent understandings and experiences of the nuclear; such diverse perspectives only enrich a holistic understanding of the nuclear. Thinking about the nuclear holistically provides a fuller picture of the pervasiveness of nuclear industries, their infrastructures and the ongoing impacts of nuclear colonialism.

⁷⁶ I discuss this in more detail in chapter two.

⁷⁷ One's implication in certain systems is of course layered and complex and should be thought about intersectionally, considering geography, class, gender, race and a plethora of socio-economic/political factors. With this in mind it feels pertinent to acknowledge my positionality as a white working-class man, the working-classness being a noteworthy dimension, particularly in terms of academia and the arts within a UK context. Since working class people are considerably underrepresented in these contexts. See Brook, O., Miles, A., O'Brien, D., & Taylor, M. (2022). Social Mobility and 'Openness' in Creative Occupations since the 1970s. *Sociology*, 0(0); and <https://www.ucu.org.uk/barriersholdbackworkingclassstaff> Accessed 19 April 2023. It is also important to acknowledge these positionalities given the violent dispossession, trauma and exploitation the nuclear colonial project has wrought, and who has ultimately benefited and to what degree.

Nuclear colonialism arguably stems from the term ‘radioactive colonialism’ used by Native American scholar-activists Ward Churchill and Winona LaDuke⁷⁸ around thirty-five years ago. The term refers to how the entire fuel cycle from uranium mining and refining to nuclear power and weapons development, production and testing, and the subsequent dangers of nuclear waste, disproportionately affects Indigenous peoples and their lands.⁷⁹ Similarly, academic Elizabeth Tynan attributes the use of ‘nuclear colonialism’ to anti-nuclear activist Jennifer Viereck describing it as ‘the taking (or destruction) of other peoples’ natural resources, lands, well-being for one’s own, in the furtherance of nuclear development.’⁸⁰ Nuclear colonialism inevitably runs through all art projects engaging with the nuclear, since the possibility of nuclear power and weapons is predicated on the exploitation of land which, more often than not, is Indigenous land. Approximately 70% of the world’s uranium is found on Indigenous lands, two-thirds of mined uranium being in Kazakhstan, Canada and Australia. The furtherance of Britain’s nuclear technologies, their capacity to produce electricity for the National Grid as well as the development and maintenance of Britain’s nuclear weapons programme is and was only possible due to the unwilling sacrifice of and devastating practices on land elsewhere, and the environmental and humanitarian injustices this has wrought.

Such accounts of the struggle, pain, suffering and resilience in relation to Britain’s nuclear testing can be heard from Karina Lester, whose family lived through nuclear weapons testing in Australia. Lester has been a committed anti-nuclear campaigner for many years and Lester’s late father, Yami Lester, was also an important anti-nuclear figure and was integral to the initiation of the Royal Commission into the British nuclear tests, the tests that took away his ability to see. Karina Lester is a Yankunytjatjara Anangu woman from the Anangu Pitjantjatjara Yankunytjatjara Lands (APY Lands) in the far Northwest of South Australia and has worked alongside the International Campaign to Abolish Nuclear Weapons (ICAN), taking part in the negotiating conference for the UN Treaty on the Prohibition of Nuclear Weapons. A treaty that was adopted in 2017, earning ICAN the Nobel Peace Prize. Lester also played a role in the prevention of nuclear waste storage facilities proposed in South Australia, alongside others such as the Kupa Piti Kungka Tjuta—the senior Aboriginal women of Coober Pedy—whose multi-year campaign ‘Irati Wanti: The Poison, Leave It’ started in 1998, led by the Pitjantjatjara, Yankunytjatjara, Antikrinya and Kokatha Women who lived in Coober Pedy.⁸¹ These experiences are a case in point, demonstrating an example of

⁷⁸ Churchill, Ward, and Winona LaDuke. ‘Native America: The Political Economy of Radioactive Colonialism’. *Insurgent Sociologist* 13, no. 3 (April 1986): 51–78.

⁷⁹ Runyan, Anne Sisson. ‘Disposable Waste, Lands and Bodies under Canada’s Gendered Nuclear Colonialism’. *International Feminist Journal of Politics* 20, no. 1 (12 February 2018): p.25.

⁸⁰ Tynan, 2018, p.3.

⁸¹ See ‘Malatja tjutaka Ara Irati Pulkatjara (Generational Story of Nuclear Colonisation): Early Memories’ in Lester, Karina, Lisa Radford, Yhonnice Scarce, David Sequeira, Patrice Sharkey, and Azza Zein. *The Image Is Not Nothing (Concrete Archives) Catalogue*. Edited by Lisa Radford. Adelaide: ACE Open and Person Books, 2021. Within this essay Lester shares memories of her family’s experiences during the testing, as well as her activism and the ongoing struggles against nuclear colonialism and its lingering effects. For stories of the Kupa Piti Kungka Tjuta see Kupa Piti Kungka Tjuta, and Nina Brown, eds. *Talking Straight out: Stories from the Irati Wanti Campaign*. Coober Pedy, S. Aust: Alapatja

how the intrusive and damaging forces of the nuclear cycle affect Indigenous communities, particularly the activities of mining, testing and storage. It also shows how these same communities have taken leading roles in international anti-nuclear efforts.

This is the backdrop to both of my sites of interest on Essex's east coast, Foulness Island and the Blackwater Estuary; both of which play a significant role in the nuclear legacy of Britain, the former to the military, and the latter to the civil developments of nuclear power. By looking at these two sites I argue that one can begin to trace and see them within the global operations of nuclear colonialism. I will also be arguing that doing this research through the field of the curatorial provides a generative framework to make strands of this research public through artists' production of work, its subsequent framing and the convergences and divergences within the artwork; how an artist's work may respond directly to the context one is proposing whilst simultaneously pushing against and beyond this.

Thinking about the nuclear in this way demonstrates its entangled ubiquity. Since the specificities of the nuclear tend to be separated into their respective sectors and their subsequent study siloed into and stuck within disciplinary boundaries. Nevertheless civil and military nuclear projects have always been inextricably linked. Whether this is their use of the same supply chains, or the retainment of special skill sets needed between the two. It must be acknowledged, and questioned, why the UK has focussed on nuclear power being needed at such a scale in the country's carbon neutral energy mix. This is something that the Science Policy Research Unit (SPRU) at the University of Sussex has asked in their SPRU Working Paper 'Understanding the Intensity of UK Policy Commitment to Nuclear Power'. They analyse linkages between the military and civil nuclear sectors in the UK in relation to high-level processes around supply chains, skills and expertise. They note that between 2003-2006 when the position of nuclear power shifted from 'unattractive' to calls for a 'nuclear renaissance', intense activity around UK nuclear submarine capabilities can be observed.⁸² What this arguably hints towards is the inseparability of the nuclear sectors, they are not clearly defined units that have no relation to one another, their boundaries are not distinct, no matter how much one may try and make them so. I argue that by initially focussing on a particular locality one can begin to gain a level of understanding of a state's pursuit of nuclear technologies, and perhaps why.

Essex, then, is my point of departure. From here one can begin to map the colonial project of nuclear power production and weapons development, and how apparently disparate nuclear sites are connected politically, geographically, ecologically or ideologically. There are many ways one could articulate these relations. Since the crux of all nuclear industries depends on the acquisition

Press, 2005. And for Yami Lester's account see Lester, Yami. *Yami: The Autobiography of Yami Lester*. Alice Springs, Australia: Institute for Aboriginal Development Publications, 1993.

⁸² Cox et. al., 2016 p.2.

of land (legitimately or otherwise), its terraforming, movement, and extraction. Fundamentally, land is seen as a resource to be exploited. Exploring the nuclearscapes of Essex, and calling them nuclearscapes, acknowledges their terra connections via the -scape suffix, without prioritising land but acknowledging air, water, the subterranean, the atmosphere and how the nuclear military industrial complex, its infrastructures and contaminating capabilities eventually end up back down to earth on land or in the sea some way or another. Nuclearscapes can shift and contain the myriad of nuclear contexts one might be presented with, allowing one to follow their interconnectedness. When one looks close enough the infrastructures of the nuclear can be made sensible—either tactilely, visually, sonically—and one can think about what role Essex plays in the global nuclear story. In doing so one might start to understand how inherently interconnected nuclear sites are and begin thinking of the nuclear holistically. The county is, then, a microcosm of the UK's nuclear industry with its network of military and civil nuclear sites entangled in a global nuclear anthropocene.

This chapter has provided a rich contextual basis for my project rooted in place. My main arguments have been to advocate for and articulate what can be constituted as the nuclearscape of Essex, or varying mutable nuclearscapes across the county. The chapter attempts to do this by analysing nuclear sites within this locality alongside scholarship in relation to land as well as the coloniality of the nuclear. I aim to establish and understand Essex within the context of the nuclear military industrial complex, which is a key motivation of this chapter. In doing so I provide a generative point of departure to further consider my curatorial work beyond place and within the disciplinary boundaries that chapters two and three then traverse. In order to consider curatorial work like this, rooted in place, it is important to go through a process of intense study and defamiliarisation, particularly if one seems to know the context well; this chapter undergoes this process, to not only make the case for a distinct way to describe and understand the nuclear in and across place, via nuclearscapes, but also to understand my home county anew.

Chapter Two: Nuclear Culture, Contemporary Art and Curating

Artistic and curatorial projects around nuclear culture are often situated at the extremities of the nuclear's spectrum of consequences: from the imperceptibility of radiation that humans cannot taste, smell or feel; to the spectacle of the atom bomb's mushroom cloud or the devastation wrought by disasters like Chernobyl and Fukushima. Although many projects do ponder this dichotomy there are others that push beyond these extremes. Here I will begin to highlight the rich and diverse artistic approaches and curatorial strategies employed to think about the nuclear, engaging with the plethora of ways that the splitting of the atom and the implications thereafter manifest themselves in art and curatorial practice. In doing so I am situating my project within a thriving context of contemporary art projects that are working with the multiple temporalities and global entanglements of the nuclear. By exploring the broad spectrum between radiation's invisibility and the spectacle of disaster one gets a sense of the extent of work grappling with the expansiveness of the nuclear military industrial complex. This chapter begins by working through what constitutes 'nuclear culture', its intersection with contemporary art, and how this feeds into curatorial work pertaining to nuclear thematics and concerns within contemporary art practices. It also considers curating and its instrumentalisation in the nuclear industry. The chapter is made up of direct observation as well as the analysis of documentation from secondary material such as catalogues, curatorial statements, installation photographs and other sources. Throughout the chapter I intend to indicate the ways and means through which I analyse the works herein, since this has implications on the interpretation of the work discussed. The case studies within this chapter were chosen to demonstrate the breadth of work produced within the thematic framework where my project could be considered to sit. Each example has distinct qualities that help elucidate this richness of the field in question.

There is an extensive range of nuclear related art and curatorial research projects which provide a backdrop to my research, providing an understanding of the ways artists have responded to the breadth of the nuclear, how it manifests within their practices as well as the ways that curators have worked with artists and others in this context, and drawing links between disparate works and how they are made public. These moments of publicness take many forms, from exhibitions, exhibitions that are 'open' but in areas of nuclear contamination, workshops, events, talks, and other curatorial moves to bring together disparate artworks, objects and contexts that may have the capacity to map nuclearscapes. The projects drawn on below will not be an exhaustive list which catalogues the entirety of nuclear related art projects, but rather a way to situate and contextualise my project within contemporary art's exploration of nuclear culture. I will also discuss parts of the field of nuclear humanities as well as curating and its role within the development of the nuclear industries. All this is to say that the below discussion around nuclear culture and contemporary art is important contextual and curatorial work. It is a means to do important advocacy work for

curatorial practice in all its forms to bring together, juxtapose and propose new contexts for artwork to enter into dialogue with one another and its publics.

Nuclear Culture, what is it?

Over the last twenty-five years or so there has been an expansion and diversification of humanities-related scholarship around the nuclear, extending to the British context. The mid-nineties saw historian Kirk Willis coin the term 'British nuclear culture' to talk about the nuclear's development, culturally speaking, leading up to the start of the Second World War. Nuclear scholarship around this period, from 1895 to 1939, tended to focus on a more top-down history of nuclear culture. These histories looked at the government officials who were charged with policy decisions that determined Britain's nuclear future, and the scientists who were researching and developing nuclear technologies.⁸³ In addition, one could argue with the new Christopher Nolan film *Oppenheimer* (2023) that this preoccupation in the mainstream imagination is alive and well. In recent years scholarship's focus has broadened, moving away from top-down stories in order to think about the nuclear holistically, making space for other voices and approaches.⁸⁴ Historian Jonathan Hogg's book *British Nuclear Culture: Official and Unofficial Narratives in the Long 20th Century* (2016) describes British nuclear culture 'as the distinct corner of British culture characterised by the development of the nuclear state and the complex and varied ways in which people *controlled, responded to, resisted or represented* the complex's influence of nuclear science and technology, the official nuclear state, and the threat of nuclear war.'⁸⁵ My project could be understood within the context of this characterisation, since it is very much a response to the nuclear military industrial complex in Britain, but also how it is situated within a global nuclear context and the impact of Britain's role in nuclear state building that reverberates across the world.

My PhD project can be read through the lens of British nuclear culture, however there are some very specific areas of cultural production within which it sits: contemporary art and curatorial practice. This chapter is a way to understand this field in which I am working as well as acknowledging the practice-based work in curatorial and artistic practice that contributes to and informs my approach. Not only this but it places these works in dialogue, contributing to the overall discourse around contemporary art practice and nuclear culture. This chapter illustrates an

⁸³ Willis, Kirk. 'The Origins of British Nuclear Culture, 1895–1939'. *Journal of British Studies* 34, no. 1 (January 1995): pp.59–89.

⁸⁴ See Hogg, J. *British Nuclear Culture: Official and Unofficial Narratives in the Long 20th Century*. London ; New York: Bloomsbury Academic, an imprint of Bloomsbury Publishing Plc, 2016. There is also a special issue in *The British Journal for the History of Science* edited by Jonathan Hogg and Christoph Laucht, Please see: Hogg, J., & Laucht, C. (2012). *The British Journal for the History of Science*, 45(4). This special issue is a really useful reference point and consolidation on scholarship within the humanities.

⁸⁵ Hogg, J. *British Nuclear Culture: Official and Unofficial Narratives in the Long 20th Century*. London ; New York: Bloomsbury Academic, an imprint of Bloomsbury Publishing Plc, 2016. p.7 [emphasis in original].

incredibly vibrant, exciting and generative field, showing an area of study and cultural production that has been developing a means to interrogate nuclearscapes through critical, rigorous and varied forms of artistic and curatorial practice. What follows demonstrates how cultural production relative to the nuclear can contribute to other disciplinary frameworks, knowledge around the nuclear and its cultural impact.

Contemporary Art's Disaster Response

In March 2011 a tsunami off the west coast of Japan wreaked tremendous devastation. It caused a nuclear disaster at the Fukushima Daiichi Nuclear Power Plant resulting in its reactors melting down, exploding and releasing radioactive materials into the atmosphere. This led to a large portion of Fukushima Prefecture being evacuated, and an exclusion zone was established where people could not return home or visit due to the levels of radiation. This catastrophic event produced numerous responses from artists. Below I will discuss some of these examples in order to explore how artists have reflected upon and responded to catastrophes that have happened contemporaneously. The rapidity of artists' responses demonstrates the capacity of contemporary art practices in their ability to respond to nuclear disasters in a way that is critical and multi-faceted. To preface this, in 2017 and prior to beginning this PhD project I took part in a residency in Japan with artist and curator James Ravinet. As a part of this I spent time with artists who live and work in close proximity to the exclusion zone. During our time we were guided through Fukushima City and its extensive clean up effort with photographer Shuji Akagi, and hired bicycles with artist Kota Takeuchi to travel up to the boundaries of the exclusion zone.⁸⁶ This preliminary work provided first-hand insight into and ways of approaching place-specific contexts that are wrestling with the tragedies wrought by nuclear power and its capacity to cause disaster.

Chim↑Pom, an art collective that formed in Tokyo in 2005, initiated the project *Don't Follow the Wind (DFW)* (2015 - ongoing), which took its name from the advice given to evacuees of the Fukushima disaster, who told each other not to travel in the direction that the wind was blowing, as this would carry the radioactive fallout along with it.⁸⁷ The artists exhibiting as part of the *DFW* project were Ai Weiwei, Aiko Miyanaga, Chim↑Pom, Grand Guignol Mirai, Nikolaus Hirsch and Jorge Otero-Pailos, Kota Takeuchi, Eva and Franco Mattes, Meiro Koizumi, Nobuaki Takeawa, Ahmet Ögüt, Trevor Paglen and Taryn Simon, and was curated by Kenji Kubota, Eva and Franco Mattes, and Jason Waite. The artists responded to the disaster by making work that was then exhibited inside the exclusion zone, the exhibition was perpetually open but inaccessible to the public. This inaccessibility offers up an interesting counterpoint to the making public of art and the implications of doing so in a context that the public can not access. This kind of refusal further

⁸⁶ See <https://www.warrenharper.info/nuclear-research-residency>. Accessed 23 January 2024.

⁸⁷ Sawaragi in Carpenter, 2016 pp.79-83.

foregrounds the long term impacts of nuclear disaster, questions of access, mediation and the value of art that can't be experienced first-hand. The reflections and analysis of *DFW* therefore come from secondary materials, since the exhibition is inaccessible, as well as primary analyses via an iteration of the project shown at arts organisation Arts Catalyst in late 2017, when they were based in London, which was part of their *Real Lives Half Live: Fukushima* programme. There have been recent developments for *DFW* where the evacuation order in areas of Fukushima have now been lifted, meaning Meiro Koizumi's contribution was the first to become accessible to ticket holders over 16 days between 22 October to 4 December 2022. The infrastructure surrounding this particular venue was restored alongside consultation with local residents. For this special period Koizumi's work was recreated on the site by the artist and expanded upon. The other eleven projects remain closed since they still sit within the exclusion zone, and it is unknown if and when they will open,⁸⁸ or if inside the exclusion zone will ever be temporarily accessible. This shows how governmental boundaries imposed upon places due to nuclear disaster are constantly being reassessed and tested due to ongoing decontamination efforts. This is in order to determine a certain measure of safety, which undoubtedly shifts depending on governments or territories and their associated protocols pertaining to nuclear safety. Herein lies another dimension of how one could designate, point to, or name a nuclearscape; one which is mutable and always shifting.

The counterpoint of the work within the exclusion zone was the *Don't Follow the Wind* Non-Visitor Center exhibition at the Watarium Museum of Contemporary Art in Tokyo (2015). A similar framing also occurred during the showing of Koizumi's work during 2022 where a 'Non-Visitor Center' was also open. Generally, when visiting many operational nuclear sites there is a visitor centre nearby to provide information on the nuclear industry and to project a positive image; the genealogy of these can be seen in the *Atomic Train* touring exhibition I will discuss below. The visitor centre for *Don't Follow the Wind* operates as a critique of the ways that the nuclear industry utilises methods of exhibition-making as a site to soften and legitimise its image. An iteration of what one could arguably understand as a 'Non-Visitor Center' to the exhibition in the exclusion zone was shown at Arts Catalyst, where the *DFW* curatorial collective presented *A Walk in Fukushima*, a selection of 360° videos via headsets taking the viewer on an immersive walkthrough of the exclusion zone within Arts Catalyst's London centre. The headsets worn were made by Fukushima residents and are distinct in character. The artworks of *DFW* are absent from the physical space of Arts Catalyst, but accompanying the headsets are other physical objects and furniture from the exclusion zone. This curatorial move encourages the viewer to consider the materiality of the exclusion zone from afar, experiencing the site via discrete objects deeply rooted in place. The 'non-visitor centre' serves as a way to traverse considerable distances, bringing that which is inaccessible into view. It is a curatorial method that, figuratively speaking, collapses space to meet the viewer, bringing parts of the exhibition or other materials within reach. Visitor centres are particularly interesting in Japan

⁸⁸ <http://dontfollowthewind.info/dfw-ex-en>. Accessed 27 April 2023.

in that there is a very specific way of representing them and softening their image, via mascots. Whether this is Fukuppy at Fukushima's nuclear power station; Pluto-kun who was used by Japan's nuclear industry to represent plutonium; or Tomarin, a dome-shaped character like a reactor building, who was everywhere in Tomari Nuclear Power Plant's visitor centre during the aforementioned residency I went on back in 2017. Here one is presented with questions around mediation and the ways in which methods of display are employed in order to encourage the alignment of its viewers with certain ideological positions pertaining to the nuclear. *Don't Follow the Wind* problematises this relationship, where its provocation destabilises the relationship between the nuclear industry and its dissemination of materials via methods of public display. It utilises the site of disaster and sites elsewhere as a means to highlight these links whilst also foregrounding the consequences when the purported safety of these places fail us.

Critic Noi Sawaragi (2016) attempts to frame *Don't Follow the Wind* within the site/non-site binary that goes back to Robert Smithson and his thinking around site-specific earth works and their documentation and representation within a gallery context.⁸⁹ Sawaragi argues that *Don't Follow the Wind* instigates 'a whirlwind of encounters and exchanges between 'heres' (non-sites) and 'elsewheres' (sites)' causing a reconfiguration of 'site-specific art as a distributed and networked concept in the same way that radiation doesn't recognise borders.'⁹⁰ These encounters and exchanges between 'heres' and 'elsewheres' are articulated by how each artist has made work responding to the Fukushima nuclear disaster. An example of this is Ai Weiwei's *Ray of Hope* (2015-), a light installation that powers two lightbulbs for a few hours in the morning and evening via solar panels within one of the abandoned properties. This gesture animates a landscape otherwise devoid of human activity, foregrounding the loss, disruption and anguish of many families affected by the disaster. Families that have no choice but to be elsewhere. Kota Takeuchi's *Time Travellers* (2015) also dwells upon the absence of families impacted by the disaster and what they have left behind. Here, Takeuchi has installed a life-sized hi-definition photo documenting him and a colleague in a bedroom dressed in the clothes discarded on the bed before the evacuees had to abruptly flee their homes.⁹¹ What these examples show is the multiple 'heres' and 'elsewheres' constantly surfacing that Sawaragi places within the site/non-site binary.

I argue that the binary character of the site/non-site is limiting, much like the limitations presented by thinking through the nuclear solely at the extremities of invisibility and spectacular disaster. Although Sawaragi attempts to destabilise the binary established by Smithson's theory it falls short in articulating successfully the complexity inherent within the distributed and networked conceptions Sawaragi uses to discuss *DFW's* overarching thematics. The site/non-site binary is

⁸⁹ See 'A Provisional Theory of Non-Sites' (1968) in Smithson, Robert, and Jack D. Flam. *Robert Smithson, the Collected Writings*. The Documents of Twentieth-Century Art. Berkeley: University of California Press, 1996, p. 364.

⁹⁰ Sawaragi in Carpenter, 2016 p.80.

⁹¹ <https://frieze.com/article/dont-follow-wind>. Accessed 23 April 2023.

unable to articulate the distributed and networked concept put forward, and by extension the analogy between the reconfiguration of site-specific art and radiation is incongruous. Granted, as an initial framework it is helpful to begin pursuing certain curatorial methods for the 'here' and 'elsewhere' but beyond this we need to bring in other concepts or ways of thinking to assist in problematising the binaries Smithson's proposition establishes. I argue that applying an interscalar lens can help elucidate this. The interscalar holds the incommensurate realities alluded to within *Don't Follow the Wind* within the same conceptual frame whilst being able to maintain the complexity that this implies.⁹²

Artist-researcher Susan Schuppli also engages with the devastating fallout of the nuclear disaster in Fukushima. This response looks at the gradual, slow seepage of contaminants over more protracted periods and across incredibly long distances. In her trilogy *Trace Evidence* (2016) the artist focuses on three events that explore 'the geological, meteorological and hydrological appearance of nuclear evidence secreted within the molecular arrangement of matter.' Here radionuclides bear witness to themselves. The particular events include 'the unearthing of ancient nuclear reactors at the uranium mine site in Oklo, Gabon in 1972, the discovery of Chernobyl's airborne contaminants at the Forsmark power plant in Sweden in April 1986 and the 7,600 kilometre five-year journey of Caesium-137 from Fukushima-Daiichi through the waters of the Pacific Ocean to the west coast of Vancouver Island.'⁹³ It is within the hydrological part of the trilogy where one travels with the Fukushima Daiichi Power Plant's Caesium-137; the materiality of a nuclear disaster's fallout can tell you about its global movements and in turn the interconnectedness that earth's systems facilitate. I saw Schuppli's trilogy in the context of the group exhibition *Perpetual Uncertainty*, at the Malmö Konstmuseum, curated by Ele Carpenter. *Trace Evidence* was one of the first works one encounters, to the left after ascending the museum's staircase that led to the exhibition's galleries. Each episode of the trilogy is seen sequentially and provides the viewer with an insight into the breadth of where and how nuclear materials permeate earth, air and sea. The work provides an incredibly rich, holistic and altogether complex sense of how nuclear materials behave, travel or engage with others. In this particular situation it is an appropriate introduction to the exhibition, which provides an insight into the scope of the global nuclearscape, where the viewers get a sense of the ubiquitous spread and unruly nature of nuclear materials.

What Schuppli observes is that the nuclear is different from the spatial dispersal of other contaminants, since radioactive isotopes are able to be traced due to their unique signatures. This allows for them to be tracked directly to their source, which goes counter to the understood difficulty in perceiving them (such as no taste, smell or touch). The three events *Trace Evidence* explores demonstrate the evidentiary qualities within the nuclear and how research and practice

⁹² See chapter three of this written dissertation where I begin to develop and propose an interscalar curatorial framework.

⁹³ <https://susanschuppli.com/TRACE-EVIDENCE>. Accessed 23 April 2023.

coalesce to think through its materiality, the traces it leaves and the means at which it moves across the earth. This trilogy is exemplary in how art practice can hold the complexity of disparate localities, materialities, eventualities and temporalities within the same conceptual frame. The Caesium-137 in this context could be read as an interscalar device that allows one to follow the dispersed journey of radionuclides after a nuclear disaster or accident.

The Nuclear's Bedfellow: Photography

Within Schuppli's *Trace Evidence*, the artist employs visual references pointing to innovative and image-making technologies specific to the nuclear industry, which are used to visually represent levels of radiation. Across underwater shots within the *Hydrology* episode one sees various coloured squares together, from green through to red, overlaid onto underwater footage. These visual cues are drawn from a gamma camera, which is used to represent radioactive hotspots that would otherwise be difficult to detect; the greens are lower whilst the reds indicate higher concentrations of radiation. This is one example of a long line of image producing technologies that have close associations with the documentation of radioactive events. Gamma cameras have been used within the nuclear industry to determine hotspots throughout the Fukushima Daiichi Power Plant post-accident. They have also been applied throughout the surrounding area in the forests near the power station to trace hotspots otherwise unseen.⁹⁴ Such technical developments arguably come from a long line of photography's enthusiastic pursuit of capturing images of nuclear tests, their set up and aftermath. Not to mention the first images produced of x-rays around the turn of the twentieth century.

In some capacity, much artwork exploring the nuclear utilises the camera, or other screen-based image-making technologies. Photography and its associated technologies are ubiquitous, but their relation to the nuclear is significant. It would be remiss to not mention that image-making technologies that stem from photography have been integral to our perceptions of the nuclear; many of the art projects discussed within this thesis are a testament to this. Photography has developed alongside and been entangled with nuclear technologies, their representation and reception. The technical requirements needed to capture nuclear bomb testing meant pushing the capabilities of image-making, which saw innovations that complimented the developments of nuclear technologies. Not only has photography been utilised to document, arguably obsessively, the testing of nuclear bombs, photographic film has also been applied in order to search for uranium deposits as well as to document nuclear disasters and their aftermath. The forthcoming discussion and analysis stems primarily from secondary materials of curator and art historian John O'Brian's exhibition *Camera Atomica* (2015) exhibited at the Art Gallery of Ontario, Canada. The

⁹⁴ Ibid.

exhibition uses photography as a point of departure to consider the ways in which it has shaped our perceptions of the nuclear, covering the whole post-war period from the devastating bombs dropped on Hiroshima and Nagasaki to disasters in civil nuclear power production like Chernobyl and Fukushima. 'Wherever nuclear events occur, photographers are present', O'Brian asserts.⁹⁵ The exhibition consisted of documentary photographs as well as artworks, alongside an extensive exhibition catalogue. The exhibition catalogue features texts that critically reflect on the nuclear and its relationship to photography, from exploring the infrastructures and equipment needed to meticulously document nuclear weapons testing and bomb detonation to the ways that material traces of radiation represent themselves through the photographic process.

To open up and extend the discussions around the project further a symposium was organised by John O'Brian and Claudette Lauzon on 23-25 September 2015, titled *Through Post-Atomic Eyes*. A volume of essays with the same title followed in 2020 asking 'what can photography tell us about a world transformed by nuclear catastrophe?'.⁹⁶ A 2016 review of *Camera Atomica* and the associated extended programme rightly foregrounds the importance of an interdisciplinary approach across various formats.⁹⁷ The focus of this project is different from other examples laid out above in its initial focus on medium specificity and the associated implications. However, the sentiment of interdisciplinarity is maintained as well as the discursive quality of different formats (exhibition, publication, symposia); this is a crucial and necessary method for nuclear related projects seeking to consider the nuclear critically and holistically. Although these observations do not discern how the process unfolded to determine the public outcomes, the project has given ample space to consider the various perspectives of photography's interaction with nuclear technologies, weapons, disasters and artist's responses. From the exhibition and its catalogue to the subsequent symposium and accompanying volume of essays, this project over the course of several years constitutes an in depth and considered engagement with photography and the nuclear's inextricable links to it.

Photography and its development in relation to the nuclear is significant to note. Particularly in terms of how the nuclear is perceived and the symbolic power implied, mushroom clouds from bomb detonations being one clear example. The *Camera Atomica* project, its point of entry into the nuclear and associated strands of programming are also important, particularly for the purposes of this project. *Camera Atomica* not only traces an important lineage of photography and its development but also allows photography to take those who engaged with the exhibition and associated programming on a journey through a significant part of the nuclear's history, how it has

⁹⁵ O'Brian, John, and Art Gallery of Ontario, eds. *Camera Atomica: Art Gallery of Ontario, 8 July 2014 - 25 January 2016*. London: Black Dog Publ. [u.a.], 2015. p.11.

⁹⁶ Lauzon, Claudette, and John O'Brian, eds. *Through Post-Atomic Eyes*. McGill-Queen's/Beaverbrook Canadian Foundation Studies in Art History. Montreal ; Kingston ; London ; Chicago: McGill-Queen's University Press, 2020.

⁹⁷ Glessing, Jill. 'Deconstructing Nuclear Visions'. *Esse Arts + Opinions*, no. 86 (2016): pp.94-97.

been documented and responded to through the production of images. It is the various formats of making public that are of note, how the project utilised different programming approaches to extend and reflect upon the richness of research that the project draws on. Although the exhibition was a crucial dimension of *Camera Atomica* it is the other aspects of published writing and research as well as symposia that enriches the exhibition and allows space to develop discourse. Although a well-trodden modus operandi for programming (exhibition as central event accompanied by other public activity), *Camera Atomica* is noteworthy for the purposes of my research through its utilisation of a discrete thing, photography, as a means to interrogate the nuclear and its impact. It demonstrates the generative possibilities of homing in on something (like photography or Essex) to understand the nuclear's global impacts and how humans have sought to document and make sense of this.

Back to the UK

The above has demonstrated the breadth of nuclear related art projects and their genealogy through nuclear culture and contemporary art. Although Jonathan Hogg's *British Nuclear Culture: Official and Unofficial Narratives in the Long 20th Century* (2016) provides insight into culture pertaining to Britain in a broad sense, some specificity is necessary to focus on contemporary art and its production in relation to the nuclear, which I have attempted to do above. Before moving into discussions of the curatorial in this chapter and into chapter three, it is worthwhile briefly shifting back to a UK context in order for my research to return to this locality. The below observations were made through varying means. I start by discussing David Mabb's work, which I have seen in various iterations. His nuclear-related work accompanied the *Nuclear Culture Research Symposium* I curated with Ele Carpenter in 2018; where a select number of his placard based works were present in the studio space in Goldsmiths' Deptford studios where the symposium took place. Other observations made in relation to Mabb's work have been through secondary sources. The other two projects discussed below, *Power in the Land* (2016) and *Cumbrian Alchemy*, are also predominantly via secondary means. Helen Grove-White, curator of *Power in the Land*, participated in the *Nuclear Culture Research Symposium* and presented on the project and the context of Wylfa Nuclear Power Station on Anglesey. My observations of *Cumbrian Alchemy* are based primarily on secondary material, such as the publication produced to accompany the project and other documentation. *Cumbrian Alchemy* Robert Williams also participating in the *Nuclear Culture Research Symposium*, where he chaired a series of sessions. Although this impacts the way in which the projects may be interpreted and perhaps imposes some limitations in this respect, the main impetus for selecting these two examples of UK-based nuclear art projects, demonstrating a precedence of artists working in embedded and place-specific ways.

Artist David Mabb's installation *Provisional Memorial to Nuclear Disarmament* (2016) is located

squarely within British nuclear culture *and* contemporary art. Mabb's work explores the aesthetics of William Morris' designs within a contemporary context. The work in question's point of departure is Mabb's research into British nuclear submarines and their William Morris upholstered interiors. Here one sees a somewhat peculiar juxtaposition between the Royal Navy and Morris' designs. It is surprising to find a famous socialist's designs within the bowels of a piece of twentieth century technology which is symbolic of war and Britain's pursuit of conquest. Mabb makes a shift within the context of the nuclear for Morris' designs and perhaps a shift speculatively more fitting for Morris' politics, from the interiors of the nuclear military complex to anti-nuclear protests. The installation consists of 15 old free standing projection screens, with the fronts featuring plain William Morris fabrics with the majority painted black or yellow, the colours that protestors regularly appropriate from radiation warning signs. Black surfaces abound recalling Modernist paintings or anarchist protest. On the backs of the screens the Morris prints come to the fore, mingling with slogans, signs, and symbols of the anti-nuclear movement.⁹⁸ Within these works different ideologies and political positions converge as do different visual languages. This shows the capacity of contemporary art to hold together incommensurabilities, or encourage those that encounter the work to think about different or opposing ideologies, value or belief systems and how art and visual culture is appropriated, utilised or instrumentalised.

The two other UK based projects that serve as helpful reference points for my research in that they focus on specific localities in the UK, helping situate my project within other place-specific UK-based artistic projects around the nuclear. One being *Power in the Land* (2016) curated by artist Helen Grove-White and the second *Cumbrian Alchemy* (2013), a project by artists Robert Williams and Bryan McGovern Wilson. *Power in the Land's* focus was around the Wylfa Nuclear Power Station on the island of Anglesey off the northwest coast of Wales, where Grove-White worked with nine other artists to make work in response to the site. *Cumbrian Alchemy* was a collaboration between Williams and McGovern Wilson where they explored the complex relationships of the energy industries in North Lancashire and Cumbria—nuclear power and renewables—and that of mineral extraction, the land, archaeology and folklore. Both above projects featured an exhibition and were accompanied by a publication that sought to consolidate and contextualise the projects further, providing critical analyses, documentation and reflections. Each project is hyper-local, they are interrogating a very specific geographic location and how it is implicated within the nuclear military industrial complex. Each place is part of a networked nuclearscape, tied together through the extraction, manipulation and movement of uranium ore. The intention of my PhD project (through the intent of making artwork public within a particular context and locality as an initial point of departure) is to understand the role of a particular place (in

⁹⁸ <https://thebulletin.org/2016/09/protest-and-survive-reclaiming-william-morris-from-britains-nuclear-fleet/>. Accessed 23 April 2023. For a book charting the various protest banners made for Greenham Common peace protests see Dew, Charlotte. *Women for Peace: Banners from Greenham Common*. Four Corners Irregular 8. London: Four Corners books, 2021.

this case Essex) within broader systems and structures, how my home county contributed to the development and implementation of global industries, nation states and power structures. For some from Essex, or who live, work or otherwise know it well, the intent of this project is to encourage a sense of defamiliarisation, of seeing, sensing and understanding a familiar place anew; through such critical and close reading the grasping of Essex's positionality within global systems and structures that the nuclear military industrial complex is facilitated by, such as capitalism, colonialism and the establishment and consolidation of nation states, can be gleaned. The elucidation of the rich field of contemporary art and nuclear culture demonstrates the breadth of art practice within which my project sits. It shows the global reach of the nuclear as well as the artistic approaches and areas of research that artists have taken up in order to respond to this.

Curating the Nuclear

Before moving into chapter three and discussing the curatorial beyond the nuclear, my proposed curatorial framework of the interscalar and the practice-based outcomes of this project, I argue it is necessary to further contextualise, highlight and articulate the intersections of nuclear culture and art; pertaining to the genealogy of the exhibition and curating, in particular. Exhibitions, and therefore curating, have been central to the nuclear narrative in Britain, particularly nuclear power production. The publicity activities of the Atomic Energy Research Establishment, such as its exhibitions, were heavily moderated by the UK's central government. Throughout the late 1940s and 1950s there were displays at large-scale events like the 1951 Festival of Britain, the *Atomic Train* touring exhibition as well as the variety of exhibitions the display model of Britain's first nuclear Graphite Low Energy Experimental Pile (GLEEP) reactor featured in. The GLEEP display model appeared in commercial fairs, the national museum, a Commonwealth exhibition and other displays that were staged for communities near the site of the new Windscale reactor, which was at Sellafield, Cumbria. It was during these exhibitions where organisers promoted the notion of the benign atom, using banalising and obscuring tactics.⁹⁹ It is not radical nor surprising to see that the exhibition format was and still is utilised by the nuclear industry to promote its activities. It is likewise unsurprising that artistic responses to the nuclear have also taken on one of the most prominent forms of making public in the art world, namely the exhibition, conventionally understood as the showing of discrete objects and artworks in a gallery or museum context.

Arguably, it follows that the modes of display of the nuclear industry's visitor centres and associated touring exhibitions do similar work to the first European museums and international

⁹⁹ Boyle, Alison. "'Banishing the Atom Pile Bogy': Exhibiting Britain's First Nuclear Reactor". *Centaurus* 61, no. 1–2 (2019): 14–32. For the examination of the representation of atomic science in Britain in museums, exhibitions, and print in the period 1945–1960 see: Forgan, Sophie. 'Atoms in Wonderland'. *History and Technology* 19, no. 3 (September 2003): 177–96.

World Fairs¹⁰⁰ in their instrumentalisation, which in the nuclear's context would be to contribute to the consolidation and legitimisation of the nuclear industry, both civil and military. Curator Carolina Rito helps in making the connection between exhibitions, the furtherance and consolidation of certain ideologies by writing that

there is no neutral act of exhibiting and no neutral exhibition space. Any consideration of the genealogy of museums and exhibitions cannot overlook the first European museums and the international World Fairs. Both formats are known for playing an important role in the consolidation of the colonial episteme of racial superiority, ontological differences, which refused to recognise the intellectual and cultural complexity of non-European peoples.¹⁰¹

One could argue that the nuclear industry and its utilisation of the exhibition format is an extension of the colonial episteme Rito discusses and another part of the genealogical thread that weaves through to current exhibition-making practices today. This does not undermine the exhibition as a legitimate format to share and disseminate knowledge, but it does foreground its capacity to be instrumentalised; the exhibition is never objective and its motivations, whatever they may be, are made apparent through the curation, the inclusions, omissions and ways in which the discrete objects displayed are framed through placement, juxtaposition and interpretation.

The exhibition, however, is only one facet of current curatorial and artistic practice. 'Exhibition' here should be understood in its traditional capacity of exhibiting and contextualising discrete objects within galleries and museums. In addition, this dimension of exhibition-making, the exhibitionary complex, of which exhibitions are a part, extends the parameters and capacity of art-making, the forms it takes and the ways in which one could make artwork public—such as radio shows, talks, walks, workshops, publishing, performance and interventions in the public realm beyond the museum or gallery walls. Additionally, the exhibitionary complex also brings into focus the infrastructures at play that facilitate the possibility of making artwork public and the ongoing discourses that develop as a result. The exhibitionary complex was initially introduced by sociologist Tony Bennett in 1988 when discussing the institutions of exhibition that emerged in the eighteenth and nineteenth centuries such as museums, exhibition halls and department stores, juxtaposing them with Foucault's analysis of contemporaneous institutions of confinement, such as the prison, asylum and clinic. Bennett discusses how museums serve as a means to encourage self-regulation within the populace. This developed alongside emergent disciplines like anthropology, art history, biology and history that informed and contributed to the filling of museums with discrete objects, living things and other purported specimens from across the world.

Bennett observes that the technology of vision developed in relation to architectural forms during

¹⁰⁰ An artwork that springs to mind that directly references the Great Exhibition of 1851 is Ken+Julia Yonetani's *Crystal Palace: The Great Exhibition of the Works of Industry of all Nuclear Nations*, 2013. See: <http://kenandjuliayonetani.com/en/works/crystalpalace/>. Accessed 13 April 2023.

¹⁰¹ Rito, Carolina. 'Infrastructures of the Exhibitionary'. In *Exhibitionary Acts of Political Imagination / Acte Expoziționale de Imaginație Politică*, edited by Cătălin Gheorghe and Mick Wilson, 70–79. Editura Artes and ArtMonitor, 2021. p.74.

this time were not merely a reversal of the principles of the panopticon, but rather held distinct aspects of the panopticon along with the panorama. The exhibitionary complex regulated the gathering of the general public, rendering it visible to itself and incorporating it into the spectacle. The spaces that make up the exhibitionary complex were designed for one to look at and operate within them. They allowed for one to see and be seen and went hand in hand with the flaneur. What Bennett astutely observes are the machinations that saw the crowd become 'a constantly surveyed, selfwatching, self-regulating, and, as the historical record suggests, consistently orderly public - a society watching over itself'.¹⁰² Through Bennett's analysis one begins to understand the development of the exhibitionary complex and the way in which it encouraged certain behaviours of those who engaged with or found themselves implicated within its structures. The exhibitionary complex in the contemporary context, I argue, is amorphous and encapsulates the flows of labour, the circulation of objects and the infrastructures that facilitate the making and reception of art.

The exhibitionary complex, then, in the context of contemporary art, is the diverse forms art may take to be made public, in addition to the processes of doing so and the responses garnered after the fact. Rito argues further, '[f]rom the vantage point of the exhibitionary, and the expanded notion of the curatorial . . . the positing of curating-as-exhibition-making as a neutral construction or operation is a premise that is rendered highly questionable, if not downright untenable'.¹⁰³ This again foregrounds the myth of objectivity within the context of not only exhibitions but the curatorial more broadly speaking. One could say that the exhibitionary is to the exhibition what the taskscape is to landscape,¹⁰⁴ in that the latter in both instances is a definition or description of a place in spatial terms, whilst the former in both cases opens this up to the innumerable relations that feed through and extend beyond the physical parameters of that which is designated. The expanded notion of the exhibitionary operates within and beyond art into interdisciplinary relations, the exhibitionary, then, is a verb, an ongoing process.

There are two 'complexes' that converge and diverge within my project, which articulate knowledge and power relations within particular contexts, namely the nuclear and contemporary art. The nuclear military industrial complex speaks to a very specific set of relations and how they play out, as does the exhibitionary complex. Today, both of these 'complexes' utilise the same or similar infrastructural characteristics, such as the networks of roads and other transportation routes that smudge studio allude to in my first chapter. Nonetheless these infrastructural forms, of which this example is one of many, are needed to facilitate the making public of artwork as well as the ongoingness of nuclear power production or weapons development. These complexes clearly articulate the intertwined and interrelational qualities that make both art's public manifestations and

¹⁰² Bennett, Tony. 'The Exhibitionary Complex'. *New Formations* 1988(4) (1988). p.81

¹⁰³ Rito, 2021 p.74. For further elaboration on the exhibitionary and the expanded notion of the curatorial see chapter three.

¹⁰⁴ ...or the curatorial is to curating?

the production of nuclear energy or weapons possible.

Although it can be argued that exhibition-making is the product of the colonial episteme, its framework can be turned on its head in order to be critical of or decentre the ways of knowing, forms of knowledge and the apparatuses employed to uphold the status quo, whilst introducing different knowledge systems and perspectives. A prime nuclear-specific example being the touring exhibition *Exposure: Native Art and Political Ecology* (2022-2023).¹⁰⁵ *Exposure: Native Art and Political Ecology* demonstrates the breadth of stories and the richness of work produced by international Indigenous artists who have been impacted by the nuclear military industrial complex, from nuclear testing, nuclear accidents and uranium mining. The exhibition illustrates a global Indigenous nuclearscape. Its first iteration was shown at the Museum of Contemporary Native Arts (MoCNA) in Santa Fe, New Mexico, exhibiting work by Indigenous artists from Australia, Canada, Greenland, Japan, French Polynesia (Tahiti) and the United States with American Samoa and Guam. The exhibition is led by an Indigenous curatorial team that represents the extensive geographies the exhibition covers. This approach provides a multiplicity of voices across the exhibition, foregrounding and celebrating the diversity of Indigenous peoples across the world, *Exposure...* demonstrates continued Indigenous resilience and opposition to the nuclear, its ongoing impacts and the trauma experienced by Indigenous communities and their land. It shows not only that tests from the twentieth century are still felt today but that communities are still at risk from uranium speculators in search of uranium ore for current nuclear power and weaponry needs.

The nuclear military industrial complex has and continues to disproportionately affect Indigenous communities and land. Exhibitions pertaining to the nuclear curated by, foregrounding and focussing on the experiences and voices of Indigenous artists and curators are imperative when getting to grips with and understanding nuclear colonialism, its impacts and how curatorial and artistic practice have the capacity to respond. Such projects provide a crucial and central role in curatorial and artistic practice that seek to engage with nuclear culture and inevitably nuclear colonialism. Artist and scholar Marcella Ernest articulates the importance of projects like *Exposure...* when reviewing the exhibition, explaining how it 'is a cultural production that establishes meaningful acts of self-determination and social justice' and in doing so uses 'art in experimental ways to create visual scholarship within a framework of social justice' which in turn contributes to the establishment of 'strong foundations for the ideological decolonization of Indigenous peoples and lands'.¹⁰⁶ The work produced provides insight into a broad range of practice while demonstrating the global devastation and disruption the nuclear military industrial complex subjects communities to across the world. Artist Yhonnie Scarce's utilisation of materials

¹⁰⁵ Baysa, Jeff, Satomi Igarashi, Nivi Christensen, Erin Vink, Tania Willard, and Manuela Well-Off-Man. *Exposure: Native Art + Political Ecology*. Santa Fe, NM: Radius Books : IAIA Museum of Contemporary Native Arts, 2021.

¹⁰⁶ Ernest, Marcella. 'Marcella Ernest. Review of "Exposure: Native Art and Political Ecology".' *Caa.Reviews*, 23 March 2022. Accessed 25 April 2023

like glass and its indexical relation to land and nuclear weapons testing across so-called Australia is a prime example. The following analysis is via secondary sources, however MoCNA provides detailed documentation which includes a virtual museum to document the exhibition in great detail and providing the viewer a very good sense of the work in the space.¹⁰⁷

Scarce is one of the exhibiting artists in *Exposure...* whose work looks at British nuclear colonialism and its impacts. The artist is a master glassblower who belongs to the Kokatha and Nukunu peoples, in what is now known by many as Australia. Glass is a key presence in her work, often taking anthropomorphic forms or referencing bush foods like yams, bush plums and bananas. The works on display in *Exposure...* pull into focus the devastating impact of nuclear testing on Aboriginal life. Titled *Nucleus (U235) (11-14)* the glass sculptures sit atop sterile medical carts. Bush plum-like in form they are contorted with protrusions throughout, as if something has exploded from the inside out. U235 in the title references uranium-235, the isotope of uranium that is the less abundant but much needed for the production of nuclear weapons and power production.¹⁰⁸ Glass is also significant in that when testing nuclear bombs at or above ground level the extreme heat from the blast causes the sand to form glass, which is called trinitite, named as such after the first ever nuclear weapon test, Trinity.

Among Scarce's practice, and discussed here via secondary materials, she explores the impacts of the nuclear testing near her birthplace of Woomera, and the removal and relocation of Aboriginal people from their homelands as a consequence. An extensive display of Scarce's work can be seen in *Missile Park* (2021), a solo exhibition of the artist's work that was first hosted by the Australian Centre for Contemporary Art (ACCA) and then travelled to the Institute of Modern Art, Brisbane. The exhibition takes its name from a new commission also titled *Missile Park* (2021), which continues Scarce's research into the British nuclear tests in Australia in the 1950s and '60s, beginning with Operation Hurricane in 1952 and moving inland to Emu Field and Maralinga where Scarce's extended family were displaced from their homelands. The exhibition illustrates the breadth of Scarce's work, often referencing family histories and the abundance and sustenance of the land alongside her extensive research around British nuclear testing and other events that have had a devastating impact on Aboriginal communities.¹⁰⁹ Alongside her practice as an artist Scarce has been working on an expansive project with fellow artist Lisa Radford which has curatorial sensibilities. *The image is not nothing (Concrete Archives)*¹¹⁰ is an extensive exploration of sites of nuclear colonisation across the world, as well as those of genocide and the memorials erected in response to these atrocities. Scarce and Radford travelled to visit these places,

¹⁰⁷ <https://iaia.edu/event/exposure-native-art-and-political-ecology/>. Accessed 23 April 2024

¹⁰⁸ <https://world-nuclear.org/information-library/nuclear-fuel-cycle/conversion-enrichment-and-fabrication/uranium-enrichment>. Accessed 17 November 2023.

¹⁰⁹ Scarce, Yhonnie, Max Delany, and Australian Centre for Contemporary Art. *Missile Park*, 2021.

¹¹⁰ <https://www.artandaustralia.com/online/online/image-not-nothing-concrete-archives.html>. Accessed 8 November 2023.

considering how different countries reflected upon and represented them. They also invited artists to respond to the project's areas of enquiry, launching an extensive editorial project with Art + Australia online as well as presenting exhibitions, other public activities and gathering research materials; constituting an archive which maps out links between genocide, nuclear colonisation, memorialisation and artistic approaches to foreground and make visible these injustices, but also celebrate the resilience and strength of those affected.

The image is not nothing's impetus stems from Australia's distinct lack of or refusal to reckon with the genocidal violence perpetrated against Aboriginal people, and the dearth of meaningful reference points to reflect upon this. For several years Scarce has been returning to Woomera and Maralinga, a return that acts as a form of research in and of itself that in turn develops into how work might be produced and how this acts as a way to memorialise that which has long been swept under the carpet by the British and Australian Governments. Tracing Scarce's practice, from the individual works produced to the expansive research-led and site responsive approaches adopted alongside Lisa Radford, there is a multifaceted and complex engagement with the nuclear through different forms, from glass sculptural forms and the embodied processes this entails to critical engagements with archives and considering them a site of interrogation and reimagination. This breadth of work is a means to think about one aspect of nuclear colonialism, its relation to others and the many responses to it. *The image is not nothing* interrogates the impact of nuclear colonisation, how it is represented and memorialised. It does this through research, fieldwork, the archive and an invitation to other practitioners to respond to the output of these concerns.

Further drawing on these links between Britain's nuclear testing, the prospecting of uranium and the global networks and infrastructures that facilitate the nuclear military industrial complex, curator Ele Carpenter has written on the notion of decolonising the nuclear, or rather, nuclear decoloniality, drawing on art projects that highlight Britain's nuclear entanglements with Australia, in particular. Through her paper 'Nuclear Decoloniality: the nuclear cannot be undone but it can be rethought' (2022)¹¹¹ Carpenter discusses the work of Lise Autogena, Kerri Meehan and Alex Ressel, and Gabriella Hirst's work *How to Make a Bomb; How to Make a Bomb* being the project I have been working with Hirst on and which informs this PhD project. Carpenter acknowledges that the nuclear is unresolvable and that it cannot be decolonised, since nuclear waste does not go away, therefore decoloniality in the context of her argument is understood as 'a process of understanding' rather than a destination or end point.¹¹²

Artists Meehan and Ressel's work stems from their time in the Northern Territory, Australia, while

¹¹¹ All references throughout are from the unpublished English version of Carpenter's essay. For a published French version see Carpenter, E. Décolonialité nucléaire: à défaut d'éliminer le nucléaire, on peut le repenser. In *Âge atomique* (2022): 61–76.

¹¹² Ibid.

living in Gunbalanya and working at the Injalak Arts Centre. Gunbalanya is near an old uranium mine at Nabarlek as well as the Ranger Uranium Mine. The artists' work explores intergenerational storytelling around the region which has extensive uranium deposits and a rich cultural legacy informing this. Carpenter draws upon a work which starts to elaborate upon and brings the listener closer to the impact of uranium mining in Arnhem Land and Kakadu in the Northern Territory. The work in question, *Sickness Country* (2017), is a radio artwork available on the artists' website¹¹³ where Ressel and Meehan have conversations with various people from the region who discuss the knowledge developed around the uranium in the area and how contemporary knowledge of this reaches far back into ancient history. These conversations lead the listener to learn about the ancient rock paintings in the area. One in particular pictures a figure with swollen joints, a symptom associated with radiation as a consequence of disturbing the land. As Carpenter asserts, Meehan and Ressel's 'collaborative projects create and gather artworks that explore the role of intergenerational storytelling in the culturally rich uranium landscapes of the region. Working closely with the local Aboriginal community, the artists are learning to rethink the nuclear landscape in relation to Country, kin and temporality, drawing on 60,000 years of cultural knowledge.'¹¹⁴ Meehan and Ressel trace uranium back to its source, thinking with others and reflecting on long held knowledge of and relationship to land. The work confronts a very different set of relations to land, away from extraction, exploitation and commodification. When brought into dialogue, Hirst's *How to Make a Bomb* project and Meehan and Ressel's work articulate, particularly when contextualised through the lens of Britain's pursuit of nuclear state status, the legacy and ongoing impacts of British nuclear colonialism. What we learn is the disregard of the traditional knowledge of those whose land is rich in uranium, its extraction and exploitation both for the accumulation of capital and nation building projects, and the subsequent impact when technologies are developed and implemented in such a way as to cause devastation in the form of nuclear bomb testing.

An interesting shift that Carpenter observes in the works of Autogena, Hirst, Meehan and Ressel, is a move away from the discourses surrounding marking sites of nuclear waste repositories or contamination (of which I will discuss below) and towards making sensible the complex and entangled infrastructures that facilitate nuclear colonialism. For Meehan and Ressel they follow 'the long trace of uranium back to its geologic and cultural origins to consider the intergenerational deep time knowledge of radioactivity in the past as well as the future.'¹¹⁵ *How to Make a Bomb* went through a process of exploring the links between testing sites in Australia and Essex when siting the project at The Old Waterworks,¹¹⁶ which is in Southend-on-Sea and nearby Foulness Island where Foulness Atomic Weapons Research Establishment (AWRE) was based. Together they map out a nuclearscape traversing British nuclear coloniality. Autogena's long-term project

¹¹³ <http://www.ar-km.com/sicknesscountry.html>. Accessed 8 January 2024

¹¹⁴ Carpenter, 2022, pp.61-67.

¹¹⁵ Ibid.

¹¹⁶ See chapter three on a detailed reflection on my collaborative work with Gabriella Hirst and the subsequent public outcomes which form much of the curatorial practice-based portion of this PhD.

around Kuannersuit in what many now call Greenland foregrounds the difficulties local people face, which are the very real risks of Danish uranium prospecting and decommissioning. Carpenter explains how Autogena ‘developed an artwork as a form of decolonial response-ability’, acknowledging Greenland’s status as a former Danish colony and the power dynamics at play.¹¹⁷

Through these projects there is a pursuit to understand and make sensible the legacy of nuclear weapons and power production, particularly the extraction of uranium, nuclear weapons testing and the subsequent impact on land and people, flora and fauna. It foregrounds how the development of nuclear weapons and power production will not fade into the past, its legacy will persist, after all, ‘the nuclear cannot be undone but it can be rethought’. When doing the curatorial work of situating these projects in dialogue with one another the colonial dimension of the nuclear is made plain, as are the possibilities of engaging with this through artistic practice and curatorial reflection. There have been further recent articulations around decolonising or decoloniality and the nuclear, arguing that an urgent task for scholars working ‘on the history, technologies, culture, and global impact of the nuclear age is to articulate *decolonizing pedagogies of the nuclear*’.¹¹⁸ Scholar Livia Monnet’s edited volume *Toxic Immanence: Decolonizing Nuclear Legacies and Futures* (2022) is an extensive contribution to the effort to reorient scholarly work across nuclear studies towards a decolonial framework and practice.

Monney speculates on what a decolonising pedagogy of the nuclear might look like, first starting with three points that one could take as premises for informing theory and praxis, these are: around nuclear science and technology; the ‘coloniality of the nuclear’; and the notion of ‘decolonising the nuclear’. Monnet argues that ‘[n]uclear science and technologies were always and continue largely to be colonial and colonizing practices’,¹¹⁹ and that the coloniality of the nuclear is the ‘entangled power relations, epistemologies, technoscientific practices, regulatory or advisory agencies and organizations, psychosocial and affective conditioning, and cultural representations, through which all nuclear technologies have been legitimated, normalized, and institutionalized in modern nuclear states and around the world’.¹²⁰ These two initial premises provide a generative way to analyse and identify how certain contexts could be understood in nuclear colonial terms. It follows, then, that the third premise of ‘decolonising the nuclear’ opens up possibilities to rethink the context established in the first two points, for Monnet

this notion refers to any practice, theory, aesthetic, or cultural production that contests, resists, subverts, or deconstructs the hegemony, legitimacy, violence, and coloniality of the nuclear episteme and its biopolitics (or, as some critics have described it, necropolitics). *Decolonizing the nuclear* is not shorthand for anti-nuclear thought or activism; rather, it

¹¹⁷ Carpenter, 2022.

¹¹⁸ Monnet, Livia, ed. *Toxic Immanence: Decolonizing Nuclear Legacies and Futures*. Montreal Kingston London Chicago: McGill-Queen’s University Press, 2022. pp.5-6.

¹¹⁹ Ibid. p.6.

¹²⁰ Ibid. p.7.

refers to the difficult, risky task of uncovering, mapping, and critically documenting the histories, archives, and imaginaries both of nuclear technoscience and trans/national nuclear complexes and of the political and economic regimes that have built and sustained these assemblages.¹²¹

This encourages thinking through ways of re-establishing a multiplicity of voices, contexts, understandings and knowledges:

*Decolonizing the nuclear, then, describes the immanent, reflexive critical activity of documenting and providing evidence of the irrationality, coloniality, (slow) violence, and lethality of the nuclear episteme and of nuclear complexes and infrastructures with the aim of bringing about their dismantling and final abolition.*¹²²

These premises may help develop theoretical frameworks and practice-based approaches that could inform contemporary curatorial and artistic work. Monney footnotes the comment made above with a workshop and public lecture event that Ele Carpenter and I co-organised in October 2019 along with the Nuclear Culture Research Group and the Goldsmiths Critical Ecologies research stream.¹²³ The event, titled *Decolonising the Nuclear*, was held at Goldsmiths, University of London, and comprised a research workshop and keynote lecture. Invited speakers included artists and scholars whose research and work included disparate locations from Australia, Greenland, India, the Marshall Islands, Lithuania and Kazakhstan. Alongside this was a keynote by Gabrielle Hecht whose research explores radioactive residues, mine waste, air pollution, and African Anthropocenes.¹²⁴ Perhaps the *Decolonising the Nuclear* workshop was the point of departure for Carpenter's 'Nuclear Decoloniality' essay discussed above and progression for Carpenter to shift from 'decolonising the nuclear' to 'nuclear decoloniality', which arguably acknowledges the problematics around decolonisation moving into metaphor.

A pertinent point to foreground via Monnet and Carpenter is the importance of both theory and practice, how they interrelate and inform one another. Monnet argues that decolonising of the nuclear should be understood 'as a critical, situated dual activity', one that embraces theory *and* practice. The aims of which should culminate in a decolonising of the nuclear (or nuclear decoloniality) and 'total and unconditional nuclear abolition'.¹²⁵ One must acknowledge the somewhat paradoxical case in point that the nuclear is unresolvable and inherently colonial, so decolonising the nuclear is to be understood as a process, a perpetual and constant undertaking due to its 'unresolvability'. Therefore, a more generative and fitting framework and way to articulate this is through Carpenter's 'nuclear decoloniality' as a 'process of understanding'. When applying this to the context of Essex one can follow the lines of enquiry that lead away from its shores along

¹²¹ Ibid.

¹²² Ibid. [emphasis in original] p.8.

¹²³ <https://critical-ecologies.org/>. Accessed 17 November 2023.

¹²⁴ <http://m-a-r-s.online/sessions/decolonising-the-nuclear-public-lecture-and-research-workshop>. Accessed 17 November 2023.

¹²⁵ Monnet ed., 2022 p.8.

the Blackwater and Thames estuaries and out into the North Sea. The barges that took bombs, the power stations that deposit fuel element debris in Essex's waters, and the spent fuel stored by the water's edge with uranium processed from mines with no clear answer known of the make up of continents and lands within each fuel rod.

It is imperative to advocate for the approach of theory and practice happening in tandem, particularly within the arts when advocacy for the value of practice and its contribution to research in academic contexts is needed. Particularly since the validity of art and curatorial practice in and of themselves is still called into question and needs to be justified further within frameworks such as the Research Excellence Framework (REF) in UK universities. An exhibition can be just as much a contribution to knowledge production as an edited volume of essays, for example. It should be acknowledged as such without the need for qualification or description beyond the parameters of the exhibition itself and its accompanying forms of information, dissemination, the discourses it propels as a consequence of its appearance, and the relational and social forms it produces as a result. These qualitative outcomes are amorphous but in this amorphousness is possibility; a forum for curators, artists, researchers and writers to make links, map, speculate upon and wrestle with the complexities of nuclearscapes, demonstrating how contemporary art has the unique capacity to do this work.

Exhibition *Exposure: Native Art and Political Ecology*, Carpenter's curatorial framing seen in 'Nuclear Decoloniality: the nuclear cannot be undone but it can be rethought' and Monnet's proposed premises are all developing ways to rethink and reframe the approaches of artistic and curatorial work associated with the nuclear through a lens that attempts to decentre and critique its coloniality. It is within this framework of nuclear culture projects where my project sits, at once trying to think about my home county of Essex, how it is implicated within the nuclear colonial legacy of Britain and its lasting impacts. This PhD attempts to do this while also acknowledging how Essex's nuclearscape is one among many that are entangled and connected by the infrastructures, networks and various forms of fall out and contamination of the nuclear military industrial complex.¹²⁶

Ele Carpenter's work has focussed on curatorial work and its advocacy in relation to contemporary art and nuclear culture for over a decade. She is a leading proponent in the field of nuclear related contemporary art projects, commissioning many and developing an expansive *Nuclear Culture*¹²⁷ project. Carpenter is also the convenor of the Nuclear Culture Research Group, which is made up of a broad range of artists, curators and scholars, including myself.¹²⁸ In addition to Carpenter's

¹²⁶ I want to remind the reader of the discussion in chapter one around the multiplicity of colonialisms that manifest and therefore different approaches to decolonisation, and the consequences of the promiscuous use of decolonisation. Since Britain's role in the nuclear is global, one may traverse multiple colonialisms.

¹²⁷ <https://nuclear.artscatalyst.org/>. Accessed 17 November 2023.

¹²⁸ https://www.umarts.se/working_group/nuclear-culture-research-group/. Accessed 17 November 2023.

prolific activity in this context, other published work has also surfaced whose volume's focus is the nuclear and visual art.¹²⁹ It is here that the broad scope of nuclear culture and the diverse forms of production are brought into focus through contemporary art practice and its associated outcomes. Carpenter's *Nuclear Culture* project has been charting artists and their engagement with nuclear culture for several years. The project includes curating exhibitions, commissioning new artwork, publishing (in particular, *the Nuclear Culture Source Book* (2016)),¹³⁰ field research and roundtable discussions with nuclear and arts organisations. In terms of curatorial practice Carpenter's project lays the groundwork, informing my project where the curatorial approach is one that encompasses the expanded notion of the curatorial: exhibitions; roundtables; talks; publications; research trips; workshops; and various other discursive formats of making art and its associated discourses public.

One key strategy of Carpenter's has been to establish a critical context in order to commission contemporary visual art which engages communities and individuals in dialogue around the monitoring, marking and long-term siting of radioactive environments. Carpenter has been involved in an international initiative launched by the Nuclear Energy Agency (NEA) Radioactive Waste Management Committee (RWMC) called the Preservation of Records, Knowledge and Memory Across Generations (RK&M Initiative). According to the NEA 'the scope of the RK&M Initiative is encapsulated in how, through RK&M preservation, it may be possible to reduce the likelihood of inadvertent human intrusion and to support the capacities of future members of society to make their own informed decisions regarding a radioactive waste repository after closure.'¹³¹ By having a seat at the table of such initiatives around radioactive waste management and storage, Carpenter is doing crucial advocacy work and demonstrating the important contributions artists and curators can make to this perplexing conundrum.

Carpenter has participated in and contributed to various nuclear industry related research outputs and symposia, and in doing so continues advocating for curatorial practice as a means of meaningfully contributing to the RK&M Initiative as well as broader discourses around nuclear culture. Artists Andy Weir, Jon Thomson and Alison Craighead (Thomson & Craighead) have been working with Carpenter on projects that engage with various stakeholders impacted by the storage and marking of radioactive waste in perpetuity, such as museums, radioactive waste management agencies, individuals and communities. Carpenter observes that there is an established humanities discourse around the social and technical challenges of radioactive waste siting, monitoring, and site marking, and asserts that, alongside this, the visual arts have the capacity to foster in-depth

¹²⁹ See Decamous, Gabrielle. *Invisible Colors: The Arts of the Atomic Age*. Leonardo Book Series. Cambridge, MA: The MIT Press, 2018 and Volkmar, Anna. *Art and Nuclear Power: The Role of Culture in the Environmental Debate*. Environment and Society. Lanham: Lexington Books, 2022.

¹³⁰ 2016 was a productive year for books on nuclear culture. Jonathan Hogg's *British Nuclear Culture: Official and Unofficial Narratives in the Long 20th Century* was published in the same year.

¹³¹ <https://www.oecd-nea.org/rwm/rkm/>. Accessed 23 April 2023.

interdisciplinary discourse around long-term radioactive waste management. There is a plethora of contemporary art produced in relation to this topic but a serious lack of curatorial work to establish its contribution to the wider arts, humanities, and nuclear discourses. The Nuclear Culture project is an attempt to redress this and recognise the knowledge that curatorial and artistic research can contribute to the field of nuclear arts and humanities.¹³² I would also argue that the intent of my project is to contribute to this burgeoning field of nuclear arts and humanities, more specifically through curatorial work producing new knowledge in this context.

For Carpenter, artists Weir, and Thomson & Craighead's works are networked and distributed. They provide a means to work through and enter interdisciplinary discourses, provoking exciting possibilities of the contribution that contemporary art and curatorial practices can have on nuclear culture and policy. Andy Weir's *Pazugoo* (2016 - ongoing) is a discursive project with multiple points of entry via varying approaches and outcomes, from workshops, exhibitions, works, texts and presentations. Weir explains how the 'project draws on philosopher Reza Negarestani's invocation, in *Cyclonopedia* (2014), of the Sumero-Asyrrian demon of dust and contagion, Pazuzu, particularly in its method of 'double of flight', connecting local to cosmic scales through a delirious excess of wings.'¹³³ The project is centred around 'marking' nuclear sites, particularly those of nuclear waste storage facilities, and how the knowledge of radioactive waste in these sites can be communicated to future generations. These parameters situate the project specifically within discourses of radioactive waste management, providing a means to engage in this through practice. This is achieved by making and burying 'Pazugos' underground for an indeterminate period of time. 'Pazugos' are figures that take after Pazuzu, but have been reconfigured or their form shifted due to artistic intervention, be that from the artist or during workshop activity with participants. For me, the compelling part of this project is how the museum functions as a repository of knowledge around the project, mapping pertinent information around locations of buried Pazugos and other contextual information. The work was shown as part of Carpenter's *Perpetual Uncertainty* exhibition, the iteration of which I saw in Malmö in 2017. Weir delivers workshops where participants produce their own Pazugoo figures. During this activity those taking part use online museum databases of scanned artefacts as reference points, reconfiguring them to make designs and 3D printed objects. The artist along with Carpenter have since been working on a proposal to place a series of small figurines that Weir has produced at every Underground Research Laboratory (URL) entrance. The figurines are made in various materials and are intended to be placed at the entrance of every repository, as a nod to the placement of St Barbara at the head of the URLs of HADES, Mol, in Belgium and Meuse/Haute-Marne, Bure, in Northern France.¹³⁴ An open question to ask when thinking about Weir's uptake and rearticulation of Pazuzu, particularly in relation to nuclear decoloniality, is what are the implications of appropriating

¹³² <https://nuclear.artscatalyst.org/content/modern-2020-paris-2019>. Accessed 23 April 2023.

¹³³ <https://www.andyweirart.com/pazugoo>. Accessed 23 April 2023.

¹³⁴ <https://nuclear.artscatalyst.org/content/modern-2020-paris-2019>. Accessed 23 April 2023.

or rearticulating something that appears to have such specific cultural significance to a certain place or time? This is an open question, but an important one nevertheless.

A Temporary Index (2016) (also shown as part of *Perpetual Uncertainty*) by artists Thomson & Craighead is another way to consider the marking of sites that has figured in Carpenter's curatorial work. The artwork consists of an array of counters that mark the sites of nuclear waste storage facilities across the world. Each counter stands upright counting down the time in seconds of a nuclear site, telling the viewer how long it will take until the nuclear waste is safe for humans. The work has been shown in different ways, as an array in a gallery or a single counter in a site-specific context. The time frames vary from forty to one million years. Alongside the counters the artists provide further contextual information, describing the site, the human legacy of nuclear waste and what we as a species have done to deal with the ongoing care and maintenance it demands from us.¹³⁵ Considering time and our relationship to it the work protracts and extends in response to nuclear sites in its proximity or as a collection stood side by side one another at varying heights, clearly articulating how humans understand conceptions of time through both pictorial and linguistic language.¹³⁶

Situating these works together Carpenter is demonstrating how through different but interrelated means art projects in this context can contribute not only to their own respective field of contemporary art but also to discourses that are attempting to articulate and address a problem humans have created that extends so far beyond our conceptions of time that the task at hand is no mean feat. Carpenter's advocacy for curatorial work and her curatorial practice in the process of commissioning new artwork within the geological waste research and disposal discourse allows for an opportunity to produce new and novel ways of engaging with and coming to know these problems and therefore contributing to possible solutions or alternative modes of understanding.

An extensive example of Carpenter's consolidation of artistic and curatorial research to articulate the breadth of nuclear engaged contemporary art practice is the 2016 publication *the Nuclear Culture Source Book* and the expansive group exhibition that it accompanies, *Perpetual Uncertainty*, whose iterations toured to Bildmuseet, Umeå University;¹³⁷ Z33, House for Contemporary Art;¹³⁸ and Malmö Konstmuseum.¹³⁹ In *the Nuclear Culture Source Book* Carpenter separates the artworks, projects, and commissioned texts in six themes or categories: nuclear anthropocene; nuclear materiality; radioactive non-sites; radiological inheritance; nuclear modernity; radiation as hyperobject. These sections provide a framework that begins to articulate the varying registers that artists engage with the nuclear. It provides one with a set of tools and

¹³⁵ https://www.thomson-craighead.net/temporary_index.html. Accessed 23 April 2023.

¹³⁶ <https://nuclear.artscatalyst.org/content/modern-2020-paris-2019>. Accessed 23 April 2023.

¹³⁷ <https://www.bildmuseet.umu.se/en/exhibitions/2016/perpetual-uncertainty/>. Accessed 17 November 2023

¹³⁸ <https://www.z33.be/en/artikel/exhibition-perpetual-uncertainty/>. Accessed 17 November 2023.

¹³⁹ <https://nuclear.artscatalyst.org/content/perpetual-uncertainty-malmo-konstmuseum>. Accessed 17 November 2023

ways to think about the broad range of artists working in this context; this is not to say, however, that the artists featured in each section *only* respond to the nuclear in the way in which they are categorised. The sections in *the Nuclear Culture Source Book* are an effective editorial and curatorial tool to enable the disparate aspects of the nuclear and the plethora of methods of engagement to become legible for the viewer or reader.

To get a sense of the broad range of artistic approaches mentioned above I will draw on a few examples. Within the 'nuclear anthropocene' section there is one work that is exemplary in articulating how an artwork may respond to weapons testing across the globe, showing the ubiquity of radioactive fallout due to nuclear bomb detonations across from 1945 to 1998, and therefore foregrounding the case to consider the mid-century nuclear testing as a marker for the Anthropocene. Isao Hashimoto's work *1945-1998* (2003) charts the 2053 nuclear explosions that were detonated during this time, showing a time lapse map beginning with the first explosion, the Trinity Test, in New Mexico as part of the Manhattan Project and concluding with Pakistan's nuclear tests in 1998.¹⁴⁰ In *1945-1998* one sees (and hears) the years ticking by in the top right-hand corner while the tally of bombs tested increases in the bottom right, a beeping sound and flash on the map indicating each bomb tested.

It was just three years before Hashimoto's *1945-1998* that chemist Paul Crutzen and limnologist Eugene Stoermer wrote about the impact of humans on the earth and how this may warrant the move into a new geological epoch, the Anthropocene.¹⁴¹ The term was used informally by Stoermer from the 1970s and gained traction with Crutzen's usage, as he also wrote about it in the scientific journal *Nature* in 2002. Since then the discourse around the Anthropocene and the associated alternate designations: the Chthulucene, Capitalocene, Plantationocene, Urbanocene, etc.¹⁴² have permeated the arts and humanities, becoming a central theme to the work produced over at least the last decade. What these nuanced articulations show is the unevenness of humans' impact on earth both in relation to those who do the damage and those who experience the consequences, as well as the different systems that have accelerated humans' detrimental impact on earth, namely colonialism and capitalism. Hashimoto's work came at a time when this notion of a new epoch began its propulsion across disciplines, and Carpenter's nuclear anthropocene section in her 2016 publication functions as a generative means to consider the nuclear as one of these anthropogenic markers. Due to the tests beginning in 1945, traces of

¹⁴⁰ Carpenter, Ele, ed. *The Nuclear Culture Source Book*. London: Black Dog Publishing, 2016. p.22.

¹⁴¹ Crutzen, Paul J. and Stoermer, Eugene F. "'The 'Anthropocene'" (2000)". *The Future of Nature: Documents of Global Change*, edited by Libby Robin, Sverker Sörlin and Paul Warde, New Haven: Yale University Press, 2013, pp. 479-490. <https://doi.org/10.12987/9780300188479-041>.

¹⁴² See Chwałczyk, Franciszek. 'Around the Anthropocene in Eighty Names—Considering the Urbanocene Proposition'. *Sustainability* 12, no. 11 (31 May 2020): 4458. <https://doi.org/10.3390/su12114458>; Davis, Janae, Alex A. Moulton, Levi Van Sant, and Brian Williams. 'Anthropocene, Capitalocene, ... Plantationocene?: A Manifesto for Ecological Justice in an Age of Global Crises'. *Geography Compass* 13, no. 5 (May 2019): e12438. <https://doi.org/10.1111/gec3.12438>; Haraway, Donna. 'Anthropocene, Capitalocene, Plantationocene, Chthulucene: Making Kin'. *Environmental Humanities* 6, no. 1 (2015): 159–65. <https://doi.org/10.1215/22011919-3615934>; and Moore, Jason W. *Anthropocene or Capitalocene? Nature, History, and the Crisis of Capitalism*, 2016.

radionuclides can be found everywhere, in organisms and bodies across continents, showing in the geologic record the impact of humans on earth, or the evidence of systems that certain humans instigated.

Another example, this time in the 'nuclear materiality' section, artists Lise Autogena and Joshua Portway show an image of uranium ore from the Kvanefjeld in Narsaq, Greenland, stored at Risø, Danish Decommissioning since the 1980s. The image here forms part of the research for their film *Kuannersuit / Kvanefjeld* (2016) which portrays a community divided by mining in the area, since it holds one of the richest of natural uranium and rare earth mineral deposits in the world. For generations the community has made their livelihoods in farming and now their agricultural industry may be threatened by foreign investment in prospective resource extraction. The film shows a community trying to carve out their own future whilst simultaneously attempting to shake off their colonial past, showing the trade-offs and difficult decisions they have to make to obtain financial stability, autonomy and social progress.¹⁴³ What one sees here is the beginnings of the nuclear cycle and its impact on communities that surround them, reminding one that like many other forms of energy production nuclear power is underpinned by resource extraction: the removal of material from the earth to reprocess and manipulate, which produces waste products of its own like mine tailings. Radiation may be invisible and imperceptible but the impact of the removal of uranium ore for the purposes of nuclear power and weapons production is far from it. Juxtaposed against Autogena and Portway's uranium or in *the Nuclear Culture Source Book* and on the opposing page is an image from *Site Reports (Blue Danube)* (2008-2016) by artist Isabella Streffen, showing water pools for nuclear waste storage purposes. It was taken during one of her site visits to RAF Barnham in Suffolk, UK, which was built specifically for the maintenance and storage of Britain's free-fall nuclear bombs like Blue Danube. On these two pages of Carpenter's book we see the nuclear cycle bookended, from extraction to storage,¹⁴⁴ reminding us that nuclear industries still present challenges for communities today.

Carpenter's book is a compelling overview of artists touching on or focussing their creative energies on the nuclear. It demonstrates the multifaceted, rich and diverse approaches to art practice around nuclear culture. The aforementioned examples show how artists articulate the nuclear's global implications and local concerns, shifting through different scales and temporalities. Carpenter's broader *Nuclear Culture* curatorial project is exemplary in how a curatorial project can begin thinking about the nuclear holistically, through various curatorial strategies the breadth and spread of the world's nuclearscapes and their connections, convergences and divergences are made tangible.

One of the key things distinct from Carpenter's approach to curatorial strategies to my own is that

¹⁴³ <https://www.autogena.org/work/kuannersuit-kvanefjeld>. Accessed 17 November 2023.

¹⁴⁴ Carpenter, 2016 pp.66-67.

of locality. My point of departure is place-specific, being my home county of Essex in the UK. Carpenter's focus is broad in its scope in terms of geography, moving through various nuclearscapes implicated within the nuclear military industrial complex, its associated infrastructures, and sites. This is not to say that my project does not move through various sites and extend into these global entanglements, but rather the impetus of the initial proposition put forward is contextually specific to Essex, and then by extension Britain and what role the county played in a nuclear state building project whose impact is felt in many ways and in many places. The importance of Carpenter's overall curatorial practice in the field of the nuclear is significant; both in its focus on curatorial work in relation to the nuclear specifically and within curatorial practice generally. Also in terms of the commissioning of long-term projects whose research-led practices in and of themselves contribute to the production of knowledge around the concerns they are invested in. It shows the inherent interdisciplinarity of the curatorial and how it has the capacity to pull together and make connections that might otherwise be overlooked.

This chapter has elucidated the incredibly rich field of nuclear culture and its intersection with contemporary art, both in terms of contemporary artistic practices and the curatorial. I have attempted to provide the reader with an insight into the breadth of work produced by artists engaging with the nuclear military industrial complex. It also lays the groundwork for the forthcoming chapter which begins to situate this project specifically within curatorial discourse broadly speaking, before discussing the particularities of the curatorial practice that make up part of this PhD project. The main contributions of this second chapter have been to highlight and establish the field of nuclear arts and humanities as a backdrop for my work as a curator within this context, and in turn providing a basis for my contribution to curatorial practice, contemporary art and nuclear culture, which is elaborated further in chapter three. This contextual work, I argue, is important curatorial work, and crucial to the understanding of my contribution to this field of study, along with the place-based contextualisation in chapter one and the discussions further developed in chapter three around curatorial practice, which includes my proposition of the insterscalar and the subsequent practice-based elements of the project.

Chapter Three: (Interscalar) Curatorial Practice

After starting to furnish Essex with its nuclear stories and discussing nuclear culture, contemporary art and how this informs the curatorial, I will now consider and situate the project more squarely within broader curatorial discourse. This is in order to develop a discussion around the curatorial within (and beyond) its leaky disciplinary boundaries. Alongside this I introduce the notion of the interscalar and demonstrate how it is a generative way to think about curatorial and artistic practices as well as contexts like global nuclearscapes. What kind of curatorial research project might be able to articulate the complexities and planetary relations of the nuclearscapes of Essex, and by extension, the artworks and public moments that punctuate this project? The project should not attempt to encapsulate, in a totalising and ultimately reductive way, *everything*. Rather, my intention is to propose a way to think about the nuclear holistically, to acknowledge the way the nuclear military-industrial complex is globally entangled. To echo Tsing again, this project is situated somewhere whilst being able to point ‘to the so-much-more out there’.¹⁴⁵ I will introduce my conceptual framework in order to help navigate through the complexities of the contexts in question such as the nuclearscapes of Essex, and the intersection of nuclear culture, contemporary art and the curatorial. This framework intends to also acknowledge the discursive nature of the project’s research outputs, as forms of artistic activity made public and the process of making them as such. Before this I discuss the curatorial in order to situate an interscalar curatorial practice within its field of study. I then bring in the *interscalar* and how and why this concept is a generative way to think about curatorial practice. Finally, I move on to discuss what makes up the practice-based portion of the PhD.

Before proceeding it is important to reiterate the various positions I occupy within the context of this project, particularly in light of the practice-based aspects in the latter part of this chapter. During the commissioning process I was curator of the projects, director of The Old Waterworks, and a PhD researcher affiliated with Goldsmiths, University of London. Occupying these various positions facilitated certain levels of access and opened up certain opportunities along the way due local and organisational connections I had. This did, however, throw up other considerations, such as the necessity to ensure the work commissioned factored into the overall mission, vision and values that TOW upholds. In addition my embeddedness in the local arts and broader communities in the locality also held a tension between familiarity and critical distance. All of this is to say that, due to these multiple positions, the whole process challenged my capacity to negotiate the various stakes I had in the project. It did this in a productive way and provided me with the tools to work through the inevitable complexities I may encounter with place-specific, long-term and process-based projects in the future.

¹⁴⁵ Tsing, Anna L. *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins*, 2015. p.viii.

In this chapter I will argue that the interscalar allows one the capacity to not only cut across and traverse the incommensurate realities contained within nuclearscapes (from the radionuclides undetected by humans to the swathes of land enclosed for nuclear testing) but also, through the making-public of artistic activity. The interscalar is a means to provide members of the public different perspectives and ways of engaging art projects that are rich in research and allude to the varying means one can enter into them. These entry points operate in an interscalar way, applying different approaches that register on different levels, or scales, from the intimate and embodied through to the more abstract or cognitive. With this comes different levels or degrees of the social, from solitary self-reflection and intimate workshops centred around embodied activity to curated discursive discussions that propel the artworks in question out into the realm of other bodies of research. These bodies of work converge and diverge with others' practices, another consideration is the ongoing impact the work has in the world and the reactions it conjures. Examples within this PhD are evidenced in the workshops delivered with artist Gabriella Hirst for *How to Make a Bomb*, which invites participants to propagate and tend to a rare species of rose, whilst reflecting upon the histories the name of the plant—*Rosa floribunda* 'Atom Bomb'—may carry. The rose itself facilitates an interscalar shift within the artwork, from the intimacy of gardening and the implications of gardening something that has such a violent name and which brings to bear such traumatic stories. Interscalar shifts can also occur at the project level too within the different aspects of public programming, such as during *The Rose Garden Conference*, which is also part of *How to Make a Bomb*. The conference brought in other voices, focuses and experiences from a diverse group of artists, scholars and others who have been impacted by or are knowledgeable of British nuclear colonialism, botany and militarism. In addition, artist Nastassja Simensky utilises radio as a means to consider the incommensurabilities of the Blackwater Estuary, how the nuclear industry permeates across every facet of this context and leaks out beyond its boundaries. It is on an interscalar level where artistic and curatorial projects should be operating, finding the conceptual and practical means to traverse different timescales, spaces and finding ways to make this complexity public.

Towards an Interscalar Curatorial Practice

Before adopting an interscalar curatorial approach one also needs to situate the project further within curatorial discourse. Literature in curating or 'the curatorial' has increased considerably, particularly since the early 1990s, as has the university degree courses on the subject, facilitating the aforementioned expansion of the curatorial. Alongside this surge in interest of curating and the curatorial there was also increased attention in the art world on relational, social and participatory art practices.¹⁴⁶ Both were rethinking and reconfiguring the production of art, its dissemination and

¹⁴⁶ See Bishop, Claire. *Artificial Hells: Participatory Art and the Politics of Spectatorship*. London ; New York: Verso Books, 2012; and Bourriaud, Nicolas. *Relational Aesthetics*. Nachdr. Documents Sur l'art. Dijon: Presses du réel, 2002.

what is constituted within the framework of the exhibition format as well as the history of exhibition making and the ongoing development of curatorial practice.

Many projects and writings around curatorial practice over the last 30 years have expanded on what 'the curatorial' encompasses. With this expansion, I argue that curatorial studies and the related discourses can be understood in relation to the interscalar, in the sense that a key aspect of both is to draw relations between disparate things, such as objects, places, contexts or moments in time. In order to place an interscalar curatorial practice within curatorial discourse, broadly speaking, and how this informs my approach, it is necessary to provide context to the field. Maria Lind's *Performing the Curatorial: within and beyond Art* (2012) sees 'the curatorial' as 'a more viral presence consisting of signification processes and relationships between objects, people, places, ideas, and so forth, that strives to create friction and push new ideas—to do something other than 'business as usual' within and beyond contemporary art'.¹⁴⁷ A key characteristic of the interscalar is its capacity to hold together the relationships between disparate objects of study or points of reference, which is also a key factor in Lind's conceptualisation of the curatorial. Lind foregrounds the inter- or cross-disciplinary and social dimensions of curatorial practice. I would also like to consider how curatorial practice might intervene in the 'business as usual' of not only art but also the nuclear. Just as Lind here talks of friction I have written elsewhere with one of my fellow collaborators, artist Nastassja Simensky, 'that the movement through scales that the interscalar may facilitate within artistic, curatorial and scholarly work is not necessarily applicable to the specificities of those that inhabit or are implicated within a particular context. The movement through scales should not be fetishised as a frictionless endeavour'.¹⁴⁸ The interscalar can be mutable and dynamic, but not seamless.

Nicola Triscott's curatorial model of co-inquiry speaks to the dynamic movement across and collaboration between disciplines more explicitly, opening up the possibility for exciting new insights and unexpected outcomes, such a mode that 'seeks to enable long-range transdisciplinary inquiries and interventions into co-production of science, technology, society and culture, as well as experiments with new forms and processes of curatorial and artistic inquiry and presentation'.¹⁴⁹ Triscott also alludes to the way curatorial inquiry can enable long-ranging engagements, which again foregrounds how one may traverse the expanse of metaphorical space that keeps certain areas of study siloed within their disciplinary boundaries. Curatorial work helps break down these boundaries and I argue that an interscalar approach helps move across these perceived gaps by facilitating space where multiple ways of engaging with or knowing a context, place or discipline can coalesce. Triscott and Lind provide one with important approaches that foreground the social

¹⁴⁷ Lind, Maria, ed. *Performing the Curatorial: Within and beyond Art*. Berlin: Sternberg Pr, 2012. p.20.

¹⁴⁸ Harper and Simensky, 'Care and maintenance in perpetuity? The nuclear landscape of the Blackwater Estuary' in Johanna Dale, ed. *St Peter-On-The-Wall Landscape and Heritage on the Essex Coast*. S.I.: UCL PRESS, 2023 p. 362.

¹⁴⁹ Triscott, Nicola. 'Art and Intervention in the Stewardship of the Planetary Commons: Towards a Curatorial Model of Co-Inquiry'. University of Westminster, 2017. p.23.

and interdisciplinary dimensions to curatorial practice. To extend upon Triscott's comment on 'long-range transdisciplinary inquiries' one could also read this in spatio-temporal terms to encompass not only the scope of disciplines entangled within a curatorial project, but also the wide-ranging localities implicated under consideration and embedded in said project and the punctuated moments of making-public, by which I mean public-facing activity. How, then, does one also begin to think of the collapsing of time and space within a curatorial project, or the metaphorical, and literal, movement between disparate scales in order to consider the nuclear holistically, from different positions and places?

In the publication *Locating the Producers: Durational Approaches to Public Art* (2011), edited by Paul O'Neill and Claire Doherty, there is a sense of foregrounding the processual nature of commissioning frameworks and the complexities this may allow for, and the temporalities such commissioning frameworks operate on. Here, Mick Wilson discusses the different temporalities within the three-year curatorial research project and public events programme, *Locating the Producers*. Led by Paul O'Neill the project investigated how public art and its curation has begun to recognise the significance of engaging audiences and encouraging research-based outcomes that are responsive to their specific contexts, audiences and locations over time.¹⁵⁰ This, again, focuses on the social and dialogical, bringing in the various temporalities (albeit anthropocentric) that *Locating the Producers* operated on. The interscalar can extend these temporalities beyond an anthropocentric positioning, such as Hecht's interscalar vehicle, uranium ore, which allows the reader to travel along the human-bound temporal boundaries and also deep into geological strata, back in time to naturally occurring nuclear reactors or to where the uranium fuel that sits in the UK's reactors once came.¹⁵¹ An interscalar curatorial project can be thought of in a similar way, where the projects within its framework take up disparate but interrelated concerns, taking the viewer on a journey through different temporal and spatial registers. It's these kinds of discussions around curatorial practice that are in part the backdrop to my thought processes around the project, finding a way to extend them and push beyond the boundaries they have set up. The expansion of the 'curatorial' has played out in some of the examples above, where the term has many dimensions, negotiating the processes integral to producing an exhibition or other curated encounters such as events, seminars, performance, place-specific work and so on. The curatorial

¹⁵⁰ Wilson says that 'the method of [*Locating the Producers*] must be articulated in terms of its temporalities, its quicknesses and its slownesses, its slow lead-ins and its (occasionally) quick exits. [The project] operated many temporalities: the temporality of repeatedly coming together and departing; of building friendships and of encountering new people for the first time in the context of people who have long been known well; the temporality of several days immersed in dialogue, in intense listening, in speaking across second languages, in eating-and-drinking conversation and in travelling conversation; the temporality of a finite research project with a beginning and an end as it intersects other projects, with other temporalities, with other beginnings and other endings; the temporality of different people's busy-ness and the intense investment in our own work that we never quite leave behind and can never quite return to; and the temporality of travelling to places to attend to the particularities of place while all the while trying to be alert to the potential erasure of place precisely through the rampant, non-place production of contemporary travel and the cultural pilgrimage regime that claims as its own.' See Doherty, Claire, and Paul O'Neill, eds. *Locating the Producers: Durational Approaches to Public Art*. Antennae 4. Amsterdam: Valiz, 2011, p.310.

¹⁵¹ Hecht, 2018.

operates as a means to create space for and open up new contexts, for publics with shared concerns. These discussions laid out are not intended to be an exhaustive and definitive definition of curating or the curatorial, but, rather, they are indicative of how certain ways of thinking and practicing the curatorial/curating are articulated.

Much curatorial work also goes hand in hand with research. In the anthology *Curating Research*, edited by Paul O'Neill and Mick Wilson, the essays explore the alignment between curating and the 'curatorial' with certain understandings of research. O'Neill and Wilson suggest that 'the 'curatorial' is most often expressed with reference to modes of becoming - research-based, dialogical practices in which the processual and serendipitous overlap with speculative actions and open-ended form or production.'¹⁵² My project can be understood at the cross section of the curatorial and research, and perhaps constitutes, as Kate Fowle may frame it, action research,¹⁵³ where the knowledge and understanding of curatorial practice, the theoretical or conceptual frameworks one might think through in relation to this and the context of the project's particular inquiry are produced through theory and practice in tandem. Fowle highlights the ongoing considerations of curators where their work spills over disciplinary boundaries and political realities:

In an art world that is increasingly intertwined with real life politics, to curate *is* to navigate political machinery while revealing it, and the responsibility of the curator is to present work in ways that neither obfuscate nor distort meaning. Rather than just concerning ourselves with the balance between the representation and form of the artwork, we are now also responsible for thinking about the representation of emerging contexts as they continue to diversify.¹⁵⁴

I want to argue the importance of theory and practice working closely together in a way that navigates the curatorial and the contexts in which it operates beyond as well as inside its art world context. Fowle above highlights the broadening of where curatorial work might happen and also foregrounds the importance of making sure the work and the context in which it might sit or respond to are carefully considered. A case in point is the siting of *How to Make a Bomb* at The Old Waterworks nearby Foulness Island. In doing so the proximity of the project to the physical traces and geographic points of interest it refers to grounds the project. The curatorial, then, could be understood as the enactment of the *event of knowledge* where the curatorial is a staging ground in the development of an idea or insight, factoring in the convergence of a multiplicity of knowledges, ways of knowing or disciplines taken up during the process of speculating upon or drawing a new set of relations.¹⁵⁵ Here lies a possible distinction between curating and the curatorial. The former is constitutive, it is the action of compiling, distilling (to a degree) and making public moments of the curatorial. The curatorial differs and is more dynamic in that it is a disruptive

¹⁵² O'Neill, Paul, and Mick Wilson, eds. *Curating Research*. Occasional Table. London : Amsterdam: Open Editions ; de Appel, 2015, p.12.

¹⁵³ Ibid. pp.153-172.

¹⁵⁴ Ibid. p.172.

¹⁵⁵ See Rogoff in Martinon, Jean-Paul. *The Curatorial: A Philosophy of Curating*. London: Bloomsbury, 2013, pp.45-46.

activity, disrupting received knowledge and that which constitutes us (our understanding of art, philosophy, knowledge, culture heritage, art history and so on).¹⁵⁶ So although curating and the curatorial relate to and touch one another they are somewhat distinct.

Curating could be understood as the act of making public moments of the field in which the curatorial is constituted. Like punctuation marks, curating gives a moment's pause or a shift in cadence, consolidating and distilling a moment of the curatorial's inquiry. Curating, however, is preoccupied with the pragmatics of making-public.¹⁵⁷ If one were to somewhat simplify the distinction between the two, the curatorial could be the theoretical framework, field of study and diverse range of relations evoked, what one might call a 'fabric of interrelations',¹⁵⁸ whilst curating is the practical doing, the activity of making-public; simply put 'curating is a constellational activity [...] By comparison, the curatorial is the dynamic field where the constellational condition comes into being.'¹⁵⁹ Rather than siloing curating and the curatorial one could argue it is best to think about them in tandem, or two sides of the same coin. Curator and researcher Wiebke Gronemeyer argues how 'curating can be a production of practice for a reflection on theory as much as it can result in a production of theory for a reflection on practice'.¹⁶⁰ A relationship like this emphasises the processual, dialogic and collaborative qualities of the research and hence how commissioned work enters into the world. Overall, an interscalar curatorial research project intends to consider and employ theory and practice together; allowing for a more reflexive and dynamic relationship between them, akin to Gronemeyer's proposition of moving beyond their distinctions of theory and practice, how one can lead the other and vice versa. My project seeks to foreground the importance of theory and practice operating together whilst still acknowledging the importance of how they stand independently. This written thesis and the public programming the practice dossier speaks to can be encountered separately from one another, and although they may have the capacity to stand alone, it is more generative to consider them together.

Interscalar as Concept and Practice

Thinking- and making-with others is a necessity to any art project. 'Nothing makes itself',¹⁶¹

¹⁵⁶ Martinon, 2013, p.6.

¹⁵⁷ Here I am referring to curating in the context of exhibition-making and other forms of presenting art to the public. I do however acknowledge that curators also take care of collections along with the preservation and conservation methods this entails.

¹⁵⁸ Bismarck, Beatrice von. *The Curatorial Condition*. London: Sternberg Press, 2022. p.9.

¹⁵⁹ 'Curating/Curatorial: A conversation between Irit Rogoff and Beatrice von Bismarck' in Bismarck, Beatrice von, Jörn Schaff, and Thomas Weski, eds. *Cultures of the Curatorial*. Berlin: Sternberg Press, 2012. p.24.

¹⁶⁰ Gronemeyer, 2018, p.17.

¹⁶¹ Sympoiesis, or making-with, according to Donna Haraway is 'a simple word; it means 'making-with'. Nothing makes itself; nothing is really autopoietic or self organising . . . *sympoiesis* is a word to complex, dynamic, responsive, situated, historical systems. It is a word for working-with, in company. Sympoiesis enfold autopiesis and generatively unfurls and extends it' For Haraway the word and concept of sympoiesis arose from a Canadian environmental studies student in 1998, Beth Dempster, suggesting the term as being for spatial or temporal boundaries, stating sympoiesis as 'collectively-producing systems that do not have self-defined spatial or temporal boundaries. Information and control are distributed among components. The systems are evolutionary and have the potential for surprising change.' Dempster

whether this is the nucleascapes of Essex or a curatorial project working with artists and others to make art public in various ways. I argue that thinking- and making-with others facilitates an oscillation between designation and process, or from theory and practice; by this I mean moving from pointing to something—be that a place, an event, an object, a concept, and so on—towards a more active, embodied, social or public engagement through practice. A concept relative to nuclear studies and nuclear humanities that is a way to facilitate these shifts—which has also been taken up within an art context and what I have been alluding to throughout this thesis—is the *interscalar*. I argue that it has the capacity to move across various contexts from nucleascapes through nuclear culture and contemporary art and into the curatorial. Thinking- and making-with others demands such a dynamic approach. The interscalar is a generative conceptual and curatorial tool that can help make sense of the various contexts this project sits within, whilst acknowledging their complexities and incommensurabilities. An interscalar curatorial framework is a means to hold complex and at times incommensurate realities within the same conceptual frame. The interscalar operates at different levels, through devices the artist employs within the artwork, the ways the work is made public and disseminated and the capacity this has to move between contexts and histories. Given the breadth of literature on curating and the curatorial one could argue that a curatorial practice that is interscalar operates within an expanded field, where thinking- and making-with are integral. This inherent collaborative dimension to curating and the curatorial brings together individuals with particular disciplinary expertise, technical abilities, specific knowledge or positionalities. This could be the installation technicians who help realise the works' public display; speakers who are invited to participate in discursive programme activity; arts professionals with knowledge in fundraising or marketing; or community members who hold significant insight into the concerns the project seeks to explore. It is important that all of these factors and more are considered within curatorial work.

The interscalar can highlight and carry the richness, dynamism and complexity of the contexts and nuclear stories explored within this project. Gabrielle Hecht proposed the notion of the interscalar within her concept of 'interscalar vehicles', which she defines as:

objects and modes of analysis that permit scholars and their subjects to move simultaneously through deep time and human time, through geological space and political space.¹⁶²

Hecht's adoption of uranium ore as an interscalar vehicle is a prime example of how the interscalar's uptake can be incredibly useful in allowing a body of research to occupy multiple

understood cultural and ecological systems as sympoietic and Haraway extends this thinking to the conceptualisation of biological organisms, moving beyond a framework of thinking our world in defined units and towards dynamic, shifting interrelations. See *Staying with the Trouble: Making Kin in the Chthulucene*. Experimental Futures: Technological Lives, Scientific Arts, Anthropological Voices. Durham: Duke University Press, 2016. pp.58-61 and Dempster, M Beth L. 'A Self-Organizing Systems Perspective on Planning for Sustainability'. Masters, University of Waterloo, 1998. p.v.

¹⁶² Hecht, 2018 p.135.

scales, spaces and temporalities. With uranium Hecht is able to connect stories and scales usually kept apart, such as the disappearing of imperial scales into national scales when Gabon gained independence from France in 1957, and how this informed the prospecting for uranium in Africa in the mid-twentieth century. Hecht also goes back in deep time to the naturally occurring nuclear reactors in Oklo, Gabon that caused uranium ore to undergo chain reactions naturally in the earth's strata 2 billion or so years ago,¹⁶³ causing subsequent excitement in the scientific community when they discovered it in the 1970s. All while travelling on her interscalar vehicle, uranium ore.¹⁶⁴ Presented here are anthropocenic forces and localised events simultaneously, how they interrelate and how one is significant to the other. It is on this interscalar level that curatorial projects should be operating on—and arguably in some cases do—finding the conceptual and practical means to traverse different timescales and spaces and finding ways to make this complexity public.

If one extends this to artists and curators, some make work (public) that could be understood to engage super-complex systems, producing and deploying interscalar vehicles or devices along the way. These interscalar sensibilities can operate both within the artwork, in the forms the project takes in terms of its interactions with its public and within the curatorial, becoming operative in facilitating the movement between incommensurabilities. I argue, therefore, that art could be considered interscalar. The interscalar enables one's analysis to be located somewhere while pointing to or simultaneously being somewhere else. It can help one move through time and down through geological strata, or across disciplinary boundaries, whilst maintaining a critical and situated inquiry. What the interscalar does when mobilised is allow for incommensurate realities or spaces to sit together within the same conceptual frame. To be incommensurate is to have no common measure, but to be incommensurable does not mean these disparate realities, spaces, and times should be siloed. The ways artists collaborate with practitioners, move across disciplinary boundaries and consider human and non-human agencies can open up exciting ways in which to engage with and move through multiple scales whilst keeping these scales in the same analytical frame. The mechanisms of curating, the curatorial and associated practices have the capacity to make this public to multiple audiences.

Artist and scholar Susan Schuppli discusses the notion of the interscalar, as a device rather than a vehicle, in her book *Material Witness: Media, Forensics, Evidence* (2020) where she writes about artist Harun Farocki's video work *Inextinguishable Fire* (1969). Schuppli picks out a particular scene where Farocki reads testimonies from the Russell Tribunal in relation to military violence and chemical warfare in Vietnam and the use of napalm. What Farocki attempts is to present an image to the viewer that can testify to the extreme heat of a napalm attack but in such a way that the viewer does not turn away or shield their eyes to avoid looking. In order for the viewer to ascertain

¹⁶³ This is also the focus of one of Susan Schuppli's episodes in *Trace Evidence* (2016). See <https://susanschuppli.com/TRACE-EVIDENCE> Accessed 17 November 2023.

¹⁶⁴ Hecht, 2018 pp.115-122.

in some way the intensity of the searing heat of napalm Farocki, Schuppli argues, employs an interscalar device, in the form of the artist stubbing out a lit cigarette on his own forearm. Schuppli writes that Farocki does this 'to produce a visceral sensate experience that might momentarily capture the comparative intensity of napalm scorching human flesh.'¹⁶⁵ Schuppli continues:

the cigarette burn is an interscalar wound that allows Farocki to narrate the larger story of chemical warfare and imperial aggression . . . Rather than moving along a sliding scale from the particular to the planetary—zooming in and out—the interscalar manages the incommensurate realities through the deployment of a kind of material proxy.¹⁶⁶

An interscalar device holds two or more wildly different realities within the same conceptual frame, bridging the gap between that which is incomprehensible or incommensurate. In this instance it is achieved by confronting the viewer with the artist burning his forearm with 'a kind of material proxy', in this instance, a cigarette, providing only a hint of the ordeal of being burnt by napalm: the cigarette burns at 400°C whilst napalm burns at 3000°C. Farocki's cigarette burn pushes the viewer to consider the pain and heat exuding from the red embers of the tobacco, and urges them to multiply the imagined pain and heat of this by approximately eightfold. At that moment the associated stories of 'chemical warfare and imperial aggression' tied up in the production and use of dangerous substances as weapons becomes entangled within and communicated through the act of Farocki burning himself with a cigarette, which facilitates this interscalar shift.

The interscalar vehicle is also drawn out as a mobilising force for writer and theorist Kodwo Eshun when discussing Cape Town based Chimurenga.¹⁶⁷ This time the interscalar is applied not as a mechanism within an artwork but as a means to describe the qualities of Chimurenga as a project and how it operates. Eshun describes them as 'a project-based mutable object: a print magazine, a publisher, a broadcaster, a workspace, a platform for editorial and curatorial activities and an online resource.'¹⁶⁸ Eshun goes on to talk about Chimurenga and their similarities to the Otolith Group, of which Eshun is a part:

Chimurenga's preoccupations resonate with Otolith's ongoing concerns with mutation and alienation. Both of us are drawn, asymptotically speaking, towards the syncretic synthesis of futures old and new. We operate between creation, criticism and curation. We are preoccupied by the will to complicate. We are interscalar vehicles that mobilise knowledges outside of the academy along vectors unbound by disciplinary protocols. We are informal socialities of study operating in the key of musics and the light of screen.¹⁶⁹

Art projects articulated as interscalar vehicles is a way to demonstrate how they engage and

¹⁶⁵ Schuppli, Susan. *Material Witness: Media, Forensics, Evidence*. Leonardo. Cambridge, MA: The MIT Press, 2020, p.165.

¹⁶⁶ Ibid.

¹⁶⁷ <https://chimurengachronic.co.za/about> Accessed 4 November 2023.

¹⁶⁸ Eshun, Kodwo, Avery F. Gordon, and Emily Pethick. 'Navigating Pan-Africanisms: On the Chimurenga Library'. *Afterall: A Journal of Art, Context and Enquiry* 43 (March 2017): 80–87. <https://doi.org/10.1086/692557>. p.80.

¹⁶⁹ Ibid. p.83

think-with multiple knowledge systems that traverse disciplinary boundaries, communities and employ wide ranging artistic and curatorial approaches and media; the mobilising quality of the interscalar is its mutability, flexibility and ability to hold incommensurate realities and temporalities, perceived or otherwise, within the same conceptual frame. Objects that are employed as interscalar devices (or vehicles, or perhaps possess an interscalar quality) bring that which may be outside of human comprehension or perception within reach. The interscalar pushes one to think-with others, be this the intense heat of napalm or the imperial aggression of chemical warfare this stands in for.

The notion of the interscalar appears in Hecht's work around the nuclear via interscalar vehicles; it is also implicated in art and curatorial practice through Schuppli and Eshun. Firstly, the interscalar situates my curatorial project within a particular discourse around the nuclear with Hecht, while Schuppli and Eshun's articulation of the interscalar in relation to artistic practices situates my project back within an art context. The interscalar at once situates my project in the disciplinary boundaries in which I am operating whilst pushing beyond these to form interdisciplinary connections and relations. Hecht's research has articulated a critical framework for analysing nuclear (de)colonisation, and looking into areas such as nuclearity and the anthropocene while Schuppli and Eshun demonstrate the potentiality of the interscalar's application within artistic and curatorial practices. This is where the dynamism of an interscalar approach lies, it can be utilised both within an artwork as a means of bridging incommensurate gaps, be they temporal or spatial, but also within an art project's broader approach within the realm of the curatorial as a way to move across and employ different means of making a project public. An interscalar project is a mutable project that utilises diverse approaches to knowledge production which demands equally diverse methods of dissemination, from publications, exhibitions, symposia, workshops, lectures and so on, whichever approach best articulates the areas of research within a project one wants to foreground. The work that some artists and curators undertake may have the capacity to inquire into apparently disparate information and different ways of knowing that produce outcomes that do the work of the interscalar. The ways artists collaborate with practitioners, move across disciplinary boundaries and consider human and non-human agencies can open up exciting ways in which to engage with and move through multiple scales whilst keeping these scales in the same analytical frame. The mechanisms of curating, the curatorial and the associated practices have the capacity to make this public to multiple audiences.

The interscalar is a necessary and complimentary curatorial framework to the nuclearscape, due to their commonalities of complexity, dynamism and mutability. My project brings the point of departure back to Essex, but it intends to do so in a way that is mindful of both the situated context of the county as well as how it is implicated in the global nuclear military-industrial complex. Lines of enquiry are inevitably and invariably extractive, since the nuclear industries are predicated on the

extraction of resources and the challenges of waste storage keeps deep geological disposal options on the agenda. Bradwell's interim storage factors into this issue, where it waits above ground until a final storage location is determined. The investigative works for the new nuclear power station of Bradwell B have drilled boreholes deep underground to help establish geologic suitability for a new power station's foundations. During the 1980s there were protests that prevented proposals for nuclear waste to be stored on-site just below ground-level. Not only is the Blackwater Estuary an actual repository for nuclear waste it is also implicated within the extraction of matter from elsewhere. The aforementioned proposals for waste storage from the 1980s makes this plain as does the nuclear cycle and the extraction of uranium ore from mines in Australia, Canada, Democratic Republic of the Congo and Namibia,¹⁷⁰ which supplied fuel to UK power stations, including Bradwell. This would have created massive changes to other places, considerable waste in the form of mine tailings and other byproducts, as well as impacting communities.

Essex and its role in the UK's nuclear story is ultimately related to and involved in, by association, the forms of violence Hecht discusses with her case study of Gabon (of course this involvement by association can be said about all capitalist extractive processes). It is plausible that the ore from the mines in Australia, Canada, Democratic Republic of the Congo and Namibia ended up within Bradwell's now decommissioned reactors and the weaponry tested by Britain; in the spent fuel and other nuclear waste that travelled to Sellafield; the Fuel Element Debris (FED) effluent that has been deposited into the Blackwater Estuary's waters; and in the other waste that sits in the intermediate level waste (ILW) storage facility at Bradwell until the UK decides upon a location and builds a Geologic Disposal Facility (GDF). The task of the latter is to allocate a community, seek permission from them and dig deep underground to store nuclear waste for thousands of years. It is the UK's largest ever environmental protection project.¹⁷¹ After considering the above and thinking-with Hecht, how does or how can waste and its management (or other byproducts/impacts of the nuclear complex) produce new social relations, cultural forms and political demands?¹⁷² How might artists respond to this? And how can a curatorial project and the programme it commissions contribute to the production of new social relations and cultural forms? I propose that a practice-based approach in doing this must be interscalar.

Hecht, Schuppli and Eshun's articulations of the interscalar highlight its potential in scholarly, artistic and curatorial work. As a vehicle it can propel thinking in scholarly writing, like Hecht's uranium, or as a means to understand the dynamism of a certain project or curatorial framework and the complexities therein, both in terms of content and form, such as Eshun's description of the

¹⁷⁰ Butler and Bud, 2017.

¹⁷¹ <https://www.gov.uk/government/publications/the-siting-process-for-a-geological-disposal-facility-gdf>. Access 8 November 2023.

¹⁷² Hecht, 2018, p.111-112.

Otolith Group and Chimurenga. As a device it can operate within the parameters of an artwork, such as the cigarette burning human flesh in Farocki's *Inextinguishable Fire*, as described by Schuppli. The interscalar may therefore operate at the level of or within an artwork or in broader terms as a project, where different approaches of dissemination and making public shift to consider the content and research of the project and how this is conveyed. In practice, the interscalar employs different media or approaches within art making, from filming the act of one burning one's own flesh with accompanying voiceover. It could also be understood on the level of the curatorial through methods of dissemination or ways of making public which are determined by the complex research, the means of articulating this complexity and the social forms produced through the public moments proposed. Through theory and practice the interscalar becomes a generous framework for one's reader, viewer or participant to engage with one's subject.

For example, one of the main aspects of *How to Make a Bomb* by artist Gabriella Hirst—one of the projects I discuss below—is the propagation of 'Atom Bomb' roses, which are done alongside members of the public during workshops as well as in The Old Waterworks' garden at optimal times to take advantage of the increased possibilities of creating new plants. In its public form via workshop the process is carried out prior to a performative lecture by Hirst, which details the lines of enquiry the project follows, through botany, militarism, the nuclear and their colonial links, their convergences and divergences and how they pertain to Britain as well as Essex's role in Britain's nuclear project. Through the attentive and somewhat fiddly process of grafting a new rose and the ongoing care needed to give the plant its best chance of survival one's attention shifts from the material experience of grafting to the implications of tending to something with such a violent name, the histories it holds within the context one is situated and the global networks it is entangled within. Through the act of propagation and ongoing care one traverses multiple times and spaces, figuratively speaking, such as attuning to the different notions of time that gardening and the nuclear evoke. Engaging in this process one undergoes slow interscalar shifts, shifts that are not as abrupt as Farocki's burning cigarette, but are nevertheless interscalar.

An example of another project arguably doing this sort of work within a gallery exhibition context is *Daughters of Uranium* by artist Mary Kavanagh with co-curators Christina Cuthbertson and Lindsey Sharman. Shown at the Southern Alberta Art Gallery; Founders' Gallery at the University of Calgary; and the Kitchener-Waterloo Art Gallery, *Daughters of Uranium* consisted of sixteen distinct works, or bodies of work, that explore Kavanagh's research into the Trinity Atomic Test Site in New Mexico, United States. My observations here are based on secondary materials, which does arguably limit one's analysis and the interpretations reached. However, one can determine within this context the range of approaches employed in order to bring out the different qualities and avenues of research the project presents. Kavanagh is utilising different methods of art-making—photography, moving image, the archive, sculpture, found objects—to consider the

breadth of research and art's capacity to create links, relationships and various methods to consider this site, in what I would argue have interscalar sensibilities. Utilising the exhibition format in order to consider the Trinity Atomic Test Site in all its complexity, the interior architecture of the gallery and the pages of the accompanying *Daughters of Uranium* publication attempt to hold the complexities, incommensurabilities and incomprehensibilities of the nuclear within the same conceptual (and physical) frame. An attempt to think about the nuclear holistically via contemporary art practice, beginning with place and the body.¹⁷³

An interscalar curatorial practice connects various contexts and histories, in doing so it moves across incommensurate realities. By this I mean the curatorial has the capacity to operate via the interscalar. It achieves this through the curatorial research undertaken, the artists one works with, other collaborators and the ways in which the projects are made public. Here, the interscalar is twofold: it operates within the artists' work and how they incorporate aspects that act as interscalar devices or vehicles, like Hirst's 'Atom Bomb' rose mentioned above; and on the level of the curatorial and how the various public moments tune in to and foreground varying aspects of research and practice, but also how these moments offer interscalar slippages where one is moving between incommensurate concerns that are situated within wildly different boundaries. These could be the expanded notion of the curatorial, the role of embedded place-specific projects and their generative capacity, or the specific context of Britain's nuclear bombs and their direction of travel by barge from one island in Essex via Kent, UK, to another island on the Northwest of Australia in the early 1950s. To summarise, the interscalar operates at the level of and within the artwork—like a rose or a cigarette burn—as well as the mechanisms through which art is made public, juxtaposed with and introduced into dialogue with other bodies of research, practitioners and lines of enquiry. Such a diverse range of trajectories traverse different scales, temporalities and spaces, and thinking through the interscalar allows for all of this to occupy the same analytical frame or for one to hold these incommensurate realities together, if only briefly.

The public outcomes of an interscalar curatorial practice are never predetermined, each moment of the project that is shared with the public reflects the research but does so through trying to find the most appropriate outcomes where aesthetic motivations and the research it is embodying or interacting with align or cause friction. Curatorially this can be achieved partly through providing the space and critical support for artist's to develop their work whilst working with them to determine the best avenues for its public appearance. This is in order to acknowledge the diverse avenues of research the overall project may embody and what is foregrounded in relation to the various public iterations the artworks take and the contexts entered into during this process. An interscalar curatorial practice is responsive and always seeks to find the best way to work with artists and show their work within interesting and engaging contexts, whilst always considering the

¹⁷³ See Kavanagh, Mary. *Mary Kavanagh: Daughters of Uranium*. Lethbridge, AB: Southern Alberta Art Gallery, 2020.

dichotomies of resources versus ambition. An interscalar curatorial practice, therefore, must work with artists whose practices have interscalar sensibilities which once they enter into a contextually specific curatorial project open up further; where dialogue with and movement between concerns inherent within the project occur whilst also opening up to shifts due to the work's interaction with its publics, the potential for new social forms and the connections this may generate.

The fact that the public outcomes are not predetermined offers exciting possibilities for the artist to develop and respond to a given context in a processual way. These challenges really came to the fore as part of *How to Make a Bomb* with Hirst when we showed *An English Garden*, discussed below. Although a productive and exciting opportunity arose to show parts of the project's research in a careful and considerate way, it also had adverse reactions from a select number of Conservative councillors in Southend-on-Sea's Council. A perceived limitation or consideration to bear in mind for future projects that take on an interscalar logic would be to try and preempt such reactions, even if one believes them to be disproportionate, or even absurd. Along with the process-based approach in deciding forms of making public, one should also scrutinise the very implications of making art public, to the extent that one must interrogate the perceived extremities of possible reactions. One must therefore plan for forms of response to counteract difficult situations escalating or the artist's work being compromised.

Overall my project aims to contain—in a somewhat indeterminate, leaky and open-ended way¹⁷⁴—many apparently disparate elements, temporalities or spaces within the same conceptual frame (utilising the notion of the interscalar, and the constellation of relations it evokes). This could be the mining of uranium ore in Australia and its use in civil nuclear reactors or nuclear weapons assembled in Essex or the local opposition to Bradwell B, a proposed new nuclear power station on the Blackwater Estuary, and other opposing positions by those in the Northern Territory in Australia against prospective new uranium mines. It is from these mines where, if Bradwell B goes ahead, uranium could well be extracted to serve. One could also draw relationships between the civil and military nuclear programmes or consider the release and slow violence of radionuclides that such processes may cause and the unknown impacts of these. In addition, there are the conversations, correspondences and crossovers with other projects, with artists, historians, archaeologists and activists that the project inevitably encounters. This written thesis and the practice-based elements work together to attempt to communicate the nuclear holistically through the nuclear culture projects discussed herein, the curatorial and artistic approaches deployed, and the particular sites, localities and contexts which through curatorial work begin to coalesce. This project is an attempt to think about these together as a web of relations necessarily traversed

¹⁷⁴ This leakiness reminds me of Peter C. Van Wyck's comments when he talks about nuclear materials and how they 'stand in relation to their containment only very imperfectly— there is always leakage.' See: Van Wyck, Peter C. *Signs of Danger: Waste, Trauma, and Nuclear Threat*. Theory out of Bounds, v. 26. Minneapolis: University of Minnesota Press, 2005.

through the lens of the interscalar.

Folding into all of this are entangled geographies, contested histories and uncertain futures alongside rich artistic practices with their own focusses and trajectories. An Interscalar curatorial practice attempts to make all of this stuff present within the same stories, helping one to tie stories together from multiple temporalities and geographies, whilst acknowledging the abundant divergences and mobilising different knowledges. To really think about curatorial practice through the interscalar is to accentuate the transdisciplinary and collaborative nature of curatorial practice. Not only this it also acknowledges, expands upon and encompasses the various temporal registers as well as the numerous localities that are implicated within the project as a whole and each commission therein. An interscalar approach is a way to mobilise or foreground what Beatrice von Bismarck calls 'curatoriality',¹⁷⁵ which encompasses curating and the curatorial.

Taking up an interscalar curatorial practice invites and encourages many ways to think about the nuclearscapes of Essex. With stories that encompass varying categories, temporalities, and localities and their interrelationships. The attempt here is to articulate the project via these varying registers in order to retain and embrace the complexities of Essex's nuclear stories and subsequently attempting to avoid reduction, whilst at the same time acknowledging its inevitability. It is further enriching and generative to be working with artists who are themselves developing their own practices that are interdisciplinary, expansive, and which arguably utilise 'devices' or 'vehicles' that 'move[s] simultaneously through deep time and human time, through geological space and political space' to engage with entangled, interrelated, complex, leaky and unruly concerns.

Building upon this within my curatorial research project will bring into focus the interrelationships of the practice-based aspects alongside the critical reflection and contextualisation of the written dissertation. The curatorial project itself operates through different temporalities, both quick and slow, and the context reflects this from the deep-time of geology, slow decay of nuclear waste and the haste of building a nation's nuclear infrastructure. The interscalar helps to think about the nuclear holistically through its capacity to (briefly) hold incommensurabilities. Curator Ele Carpenter has discussed artists working on place-specific nuclear related art projects and how:

the curatorial work around these artists' practices and journeys can now start to map global relations between atomic test sites, weapons production, nuclear power and nuclear archives, through curatorial knowledge of the artwork. This process of curatorial research, into connections between artworks and sites, is significant because the sciences and even the social sciences and humanities have a tendency to compartmentalise their nuclear study, focusing on one aspect of nuclear production such as nuclear energy, or weapons, or

¹⁷⁵ Beatrice von Bismarck provides an insightful expansion on the curatorial situation in her recent book *The Curatorial Condition*. See Bismarck, Beatrice von. *The Curatorial Condition*. London: Sternberg Press, 2022. p.9. I also quote this below on p.94 of this thesis.

waste, or mining.¹⁷⁶

What is important to highlight here is how Carpenter foregrounds the capacity in and potential of curatorial practice to draw links between places and the artworks produced in relation to them, which in turn provides a richer context—and nuanced forms of engaging with said context—having the capacity to further develop meaning and produce new knowledge. Working with artists who work in or respond to place-specific contexts has allowed for a way for me to develop a project that ‘maps global relations’ of parts of Britain’s nuclear colonial project. I argue that a curatorial practice that is interscalar facilitates this process.

Before moving on to the aspects of practice based activity that forms part of this project, it is worthwhile to reflect upon the implications the adoption of an interscalar approach to curatorial practice might garner. Much of an interscalar approach is thinking through the research, the practices of the artists and the projects they are developing to identify, alongside the artists, how this is materialised and made public in different ways. Given the context of the project, which came to the fore through my curatorial propositions as well as through the strong and engaging practices of the artists involved, a few reflections are warranted. Practice-based work is a messy, undulating and at times contingent process, not least because of varying outside factors beyond my or the artist’s control. One somewhat obvious factor, which affected the trajectory of this PhD project considerably, was COVID. COVID compelled me to reconsider the timelines of my projects, the planned commissioned activity, and also forced the cancellation of some of my original plans, such as a workshop with artist Nastassja Simensky and academic Colin Sterling, which was indefinitely cancelled due to its funding dissolving.¹⁷⁷ The generative and limiting implications of an interscalar process are two sides of the same coin. Its process oriented character and lack of prescription allows for an exciting level of openness and possibility, but the inversion of this is that the process can throw up unexpected challenges or problems. Therefore, the discussions around the practice-based aspects of the project which follow are a product of this. Although the ongoing conversations, developments and collaborative working with the artists developed over a similar timeframe, the volume of ‘publicness’ of each project differs. This is not to say the ongoing and unseen work of research, conversations, relationship building and research differed in any considerable way, but rather that the appropriate public moments did not necessarily present themselves evenly. Equal or comparable efforts may be exerted in varying directions, but what is made public out of this can vary. This is not negative nor positive but merely different, and demonstrates how each project presents its own complex contextual situations and interrelationships.

It is also important to note the implications of making art public and who engages with the work

¹⁷⁶ Carpenter, 2022.

¹⁷⁷ See appendix four of this thesis for the summary of this workshop. p.150

presented. Making something public from the perspective of the research produced is one thing, but trying to determine or ascertain who that public is as well as their motivations and reasons to engage, is very much something else. Given the limited capacity of myself, The Old Waterworks and the scope of this project, it proved difficult to develop an extensive evaluative framework to determine this. It is this deeper evaluative work that needs developing in my research and curatorial work moving forward. In order to achieve this, more considerate preparation needs to be established alongside appropriate resources to ensure meaningful evaluation. Throughout this chapter, and when possible, I will provide information on the quantitative and qualitative data gathered and how this might provide insights.



Figure 7: The Old Waterwork library. Photograph courtesy Anna Lukala.

The Old Waterworks and the Focus on Artists' Research and Development

The focus on two localities in Essex pertinent to Britain's nuclear story as a point of departure has generated collaborations with two artists, Gabriella Hirst and Nastassja Simensky, that have taken different directions and are at different stages of their trajectory. This has in turn involved various other collaborators from graphic designers, garden designers, arts organisations, photographers, gardeners, volunteers, academics, artists, curators, plants. The curatorial and commissioning framework of both projects has developed alongside my time as a PhD student at Goldsmiths,

University of London, as well as during my role as director of The Old Waterworks (TOW). The interplay of these two positions has allowed for new social forms to emerge during the process of making public artistic activities, as well as a way to reflect upon and articulate the aspects of the curatorial that this project touches upon in theory and practice. I started my post at TOW at the same time as this PhD, without a sense as to how they might cross over. It has become clear that TOW became integral to the practice-based dimension of my PhD project. The curatorial framework that I was fostering at TOW provided an ideal context for the projects being developed as a part of this PhD, a container for the project's incubation outside of a university context but somewhere relevant to its concerns and embedded within the locality's arts community.

The logic of my first commission at TOW was to orientate the organisation's focus towards research, practice development for artists and commissions that critically respond to Southend-on-Sea (where in Essex TOW is based), the surrounding area, and Essex more broadly. This first commission was with two local networks and creative organisations, Grrrl Zine Fair and the Agency of Visible Women. The former is a project founded by Southend-based artist Lu Williams with a focus on zine culture and self-publishing, foregrounding feminist, queer and working class perspectives; the latter is a Southend-based intersectional feminist network of artists predominantly in and around Southend and founded by artist Ruth Jones. In partnership with these two groups I wanted to build a library at TOW along with the resources needed to self-publish affordably. The goal was to provide a space for artists to gather, research and have access to materials otherwise unavailable or inaccessible in Southend. This commission was central, along with the artist community that the studios in situ laid the groundwork for, to developing a culture of practice development and the associated research practices that inform this. It is in this library space where a number of the workshops were delivered that inform my research within the framework of this PhD. This first commission at TOW made possible a generative space for research, development and discussions around various projects. This also included discursive approaches to practice and broader discussions around art in the context of Southend, Essex and further afield.

Alongside the specific research and works that encompass this PhD project and the library commission above, I had been developing TOW as an artist-centred charity, ensuring the structure of the organisation focused on artists' development and the aforementioned focusses of locality and community. This in turn embedded the work the organisation does within the city of Southend-on-Sea specifically, as well as Essex, and how the county feeds into local or global geopolitical concerns. This was borne in mind in terms of the specificity of the projects TOW commissioned, the artistic community fostered and the publics the organisation engaged with. It is important to highlight these motivations due to the key importance of their role within the curatorial situations herein. By this I mean how integral TOW's ethos was and the importance of ensuring the

works produced aligned with the mission, vision and values I developed for TOW. An important factor for TOW as an organisation was its capacity to celebrate and focus on artists, developing and providing resources—in terms of time, space and money—to focus on projects that are long-term, processual and where fixed or prescriptive outcomes were not expected. This allowed for projects that take on varying forms at different scales, as a means to encompass each project's multiple points of entry in a way that speaks to different avenues of research, which may embody numerous aesthetic registers. A case in point in developing these was the first commission of a library I instigated for TOW mentioned above, providing a space for artists and others to develop their work with resources otherwise unavailable locally.

This PhD project converges with and contributes to recent conversations around collaborative research between the culture and Higher Education (HE) sectors and the importance of furthering the contributions of knowledge production from curatorial and artistic practices beyond the HE context. I am researching and writing within the framework of HE, however much of the project's practice-based elements and their 'making-public' happened across and within the framework of small arts organisations predominantly in South Essex, namely two Arts Council England National Portfolio Organisations, Metal Culture and Focal Point Gallery, and The Old Waterworks during my directorship. The collaborative partnerships of these organisations facilitated the discursive formats required. This allowed for the multiple facets of the project, the various forms of reception and the development of forms of sociality across spaces and localities (both digital and physical) as well as varying levels of engagement from publics, from the general public to specialists in the nuclear and artistic fields. These organisations were the site of research and dissemination, through the practice of making-public. They were where audiences encountered the work's diverse forms and as such engaged in a variety of ways, allowing for multiple points of entry and an openness to possibility.

Curator Carolina Rito was Head of Public Programmes and Research at Nottingham Contemporary until November 2019 when she joined Coventry University as Professor of Creative Practice Research. Around the time of this crossover from culture to HE sectors Rito argued for the importance of different sites of knowledge production, in particular research-led programming in non-collecting arts organisations (and I would also suggest other galleries and art centres outside of a university context). Here there is a strong and worthwhile case to be made since other forms of knowledge production are privileged, such as working with collections:

Collection-related research is widely recognised, fundamentally due to its epistemic similarities with traditional academic research. The privileging of such an insufficient paradigm—which refuses to acknowledge new modalities of knowledge production in arts institutions—limits the potentials of research within, beyond, and at the intersection of the

academia and the cultural sector.¹⁷⁸

Rito goes on to explain how some contemporary art institutions have ‘demonstrated an increasing interest in research-led programming, promoting longitudinal lines of enquiry’. Rather than programming for a prescribed audience, Rito explains that these institutions set up questions that ‘generate an audience-in-the-making’.¹⁷⁹ I strongly believe that the support of research-led programming activities is imperative with regard to the advocacy needed for curatorial practice and the legitimacy of every facet of its make-up. Not only should the study of and research into curatorial practice be of value within the context of the university but practice- and research-led programming within public arts organisations should also be foregrounded as a site of research and development for the curatorial. Non-collecting arts organisations and the extended programmes they deliver should be considered legitimate sites of knowledge production. As a way to articulate the dynamism of the curatorial and its capacity of bringing together (be that disciplines, artists, places) and making public, Rito describes the curatorial through ‘surface’.¹⁸⁰ In many ways this is not dissimilar to curatorial practice through an interscalar lens, which is mutable, interdisciplinary and open to unexpected moments of change. An interscalar curatorial approach facilitates and prescribes to the form of the curatorial that explores ‘research questions through discursive and exhibitionary practices and through longitudinal and interdisciplinary projects. It is the practice of programming itself that research is conducted and advanced.’¹⁸¹ Rito argues that ‘if exhibition stands for a display of objects, the exhibitionary is the network of ongoing exposures—material and immaterial, of physical things and abstract ideas—where exhibitions take place’.¹⁸² Understood in this way the exhibitionary encompasses the discursive forms that manifests through art-making and curating (exhibitions, events, publishing, workshops, talks, and so on). It is the institutional frameworks that facilitate the making of art and its capacity to make public the outcomes of cultural production. It is also the ongoing reception of and responses to the curatorial activities encompassed within the exhibitionary. I argue that what Rito is considering is how the exhibitionary operates and extends beyond the discrete objects together in an exhibition, or a moment in time where artwork, artist, audience etc. come together, but within the infrastructures before and after as well as the subsequent discourses as a result.

I will now begin to turn to the activities delivered and artists collaborated with during the period of this PhD project. Alongside my textual recounting of the last several years of research (both ‘desk

¹⁷⁸ Rito, Carolina, and Bill Balaskas, eds. *Institution as Praxis: New Curatorial Directions for Collaborative Research*. Berlin: Sternberg Press, 2020. p.47.

¹⁷⁹ Ibid. pp.49-50.

¹⁸⁰ For Rito ‘Surface is the plane of the curatorial—a plane that: enables movement across disciplines; allows seemingly unrelated subjects to meet along their lines of flight; is driven by intellectual and conceptual disquiet; recognises intuition and contingent encounters; and finds new ways of engaging with urgent and current issues and their fugitive affects.’ See Rito, Carolina, and Bill Balaskas, eds. *Institution as Praxis: New Curatorial Directions for Collaborative Research*. Berlin: Sternberg Press, 2020 p.50.

¹⁸¹ Rito, Balaskas, 2020: 17-18.

¹⁸² Rito in eds. Gheorghe and Wilson, 2021, p.71.

based' and through practice) and collaborations, I will be sharing a practice dossier¹⁸³ which maps out my activities, as well as the accompanying photographs featured throughout this written thesis. My curatorial research proposes a context and point of departure for the work of the two artists I have been working with, Gabriella Hirst¹⁸⁴ and Nastassja Simensky.¹⁸⁵ In doing so the work produced within these contexts creates a coming together, foregrounding a common ground and shared concerns with those engaging with the work, as well as divergences of understanding or disagreements, all of which can be generative. The artists' work is tangled up with these Essex nuclearscapes and therefore the county's geopolitical interrelationships with the global nuclear military industrial complex, the nuclear industry's networks, sites of production and sites of devastation either by accident, violence, and the ongoing slow violence of radiation which is still felt today. This is just one dimension of the projects' research concerns, each artist has an expansive, discursive, and enriched practice whose research interests converge and diverge with my own. I argue that these artists offer an interscalar approach within their own practices and other work produced, which is beyond the purview of this project. However, what is within the purview of this project is developing and discussing their work within the various frameworks featured herein, namely Essex, nuclear culture, contemporary art and curatorial practice.

The Blackwater Estuary and Foulness Island are sites of research and production, providing material traces that connect with other places, mapping the geopolitics between uranium mining, bomb production, testing, energy production and waste storage, and how they inhabit or pass through my home county and where I have lived most of my life. Alongside this The Old Waterworks (TOW) is the organisation through which the research-led programming and activities take place, alongside partner organisations and independent practice. I have been reflecting a lot on my curatorial role and the working relationships I foster to make the projects I work on possible. How the project operates both within my broader practice as a curator; a PhD researcher; as director of TOW; and the programmes and development opportunities TOW provides. The programme and opportunities at TOW are preoccupied with artists from or local to Essex, or projects that focus on the locality, make connections and histories discernible or raise questions pertaining to Essex. In conjunction with this I am working with two artists who have their own very strong and fascinating research-led practices driven by particular questions, concerns, complicities and positionalities, which of course informs the way in which they are approaching the contexts of Essex's nuclearscapes. My focus is on artists' development and how to facilitate the realisation of the projects with limited resources available. In addition I am preoccupied with when these projects enter the public realm in their various capacities and how they produce new social forms. The consequences of this is the possibility of various publics engaging with the work and the related

¹⁸³ See Appendix seven, or https://miro.com/app/board/uXjvNQfgyg4=?share_link_id=582772683808. Accessed 26 November 2023.

¹⁸⁴ <https://gabriellahirst.com>. Accessed 8 November 2023.

¹⁸⁵ <http://www.nastassja-simensky.com/>. Accessed 8 November 2023.

research in a range of ways. Each project has taken shape through innumerable factors and varying collaborative processes: there are ongoing discussions with the artists; making sense of the context; funding prospects; and various possibilities available to us for opportunities of making public, their broader considerations, and varying points of entry. Mutability is important to these projects, where the artists have many possibilities at their disposal to really enliven and demonstrate the richness of options available to engage with a context artistically.

'Making-public' are the points at which the discussions, research, development and articulations of the work are presented in various formats to members of the public. This process of making artwork public is central to the curatorial. These public instances can be workshops, sculpture, installation, publications, talks, exhibitions, events. Each activity may ask different questions about the project's general concerns, coming together to form a body of practice-led research.¹⁸⁶ Working with each artist has been particularly distinct in their outcomes for this PhD, with convergences and divergences that intersect at this project as well as move beyond the parameters of my involvement, offering up productive curatorial situations. Beatrice von Bismarck articulates the breadth of the curatorial situation as

a coming-together in the interest of the becoming-public of art and culture. Each generates a fabric of interrelations among all of the various human and non-human participants—the exhibits, artists, and curators, but also critics, designers, architects, institutional staff, various recipients, and publics as well as the display objects, mediating tools, architecture, the spaces, sites, information, and discourses. As these elements connect with one another, the becoming-public of art and culture always implies change: exhibits find themselves in new juxtapositions, entering into relations with altered spaces and social, economic and discursive contexts, encountering (many different, more or less familiar) humans and nonhumans.¹⁸⁷

It is with this in mind that I will be considering the practice-based aspects of this project. Taking an interscalar approach to try to keep within the same conceptual frame the depth and complexity of the curatorial situation, the artists' work and the context(s) the work is responding to and implicated within.

The interscalar permeates each aspect of the project: from the context and the mutability of nuclearscapes, which have interscalar sensibilities; the ways that the projects traverse and move through disciplinary boundaries; the different approaches that are taken and shifts made due to the points of entry determined through the various means of making public; to each project having a specific means of traversing these concerns, for Gabriella Hirst it is the 'Atom Bomb' rose and for Nastassja Simensky, radio is a generative method. So not only does this notion of the interscalar facilitate different points of entry to the work for the public, the internal interscalar devices—the rose and the radio—provide access to different registers of knowledge and aesthetic engagements.

¹⁸⁶ This reminds me of Rito's remark that 'linked activities can be a method of enquiry'. See Rito, 2020 p.52.

¹⁸⁷ Bismarck, Beatrice von. *The Curatorial Condition*. London: Sternberg Press, 2022. p.9.

Provided here is the perceived ability to shift across different scales and bring together things usually kept apart, operating through different access points the projects offer from workshops and writing, to exhibitions and fieldwork.

Both projects I discuss below take on different trajectories in the ways the collaborative and curatorial process unfolds. I had the pleasure to share so much time with and develop ideas alongside artists Gabriella Hirst and Nastassja Simensky, about our own practices, research interests and how they intersect and diverge. This operates in such a way that is open and without predetermined outcomes imposed, which allows for the process to develop where practice and research come together and produce something exciting, taking unexpected trajectories. Each project was distinct in its outcomes, given the collaborative process and the unique circumstances of each project. Due to the nature of working in a processual, longitudinal way, it is difficult to preempt the extent of each project and therefore how the projects unfolded, particularly within a limited timeframe and with finite resources. There were ongoing conversations with each artist, discussing how the research developed as well as trying to identify opportunities of public facing activity along the way. Due to these circumstances the public outcomes of each project differed, and therefore the content made public could be perceived as disproportionate if one was to compare them. However, this disproportionate outcome of public activity does not determine the levels of engagement between artist and curator, but it does provide an insight into the opportunities each project was presented with as well as the stages they were at. The importance is the process, where a robust collaborative relationship was established, out of which came a generative space for research, development and the opportunity to share some of this with various publics through different means.

The decision of working with the two artists—Gabriella Hirst and Nastassja Simensky—over the course of this project was reached in an organic way. It was important that the research interests of the artists' practices aligned with my own, but also that they diverge in productive and generative ways. This proximity of relative research is of course crucial, but alongside this there was an arguably more important factor to consider, and that is the establishment of positive and trusting relationships with the artists in question. This latter concern is harder to achieve or ascertain and only becomes clearer over time, as it is only with time that one can establish whether such a collaborative relationship will prove to be successful.

I start by discussing *How to Make a Bomb*, a project by Gabriella Hirst that I have been working with her on for more than four years. The shape the public programming takes is mutable—from workshops through performance to exhibitions—operating on different scales and varying spatial registers. In addition to this there were many intimate and caring moments for me in relation to the 'Atom Bomb' roses in particular—the main (interscalar) vehicles that propel the project—which

were situated at The Old Waterworks just outside of my office in the garden. The second project with Nastassja Simensky has developed over several years and over many discussions and research trips. Stemming from my initial proposition to make work in response to the Blackwater Estuary, the artist has pushed this forward, extending and building upon our shared research interest into the estuary as well as her own distinct areas of focus, working with various organisations to facilitate the public moments that have punctuated the project. Simensky has been developing this research further within her own practice-based PhD research, considering the potentialities of how artists and archaeologists can develop generative approaches to collaborative research in the field.

What follows is discussion on the different dimensions of Hirst's and Simensky's projects and my role in a curatorial capacity, primarily via The Old Waterworks during my time there as director, which ran alongside much of this PhD project. Before discussing the details of each project, it is worth noting the more pragmatic but incredibly important dimension of the projects, these being funding, partnerships and the different roles one may occupy as a curator. I argue that these are and should be imperative considerations within all curatorial work. As I have discussed above, making- and thinking-with is an integral dimension of curatorial practice, and this extends to the partnerships fostered and funding sought in order to make the artistic programming possible. This becomes even more important when resources are limited, since when one works in a small arts organisation the work one does is dispersed. The areas that may traditionally sit separate from the curator come within the purview of the curator or director's job description. This is perhaps somewhat obvious and unsurprising, but I would argue it is significant, particularly in understanding the parameters of practices for curators working within different organisational contexts, from DIY and grass-roots to large-scale well resourced institutions. The resources available determine the extent of the division of labour. Each project's trajectory is of course driven by the artist's intent and creative vision, however to convert these creative possibilities into public activities, certain resources are required: funding; time; partnerships; support. Fundraising was a necessity in order to meet the ambitions of the projects and their ongoing public facing elements, as was partnership building. This also helped in terms of marketing, PR and administrative support, further financial support as well as other in-kind support. When one has limited available resources to commission work commensurate with the artist's ambition, partnerships and fundraising are imperative. This is one of the fundamental challenges presented with any practice-based PhD curatorial research project, since a key part of this is to work with artists and make artworks public, however artists need to be paid for their labour and infrastructures are needed in order to facilitate the process of making-public. If a curator does not have these resources readily available to them then much of the groundwork to facilitate the commissioning process, with and for the artist, may fall to the curator, or even the artists themselves..

How to Make a Bomb with Gabriella Hirst¹⁸⁸

I met Gabriella Hirst during a reading group on nuclear landscapes I was leading in 2018 at Goldsmiths, University of London. We discussed our respective research areas and Hirst told me about *How to Make a Bomb*, which came out of *Battlefield*, another of the artist's projects that has developed and unfurled over the course of the several years we have been working together. Since 2014 Hirst has been researching and collecting plant varieties that are named by plant breeders to commemorate, memorialise or celebrate war and the associated military personnel, conquered territories and weaponry. Since 2015 plants that constituted *Battlefield* have been grown together at the community gardens of the Temelhofer Feld, Berlin. A new and extended iteration of the project has been shown in the courtyard of Kunsthalle Osnabrück, Germany, where the garden's arrangements reference formal, historic garden designs and military drill formations.¹⁸⁹ It is through this research-led plant search within *Battlefield* where Hirst came across the *Rosa floribunda* 'Atom Bomb', whose unearthing developed into the *How to Make a Bomb* project.

How to Make a Bomb (2015 - ongoing) is a durational gardening project by Hirst centred on the propagation and redistribution of a nearly extinct species of garden rose which was created and registered under the name *Rosa floribunda* 'Atom Bomb' in 1953. The project charts the various attempts by Hirst to produce new specimens of the 'Atom Bomb' rose through grafting and cuttings. Propagated plants are distributed throughout gardens in the UK through workshops and other activities while Cold War era narratives and fear mongering in the media and political rhetoric have seen a resurgence. The 'Atom Bomb' rose is the protagonist of an extensive research project by Hirst, unpacking the various links and associations embodied by this species in relation to processes of manipulation and care. The rose is a vessel to explore ideas of historical global power structures enacted through gardening, a means to approach the ungraspable timescales of nuclear materials, and the coexistence of tenderness and violence within relationships between humans and plants. With this in mind it could be argued that the rose allows one to think about the nuclear holistically in a way that is interscalar.

Since 2019, the *How to Make a Bomb* project has been hosted at The Old Waterworks (TOW) where the roses are (and will continue to be) propagated. It is poignantly close to Foulness Island, where test weapons bound for Australia were developed in the 1950s. I argue that this contextual shift for the project was incredibly important. It was clear that Hirst's research converged with my own and that siting the project in close proximity to Foulness Island and within the context of TOW,

¹⁸⁸ There is an overview of the project on my personal website, Gabriella Hirst's website and The Old Waterworks' website. See <https://www.warrenharper.info/how-to-make-a-bomb/>, <https://theoldwaterworks.com/projects/how-to-make-a-bomb/> and <https://gabriellahirst.com/>. Accessed 23 April 2023. Documentation can also be found in the practice dossier of this PhD project.

¹⁸⁹ See <https://www.battlefield.garden/>. Accessed 17 November 2023.

whose focus under my leadership was on developing artists' projects and practices, made sense critically and contextually. *How to Make a Bomb* saw various forms through which the project was made public: a permanent installation of the roses at The Old Waterworks; the propagation of 'Atom Bomb' roses; public rose propagation workshops; a research-led performative lecture that evolves throughout the project; publications featuring botanical studies, other research drawings by Hirst of the propagation process, and charting the project's progress; a guide to different propagation techniques; an in depth essay reflecting upon the project; exhibition; public installation; a talks programme; and the subsequent dispersal of the roses once they have been propagated. The dispersal of roses is so they can find their way into the British garden through guerrilla gardening practices, participants taking their propagated roses home after workshops, handing-over ceremonies and giving them away. The breadth of public moments allowed for numerous entry points for audiences and allowed for varying ways to engage in the complex research the project seeks to embody and communicate, embracing discursive formats. I argue that the various capacities one can engage with the project is crucial for its ability to generate 'audiences-in-the-making'.¹⁹⁰ These different forms of making-public were responsive to external factors such as how preceding iterations of the project were received and what aspects of research the various public moments were focussing on.

Propagation: Workshops, Cuttings and Grafting¹⁹¹

Propagation is a central part of the *How to Make a Bomb* project. It is through the actions of producing new 'Atom Bomb' roses that participants of the project are encouraged to reflect on the entanglements of care, violence and control wrapped up in gardening. This provocation is taken further with the 'Atom Bomb' rose since it compels those who graft or make a cutting of a specimen, and the subsequent care for it, to think about the implications and contradictions inherent in caring for something that is named after and arguably celebrates or commemorates something so unbelievably violent and destructive. Propagation operated through workshops which provided an embodied knowledge exchange with those who participated. I would argue that the workshops are a prime example of a means to generate an 'audience-in-the-making'. Through offering up the prospect of learning a new skill or an alternative means of engagement via a different discipline—horticulture and how to propagate—the project is able to encounter participants and audiences that might otherwise not engage with, or rarely engage with, contemporary art practices. In addition to workshops the propagation also occurred through annual grafting sessions at The Old Waterworks in the garden. TOW's garden was another area of focus for me during my time as director, developing it as a site of research and development for artists

¹⁹⁰ Rito, 2020, p.50.

¹⁹¹ <https://miro.com/app/board/uXjVNQfgyg4=?moveToWidget=3458764570093798594&cot=14>. Accessed 15 November 2023.

via establishing planting areas and other zones for the studio artists at TOW to utilise, as well as other artists TOW works with. Within the garden artists have been growing plants for inks and dyes as well as making use of vegetables grown there for workshops centering food, care and wellbeing.

Grafting

In August 2019 the 'Atom Bomb' rose mother plant came to The Old Waterworks on a permanent basis. In June 2019 Hirst and I planted 50 dog roses from which material from the 'Atom Bomb' roses were grafted onto most of them. The 'Atom Bomb' rose material was taken from the mother plant in two sessions in August 2019. In January 2020 once the 'Atom Bomb' roses were established and fused onto the dog roses the dog rose growth was cut back, leaving the 'Atom Bomb' rose to take over its root system. Out of the 30 dog roses that were grafted, 20 were successful, maturing into 'Atom Bomb' roses. This process was repeated in 2020, 2021, 2022 and 2023. Hirst speaks of the parasitic nature of the grafting process in the *An English Garden* publication which is another part of this project; the geopolitical connotations this implies and how it is reminiscent of the nuclear colonial projects discussed throughout.¹⁹²

Cuttings

Cuttings are another (but less successful) propagation process that we have been attempting throughout the project. Before being planted each cutting is dipped in mycorrhizal fungi, which is a beneficial fungi that works in association with plants, taking sugars from the plants in exchange for nutrients and moisture gathered by the fungi. This relationship between plant and fungi is extremely common and highlights the interspecies entanglements and mutual dependencies that characterise life. The 'Atom Bomb' rose also allows for consideration of relations beyond itself, such as the nuclear colonial history of the UK, Essex's role within this and the far reaching implications that this has had on Country in Australia. In *the Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins* (2015) Anna Tsing tells of her 'travels with mushrooms to explore indeterminacy and the conditions of precarity'.¹⁹³ She investigates how matsutake mushrooms grow in forests devastated by human activities, such as those that have been felled and replanted with faster growing species like pine, which matsutake mushrooms thrive alongside in a symbiotic relationship. Tsing employs the mushroom as a vehicle to explore forest histories, multispecies landscapes, matsutake commerce and the precarity it engenders, as well as capitalist destruction and what and how we might survive in its wake. The 'Atom Bomb' rose could also be

¹⁹² Hirst, Gabriella, and Warren Harper, *An English Garden*. Westcliff-on-Sea, Essex: The Old Waterworks, 2021, p.17.

¹⁹³ Tsing, 2015 p.2.

taken up in a similar way, to traverse different scales through time and space, from the cellular behaviours and interactions of the rose during its propagation processes and its relations with others, to geopolitical and historical impacts brought on by the rose's namesake.

The propagation of the roses is one of the central aspects of *How to Make a Bomb*. It provides a way for Hirst to discuss the areas of concern that the project raises. The act of propagation instils the dichotomy of care and violence wrapped up in gardening, where one has to cut, remove and manipulate plant material in order to encourage growth. This provides the participants who partake in this process an intimate and embodied experience, where they are at once tending to the rose which depends on the care of the gardener for its survival, but also to the stories of nuclear colonialism and state power play the name of the plant and therefore the histories it holds. This conversational and relational quality of the work has the capacity to proliferate after the workshops cease and the roses go home with their new caregivers. Providing participants with the skills to propagate further 'Atom Bomb' roses and allowing them the opportunity to share the stories put forward by the project and tend to them in their own way. It would be hard to discern how many roses are still living in gardens across the UK and beyond, but this potential for them to be encountered by others beyond the parameters of the programmed activity instils a generative capacity within the ongoing life of the work.



Figure 8: *Rosa floribunda* 'Atom Bomb' at The Old Waterworks. Photograph courtesy the author.

Installation at The Old Waterworks¹⁹⁴

To accommodate the roses at The Old Waterworks a sculptural structure was commissioned, designed by landscape and architectural designer Cristina Morbi in collaboration with Gabriella Hirst, and fabricated by London-based Duterque Studio. The structure is situated outside of TOW within the charity's garden. The garden is a focal point for other plant-based art and community projects such as plants grown to make dyes, flax plants to produce linen, and lavender and other plants for essential oils. This installation for *How to Make a Bomb* is appropriately situated at a site where the development of artistic and curatorial practices are foregrounded and practice-based research-led practices are fostered. Not only this, but the sculptural structure also embeds *How to Make a Bomb* in Essex and in close proximity to Foulness Island, the place in the county that is significant to Britain's development of nuclear weapons and the subsequent impact that this has on Indigenous peoples and lands as well as military personnel who were subjected to the nuclear weapons testing of the 1950s and '60s in so-called Australia.



Figure 8: Structure at the Old Waterworks that houses the 'Atom Bomb' roses, designed by Gabriella Hirst and Cristina Morbi, fabricated by Duterque Studio. Photograph courtesy Anna Lukala.

The design references various structures relevant to the development of botany such as elaborate glass houses to Wardian cases, which were used to transport plant material from colonial territories back to Britain. Central to the structure and flanked either side by staggered platforms is

¹⁹⁴ <https://miro.com/app/board/uXjVNQfqyg4=?moveToWidget=3458764569639525192&cot=14>. Accessed 15 November 2023.

a shelf for the mother plant, which is framed by one of TOW's windows. On the neighbouring shelves are the mother's t-bud grafted specimens grown on dog rose root stock. The top shelf houses the oldest 2019 generation with the younger towards the bottom of the structure. Formally, when filled with the mother plant and the generations propagated over the last four or so years, the structure reminds one of the familial connotations of the daughters of uranium. This was the name given to the decay chain of uranium where uranium isotope U-238 slowly transforms into lead, a journey from instability to stability. Adding another neutron to make U-239 is a very different story, its decay leads to its first daughter, Neptunium-239, followed by the most dangerous, toxic and volatile daughter of all, Plutonium-239.¹⁹⁵

The installation at TOW operates as an important home for the project, alongside the propagation process that happens there annually, further embedding the project within Essex. It is a place to continue negotiating the ongoing care and maintenance of the roses and therefore the complex and contradictory concerns such tending throws up. I argue that it is important work to do nearby significant sites of Britain's nuclear story, in this case Foulness Island. Another important dimension of proximity, curatorially speaking, was the prospect of caring for the roses as part of my daily routine at TOW. This was an unusual and special opportunity to tend to a work in such a way that goes to the heart of the etymology of curating, curator, curatorial, which is curare, or to take care of. Being caretaker for the roses and ensuring they are healthy and getting everything they need from water, plant feed, repotting, pruning, and so on, allows for a very different dimension of research and engagement. As well as using this as a moment to reflect upon the ongoing research within the framework of this PhD project it also allowed for me to develop new knowledge, insight and skills, in this case around gardening.

¹⁹⁵ Wyck, Peter C. van 'Reading the Remains' in Kavanagh, Mary. *Mary Kavanagh: Daughters of Uranium*. Lethbridge, AB: Southern Alberta Art Gallery, 2020. p.45



Figure 10: Gabriella Hirst, *An English Garden*, 2021, Gunners Park, Shoeburyness, Essex. Photograph courtesy Connor Turansky.

An English Garden, Estuary 2021¹⁹⁶

An English Garden was a two-part commission—an installation and publication—as part of *Estuary 2021*, which was an arts festival situated along the north and south coasts of the Thames Estuary in Kent and Essex, UK, it is a 'large-scale festival that celebrates the lives, landscapes and histories of the spectacular Thames Estuary.'¹⁹⁷ The initial proposal to *Estuary 2021* for *An English Garden* can be reviewed in appendix three where one can see the development of the project from its inception, and its delivery below. The installation offered a site for quiet contemplation, whilst the publication allowed for further elaboration on the project as well as the artist's research and motivations. The research is presented in the publication as an extensive collection of drawings and an essay by Hirst, accompanied by an introduction by me and designed by London based designers Design Print Bind.¹⁹⁸ The installation took the form of two simple slightly raised flower beds reminiscent of architectural structures on Foulness Island—a hexagonal rose bed consisting of 'Atom Bomb' roses and an arched row of 'Cliffs of Dover' irises—and three benches facing the flower beds. The 'Atom Bomb' roses within the rose bed were those propagated at The Old Waterworks during the grafting sessions held in 2019 and 2020. On each bench was a brass plaque, the middle one read:

¹⁹⁶ <https://miro.com/app/board/uXjVNQfgyg4=?moveToWidget=3458764569642741817&cot=14>. Accessed 15 November 2023.

¹⁹⁷ <https://www.estuaryfestival.com/>. Accessed 17 November 2023.

¹⁹⁸ <https://designprintbind.info/an-english-garden/>. Accessed 15 November 2023.

In 1952, Britain's first atomic device was assembled at the Atomic Weapons Research Establishment on Foulness Island, only six miles from this location. This weaponry was tested not on British soil, but instead was sent to Australia where it was detonated on unceded Indigenous Land, causing enduring devastation and contamination. It is rumoured that these early devices were dispatched from Barge Pier here in Gunners Park. Britain continues to proliferate nuclear arms: in 2021, the current UK government lifted a 30-year ban on the development of new nuclear weapons, vowing to increase its nuclear armament by 40%. In doing so a choice has been made to direct considerable resources towards industries of violence instead of those of care. An English Garden reflects Britain's historical and ongoing identity as a colonial nuclear state. It is planted with *Rosa floribunda* 'Atom Bomb', a rare variety of rose that was originally created by breeder Reimer Kordes in 1953, during the height of the Cold War arms race. These plants have been propagated in Southend from one of the few remaining specimens of the original 1953 variety. The garden is a reminder that the red rose of England is entangled with an Imperial past of 'gardening the world', which has continued into a dangerously over-armed present. These are gardens that must be tended to.¹⁹⁹



Figure 11: Gabriella Hirst and Warren Harper, *An English Garden* publication, 2021. Photograph courtesy Design Print Bind.

¹⁹⁹ <https://miro.com/app/board/uXjvNQfqyg4=?moveToWidget=3458764569639525222&cot=14>. Accessed 15 November 2023.



Figure 12: One of the plaques featured in *An English Garden*, 2021. Photograph courtesy Anna Lukala.

The plaques either side feature two drawings taken from Hirst's extensive research, one shows Foulness Island and the Monte Bello Islands, with arrows indicating the direction of travel of the nuclear bomb of *Operation Hurricane*, and the other is a mind-map relative to Foulness Island and the Monte Bello Islands, charting their entanglements. These subtle visual cues at first glance would not look out of place in any garden.

The *An English Garden* installation was situated in Gunners Park, Shoeburyness, Essex, which is not far from TOW. The park is also on land that has a long military history associated with it and is just up the coast from Foulness Island to the east. Essex Wildlife Trust manages the land at Gunners Park, which is now a 25 hectare nature reserve. The nature reserve includes the Shoebury Old Ranges Site of Special Scientific Interest and across the park there are more than twelve habitats including a large pond, coastal grasslands, dunes and historic military buildings.²⁰⁰ The park is a popular spot for dog walkers and its southern side butts up against the Thames Estuary. An interesting counterpoint to the *An English Garden* installation is two commemorative benches and a lectern near Barge Pier at a different part of Gunners Park. Barge Pier is where it is rumoured the earlier nuclear devices were dispatched from. These benches commemorate the two World Wars and in between them is a lectern with an information panel describing a previous temporary installation that was installed in 2017 to mark the centenary of the First World War. *Poppies: Wave* (2017) by artist Paul Cummins and designer Tom Piper, featuring thousands of red

²⁰⁰ <https://www.essexwt.org.uk/nature-reserves/gunners-park-shoebury-ranges>. Accessed 17 November 2023

ceramic poppies that swept upwards out towards the Thames Estuary at the end of Barge Pier.²⁰¹ Such prominent commemoration of one aspect of warfare is significant to consider, given the forced removal of *An English Garden* and imploring one to reflect upon whose stories are told, or not.

An English Garden was due to remain at Gunners Park beyond the conclusion of *Estuary 2021*, with planned deinstallation of the work being after 30 August 2021. This was to give the roses all summer for visitors to enjoy them and the installation, as well as what *An English Garden* invited audience members to think about. Sadly members of the local group of Conservative Councillors within Southend's council took offence to the content of the plaque with one of them calling it 'a direct far left wing attack on our History, our People and our Democratically Elected Government (sic).'²⁰² This along with a 48 hour ultimatum stating that if the work was not taken down then 'action' would be taken meant that Metal, the leading commissioning organisation for the work, ultimately made the decision to remove it prematurely. They did this in order 'to protect the wellbeing and mental health of our small team of staff and volunteers in Southend from possible adverse effects that might arise from any 'action' taken against the work based on a distortion of the actual meaning of the work and our intentions for including it within the programme for *Estuary 2021*.'²⁰³ The decision of this outcome was not made lightly and there were intense discussions between Metal senior staff and board, the TOW team and board, and the artist. Throughout these numerous conversations there were of course different perspectives on how the situation should be handled. Metal's decision, as lead commissioner, was ultimately supported by all parties, even if everyone was not in agreement or disagreed with the outcome of this decision. Perhaps the response was disproportionate to the threats made, but this is now impossible to know. As part of the response to the removal of *An English Garden* there were several statements made. One of them—in appendix four of this thesis and featured in the practice dossier in appendix seven—was a statement released by The Old Waterworks and written by me. Signed off by the TOW Board of Trustees, it provided an opportunity for me to articulate the dismay from TOW's perspective, but also in a way that resonated with my own disappointment. It set out the organisation's position and also highlighted the shortsightedness of those responsible for the work's removal.

The forced removal of the *An English Garden* installation is pertinent in that it demonstrates a reaction, albeit an extreme one, to the implication of making art public that seeks to gently prompt its viewers to consider the nuclear colonial legacy of Britain, Essex's role and how one considers

²⁰¹ <https://www.1418now.org.uk/commissions/poppies-wave-at-southend/>. Accessed 17 November 2023.

²⁰² See TOW's statement in the practice dossier for the project here: <https://miro.com/app/board/uXjVNQfgyg4=?moveToWidget=3458764569639525261&cot=14>. Accessed 15 November 2023. Metal Culture's statement can be read here: <https://metalculture.com/2021/07/13/public-statement-an-english-garden/>. Accessed 17 November 2023. A document featuring a range of responses from social media to the news media can also be found in my practice dossier here: <https://miro.com/app/board/uXjVNQfgyg4=?moveToWidget=3458764569639525433&cot=14>. Accessed 17 October 2023.

²⁰³ <https://metalculture.com/2021/07/13/public-statement-an-english-garden/>. Accessed 17 November 2023.

this in relation to the present. The garden was a quiet, reflective space and a significant demonstration of the political power of gardens, gardening and the naming of plants, as well as the capacity for art to produce such a response whilst using visual language associated with reflection, introspection, and contemplation. The repercussions of the forced removal resulted in national coverage by the press and art press, support from the British Nuclear Test Veterans Association (BNTVA), support across social media as well as an open letter with calls to reinstate the installation from artists and scholars from the arts and other disciplines working with the nuclear.²⁰⁴ The open letter, written and signed by members of the Nuclear Culture Research Group, showed overwhelming support from other artists, curators and academics in the fields relative to nuclear culture, reaffirming the work's legitimacy in terms of its content and the accuracy of the research therein. Much of the debate on social media that I gathered and analysed, particularly on Twitter, also shared concern over the censorial tendencies. Permissions were not possible to ascertain to reproduce within this research project, due to ethical considerations; nevertheless, the reaction was considerable, with some tweets receiving more than 2000 reposts and several thousand replies. Much of the responses have been collated for posterity and the opportunity to reflect on these in greater depth would of course provide further insight into the situation.

What this demonstrates is how this project actively engaged with the polarising views of nuclear weapons, their application, ongoingness and associated politics. It shows how this work could be read as a quietly critical and reflective piece that challenges the motivations to invest in nuclear weapons and asks the viewer to question this. Whilst on the other hand it could be read as an affront to the inclinations of certain political parties or some kind of attack on the UK as a nation state doing its duty in protecting its citizens, regardless of the plaque being factual. The plaque, which is an integral part of the work, is of course a provocation, a critique, but to take offence over historical reality is perplexing. This particular scenario gets to the heart of certain attitudes towards historical and current nuclear policy around weapons development. It became apparent that the work had the capacity to bring out both pro- and anti-nuclear sentiments. The work, in part, also became about censorship. From my curatorial perspective it threw up very interesting but challenging issues around how to approach art in public spaces. It also foregrounded the importance of preempting situations like this arising and working through the necessary measures to ensure that all those involved throughout the process, and who might be impacted by such an event, are cared for appropriately and that artistic expression is protected. Nevertheless, although the reaction experienced was disproportionate, the fact that the work received this kind of reaction points to its success, it highlights that even the subtle aesthetics and gentle sensibilities of a rose garden can evoke such strong reactions.

²⁰⁴ For the open letter and signatories see: https://docs.google.com/forms/d/e/1FAIpQLSdoEU0GDcJoFsc0HRO2Fa-IPLnycQ7hGs_VkGychN5bfKJeA/viewform?pli=1. Accessed 8 November 2023.

It is important to note that *An English Garden* was not only the installation but a publication with an accompanying *How to Make a Bomb* pamphlet insert. The pamphlet is an important part of the project overall in that it is the step by step guide in propagation and is therefore a crucial part of dissemination, not only of the roses but of the information required for them to proliferate. Hirst charts her research in the form of an essay and drawings that were later framed and shown as part of a group exhibition *Tip of the Iceberg* at Focal Point Gallery in Southend-on-Sea, UK, which I will discuss below. Unknowingly, Hirst puts forward a provocation to the councillors with censorial tendencies within the essay in the *An English Garden* publication:

the 'Atom Bomb' rose is a living reminder of the deep connections between gardening and imperial histories. As inhabitants of colonised and colonising lands, we cannot simply extricate ourselves from the contradictory issues and complicated feelings that may arise from the entanglements that have moulded the world we live in.²⁰⁵

This provocation by Hirst makes clear the entangled aspects of one's implication within the nuclear and its far-reaching effects. The publication was a forum for Hirst to present her artistic research and the different forms it takes. It allowed the space for the artist to reflect upon the richness of this project through writing and drawings, charting the project's trajectory and weaving through the other strands that the project explores, such as the coloniality of botany, the power in naming things and the political power of gardens. The garden installation was a carefully considered site to sit with the uncomfortable realities of the nuclear colonial project of Britain and one's inevitable implication within this. The book was also on-site during *Estuary 2021* at a nearby gazebo that was set up as a point of contact for festival visitors to learn more of *Estuary 2021* and the broader programme. Given the gazebo's relatively close proximity to the installation, visitors had the opportunity to borrow a book and take it with them to view the *An English Garden* installation, as a means to provide further context and information for visitors if warranted or requested. The *An English Garden* publication was a crucial means of sharing the extensive research gathered by Hirst during the development of the project. Given the project's depth of research this was a crucial method of dissemination beyond the parameters set by date ranges specified by particular public activity.

There are important observations to make in relation to this commissioning experience, particularly regarding the visceral reaction of the installation from certain political figures in Southend, and the ensuing discourse as a result of this. One of the key questions at the centre of this PhD was how the work may produce, inform or contribute to contemporary politics around the nuclear. As mentioned, one of Hirst's intentions for the work was to create a contemplative space to reflect upon the UK's historical role in nuclear colonialism, but also the UK's commitment to ongoing nuclear weapons by the current government. Although the work was based on rigorous research it

²⁰⁵ Hirst, Gabriella, and Warren Harper, *An English Garden*. Westcliff-on-Sea, Essex: The Old Waterworks, 2021, p.25.

was not immune from individuals abusing their power to quash something that they *perceive* to be incorrect or inappropriate; perception and reality, however, are not always necessarily one and the same.

Hirst carefully and considerately conceived an artwork that was an ideal space to do the work of the interscalar, which is to hold together, within the same conceptual framework, incommensurate realities and the complexities they throw up; *An English Garden* provides those that engage with it the space to reflect on these complexities, the history and present of Britain's nuclear stories, and one's possible complicities within them. During *An English Garden's* exhibition there was an estimated 1033 visitors²⁰⁶ that encountered the work, however due to the work being in a public nature reserve the accuracy of this figure is hard to definitively ascertain. Due to the fallout of the work's premature removal, the project also received national attention by various news outlets across the country, including *The Guardian*, *The Observer*, *The Independent* and *The Art Newspaper*. This situation that we found ourselves in propelled us and the work directly into the political concerns of the project in a very public way.

Tip of the Iceberg, Focal Point Gallery, Sub Rosa²⁰⁷

A few months after *Estuary 2021* and the showing of *An English Garden*, I worked with Hirst to exhibit an iteration of the *How to Make a Bomb* project as part of the group exhibition *Tip of the Iceberg* at Focal Point Gallery (FPG). FPG explains that the exhibition

explores the relationship between art and alternative growing practices, which are increasingly coming together in pursuit of climate action and social justice. New and recent works by local and international artists explore three key themes: the notion of the 'commons', i.e. our common right to the earth's natural resources (air, water, soil, land); how plants can be considered as both witnesses and agents across history, and how local hidden economies can act as catalysts for wider change.²⁰⁸

Within the exhibition was *Sub Rosa*, a series of framed drawings by Hirst, accompanied by an 'Atom Bomb' rose. They were shown alongside artists Becky Beasley and Alida Rodrigues in gallery two.²⁰⁹ Alongside the exhibition I was also invited to curate a reading list to elaborate upon

²⁰⁶ This is the figure Metal provided me via email correspondence on 25 April 2024, shared with permission.

²⁰⁷ <https://miro.com/app/board/uXjVNQfgyq4=/?moveToWidget=3458764569697289132&cot=14>. Accessed 15 November 2023.

²⁰⁸ <https://www.fpg.org.uk/exhibition/tip-of-the-iceberg/>. Accessed 23 April 2023.

²⁰⁹ During *Tip of the Iceberg* Hirst's framed works were shown in Focal Point Gallery's Gallery 2 alongside Becky Beasley and Alida Rodrigues. 'London-based artist Alida Rodrigues produces compositions that use botanical imagery combined with found 19th century black and white portrait photographs to explore the issues related to archive, memory and the formation – or denial – of history,' while Beasley 'presents a new set of eleven poster format prints each combining a single page scanned from Paul Nash's extraordinary late essay, 'Aerial Flowers' with a section of text extracted from Beasley's 2018 publication 'Two Plants in Dip', a parallel portrait of the artist's mother and the octogenarian, reclusive, Alien Plant expert, Eric Clement. The book reflects on the future, via botanical conversations between these two friends and with the artist.' See <https://www.fpg.org.uk/exhibition/tip-of-the-iceberg/>. Accessed 15 November 2023.

some of the themes within the show.²¹⁰ Additionally we hosted a *How to Make a Bomb* workshop and lecture in the public square outside Focal Point Gallery. Although the plans were always to exhibit an iteration of *How to Make a Bomb* as part of *Tip of the Iceberg* the focus arguably shifted due to the premature removal of *An English Garden*. It became even more important to make public the research that informed *An English Garden* and *How to Make a Bomb*, to demonstrate the legitimacy of the research as well as highlight how short-sighted and ill-informed the reaction to *An English Garden* was.

Each framed work of *Sub Rosa* features a selection of Hirst's research drawings scattered within them. Atop the glass of the framed piece are lines and other marks screen printed on the surface. These lines hint at land and reference the maps relative to Britain's nuclear testing on what many now call Australia. The lines coalesce at moments and are reminiscent of map contours, there are arrows that imply a sense of movement as well as squares that could be read as points of interest on a map. Compositionally speaking the lines bring the works together, providing a sense of cohesion, movement and direction of trajectory of the viewing experience. Most of the drawings are those featured in the *An English Garden* publication, further demonstrating the various forms artistic research can take in public forums. The framed drawings map out select areas of Hirst's artistic research, from gardening and horticulture to nuclear colonialism and Empire. They provide a means to engage audiences within a gallery setting, creating constellational compositions of drawings that interrelate in terms of research and visual language, creating a flow where one can start to draw links between each discrete drawing with those around it. Each of the seven framed compositions that make up *Sub Rosa* sit alongside one another and call for the viewer to make their own aesthetic or thematic links. The exhibition saw 1,531 visitors come through the gallery's doors, which the gallery have explained is lower than anticipated (principally due to COVID). They also saw 134 people come in group visits from schools and colleges.²¹¹

²¹⁰ <https://www.fpg.org.uk/event/tip-of-the-iceberg-recommended-reading-list/>. Accessed 8 November 2023.

²¹¹ This is the figure Focal Point Gallery provided me via email correspondence on 3 May 2024, shared with permission.



Figure 13: Gabriella Hirst, *How to Make a Bomb: Sub Rosa*, 2021, in *Tip of the Iceberg* at Focal Point Gallery. Photograph courtesy Anna Lukala.

How to Make a Bomb Performative Lecture and Workshop at Focal Point Gallery²¹²

The gallery's external windows had a long row of dog roses which had been potted up at TOW a month prior in preparation for the exhibition. They were planted in used plastic beer kegs that we have become accustomed to using as planters at TOW and are reused from local micropubs in Southend. The roses sat atop a long metal bespoke shelf made for the exhibition which was given away to a local charity afterwards, which provides mental health support projects, particularly around gardening. The facade of the gallery faces onto a public square and on 12 September 2021 we invited members of the public to join us for a workshop on how to graft your own 'Atom Bomb' rose using the dog rose stock lined up outside the gallery. On the square directly outside the gallery were tables set up to prepare the dog roses. At one end of the square is Big Screen Southend, a large LED screen that Focal Point Gallery use for programming, upon which we transmitted close-up footage of Hirst grafting roses at TOW, interspersed with the project's title on a green background: 'How to Make a Bomb'.

²¹² Documentation of the workshop and lecture can be found on FPG's website: <https://www.fpg.org.uk/exhibition/how-to-make-a-bomb/>. Accessed 8 November 2023.



Figure 14: the exterior of Focal Point Gallery during *Tip of the Iceberg*. Photograph courtesy Anna Lukala.

Prior to the workshop portion of the event Hirst, in a red jumpsuit, gives a performative lecture on the project, its research and pertinence to the locality, again Focal Point Gallery is situated nearby to Foulness Island. Flanked either side of Hirst are 'Atom Bomb' roses, which were the ones removed from *An English Garden*. With the unexpected situation we were faced with *An English Garden* and its forced removal, it felt important to respond in a way that felt generative and continued the conversations the work proposed. This could be understood as a defiant symbolic gesture, where material from the 'Atom Bomb' roses within *An English Garden* are distributed throughout the community and planted within participants' gardens or wherever they choose.

Tip of the Iceberg was an opportunity to situate the research within the framework of a group exhibition. An unforeseen opportunity it brought to the fore was to respond in some way to the unfortunate event that led to the removal of the *An English Garden* installation. Within the framework of this exhibition there was scope to explore different means to make public the multiple facets of the project, the varying ways it demonstrates how practice-based research can come into being and engage with its publics. In addition to this it was a chance for the project to be situated beyond its own specific contexts and extends this to other (trans)local concerns. *Tip of the Iceberg* further embedded the project within its locality by being placed in further dialogue with local Southend-based artists (all of which have worked with and/or have studios at The Old Waterworks), as well as artists from disparate locations nationally and internationally. Although

How to Make a Bomb has its home at TOW, which has a community of artists and creative organisations at its heart, *Tip of the Iceberg* allowed the project to be placed in broader dialogue with other artists' practices more directly, drawing out themes otherwise tangential to the main lines of enquiry *How to Make a Bomb* explores.

The Rose Garden Conference, Saturday 23 October 2021²¹³

Another aspect of the *How to Make a Bomb* programming of 2021 was *The Rose Garden Conference* which was delivered online and organised by Gabriella Hirst and myself. *The Rose Garden Conference* was a one-day event of talks that focussed on two seemingly opposed or unrelated topics: gardening and global armaments. We invited artists, curators, writers, historians and activists to share their insights into both the nuclear and the botanical. As a starting point the event took its name from the press conferences held in the Washington White House gardens in 2020; considering the subtle and overt ways plants and gardens are inextricably linked to the theatre of political powerplay, as witnesses, players and tools. The event's specific focus was nuclear armaments and Britain's nuclear story, particularly in relation to Australia.²¹⁴

We invited speakers from Australia, the US and the UK and hosted the event online. As an introduction to *The Rose Garden Conference* we sought permission to play a recording of Kokatha elder, activist and nuclear test survivor, Auntie Sue Coleman-Haseldine's address to the 2021 UN General Assembly High-level plenary meeting to commemorate and promote the International Day Against Nuclear Tests. We were joined by artist Yhonnie Scarce (Naarm/Melbourne, Australia); activist and co-founder of the International Campaign to Abolish Nuclear Weapons (ICAN), Dimity Hawkins (Naarm/Melbourne, Australia); Dr. David Burns (Royal College of Art, UK); Wayne Cocroft (Historic England, UK); Dr. Marleen Boschen (Goldsmiths, University of London, UK); Dr. Ele Carpenter (Umeå University, Sweden); activist and educator Kathleen Sullivan (USA); and Wesley Perriman (British Nuclear Test Veterans Association, UK). The day consisted of an expansive session with a multiplicity of voices, perspectives and positionalities, providing insight into artistic practices that consider the impact of colonisation on Aboriginal peoples; the British nuclear test veterans who were there during the tests; the campaigning on the abolition of nuclear weapons; the coloniality of botany;²¹⁵ and a historical account of the development of the Atomic Weapons Research Establishment at Foulness Island. *The Rose Garden Conference* provided a discursive forum to demonstrate the breadth of scope of *How to Make a Bomb* and the various points of entry

²¹³ A recording of the Rose Garden Conference is featured in my practice dossier here: <https://miro.com/app/board/uXjVNQfgyq4=?moveToWidget=3458764569639525204&cot=14>. Accessed 15 November 2023.

²¹⁴ www.htmab.xyz. Accessed 2 November 2023.

²¹⁵ For research on the coloniality of botany see Gray, Ros, and Shela Sheikh. 'The Wretched Earth: Botanical Conflicts and Artistic Interventions'. *Third Text* 32, no. 2–3 (4 May 2018)

to the project, whether that is diverging disciplines, personal stories or activist motivations. Thought about in terms of the curatorial *the Rose Garden Conference* set up a new site of encounter, between fellow speakers and the audiences watching online. It was a way to broaden the reach of the project's audience, *How to Make a Bomb* speaks to inherently global entanglements, particularly in relation to Britain's nuclear colonial legacies.

Making the decision to host the conference online allowed for us to reach a potentially global audience, not only broadening the areas of discussion but also who and where it reaches. Although I was unable to determine the geographic spread of those engaging with the conference, we did have 335 audience members joining us for the session.²¹⁶ The recording is also online indefinitely, which allows for the conference to be readily available as reference material for posterity. The conference was crucial to open up and provide space for a multiplicity of voices, exploring similar terrain but from differing perspectives and disciplinary insights. Given the controversy brought on by *An English Garden*, this conference was incredibly important to bring back the discussions to rigorous research, art practice and the impacts of the nuclear testing the project pertains to. Although the project was somewhat sensationalised due to the controversy surrounding it, *the Rose Garden Conference* was a way to bring it back to the important issues it raises.

How to Make a Bomb workshop with Radar²¹⁷ at Loughborough University,²¹⁸ and the project as it stands

On Thursday 14 July 2022 Hirst and I travelled to Loughborough University to work with Radar, the university's contemporary arts research programme. We brought an 'Atom Bomb' rose which was planted in the gardens of the Institute of Advanced Studies' International House as part of the university's art collection. Prior to the handing over of the rose we brought extra plant material with us from The Old Waterworks to host a grafting workshop, where participants grafted their own roses and took them away to keep. The workshop was preceded with a short lecture by Hirst, in order to provide context for the project.

At the time of writing the *How to Make a Bomb* project is ongoing, the roses will remain at The Old Waterworks, with the intent that a grafting session will occur every year. In the summer of 2023 we

²¹⁶ This is the figure Metal provided me via email correspondence on 1 May 2024, shared with permission.

²¹⁷ Radar is Loughborough University's contemporary arts research programme, and forms part of LU Arts. They invite artists to produce new work in response to, alongside and in provocation of research undertaken across Loughborough University's two campuses. They also programme events bringing together artistic and academic work. The work they commission is process-led, frequently participatory, and often takes place in the public realm, including across their campuses. See <https://radar.lboro.ac.uk/>. Accessed 23 April 2023.

²¹⁸ <https://www.youtube.com/watch?v=DPrZrrORYKQ>. Accessed 17 November 2023.
<https://miro.com/app/board/uXjVNQfgyq4=?moveToWidget=3458764571072857348&cot=14>. Accessed 17 November 2023.

also took part in *Atomic Terrain*, a project instigated by Lovely Umayam, a writer, nuclear non-proliferation expert and founder of arts collective Bombshelltoe.²¹⁹ With this project we toured *How to Make a Bomb* to the US, visiting New York,²²⁰ Los Angeles²²¹ and Washington DC and published a third edition of the *How to Make a Bomb* pamphlet in collaboration with Passenger Pigeon Press.²²² Although this portion of the project sits outside the purview of this PhD project, it demonstrates how the project has taken different forms and has permeated beyond the contextually specific locality of Essex and the UK. The structure outside TOW, however, will remain, which visitors will pass daily as it is sat next to TOW's main entrance. The main driver of the project, the propagation process, and the associated relational, contemplative and practical dimensions this infers, will also hopefully continue. Having a permanent base to do this where the roses can flourish allows for a continued metaphorical open door to ongoing conversations around the concerns the project explores. It provides the means to keep tending to the complex, contradictory and difficult histories that the project points to. Not only this, the duty of care over the roses shifts to those who have grafted their own and taken them away. For the most part the dispersal of the roses and their ongoing health is unknown but this dispersal and uncontainable nature of the project is a distinct and significant quality.

How to Make a Bomb has utilised different approaches and strategies of 'making-public', from the more passive but permanent installation at The Old Waterworks; temporary public art installations, whose response would have been incredibly difficult, if not impossible, to predict; participatory experiences from workshops; dialogical approaches through talks and lectures; delving into the research in depth via publication; and showing framed work within a gallery context among other artists' work and broadening out into further contexts. Here, the gallery exhibition is not the default output or assumed outcome, public outcomes are guided first and foremost by research, but also circumstance, what spaces are available and when, what funding is available and how much. Being pragmatic as well as ambitious is a fine balance to strike with curatorial and artistic work.

Leaky Transmissions with Nastassja Simensky

The next project, this time with artist Nastassja Simensky, came from a very different place. The Blackwater Estuary has been an area of fascination for me for over seven years, working and sharing research with long-term collaborators, particularly Simensky, artist and curator James

²¹⁹ <https://bombshelltoe.com/>. Accessed 4 November 2023.

²²⁰ <https://www.cara-nyc.org/program/events/atomic-terrain-reading-conversation-and-plant-grafting>. Accessed 4 November 2023.

²²¹ <https://wendemuseum.org/program/atomic-terrain/>. Accessed 4 November 2023.

²²² <https://www.passengerpigeonpress.com/atomic-terrain>. Accessed 4 November 2023.

Ravinet²²³ and artist and long-standing Othona Community member Angenita Hardy-Teekens.²²⁴ During this time regular visits to the estuary have been enjoyed, many walks along the sea wall, across the arable land and through the neighbouring villages. For most of the trips we would stay at the Othona Community, participating in the ongoing activities within the community such as daily chores and communal meals. Spending time at the estuary in this way was important, to understand the context and to get to know the people who have spent much of their life living or visiting the area and who can recall Bradwell A humming in the distance.²²⁵ By being a part of the daily rhythms of Othona there is a sense of closeness one has with the locality as well as the ebb and flow of community life on the estuary.

During our time spent thinking together and being in and around the estuary, relations were built, friendships fostered and a shared investment in the estuary consolidated. James, Nastassja and I have lived nearby the Blackwater Estuary for much of our lives and are all from Essex. The connection and investment in learning about the estuary's place within global geopolitical concerns and how artistic practice can help in exploring this, for me at least, is due to proximity and to build an understanding of where one is from, particularly against the continued assumptions and stereotypes levelled at those from Essex. By seeking to understand this context and the impact of the civil nuclear industry one can conceive the depth and breadth of Britain's nuclear colonial project. Additionally, the process of researching alongside artists with their own commitments and interests in the locality of the Blackwater Estuary is an incredibly generative experience. Each artist has their own investments, interests and idiosyncratic engagements with this context. This allows for a productive and engaging experience of gathering research and developing insights into the place in question.

²²³ James has been a long-term collaborator over many years, we have worked on various curatorial and art projects together, some nuclear related. James has researched extensively and made work responding to Bradwell Nuclear Power Station, which has been an invaluable resource for me, informing my work and approach immeasurably. Thank you James! See <https://jamesravinet.info/Autonomy-in-the-Anthropocene-Essex-Nuclear-Archive>. Accessed 2 November 2023.

²²⁴ Angenita has spent many years around the Blackwater Estuary, and spent five years as Othona's warden. She has been making work in response to the estuary over the seven or so years I have known her. It has been a pleasure seeing her work and responses to the estuary develop.

²²⁵ It was artist Angenita Hardy-Teekens who told me the story about the humming stopping once the power station stopped producing electricity.



Figure 15: photograph from research trip on the Blackwater Estuary with Nastassja Simensky. Photograph courtesy the author.

The numerous trips taken and time spent on the estuary were integral to the process for developing research and relationships with others together, and for Simensky to consider ways in which to make work in response to this context.²²⁶ This proved to be a generative space for Simensky who after my initial proposal—to make work in the estuary in response to its place within Britain’s nuclear story—has also gone on to develop her project further into a practice-based art PhD at Slade. Simensky’s project engages not only with the nuclearity of the Blackwater Estuary but also explores its place within the estuary’s local and planetary relationships beyond the nuclear. This foregrounds the interconnected, sympoietic, dialogic and discursive process we have undergone as collaborators whose respective practices and research interests converge and diverge. Additionally, it demonstrates the richness of possibility the estuary offers and the potentiality of interdisciplinary, collaborative research-led practice. This way of working is open and generous, reminding me of Robin Wall Kimmerer’s assertion that ‘all flourishing is mutual.’²²⁷

²²⁶ Please see appendix one for field reports in relation to some of these research trips.

²²⁷ <https://emergencemagazine.org/essay/the-serviceberry/>. Accessed 17 November 2023.



Figure 16: photograph from research trip on the Blackwater Estuary with Nastassja Simensky. Photograph courtesy the author.

Leaky Transmissions came out of my initial proposition to Simensky but has become a sprawling project of practice-based research where the artist has fostered exciting collaborative avenues with fellow artists, archaeologists, musicians, and members of the Othona Community. The project's point of departure is to consider radio as a means of 'communication, collision and interference.'²²⁸ So far Simensky has produced a number of public outcomes for the project including: a residency with Sheffield-based arts organisation Arts Catalyst, which has included workshops and a series of episodes for the organisation's programme Radio Arts Catalyst;²²⁹ *Ythanceaster: Atoms on the Wall* (2022), the first episode in a four-part moving image work, shown at Focal Point Gallery as part of group exhibition *Receiver*;²³⁰ *Atoms on the Wall* (2022), a performance in St. Peter-on-the-Wall with Keeling Curve, an electronic music duo comprising composer Will Frampton and violinist Rhiannon Bedford; *Rings on Water*²³¹ (2022) with artist Rebecca Lee, a collection of 'sonic fieldnotes' commissioned as part of FPG's ongoing experimental sound programme *FPG Sounds*; and *The Long Count*,²³² which I curated and was shown at The Old Waterworks alongside a workshop on how to set up a camera with a Raspberry Pi. *The Long Count* coincided with the

²²⁸ <http://www.nastassja-simensky.com/longcount.html>. Accessed 17 November 2023.

²²⁹ <https://artscatalyst.org/whats-on/leaky-transmissions/>. Accessed 17 November 2023.

²³⁰ <https://www.fpg.org.uk/exhibition/receiver/>. Accessed 17 November 2023.

²³¹ <https://www.fpg.org.uk/exhibition/rings-on-water/>. Accessed 17 November 2023.

²³² <http://www.nastassja-simensky.com/longcount.html>. Accessed 17 November 2023.

launch of *Rings on Water*, and the sound commission accompanied the works shown at TOW. *Rings on Water* came as an edition of 125 cassettes each with a total length of 46.7 minutes, which is the same duration of the half-life of Caesium 125. Here, one can see how different iterations of Simensky's research-led practice is punctuated by varying ways of making-public, the forms of which being determined by how the research materialises via different media and through different commissioning bodies.

There was also activity that was planned with funding secured, only to be cancelled due to the COVID-19 pandemic. Along with academic Colin Sterling, Simensky and I planned a weekend of



Figure 17: Nastassja Simensky, *The Long Count*, The Old Waterworks, 30-31 July 2022. Photograph courtesy the author.

discussions scheduled at the Othona Community for June 2020, where a group of invited scholars, artists and community members would gather to talk about the estuary and its implication within complex global entanglements. In particular, this session was going to think about the estuary in order to foster generative dialogue between archaeology, heritage, geography, anthropology, environmental conservation and curatorial practice. As the weekend progressed myself and Simensky were to work with the participants, documenting the conversations, occlusions, affordances and potentialities unearthed in relation to the Blackwater Estuary. This would then have fed into (or not) the works produced for *Leaky Transmissions*, an experiment in practice-based artistic and curatorial research.

The Long Count²³³

The Long Count is an iteration of *Leaky Transmissions* and includes a series of six framed works produced during her many trips to the Blackwater Estuary. Shown at The Old Waterworks on 30 and 31 July 2022 were images from a growing image archive.²³⁴ The means to produce them are via slow-scan television (SSTV), which is an image transmission method. Thinking with SSTV is a means for Simensky to consider the forces at play in the estuary which are not tangible to humans. An obvious one being radiation. SSTV is generally used by amateur radio operators to transmit and receive static pictures over the radio spectrum. Radio is a technology that is ubiquitous but invisible to humans, however it has had a very physical presence within the estuary in terms of certain infrastructures that make radio possible such as MV Ross Revenge, which is a former fishing trawler turned radio ship anchored-out in the estuary. By taking up this particular technology Simensky is at once acknowledging the history of pirate and legitimate radio practices in the estuary whilst utilising it as a method of practice research in and of itself. The artist also studied for and took the exam to obtain a radio licence to continue developing these lines of enquiry further. Through radio Simensky is exploring the material legacies of changing land-use and energy production in the Blackwater Estuary. *Rings on Water* was played in accompaniment during the weekend, as well as the hosting of a workshop (which I will discuss below). The audio-work was commissioned by Focal Point Gallery as part of their experimental sound programme and was in collaboration with artist and musician, Rebecca Lee, who Simensky has worked with on previous projects.

The sound work played in conjunction with *the Long Count* provided an aural access to the Blackwater Estuary, where the visitor gained another point of entry and means to consider the work and its context. *Rings on Water* consists of fourteen sound pieces that draw on the artists' shared interest in listening, time, land-use and material culture. The artists see *Rings on Water* as a collection of sonic fieldnotes which include field recordings, radio and amateur radio that draws material from *Leaky Transmissions*. The work utilises various recording and transmission technologies, from magnetic tape, coil receivers, FM radio as well as contact microphones that have been dispersed through the protected shale banks and saltmarshes of the Dengie Peninsula and neighbouring industrial arable land. Simensky is acutely aware of the ways that human transmission is present in the estuary, thinking through how cellular networks, wireless connections, ham radio transmissions, Bluetooth signals and high-frequency short wavelengths all coalesce, traversing the infrastructures imperceptible to humans without technical help. These various signals, along with the very low frequency signals generated from thunderstorms and solar

²³³ <https://miro.com/app/board/uXjvNQfgyg4=?moveToWidget=3458764569696936596&cot=14>. Accessed 15 November 2023

²³⁴ See <http://leakytransmissions.com/>. Accessed 17 November 2023.

weather, sit at the opposite end of the radio spectrum of the high-frequency short wavelengths of the irradiated graphite that sits within Bradwell A's enveloped reactor buildings. Here one is reminded of the non-human forces that persist.²³⁵ Here, radio is taking on interscalar sensibilities in that it is deploying a means to hold incommensurate realities within the same conceptual frame, allowing to present various sonic phenomena together via different media transmitted and translated into visual data. Here, we have different sensorial points of entry to the estuary and its context.



Figure 18: *Spectral Images: Experimental Tools for Fieldwork* invite poster. Designed by Molly Dyson.

²³⁵ <https://www.fpg.org.uk/exhibition/rings-on-water/>. Accessed 8 November 2023

Workshop: Spectral Images: Experimental Tools for Fieldwork²³⁶

To accompany the public exhibition of *the Long Count* at The Old Waterworks Simensky and I worked with contextual artist Laura Trevail to host a workshop that invited artists to learn how to build, set up and use a Raspberry Pi with a NoIR (No InfraRed) Camera. A Raspberry Pi is a small single-board computer that operates using open source software, originally introduced by the Raspberry Pi Foundation in the UK in association with technology company Broadcom. The camera is compact and only weighs three grams, it features a fixed focus lens and since it has no infrared filter has useful applications such as infrared and low light photography. It can be used to document photosynthesising plants and thermal objects, for example. The invited participants consisted of artists who are based at, or frequent visitors to, TOW and the Othona Community, and hosted at TOW.

For the workshop all the artist participants were provided with the necessary equipment to set up their Raspberry Pi, which they could then take away with them to integrate within their own artistic research methods and approaches. Alongside the technical knowledge and expertise developed to work with a Raspberry Pi NoIR camera the session also provided the opportunity for participating artists to discuss artistic research 'in the field', considering the possibilities and limitations of adopting certain technologies within practice. Doing this through the act of making and amongst other artists provides a generative space for discussion and exploration. The workshop consisted of four attending artists. This small group allowed for a level of intimacy and engagement with those who participated, providing a generative context to discuss artistic approaches in a broader sense, how the topics and approaches raised in the session could be applied to differing practices and beyond the parameters of the initial context presented. *Spectral Images: Experimental Tools for Fieldwork* not only provided Simensky with a means to consider the context she was operating within, but it also facilitated broader discussions with fellow artists around how certain approaches could be applied 'in the field'. What the workshop allowed for was a site to learn new skills which can be applicable in a variety of creative ways amongst artists with converging interests. Within such a situation generative conversations and exciting possibilities have the potential to unfold.

Continued and sustained visits to the estuary have produced exciting possibilities and ways forward for Simensky's practice in relation to the estuary. She continues to work within this context and alongside Othona Community members and other artists, archaeologists and academic collaborators. The estuary demands collaboration, its complexity asks for a diverse range of knowledges to provide a fuller (but inevitably, always leaky) understanding of its context. Although the work with Simensky could be considered to have somewhat of a limited public output in

²³⁶ <https://miro.com/app/board/uXjVNQfqyg4=?moveToWidget=3458764569642933767&cot=14>. Accessed 15 November 2023.

comparison to that with Hirst, the research and discussion was nevertheless extensive and generative. It is important to note that an interscalar curatorial practice is about the process as much as the public outcomes, since it is through the aforementioned process that the possible forms it takes in a public forum start to articulate themselves. This collaborative process laid the groundwork for and contributed to Simensky's ongoing work in the estuary, which continues today. Simensky and I, alongside this ongoing engagement of research in the estuary also co-wrote an essay which was published by UCL Press in 2023. Our essay was the concluding chapter in *St Peter-On-The-Wall Landscape and Heritage on the Essex Coast* (2023), and reflected upon our shared interests on curatorial and artistic practices 'in the field'. The other essays in the volume were wide ranging and engaged with various periods and areas of history, heritage, archaeology, architecture and material culture in the estuary. Our inclusion in this peer reviewed publication further foregrounds the extent of our commitment to the context, its communities and our collaborative work throughout this process. It again highlights how valuable the process is, and that public outcomes are not necessarily the best suited or sole metric to adjudicate upon the extent of one's collaboration.

Simensky's work is complex, and like Hirst's its avenues of exploration are not solely focussed on the nuclear. This does not negate the fact that the nuclear military industrial complex figures in the work in many ways, in conjunction to the complexities of the Blackwater Estuary and the other concerns it throws up. My collaborative work with Simensky, particularly the research carried out together (the desk work, research trips and fieldwork) has been a central part of my ongoing work as a curator during my PhD journey. It foregrounds process, positive relations between artist and curator, and moves beyond the focus being on predetermined outcomes, but rather allows for the research to determine the trajectory and therefore any public moments this may facilitate. Public moments are of course important, but they are only the tip of the iceberg.

Considered as a whole this chapter not only reflects on the practice based aspects of my project, but also places this within broader curatorial discourse. In conjunction, and where all of this is trying to lead, is towards a serious consideration of the interscalar as a means to think about how one approaches curatorial work, and in turn contributes to the depth and breadth of curatorial practice and the possibilities it harbours for contemporary artistic practice. In this chapter I attempt to acknowledge that although a central tenet to curatorial work is the facilitation of making artwork public, it is also equally important to be cognizant of the other factors that operate either side of these moments; such as the process of identifying possible forms of public activity and how one might reflect, respond to and evaluate this. Throughout this research project the evaluative frameworks were difficult to establish due to capacity, it has nevertheless provided me with incredibly valuable insights on how to focus on this moving forward, both in my curatorial and academic career. In summary, this chapter situates, makes a case for and shares parts of my

collaborative work with artists that I argue apply interscalar sensibilities.



Figure 19: SSTV image produced during the workshop, 2022. Image courtesy Laura Trevail.

Conclusion

Over the last five years I have been thinking-with many others, reflecting on place, nuclear culture, contemporary art, the curatorial and how they coalesce. Through the framework of this PhD, of a written thesis and practice-based programme of activities, I have been leading up to and arguing for a curatorial practice that explores what I have been calling the nuclearscapes of Essex through the interscalar. It has been incredibly important throughout to consider this process through theory and practice together; working closely with the artists and building strong relationships, making some of the work they produce public and reflecting on this within a theoretical framework in order to situate the work in its many contexts, be this locality, nuclear culture, contemporary art or curatorial studies. The movement through each area of research is held together when thinking with the interscalar. In doing so one can hold many facets within the same conceptual frame, thinking through the complexity of nuclearscapes but also how artistic practices and curatorial approaches can elucidate their breadth, depth, amorphousness, ubiquity and specificity. The polarities of the nuclear hold seeming contradictions which the interscalar helps practitioners hold on to.

By starting with my home county and the place I have spent the most of my life, I wanted to consider this place anew and through a different lens. By thinking about Essex through its nuclear stories one undergoes a process of defamiliarisation, looking more intently and drawing links between this place and many others. In discussing these areas of Britain's pursuit of becoming a nuclear power I have attempted to discuss the complex relationship this implies to place. By articulating this through the nuclearscape's uptake one can see how seemingly local concerns are sprawling and interrelated, and by telling the story of one place you are also telling the stories of many. The main thread of the first chapter was to argue for a novel way to consider the nuclear holistically via the 'nuclearscape'. The nuclearscape's uptake and application has the capacity to describe the breadth but also specificities of the nuclear, and where and how it resides. By virtue of this, nuclearscapes are mutable and can articulate the complex manifestations of the nuclear. This could include the localised journeys of irradiated materials on an atomic level; the nuclearscape of Essex and its involvement with Britain's nuclear pursuits; or towards the ubiquity of the global nuclearscape, where nuclear technologies and all that is associated with them has affected air, land and water. One of this chapter's key arguments is that nuclearscapes hold the generative capacity to contribute to the field of nuclear studies within the arts and humanities by developing new terminology to help describe and contain, but also to acknowledge the amorphousness, of the nuclear. I argue that chapter one provides the reader with in depth consideration and analyses of my home county in the context of literature on place and nuclearity, and presents a succinct and convincing account of Essex's role in Britain's nuclear story.

After setting the scene and navigating the terrain of nuclearscapes, and how Essex nuclearscapes traverse beyond the county's boundaries, it has been necessary to further contextualise my curatorial research, moving into another realm where this project sits, and that is at the intersections of nuclear culture, contemporary art and curating. An attempt was made to further illustrate the arts and humanities research and how it informs my own work. I also elaborate upon the development of 'British nuclear culture', how certain forms of display that are prevalent within contemporary art have been utilised by the nuclear industry, and how contemporary art has had a sustained and generative engagement with the nuclear, responding to the plethora of ways it manifests. The key motivations for this chapter were to establish what 'nuclear culture' is, the ways artists sit within the parameters of this distinction, and how curating and the curatorial figures within the development of the nuclear industry, as well as curatorial projects that have centred the nuclear. I argue that the discussion herein is important curatorial work to contextualise my project within nuclear related contemporary art practices. It described the distinct field of study that I am operating in and the avenues contemporary art practice has taken when interrogating the diverse facets of nuclearscapes. In doing so the chapter establishes an incredible vibrancy of practice engaging with the nuclear, and at once locates my work as a distinct contribution to this burgeoning field.

In the final chapter the discussion turned to a closer look at curating and the curatorial, further situating this practice-based research project within the disciplinary boundaries of curatorial studies. Through the initial discussion of curatorial discourses the main arguments were to contribute a case for an interscalar approach within curatorial practice via an interdisciplinary and practice-based process, embedded in place, but also as a means to look beyond a given locality. The introduction of the interscalar, its framing and application within the context of the curatorial, I argue, is a productive means to consider curatorial practice. Curatorial practice figured in this way advocates for an expanded understanding of the curatorial and acknowledges the breadth of work curators tend to. An interscalar curatorial approach adopts a means to hold within the same conceptual framework the complexities of a project that not only looks intently at a particular place, but also beyond its parameters to consider other interrelated places and times, the pathways that connect them and the richness of history, culture, habitats and ecologies that make them. An interscalar approach also opens up the curatorial and artistic possibilities, allowing for an openness of consideration which in turn leads to exciting and unexpected possibilities that can feed into the art making process and the public moments that punctuate this. Finally I discuss my own personal process of working with artists on longitudinal, processual, open-ended and research-driven projects through my directorship at The Old Waterworks, with the goal to reflect on this very process and consider how they engage with the nuclearscapes of Essex. The discussion of the

practice based aspects in the latter portion of chapter three provides insight into the outcomes produced by the artists and informed by a collaborative process that has considered not only the rich and complex research inherent in the project, but has done so in a way that is attuned to the localities figured in my initial propositions. I argue that a curatorial process of working closely with artists to foreground distinct parts of practice rich in research and aesthetic outcomes is best done so through the interscalar.

This PhD has been an incredibly valuable process to understand and negotiate the positionalities I occupied and will likely continue to occupy throughout my career in one capacity or another, whether that is as a researcher, curator, project manager, director, or local community member. There have been possibilities and limitations that these varying positions have provoked; being a part of the local arts community and from the area can be positive, but this closeness has its challenges when maintaining distance for criticality. Fundamentally, this project has foregrounded for me the complexities of one's differing roles and relationships in any given project, and how they are constantly in active negotiation and interaction with one another.

The adoption of an interscalar curatorial practice compliments and aligns itself with the nuclearscape as well as the multiple positionalities this project necessitates. Nuclearscapes describe and allow one to understand nuclear contexts, whilst the interscalar, when thought about alongside nuclearscapes, allows one to move through these nuclear related contexts. In addition, the interscalar is not only applicable to locality, but to artistic and curatorial processes. As a process the interscalar operates as a means to develop curatorial and artistic research, and assist in the determination of what and how avenues of this research are made public. Exploring the nuclearscapes of Essex through and with an interscalar curatorial practice offers up a generative relationship between the mutable, complex and amorphous Essex nuclearscapes and the curatorial and artistic work that in turn responds to it, but also to other places and contexts.

The three chapters all discuss distinct avenues that when considered together and alongside the practice-based element of this project demonstrate the capacity for curatorial work to develop complex, interdisciplinary and discursive research. This could be understood as a unique contribution to curatorial work, how the project traverses diverse concerns whilst being very much situated within place. An aim of this thesis is to locate this project within the many contexts it inhabits, advocating for the importance and capacity of curatorial practice to draw unexpected links or highlight stories that demand or require more visibility. It has been an exercise in advocating for curatorial work as well as exploring its capacity to chart a nuclear story (or stories) for Essex. It was incredibly important that the practice-based curatorial activities and the public programming presented happened primarily within the geographical boundaries of the county. Although they have now been and gone, my reflections within this PhD project and the various forms of

documentation, and thoughts and responses from the artists and others remain.

The nuclearscape and interscalar will continue to permeate through my ongoing work as a curator, researcher and arts worker, where the theoretical and critical frameworks react, respond and inform the breadth of contextual situations one finds oneself in. Where practice and theory coalesce and constantly prop up and support one another. In addition, my research moving forward will also carefully consider and improve upon some of the limitations this project faced, in particular a strong evaluative framework to fully understand the publics my curatorial work reaches. This research journey has allowed me to develop and apply a method of working with artists meaningfully and in a way that is long-term and process-driven. It has also allowed me to do this work within a critical and conceptual framework I have developed. This PhD has been invaluable in allowing me to determine ways to attune to one's context and networks, acknowledging the complexity of one's positionality and the possibilities and limitations this presents.

Bibliography

- A Brief Guide to Interdependent Curating - George Vasey* | 9 November 2020, 2020. Accessed 8 November 2023 <https://vimeo.com/479790972>.
- Alexis-Martin, Becky. *Disarming Doomsday: The Human Impact of Nuclear Weapons since Hiroshima*. Radical Geography. London: Pluto Press, 2019.
- Alexis-Martin, Becky, and Thom Davies. 'Towards Nuclear Geography: Zones, Bodies, and Communities'. *Geography Compass* 11, no. 9 (September 2017): e12325. <https://doi.org/10.1111/gec3.12325>.
- Alvarez, Robert, Ban Hideyuki, Miles Goldstick, Bernard Laponche, Pete Roche, and Bertrand Thuillier. 'The Global Crisis of Nuclear Waste'. Greenpeace France, 2019. Accessed 8 November 2023 http://www.nuclearwasteadvisory.co.uk/wp-content/uploads/2019/02/REPORT_NUCLEAR_WASTE_CRISIS_ENG_BD.pdf.
- Andersson, Jasmine. 'Southend Artwork Taken down after Tory and Conservative Councillors Claim It's a "Left Wing Attack"'. *inews.co.uk*, 15 July 2021. Accessed 8 November 2023 <https://inews.co.uk/news/uk/southend-art-installation-taken-down-conservative-ukip-councillors-left-wing-australia-nuclear-1104906>.
- Andersson, Jenny, and Eglė Rindzevičiūtė, eds. *The Struggle for the Long-Term in Transnational Science and Politics: Forging the Future*. Routledge Approaches to History 11. New York London: Routledge, 2015.
- Aronsson, Peter, and Lizette Gradén, eds. *Performing Nordic Heritage: Everyday Practices and Institutional Culture*. The Nordic Experience. Farnham, Surrey, England ; Burlington, VT: Ashgate, 2013.
- Autogena, L. and J. Portway, *Kuannersuit / Kvanefjeld*, <https://www.autogena.org/work/kuannersuit-kvanefjeld>. Accessed 17 November 2023
- Aylen, Jonathan. 'First Waltz: Development and Deployment of Blue Danube, Britain's Post-War Atomic Bomb'. *The International Journal for the History of Engineering & Technology* 85, no. 1 (January 2015): 31–59. <https://doi.org/10.1179/1758120614Z.00000000054>.
- Baldwin, Andrew, and Bruce Erickson. 'Introduction: Whiteness, Coloniality, and the Anthropocene'. *Environment and Planning D: Society and Space* 38, no. 1 (February 2020): 3–11. <https://doi.org/10.1177/0263775820904485>.
- Bangstad, Sindre, Torbjørn Tumyr Nilsen, and Features. 'Thoughts on the Planetary: An Interview with Achille Mbembe'. Accessed 8 November 2023. <https://www.newframe.com/thoughts-on-the-planetary-an-interview-with-achille-mbembe/>.
- Barad, Karen. 'After the End of the World: Entangled Nuclear Colonialisms, Matters of Force, and the Material Force of Justice'. *Theory & Event* 22, no. 3 (n.d.): 28.
- Barad, Karen Michelle. *Meeting the Universe Halfway: Quantum Physics and the Entanglement of*

- Matter and Meaning*. Durham: Duke University Press, 2007.
- Baysa, Jeff, Satomi Igarashi, Nivi Christensen, Erin Vink, Tania Willard, and Manuela Well-Off-Man. *Exposure: Native Art + Political Ecology*. Santa Fe, NM: Radius Books : IAIA Museum of Contemporary Native Arts, 2021.
- Bellacasa, María Puig de la. *Matters of Care: Speculative Ethics in More than Human Worlds*. Posthumanities 41. Minneapolis: University of Minnesota Press, 2017.
- . “‘Nothing Comes Without Its World’: Thinking with Care”. *The Sociological Review* 60, no. 2 (May 2012): 197–216. <https://doi.org/10.1111/j.1467-954X.2012.02070.x>.
- Bender, Barbara. ‘Time and Landscape’. *Current Anthropology* 43, no. S4 (2002): S103–12. <https://doi.org/10.1086/339561>.
- Bennett, Tony. ‘The Exhibitionary Complex’. *New Formations* 1988(4) (1988): 73–102.
- Bhambra, Gurinder K., Dalia Gebrial, and Kerem Nişancıoğlu, eds. *Decolonising the University*. London: Pluto Press, 2018.
- Bingham, Adrian. “‘The Monster’? The British Popular Press and Nuclear Culture, 1945–Early 1960s”. *The British Journal for the History of Science* 45, no. 4 (December 2012): 609–24. <https://doi.org/10.1017/S0007087412001082>.
- Bishop, Claire. *Artificial Hells: Participatory Art and the Politics of Spectatorship*. London ; New York: Verso Books, 2012.
- . ‘Claire Bishop on the Superabundance of Research-Based Art’. Accessed 8 November 2023. <https://www.artforum.com/print/202304/claire-bishop-on-the-superabundance-of-research-based-art-90274>.
- Bismarck, Beatrice von. *The Curatorial Condition*. London: Sternberg Press, 2022.
- Bismarck, Beatrice von, Jörn Schafaff, and Thomas Weski, eds. *Cultures of the Curatorial*. Berlin: Sternberg Press, 2012.
- Blackson, Robert. ‘Curatorial Accountability’. *Art & the Public Sphere* 4, no. 1 (1 December 2015): 87–88. https://doi.org/10.1386/aps.4.1-2.87_7.
- Blowers, A. ‘Nuclear Waste and Landscapes of Risk’. *Landscape Research* 24, no. 3 (November 1999): 241–64. <https://doi.org/10.1080/01426399908706562>.
- Blowers, Andrew. *The Legacy of Nuclear Power*. London ; New York: Routledge, Taylor & Francis Group, earthscan from Routledge, 2017.
- . ‘Why Dump on Us? Power, Pragmatism and the Periphery in the Siting of New Nuclear Reactors in the UK’. *Journal of Integrative Environmental Sciences* 7, no. 3 (September 2010): 157–73. <https://doi.org/10.1080/1943815X.2010.506488>.
- Blowers, Andrew, and Pieter Leroy. ‘Power, Politics and Environmental Inequality: A Theoretical and Empirical Analysis of the Process of “Peripheralisation”’. *Environmental Politics* 3, no. 2 (June 1994): 197–228. <https://doi.org/10.1080/09644019408414139>.
- Bourriaud, Nicolas. *Relational Aesthetics*. Nachdr. Documents Sur l’art. Dijon: Presses du réel,

2002.

- Boylan, Jessie. 'Atomic Amnesia: Photographs and Nuclear Memory'. *Global Change, Peace & Security* 28, no. 1 (2 January 2016): 55–73. <https://doi.org/10.1080/14781158.2015.1050367>.
- Boyle, Alison. "'Banishing the Atom Pile Bogy": Exhibiting Britain's First Nuclear Reactor'. *Centaurus* 61, no. 1–2 (2019): 14–32. <https://doi.org/10.1111/1600-0498.12220>.
- Broderick, Mick. 'Filmic Mutation: British Nuclear Tests in Australia 1952–1963'. *Studies in Documentary Film* 16, no. 3 (2 September 2022): 274–97. <https://doi.org/10.1080/17503280.2022.2066332>.
- Brook, Orian, Andrew Miles, Dave O'Brien, and Mark Taylor. 'Social Mobility and "Openness" in Creative Occupations since the 1970s'. *Sociology*, 17 November 2022, 003803852211299. <https://doi.org/10.1177/00380385221129953>.
- Brophy, Philip. 'Don't Follow the Wind'. *Frieze*. Accessed 8 November 2023. <https://frieze.com/article/dont-follow-wind>.
- Brown, Kate. *Plutopia: Nuclear Families, Atomic Cities, and the Great Soviet and American Plutonium Disasters*. First issued as an Oxford University Press paperback. Oxford New York: Oxford University Press, 2015.
- Burkhanova-Khabadze, Sasha. 'Curatorial Ethics and Indeterminacy of Practice', 2020, 10.
- Burrows, Tim. 'The Invention of Essex: How a County Became a Caricature'. *The Guardian*, 27 June 2019, sec. News. Accessed 8 November 2023 <https://www.theguardian.com/news/2019/jun/27/the-invention-of-essex-how-a-county-became-a-caricature>.
- . *The Invention of Essex: The Making of an English County*. London: Profile Books, 2023.
- . 'Why Are Tory Councillors in Essex Censoring Artwork?' *The Guardian*, 19 July 2021. Accessed 8 November 2023 <http://www.theguardian.com/commentisfree/2021/jul/19/tory-councillors-essex-censoring-artwork>.
- Butler, S A and R. Bud, 2017, United Kingdom Short Country Report, in History of Nuclear Energy and Society (HoNESt) Consortium Deliverable N° 3.6
- Carpenter, E., Jon Thomson, Alison Craighead, and Andy Weir. 'Nuclear Culture & Citizen Participation Networked and Distributed Art', 2019. Accessed 8 November 2023 <https://nuclear.artscatalyst.org/content/modern-2020-paris-2019>.
- Carpenter, E., ed. *The Nuclear Culture Source Book*. London: Black Dog Publishing, 2016.
- . *Nuclear Taskscape: the radioactive midground*, unpublished, 2018
- . Décolonialité nucléaire: à défaut d'éliminer le nucléaire, on peut le repenser. In *Âge atomique* (2022): 61–76.
- . 'Nuclear Culture' project website, <https://nuclear.artscatalyst.org/>, Accessed 17 November 2023.
- . *Perpetual Uncertainty: Contemporary Art in the Nuclear Anthropocene*, Bildmuseet, 2

- October 2016 - 16 April 2017,
<https://www.bildmuseet.umu.se/en/exhibitions/2016/perpetual-uncertainty/>, Accessed 17 November 2023
- . *Perpetual Uncertainty: Contemporary Art in the Nuclear Anthropocene*, Z33 House for Contemporary Art, 17 September - 10 December 2017,
<https://www.z33.be/en/artikel/exhibition-perpetual-uncertainty>, Accessed 17 November 2023
- . *Perpetual Uncertainty: Contemporary Art in the Nuclear Anthropocene*, Malmö Konstmuseum, 24 February - 26 August 2018,
<https://nuclear.artscatalyst.org/content/perpetual-uncertainty-malmo-konstmuseum>, Accessed 17 November 2023
- Carpenter, E. and W. Harper, 'Decolonising the Nuclear Workshop and Public Lecture',
<http://m-a-r-s.online/sessions/decolonising-the-nuclear-public-lecture-and-research-workshop>. Accessed 17 November.
- Carr, E. Summerson, and Michael Lempert, eds. *Scale: Discourse and Dimensions of Social Life*. Oakland, California: University of California Press, 2016.
- Chimurenga 'About', <https://chimurengachronic.co.za/about/>. Accessed 17 November 2023
- Churchill, Ward, and Winona LaDuke. 'Native America: The Political Economy of Radioactive Colonialism'. *Insurgent Sociologist* 13, no. 3 (April 1986): 51–78.
<https://doi.org/10.1177/089692058601300306>.
- Chwałczyk, Franciszek. 'Around the Anthropocene in Eighty Names—Considering the Urbanocene Proposition'. *Sustainability* 12, no. 11 (31 May 2020): 4458.
<https://doi.org/10.3390/su12114458>.
- Cluitmans, Laurie, and Centraal Museum Utrecht, eds. *On the Necessity of Gardening: An ABC of Art, Botany and Cultivation*. Amsterdam: Valiz, 2021.
- Cocroft, Wayne. 'England's Atomic Age. Securing Its Architectural and Technological Legacy'. In *Kernkraftwerke : DenKmalwerte Und Erhaltungschancen / Nuclear Power Stations: Heritage Values and Preservation Perspectives*. Berlin: Hendrik Bäβler Verlag, 2019.
- . 'Strategy on the Historic Industrial Environment Report England's Atomic Age Desk Top Investigation and Assessment'. Research Department Reports. Historic England, 2006.
- Cocroft, Wayne, and Sarah Newsome. 'The Atomic Weapons Establishment, Foulness, Essex: Cold War Research & Development Site. Survey Report.' Research Department Reports. Historic England, 2009.
- Cocroft, Wayne, Roger J. C. Thomas, and P. S. Barnwell. *Cold War: Building for Nuclear Confrontation, 1946-1989*. Pbk. ed. with corrections. Swindon: English Heritage, 2004.
- Cornum, Lou. 'The Irradiated International', 2018.
<https://datasociety.net/wp-content/uploads/2018/06/ii-web.pdf>.
- Cox, Emily, Phil Johnstone, and Andy Stirling. 'Understanding the Intensity of UK Policy Commitments to Nuclear Power: The Role of Perceived Imperatives to Maintain Military

- Nuclear Submarine Capabilities'. Working Paper. SPRU Working Paper Series. University of Sussex, 2016.
- Critical Ecologies, a research stream at Goldsmiths, University of London, <https://critical-ecologies.org/>. Accessed 17 November 2023.
- Crone, Bridget, Sam Nightingale, and Polly Stanton, eds. *Fieldwork for Future Ecologies: Radical Practice for Art and Art-Based Research*. First edition. Onomatopoeie 225. Eindhoven: Onomatopoeie, 2022.
- Crutzen, Paul J. and Eugene F. Stoermer. "'The 'Anthropocene'" (2000)". *The Future of Nature: Documents of Global Change*, edited by Libby Robin, Sverker Sörlin and Paul Warde, New Haven: Yale University Press, 2013, pp. 479-490. <https://doi.org/10.12987/9780300188479-041>
- Cummins, Paul and Tom Piper, *Poppies: Wave*, <https://www.1418now.org.uk/commissions/poppies-wave-at-southend/>. Accessed 17 November 2023.
- Dang, Tiffany Kaewen. 'Decolonizing Landscape'. *Landscape Research* 46, no. 7 (3 October 2021): 1004–16. <https://doi.org/10.1080/01426397.2021.1935820>.
- Darley, Gillian. *Excellent Essex: In Praise of England's Most Misunderstood County*. Exeter: Old Street, 2019.
- Davis, Heather, and Zoe Todd. 'On the Importance of a Date, or Decolonizing the Anthropocene', 2017, 20.
- Davis, Janae, Alex A. Moulton, Levi Van Sant, and Brian Williams. 'Anthropocene, Capitalocene, ... Plantationocene?: A Manifesto for Ecological Justice in an Age of Global Crises'. *Geography Compass* 13, no. 5 (May 2019): e12438. <https://doi.org/10.1111/gec3.12438>.
- Decamous, Gabrielle. *Invisible Colors: The Arts of the Atomic Age*. Leonardo Book Series. Cambridge, MA: The MIT Press, 2018.
- Demos, T. J. 'Contemporary Art and the Politics of Ecology'. *Third Text*. 27 (2013).
- Demos, T. J. *Decolonizing Nature: Contemporary Art and the Politics of Ecology*. Berlin: Sternberg Press, 2016.
- Dempster, M Beth L. 'A Self-Organizing Systems Perspective on Planning for Sustainability'. Masters, University of Waterloo, 1998.
- Design Print Bind, website, <https://designprintbind.info>. Accessed 17 November 2023
- Dew, Charlotte. *Women for Peace: Banners from Greenham Common*. Four Corners Irregular 8. London: Four Corners books, 2021.
- Diogo, Maria Paula, ed. *Gardens and Human Agency in the Anthropocene*. Routledge Environmental Humanities. London ; New York: Routledge, Taylor & Francis Group, 2019.
- Dixon, Hayley, and Joe Hill, eds. *Radical Essex*. Southend-on-Sea, Essex, United Kingdom: Focal Point Gallery, 2018.
- Don't Follow the Wind*, <http://dontfollowthewind.info/dfw-ex-en>. Accessed 17 November 2023

- Doherty, Claire, and Paul O'Neill, eds. *Locating the Producers: Durational Approaches to Public Art*. Antennae 4. Amsterdam: Valiz, 2011.
- Endres, Danielle. 'From Wasteland to Waste Site: The Role of Discourse in Nuclear Power's Environmental Injustices'. *Local Environment* 14, no. 10 (November 2009): 917–37. <https://doi.org/10.1080/13549830903244409>.
- . 'The Rhetoric of Nuclear Colonialism: Rhetorical Exclusion of American Indian Arguments in the Yucca Mountain Nuclear Waste Siting Decision'. *Communication and Critical/Cultural Studies* 6, no. 1 (March 2009): 39–60. <https://doi.org/10.1080/14791420802632103>.
- Ernest, Marcella. 'Marcella Ernest. Review of "Exposure: Native Art and Political Ecology"'. *Caa.Reviews*, 23 March 2022. <https://doi.org/10.3202/caa.reviews.2022.29>.
- Eshun, Kodwo, Avery F. Gordon, and Emily Pethick. 'Navigating Pan-Africanisms: On the Chimurenga Library'. *Afterall: A Journal of Art, Context and Enquiry* 43 (March 2017): 80–87. <https://doi.org/10.1086/692557>.
- Estuary Festival website, <https://www.estuaryfestival.com/>. Accessed 17 November 2023.
- Essex Wildlife Trust, 'Gunners Park and Shoebury Ranges Nature Reserve', <https://www.essexwt.org.uk/nature-reserves/gunners-park-shoebury-ranges>. Accessed 17 November 2023.
- Evens, Siegfried. 'A Complicated Way of Boiling Water: Nuclear Safety in Water History'. *Water History* 12, no. 3 (September 2020): 331–44. <https://doi.org/10.1007/s12685-020-00258-0>.
- Ferguson, Donna. "'Not in This Town": Artwork about Britain's "Nuclear Colonialism" Removed'. *the Guardian*, 17 July 2021. <http://www.theguardian.com/artanddesign/2021/jul/17/not-in-this-town-artwork-about-britains-nuclear-colonialism-removed>.
- Focal Point Gallery, <https://www.fpg.org.uk/>. Accessed 17 November 2023
- Forgan, Sophie. 'Atoms in Wonderland'. *History and Technology* 19, no. 3 (September 2003): 177–96. <https://doi.org/10.1080/0734151032000123936>.
- Glessing, Jill. 'Deconstructing Nuclear Visions'. *Esse Arts + Opinions*, no. 86 (2016): 94–97.
- Gray, Ros, and Shela Sheikh. 'The Wretched Earth: Botanical Conflicts and Artistic Interventions'. *Third Text* 32, no. 2–3 (4 May 2018). <https://doi.org/10.1080/09528822.2018.1483881>.
- Green, Jim. 'Radioactive Waste and Australia's Aboriginal People'. *Angelaki* 22, no. 3 (3 July 2017): 33–50. <https://doi.org/10.1080/0969725X.2017.1387364>.
- Gronemeyer, Wiebke. *The Curatorial Complex: Social Dimensions of Knowledge Production*. Paderborn: Wilhelm Fink, 2018.
- Grove-White, Helen, Annie Grove-White, and X-10 (Group of artists). *Pŵer yn y Tir*, 2016.
- Grusin, Richard A., ed. *Anthropocene Feminism*. 21st Century Studies. Minneapolis: University of Minnesota Press, 2017.
- Hall, Budd L., and Rajesh Tandon. 'Decolonization of Knowledge, Epistemicide, Participatory Research and Higher Education'. *Research for All*, 1 January 2017.

<https://doi.org/10.18546/RFA.01.1.02>.

Haraway, Donna. 'Anthropocene, Capitalocene, Plantationocene, Chthulucene: Making Kin'. *Environmental Humanities* 6, no. 1 (2015): 159–65.

<https://doi.org/10.1215/22011919-3615934>.

———. 'Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective'. *Feminist Studies* 14, no. 3 (1988): 575. <https://doi.org/10.2307/3178066>.

———. 'Manifestly Haraway', 2016.

———. *Staying with the Trouble: Making Kin in the Chthulucene*. Experimental Futures: Technological Lives, Scientific Arts, Anthropological Voices. Durham: Duke University Press, 2016.

Harrison, Rodney. 'Archaeologies of Emergent Presents and Futures'. *Historical Archaeology* 50, no. 3 (September 2016): 165–80. <https://doi.org/10.1007/BF03377340>.

———. 'Beyond "Natural" and "Cultural" Heritage: Toward an Ontological Politics of Heritage in the Age of Anthropocene'. *Heritage & Society* 8, no. 1 (May 2015): 24–42.

<https://doi.org/10.1179/2159032X15Z.00000000036>.

Harrison, Rodney, and Esther Breithoff. 'Archaeologies of the Contemporary World'. *Annual Review of Anthropology* 46, no. 1 (23 October 2017): 203–21.

<https://doi.org/10.1146/annurev-anthro-102116-041401>.

Hawkins, Dimity. 'Addressing Humanitarian and Environmental Harm from Nuclear Weapons: Monte Bello, Emu Field and Maralinga Test Sites'. New York: Pace University's International Disarmament Institute, 2018.

Hecht, Gabrielle. *Being Nuclear: Africans and the Global Uranium Trade*. Johannesburg: Wits University Press, 2012.

———, ed. *Entangled Geographies: Empire and Technopolitics in the Global Cold War*. Inside Technology. Cambridge, Mass: MIT Press, 2011.

———. 'If We Talk about Hurting "Our" Planet, Who Exactly Is the "We"? – Gabrielle Hecht | Aeon Essays'. Aeon. Accessed 8 February 2019.

<https://aeon.co/essays/if-we-talk-about-hurting-our-planet-who-exactly-is-the-we>.

———. 'Interscalar Vehicles for an African Anthropocene: On Waste, Temporality, and Violence'. *Cultural Anthropology* 33, no. 1 (22 February 2018): 109–41.

<https://doi.org/10.14506/ca33.1.05>.

———. 'Nuclear Ontologies'. *Constellations* 13, no. 3 (2006): 320–31.

<https://doi.org/10.1111/j.1467-8675.2006.00404.x>.

———. 'The Idea of "Disposability" Is a New and Noxious Fiction – Gabrielle Hecht | Aeon Essays'. Aeon. Accessed 26 March 2020.

<https://aeon.co/essays/the-idea-of-disposability-is-a-new-and-noxious-fiction>.

Hirst, Gabriella, and Warren Harper. *An English Garden*. Westcliff-on-Sea. Essex: The Old Waterworks, 2021.

- Hirst, Gabriella, artist website, <https://gabriellahirst.com>. Accessed 8 November 2023.
- . *Battlefield* project website, <https://www.battlefield.garden/>. Accessed 17 November 2023.
- Hogg, Jonathan. *British Nuclear Culture: Official and Unofficial Narratives in the Long 20th Century*. London ; New York: Bloomsbury Academic, an imprint of Bloomsbury Publishing Plc, 2016.
- . “‘The Family That Feared Tomorrow’: British Nuclear Culture and Individual Experience in the Late 1950s”. *The British Journal for the History of Science* 45, no. 4 (December 2012): 535–49. <https://doi.org/10.1017/S0007087412001045>.
- Ingold, Tim. ‘The Temporality of the Landscape’. *World Archaeology* 25, no. 2 (October 1993): 152–74. <https://doi.org/10.1080/00438243.1993.9980235>.
- ‘Institutional barriers hold back working class staff in colleges and universities, report shows’, <https://www.ucu.org.uk/barriersholdbackworkingclassstaff>. Accessed 17 November 2023.
- Jacobs, Sara, Emily Gordon, and smudge studio. ‘Smudge Studio by Sara Jacobs, Emily Gordon - BOMB Magazine’. *BOMB Magazine*, 2014. <https://bombmagazine.org/articles/smudge-studio/>.
- James, Elsa, artist’s portfolio, <https://www.elsajames.com/portfolio>. Access 17 November 2023.
- Johanna, Dale, ed. *St Peter-On-The-Wall Landscape and Heritage on the Essex Coast*. S.I.: UCL PRESS, 2023.
- Johnston, Megan. ‘Slow Curating as a Reflective Practice’, n.d., 404.
- Kavanagh, Mary. *Mary Kavanagh: Daughters of Uranium*. Lethbridge, AB: Southern Alberta Art Gallery, 2020.
- Kester, Grant H. *The One and the Many: Contemporary Collaborative Art in a Global Context*. Durham: Duke University Press, 2011.
- Kimmerer, Robin Wall. *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge and the Teachings of Plants*. S.I.: PENGUIN BOOKS, 2020.
- . ‘The Serviceberry: An Economy of Abundance’ in *Emergence Magazine*, October 2022, <https://emergencemagazine.org/essay/the-serviceberry/>. Accessed 17 November 2023.
- Kincaid, Jamaica, and Jill Fox. *My Garden (Book)*. New York: Farrar Straus Giroux, 2001.
- Kinsella, John, and Charmaine Papertalk Green. ‘Undermining’. *Angelaki* 22, no. 3 (3 July 2017): 63–65. <https://doi.org/10.1080/0969725X.2017.1387366>.
- Kirsch, Scott. ‘Watching the Bombs Go Off: Photography, Nuclear Landscapes, and Spectator Democracy’. *Antipode* 29, no. 3 (July 1997): 227–55. <https://doi.org/10.1111/1467-8330.00045>.
- Krauss, Rosalind. ‘Sculpture in the Expanded Field’. *October* 8 (1979): 30. <https://doi.org/10.2307/778224>.
- Kupa Piti Kungka Tjuta, and Nina Brown, eds. *Talking Straight out: Stories from the Irati Wanti Campaign*. Coober Pedy, S. Aust: Alapalatja Press, 2005.
- Lauzon, Claudette, and John O’Brian, eds. *Through Post-Atomic Eyes*.

- McGill-Queen's/Beaverbrook Canadian Foundation Studies in Art History. Montreal ; Kingston ; London ; Chicago: McGill-Queen's University Press, 2020.
- Lawless, Katherine. 'Mapping the Atomic Unconscious: Postcolonial Capital in Nuclear Glow'. In *Materialism and the Critique of Energy*. Chicago: MCM Publishing, 2018.
- Lester, Karina, Lisa Radford, Yhonnie Scarce, David Sequeira, Patrice Sharkey, and Azza Zein. *The Image Is Not Nothing (Concrete Archives) Catalogue*. Edited by Lisa Radford. Adelaide: ACE Open and Person Books, 2021.
- Lester, Yami. *Yami: The Autobiography of Yami Lester*. Alice Springs, Australia: Institute for Aboriginal Development Publications, 1993.
- Liboiron, Max. *Pollution Is Colonialism*. Durham: Duke University Press, 2021.
- Lind, Maria, ed. *Performing the Curatorial: Within and beyond Art*. Berlin: Sternberg Pr, 2012.
- Lippard, Lucy R. *The Lure of the Local: Senses of Place in a Multicentered Society*. New York: New Press, 1997.
- . *Undermining: A Wild Ride through Land Use, Politics, and Art in the Changing West*. New York: The New Press, 2013.
- Lovins, Amory. *Brittle Power: Energy Strategy for National Security*. Place of publication not identified, 1983. <https://archive.org/details/brittlepowerener00lovi>.
- Lytticken, Sven. 'Shattered Matter, Transformed Forms: Notes on Nuclear Aesthetics, Part', 2018, 11.
- Mabb, David. 'Protest and survive: Reclaiming William Morris from Britain's nuclear fleet' (20 September 2016), <https://thebulletin.org/2016/09/protest-and-survive-reclaiming-william-morris-from-britains-nuclear-fleet/>. Accessed 17 November 2023.
- Macfarlane, Robert. 'This Desolate English Path Has Killed More than 100 People', 2017. <http://www.bbc.com/travel/story/20170110-why-the-broomway-is-the-most-dangerous-path-in-britain>. Accessed 17 November 2023.
- Malin, Stephanie A., and Becky Alexis-Martin. 'Embedding the Atom: Pro-Neoliberal Activism, Polanyi, and Sites of Acceptance in American Uranium Communities'. *The Extractive Industries and Society*, January 2019, S2214790X18302508. <https://doi.org/10.1016/j.exis.2018.12.004>.
- Marder, Michael, and Anaïs Tondeur. *The Chernobyl Herbarium: Fragments of an Exploded Consciousness*. Open Humanities Press, 2016. https://doi.org/10.26530/OAPEN_606220.
- Marsh, Sarah, "Essex Girl' removed from dictionary following campaign', <https://www.theguardian.com/uk-news/2020/dec/05/essex-girl-removed-from-dictionary-following-campaign>. Accessed 17 November 2023
- Marris, Emma. *Rambunctious Garden: Saving Nature in a Post-Wild World*. Paperback ed. New York: Bloomsbury, 2013.
- Martinon, Jean-Paul. *The Curatorial: A Philosophy of Curating*. London: Bloomsbury, 2013.

- Masco, Joseph. 'Life Underground: Building the Bunker Society' 1, no. 2 (2009): 17.
- . *The Nuclear Borderlands: The Manhattan Project in Post-Cold War New Mexico*. Princeton, N.J: Princeton University Press, 2006.
- Metal Culture, 'Public Statement - An English Garden', <https://metalculture.com/2021/07/13/public-statement-an-english-garden>. Accessed 17 November 2023.
- Misler, Andrea. 'The Othona Community: "A Strange Phenomenon"'. Doctor of Philosophy, University of Birmingham, 2017.
- Mitchell, W. J. T., ed. *Landscape and Power*. Chicago: University of Chicago Press, 1994.
- Mitchell, W. J.T. 'There Are No Visual Media'. *Journal of Visual Culture* 4, no. 2 (August 2005): 257–66. <https://doi.org/10.1177/1470412905054673>.
- Mittman, Jan Dirk and Burringja (Dandenong Ranges Cultural Centre Inc.). *Black Mist Burnt Country: Testing the Bomb. Maralinga and Australian Art / *, 2016. <http://blackmistburntcountry.com.au>.
- Monnet, Livia, ed. *Toxic Immanence: Decolonizing Nuclear Legacies and Futures*. Montreal Kingston London Chicago: McGill-Queen's University Press, 2022.
- Möntmann, Nina. 'The Curatorial and Its Mediation'. *Journal of Curatorial Studies* 6, no. 2 (1 October 2017): 242–53. https://doi.org/10.1386/jcs.6.2.242_1.
- Moore, Jason W. *Anthropocene or Capitalocene? Nature, History, and the Crisis of Capitalism*, 2016.
- Morpurgo, Michael. 'Michael Morpurgo on Bradwell-on-Sea: "The Exhilaration of Infinite Beauty"'. *The Guardian*, 6 October 2018, sec. Books. <https://www.theguardian.com/books/2018/oct/06/michael-morpurgo-bradwell-sea-essex-villag-e-home>.
- Morton, Timothy. *Hyperobjects: Philosophy and Ecology after the End of the World*. Posthumanities 27. Minneapolis: University of Minnesota Press, 2013.
- Motley, Norman. *Much Ado About Something: A History of The Othona Community*. Othona, 2007.
- Nixon, Rob. *Slow Violence and the Environmentalism of the Poor*. 1. Harvard Univ. Press paperback ed. Cambridge, Mass.: Harvard Univ. Press, 2013.
- Noord, Gerrie van, Paul O'Neill, and Mick Wilson, eds. *Kathrin Böhm: Art on the Scale of Life*. London: Sternberg Press, 2023.
- Nuclear Culture Research Group, https://www.umarts.se/working_group/nuclear-culture-research-group/. Accessed 17 November 2023
- , 'Open Letter: The Name of the Atom Bomb Rose', https://docs.google.com/forms/d/e/1FAIpQLSdoEU0GDcJoFscoHRO2Fa-IPLnyrcQ7hGs_VkGychN5bfKJeA/viewform?pli=1. Accessed 17 November 2023.
- Nuclear Waste Services, 'The Siting Process for a Geological Disposal Facility (GDF)', (published

19 December 2018, last updated 18 February 2020)

<https://www.gov.uk/government/publications/the-siting-process-for-a-geological-disposal-facility-gdf>. Accessed 17 November 2023.

- O'Brian, John. *The Bomb in the Wilderness: Photography and the Nuclear Era in Canada*. Brenda and David McLean Canadian Studies Series. Vancouver, BC: UBC Press, 2020.
- O'Brian, John, and Art Gallery of Ontario, eds. *Camera Atomica: Art Gallery of Ontario, 8 July 2014 - 25 January 2016*. London: Black Dog Publ. [u.a.], 2015.
- Offord, Baden. 'Beyond Our Nuclear Entanglement'. *Angelaki* 22, no. 3 (3 July 2017): 17–25. <https://doi.org/10.1080/0969725X.2017.1387360>.
- O'Neill, Paul. *The Culture of Curating and the Curating of Culture(s)*. Cambridge, Massachusetts ; London, England: The MIT Press, 2012.
- O'Neill, Paul, and Andreasen Søren, eds. *Curating Subjects*. London: Open Editions, 2007.
- O'Neill, Paul, Lucy Steeds, and Mick Wilson, eds. *How Institutions Think: Between Contemporary Art and Curatorial Discourse*. Cambridge, MA: The MIT Press, 2017.
- O'Neill, Paul, and Mick Wilson, eds. *Curating and the Educational Turn*. London: Open Editions, 2010.
- , eds. *Curating Research*. Occasional Table. London : Amsterdam: Open Editions ; de Appel, 2015.
- O'Neill, Paul, Mick Wilson, and Lucy Steeds, eds. *The Curatorial Conundrum: What to Study? What to Research? What to Practice?* Cambridge, Massachusetts: The MIT Press, 2016.
- Parkhill, K.A., K.L. Henwood, N.F. Pidgeon, and P. Simmons. 'Laughing It off? Humour, Affect and Emotion Work in Communities Living with Nuclear Risk1: Laughing It Off?' *The British Journal of Sociology* 62, no. 2 (June 2011): 324–46. <https://doi.org/10.1111/j.1468-4446.2011.01367.x>.
- Parkhill, Karen A, Nick F Pidgeon, Karen L Henwood, Peter Simmons, and Dan Venables. 'From the Familiar to the Extraordinary: Local Residents' Perceptions of Risk When Living with Nuclear Power in the UK'. *Transactions of the Institute of British Geographers* 35, no. 1 (2010): 39–58.
- Pearson, Trevor. 'Shoeburyness Range, Essex: A Desk-Top Assessment of Its Historic Assets'. Research Department Reports. Historic England, n.d.
- Peterson, Per F., William E. Kastenberg, and Michael Corradini. 'Nuclear Waste and the Distant Future'. *Issues in Science and Technology; Washington* 22, no. 4 (Summer 2006): 47–50.
- Pitkanen, Laura. 'A Hot Commodity: Uranium and Containment in the Nuclear State'. Doctor of Philosophy, University of Toronto, 2014. https://tspace.library.utoronto.ca/bitstream/1807/74820/3/Pitkanen_Laura_L_201411_PhD_thesis.pdf.
- . 'Tactics and Strategies of Containment: Preserving State Power in Canadian Uranium Refining'. *The Extractive Industries and Society* 7, no. 2 (April 2020): 544–55. <https://doi.org/10.1016/j.exis.2019.10.003>.

- Pitkanen, Laura, and Matthew Farish. 'Nuclear Landscapes'. *Progress in Human Geography* 42, no. 6 (December 2018): 862–80. <https://doi.org/10.1177/0309132517725808>.
- Povinelli, Elizabeth A. *Geontologies: A Requiem to Late Liberalism*. Durham: Duke University Press, 2016.
- Preservation of Records, Knowledge and Memory (RK&M) across Generations, <https://www.oecd-nea.org/rwm/rkm/>. Accessed 17 November 2023
- Raish, Scott. 'First of the UK's Earliest Nuclear Sites to Be Sealed for a Period of "Care and Maintenance" - Cleaning up Our Nuclear Past: Faster, Safer and Sooner', 2017. <https://nda.blog.gov.uk/2017/01/16/first-of-the-uks-earliest-nuclear-sites-to-be-sealed-for-a-period-of-care-and-maintenance/>.
- Rajala, Ulla, and Philip Mills, eds. *Forms of Dwelling: 20 Years of Taskscapes in Archaeology*. 1st ed. Oxbow Books, 2017.
- Ravinet, James. Artist website, <https://jamesravinet.info>. Accessed 17 November 2023.
- Reckitt, Helena. 'Support Acts: Curating, Caring and Social Reproduction'. *Journal of Curatorial Studies* 5, no. 1 (1 February 2016): 6–30. https://doi.org/10.1386/jcs.5.1.6_1.
- Reilly, Maura, and Lucy R. Lippard. *Curatorial Activism: Towards an Ethics of Curating*. New York: Thames & Hudson, 2018.
- Rito, Carolina. 'Infrastructures of the Exhibitionary'. In *Exhibitionary Acts of Political Imagination / Acte Expoziționale de Imaginație Politică*, edited by Cătălin Gheorghe and Mick Wilson, 70–79. Editura Artes and ArtMonitor, 2021.
- Rito, Carolina, and Bill Balaskas, eds. *Institution as Praxis: New Curatorial Directions for Collaborative Research*. Berlin: Sternberg Press, 2020.
- Ruhland, Grit. "What Art Can Tell About Modified Environmental Systems." 11th ICARD | IMWA | WISA MWD 2018 Conference – Risk to Opportunity II (2018): 1117–24.
- Runyan, Anne Sisson. 'Disposable Waste, Lands and Bodies under Canada's Gendered Nuclear Colonialism'. *International Feminist Journal of Politics* 20, no. 1 (12 February 2018): 24–38. <https://doi.org/10.1080/14616742.2017.1419824>.
- Santos, Boaventura de Sousa, ed. *Another Knowledge Is Possible: Beyond Northern Epistemologies*. Reinventing Social Emancipation: Toward New Manifestos, Volume 3. London: Verso, 2008.
- . *Epistemologies of the South: Justice against Epistemicide*. London New York: Routledge, 2016.
- Scarce, Yhonnie, Max Delany, and Australian Centre for Contemporary Art. *Missile Park*, 2021.
- Schuppli, Susan. *Material Witness: Media, Forensics, Evidence*. Leonardo. Cambridge, MA: The MIT Press, 2020.
- . *Trace Evidence*, 2016. <https://susanschuppli.com/TRACE-EVIDENCE>. Accessed 17 November 2023
- Scarce, Yhonnie and Lisa Radford eds., *The Image is Not Nothing*, Art + Australia, <https://www.artandaustralia.com/online/online/image-not-nothing-concrete-archives.html>. Accessed 17 November 2023.

- Scott, Emily Eliza, and Kirsten Swenson, eds. *Critical Landscapes: Art, Space, Politics*. Oakland, California: University of California Press, 2015.
- Simensky, N. *Leaky Transmissions* project website, <http://leakytransmissions.com/>. Accessed 17 November 2023
- . artist website, <http://nastassja-simensky.com/>. Accessed 8 November 2023
- Simpson, Leanne. *As We Have Always Done: Indigenous Freedom through Radical Resistance*. Indigenous Americas. Minneapolis London: University of Minnesota Press, 2017.
- Smithson, Robert, and Jack D. Flam. *Robert Smithson, the Collected Writings*. The Documents of Twentieth-Century Art. Berkeley: University of California Press, 1996.
- Stilgoe, John R. *What Is Landscape?* Cambridge, Massachusetts: MIT Press, 2018.
- Storm, Anna. *Post-Industrial Landscape Scars*. New York: Palgrave Macmillan, 2014.
- The Anthropocene Curriculum, <https://www.anthropocene-curriculum.org>. Accessed 16 November 2023
- The Siting Process for a Geological Disposal Facility (GDF), UK Government website, <https://www.gov.uk/government/publications/the-siting-process-for-a-geological-disposal-facility-gdf>. Accessed 24 November 2023.
- Thomas, Antonia, Daniel Lee, Ursula Frederick, and Carolyn White. 'Beyond Art/Archaeology: Research and Practice after the "Creative Turn".' *Journal of Contemporary Archaeology* 4, no. 2 (2 February 2018): 121–29. <https://doi.org/10.1558/jca.33150>.
- Thomson, J. and A. Craighead, *Temporary Index*, https://www.thomson-craighead.net/temporary_index.html. Accessed 17 November 2023.
- Tory Councillors Remove Artwork Exploring Britain's Nuclear Armament*. Accessed 2 August 2021. <https://www.youtube.com/watch?v=hyWYFC7RFiY>.
- Triscott, Nicola. 'Art and Intervention in the Stewardship of the Planetary Commons: Towards a Curatorial Model of Co-Inquiry'. University of Westminster, 2017.
- . 'Curating Contemporary Art in the Framework of the Planetary Commons'. *The Polar Journal* 7, no. 2 (3 July 2017): 374–90. <https://doi.org/10.1080/2154896X.2017.1373916>.
- Tronto, Joan C. *Moral Boundaries: A Political Argument for an Ethic of Care*. New York: Routledge, 1993.
- Tsing, Anna L. 'On Nonscalability: The Living World Is Not Amenable to Precision-Nested Scales'. *Common Knowledge* 18, no. 3 (1 October 2012): 505–24. <https://doi.org/10.1215/0961754X-1630424>.
- Tsing, Anna L. 'Salvage Accumulation, or the Structural Effects of Capitalist Generativity — Cultural Anthropology'. Accessed 28 November 2018. <https://culanth.org/fieldsights/656-salvage-accumulation-or-the-structural-effects-of-capitalist-generativity>.
- Tsing, Anna L. 'Feral Atlas: The More-Than-Human Anthropocene'. Stanford University Press, 2020. <http://feralatlant.org>.

- Tsing, Anna L, ed. *Arts of Living on a Damaged Planet*. Minneapolis: University of Minnesota Press, 2017.
- . *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins*, 2015.
- Tuck, Eve, and K. Wayne Yang. “Decolonization Is Not a Metaphor.” *Decolonization: Indigeneity, Education & Society* 1, no. 1 (September 8, 2012).
- Tynan, Elizabeth. *Atomic Thunder: The Maralinga Story*. Sydney, NSW: NewSouth Publishing, 2016.
- Van Wyck, Peter C. ‘An Emphatic Geography: Notes on the Ethical Itinerary of Landscape’. *Canadian Journal of Communication* 33, no. 2 (1 June 2008).
<https://doi.org/10.22230/cjc.2008v33n2a2007>.
- . *Signs of Danger: Waste, Trauma, and Nuclear Threat*. Theory out of Bounds, v. 26. Minneapolis: University of Minnesota Press, 2005.
- Venables, Dan, Nick Pidgeon, Peter Simmons, Karen Henwood, and Karen Parkhill. ‘Living with Nuclear Power: A Q-Method Study of Local Community Perceptions’. *Risk Analysis* 29, no. 8 (August 2009): 1089–1104. <https://doi.org/10.1111/j.1539-6924.2009.01259.x>.
- Veth, Peter. ‘The Aboriginal Occupation of the Montebello Islands, Northwest Australia’, n.d., 13.
- Volkmar, Anna. *Art and Nuclear Power: The Role of Culture in the Environmental Debate*. Environment and Society. Lanham: Lexington Books, 2022.
- Weir, A., *Pazugoo*, <https://www.andyweirart.com/pazugoo>. Accessed 17 November 2023.
- Whelan, Ella. ‘A “Problematic” Artwork Row Proves the Tories Can Be as Illiberal as the next Social-Justice Warrior’. *The Telegraph*, 20 July 2021.
<https://www.telegraph.co.uk/art/what-to-see/problematic-artwork-row-proves-tories-can-illiberal-next-social/>.
- Williams, Robert, and Bryan McGovern Wilson. *Cumbrian Alchemy*. University of Cumbria: UniPress Cumbria, 2013.
- Willis, Kirk. ‘The Origins of British Nuclear Culture, 1895–1939’. *Journal of British Studies* 34, no. 1 (January 1995): 59–89. <https://doi.org/10.1086/386067>.
- Wilson, Brett, Barbara Hawkins, and Stuart Sim. ‘Art, Science and Communities of Practice’. *Leonardo* 48, no. 2 (April 2015): 152–57. https://doi.org/10.1162/LEON_a_00972.
- Wolfe, Patrick. ‘Settler Colonialism and the Elimination of the Native’. *Journal of Genocide Research* 8, no. 4 (December 2006): 387–409. <https://doi.org/10.1080/14623520601056240>.
- Yearsley, Ian. *The Islands of Essex*. Romford: Ian Henry Publ, 1994.
- Yusoff, Kathryn. *Billion Black Anthropocenes or None*. Place of publication not identified: UNIV OF MINNESOTA Press, 2018.
- Zonabend, Françoise. *The nuclear peninsula*. Cambridge [England]; New York, NY, USA; Paris: Cambridge University Press ; Editions de la maison des Sciences de l’homme, 1993.
<http://site.ebrary.com/id/10460140>.
- Zylinska, Joanna. *Minimal Ethics for the Anthropocene*. Critical Climate Change. Open Humanities Press, 2014. <https://doi.org/10.3998/ohp.12917741.0001.001>.

Appendices

Appendix one: Field reports from the Blackwater Estuary

5 November 2018

Field Trip #1—Jimmy the Detectorist

I had not been to the Blackwater Estuary for some time so felt it was important to visit soon after starting my PhD. So I went to stay at the Othona Community on the Estuary. I decided to go with no itinerary and just spend time in the landscape. After arriving at the Othona Community I wanted to take a walk towards Bradwell Nuclear Power Station. Othona is protected somewhat from the winds coming in from the mouth of the Blackwater and the North Sea beyond, due it being setback slightly, shielded by trees and the coastal defences that slope up. I walked out of Othona and onto the raised walkway on the aforementioned slope, before stepping up you might not even know you are by the Estuary. The expanse of the landscape and the sea beyond opens up as soon as you set foot on the walkway.

I set off along the walkway towards the power station, it was around 3pm so I wanted to get there and back while it remained light enough, because I did not have a torch, only the light on my phone to guide the way. I walked towards the power station and away from Othona with the Estuary to my right with the reactor buildings acting as my guide, they remind me of the ominous structure in John Smith's *The Black Tower* (1987). Punctuating the concrete paved walkway underfoot are Second World War pillboxes that were built to protect from invasion from the Estuary's waters, they would have served the Bradwell Bay Airfield that would have occupied much of the arable land between the Othona Community and Bradwell Nuclear Power Station—this land is now a large part of the planning permission granted for investigative works relating to a new nuclear power station. A lot of the openings for the pillboxes are now bricked up, but some remain open, flooded with water, litter and chalk graffiti on the walls from the 1960s.

About halfway to the power station, on top of one of the pillboxes looking out over the Estuary I saw a bike laying on its side. I could not see whether it was abandoned or if it had an owner, it laid there with a tatty carrier bag over its seat and an old plastic water bottle in the bottle holder within the bike frame. The bike looked like it had been through the wars, a well travelled and much loved mode of transport. Just before walking past, assuming the bike may have been abandoned, I saw a figure in the distance over by the beach walking towards the bike and I. The person had long scraggly hair under a fisherman's style beanie hat. His clothes were all dark and earthy colours: browns, beiges, khaki greens, navy blues, blacks. From about thirty feet away I noticed some kind of tool or instrument in his hand. The closer he came the more I started to realise it was a metal detector. So I thought I'd ask—similar to when I used to ask "have you caught anything?" when walking around the local fishing lakes in Basildon—"did you find anything?"

He replied saying not much today and showed me what he did uncover: a glass bottle. He estimated that it was roughly 150 years old on the account of it not having a screw top lid. The man's name was Jimmy, he had been using his metal detector along the shores of the Blackwater since 1971, when one of Jimmy's friends bought him a metal detector from the US when his friend's band was touring there.

Jimmy spoke enthusiastically about metal detecting, professing that everything he has found is interesting one way or the other. In the past this has included lots of explosives, but now if he finds anything like this he doesn't tell the authorities. According to Jimmy, when he has they have treated him like a criminal: demanded that he get down on his knees; or handcuffed him; or generally treating him with suspicion. Then to add insult to injury they would take away what he has found. So calling the authorities would just cause him grief as far as he was concerned. So if Jimmy finds anything like this now he doesn't tell anyone.

It was clear that Jimmy wanted to chat, and it became obvious that when he did he liked to grab your attention and keep it. After talking about his findings I asked what kinds of things he has found of value, be that monetary, historic or what have you. Jimmy began telling me about his friend Wayne, who now lives in Wickford, Essex. Wayne used to be one of the UK's most wanted bird egg thieves. He used to camp out by nests of rare birds and lift the eggs when the opportunity arose. He didn't do it for any other reason, Jimmy claims, other than his obsession to collect them—when I got back to Othona that evening I googled to see whether I could find a Wayne who was a rare egg thief, of which I did search and find someone...

Wayne and Jimmy met through a group at a hospital that they both attend due to an experience they both share. Both of them, according to Jimmy, have had death experiences. Wayne's came from a moment when he was staking out a bird's nest. Unknown to him he was being watched by conservators and the police. Jimmy explained how when Wayne attempted to retrieve the eggs he fell and was found dead at the scene, only to be brought back to life. Jimmy has had a similar death experience and now they both go to the hospital periodically to be subjects of a particular research project. This is how they met. I didn't find out about Jimmy's death experience.

This bewildering story, which was somewhat of a digression, was told because Wayne now collects onion shaped glass bottles. These were vessels often used to carry wine or something similar on ships and were wide at the bottom to prevent toppling. Apparently the most desirable can reach large sums of money, so when Jimmy ever finds them he sells or gives them to Wayne.

Before I left Jimmy to continue my walk towards the power station I asked him about his death experience. He didn't tell me how it happened but did express ways in which it has changed the ways he sees the world around him, particularly in relation to the Blackwater Estuary. He told me how when one visits the Estuary you 'eclipse yourself', and I am still working out what he means by this. The death experience allowed him to start to view people like they do not have a past. So you could say without prejudice or judgement? He said rather than considering himself as the one looking out at the landscape—the Estuary—it is the landscape that is looking out at him.

And I don't know exactly what he meant by this, but intuitively there is something here that resonates. Perhaps it is the decentring of human agency that the comment implies, or something like this... On this note, after about an hour had passed, I thanked Jimmy and he left. I carried on for a short time walking towards the power station, obsessing over Jimmy's outlandish stories. It was too dark to go all the way, so I resigned to turning back, fumbling down the pathway on the coastline in complete darkness back to Othona. The only light to guide me was from my mobile phone.

17-18 April 2019

Field Trip #2—with artist Nastassja Simensky

Day 1

My second trip to the Estuary was with Nottingham based artist Nastassja Simensky. Nastassja works across moving image, writing, music and performance in conjunction with fieldwork and collaboration. Her work is place-specific and involves research around entangled ecologies of political, social and technological landscapes.

This visit will be the first of a series with Nastassja where we will continue discussions around my curatorial and her artistic practices and how they crossover, informing an engaged and sustained inquiry around the Blackwater Estuary. During this first trip we wanted to keep the itinerary loose, using this as an opportunity to explore the landscape together, and talk about a possible collaborative project that feeds into my overarching premise of a curatorial project that begins with the nuclear landscape of the Blackwater Estuary as a point of departure.

After arriving at the Othona Community around lunch time on Wednesday 17 April we went to take a look at the historic Chapel of St. Peter-on-the-Wall. The chapel is a Grade I listed building, originally built by Cedd in 654, an Anglo-Celtic church built for the East Saxons on top of the ruins of a former Roman fort, Othona—the namesake of the Othona Community. After this we went to the nearby Bradwell Bird Observatory. It sits on the edge of the Dengie National Nature Reserve and the cottage which is situated there and now used by birdwatchers was the home of the Linnet family. The Linnet family moved into the cottage in the 1870s, before this the cottage housed the seaman during the Napoleonic wars who worked the semaphore station that was installed at St. Peter's.

After seeing the Bird Observatory, St. Peter's and looking out onto the Dengie National Nature Reserve we then walked past Othona and along the Estuary towards the power station. After passing the power station we continued walking south towards Bradwell Village. There we visited St. Thomas's Church, in there is a stained glass window showing St. Cedd cradling a model of the Chapel of St. Peter-on-the-Wall. St. Peter-on-the-Wall is one of the main reasons Othona was founded where it was. We then went to the village pub, the King's Head, a typically quaint pub with exposed beams and a large open fireplace. We rested, reflected on the walk and then headed back up to the Othona Community for dinner, which was put on by the volunteers at the Community.

During the evening Nastassja and I discussed possible lines of enquiry for our collaborative project on the Estuary. We identified two key themes to focus on initially: waste and extraction. These are a couple of key themes relative to the nuclear cycle more broadly and the Estuary in particular. In terms of waste at Bradwell nuclear power station there is an interim storage facility that stores Intermediate Level Waste (ILW) from Bradwell nuclear power station. Waste packages from Sizewell A and Dungeness A are also stored at the Bradwell facility. All of this will remain there until a geologic disposal facility is established somewhere in the UK. This will take decades if not centuries. Fuel Element Debris (FED) is also a waste product and has been discharged into the Estuary. FED consists mainly of Magnox metal and graphite, with small quantities of other metallic items. For the waste to be discharged into the Estuary it undergoes treatment by dissolution. This involves dissolving the magnox metal within an acid solution to bring it within safe levels of radioactivity and then discharging the effluent into the Estuary at high tide. FED discharge into the Estuary ceased on 17 June 2017.

The practice or theme of extraction comes in through the fuel that is left at the waste storage facility. The uranium that powered Bradwell's reactors was invariably extracted from uranium mines in Australia, Canada, Democratic Republic of Congo, Namibia and South Africa. In addition to this there are extractive practices currently being undertaken for the proposed new nuclear programmes in the area. In between the Othona Community and Bradwell nuclear power station is land where planning permission has been passed. On this land investigative works are underway for a proposed new nuclear power station. These works involve drilling down as deep as 150 metres and extracting core samples. These cores are then stored and tested on to gain insights into the geology of the area and its suitability for a new nuclear power station's infrastructure.

Day 2

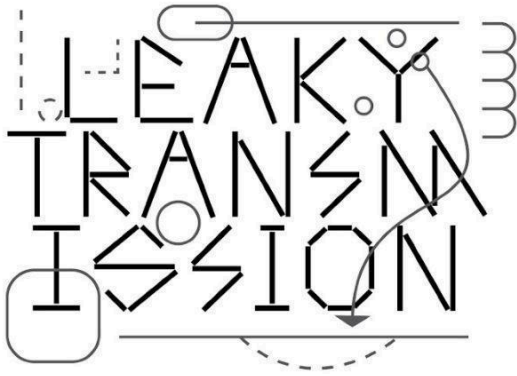
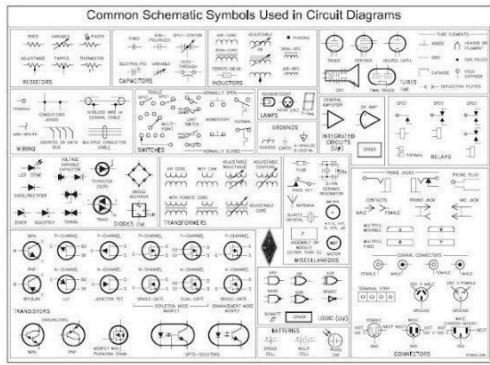
Before every meal at Othona a bell is rung to alert everyone that their food is nearly ready. After getting up we answered to the bell and finished our breakfast. Nastassja and I then went on our second walk, this time we headed south alongside the Dengie National Nature Reserve, starting at Othona and passing St. Peter's Chapel. The North Sea was out beyond the marshes on our left, the haze prevented us from seeing any of the off-shore wind farms: Gunfleet Sands or the London Array, which are out at sea. When we reached a pump house we headed north-west and in the distance we saw a Marsh Harrier gliding over the fields looking for possible prey. Continuing in this direction for about 30 minutes we passed through Bradwell wind farm, which consists of 10 turbines nearby Bradwell-on-Sea. This perhaps foregrounds the thinking about the dynamics of energy production in the area: we leave Othona who produce their own, walked by the nuclear power station yesterday and then through renewable turbines today; arguably the Blackwater Estuary as a microcosm of energy production has some traction, particularly energy production that must seriously begin to digress from fossil fuels. Our walk finished on the long Roman road that leads back towards St. Peter-on-the-Wall. We returned to Othona for lunch before leaving, ruminating on the first field trip of many to come.

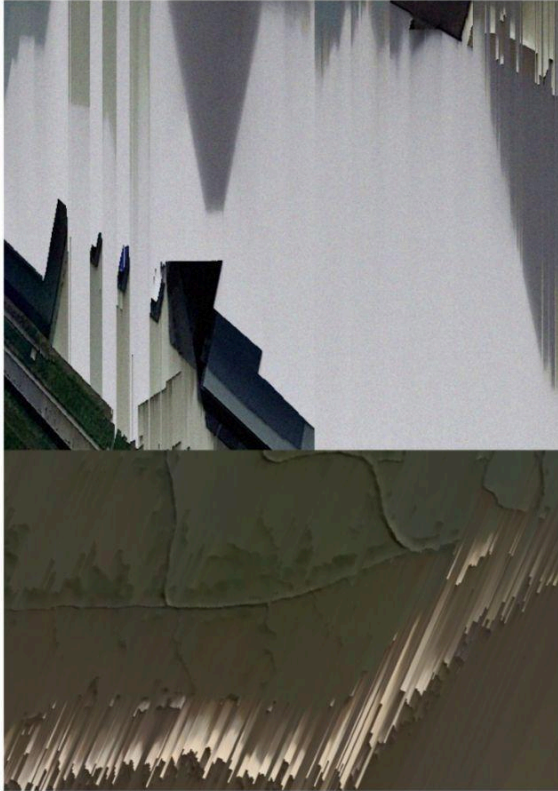
LEAKY
TRANSMISSIONS
NASTASSJA
SIMENSKY

Type 1: 'Mono'

LEAKY
TRANSMISSIONS
NASTASSJA
SIMENSKY

Type 2: 'Anthony'





Appendix two: Marginal Anthropocenes: Heritage and Sustainability in Peripheral Spaces. Workshop indefinitely cancelled due to COVID

Marginal Anthropocenes: Heritage and Sustainability in Peripheral Spaces

Date: Early June 2020, date TBC

Location: Othona, Essex

“Assemblages are open-ended gatherings. They allow us to ask about communal effects without assuming them. They show us potential histories in the making.”

Anna Tsing, *The Mushroom at the End of the World*, 2015, p.23

The Anthropocene is often seen as a totalising concept: a way of masking the complexities and injustices of modernity under the rubric of a new ‘human-made’ geological epoch. Critical scholarship across the arts, humanities and social sciences has done much to challenge this narrative, mapping out alternative vocabularies, histories and ways of living in times of ecological uncertainty. To borrow from Tsing, this work demands ‘open-ended gatherings’ and transdisciplinary assemblages to tease out the entangled effects and potential futures of the Anthropocene as a history in the making.

This workshop will investigate the different modalities of care, stewardship, sustainability and maintenance discernible within and across a specific Anthropocene landscape; in this case the Blackwater Estuary in Essex. Our starting point will be Othona – an off-grid community established in 1946 as an experiment in Christian community, where visitors are invited to build and maintain a ‘common world’ in collaboration with the natural environment. A short walk along the sea front from Othona is Bradwell Nuclear Power Station, decommissioned in 2002 and now entering a ‘care and maintenance’ phase. Closer still can be found St Peter-on-the-Wall, a seventh century chapel built using bricks and stones from an abandoned Roman Fort, and still in active use as a site of worship and pilgrimage today. These interwoven topographies of devotion, uranium, conquest, decay and regeneration speak to the more-than-human resonances of the Anthropocene, but also to the possibilities of resistance and flourishing that still endure in its shadow.

Othona and the wider Blackwater Estuary trouble many of the foundational concepts of the heritage field. Issues of care, protection, endangerment, conservation and memory look very different for those managing nuclear waste, assembling a sustainable future, or stewarding an ancient sanctuary. Through walking tours, facilitated discussions, expert talks and creative interventions, this workshop will explore the *radical temporalities* and *more-than-human processes* in play across this heterogeneous landscape. In so doing we aim to foster a generative dialogue between archaeology, heritage, geography, anthropology, environmental conservation and curatorial practice. To help achieve this goal, artist Nastassja Simensky and curator Warren Harper will lead on the co-production of a research ‘artefact’ documenting the conversations, occlusions, affordances and potentialities ‘unearthed’ in the Blackwater Estuary. This approach seeks to demonstrate the value of creative methodologies for understanding such multifaceted contexts.

Finally, our focus on the coastal region around Othona provides an opportunity to open up the problematic notion of ‘marginality’ to renewed critical scrutiny. As Amitav Ghosh writes in *The Great Derangement*, the Anthropocene has ‘reversed the temporal order of modernity: those at the margins are now the first to experience the future that awaits us all.’ But what if this future is not framed in terms of breakdown, loss and collapse, but rather as an opportunity for generative collaboration across human and non-human worlds? What happens if we take seriously those practices of care, stewardship, maintenance and community that have precisely been marginalised in and by the Anthropocene? Addressing these questions does not mean embracing a nostalgic version of the past, but rather speculating on what a *future* heritage might look like.

Application Text (submitted by Colin Sterling)

This activity aims to develop a new interdisciplinary network and research project focused on diverse notions of care, sustainability and stewardship in the Anthropocene. Building on the lead applicants current research, which is situated in the cross-disciplinary field of critical heritage studies, the activity will explore key interfaces with other departments in the Faculty and beyond, including Geography, Anthropology, History of Art, The Bartlett and The Slade. The grant will fund a pilot activity bringing together scholars, artists and community stakeholders in a site-specific workshop investigating alternative approaches to conservation, care and maintenance in peripheral spaces undergoing rapid environmental change. In collaboration with curator Warren Harper and artist Nastassja Simensky, both of whom work in and around the proposed research site of the Blackwater Estuary (details below), this exploratory activity will focus on the value of creative methodologies for investigating such spaces, leading to a grant application on these themes.

The proposed activity will provide a springboard for further trans-disciplinary research on climate change, sustainability and the Anthropocene. Emerging from the project lead's recent AHRC-funded investigation of heritage and posthumanism, the workshop and subsequent grant development will consolidate research in a number of areas and position critical heritage as a vital interlocutor in future debates on the Anthropocene within and beyond UCL. In particular, the activity will bring together scholars and practitioners in the arts and humanities with social and natural scientists to consider the vital importance of more-than-human perspectives on care, stewardship, temporality, conservation and change: all foundational concepts of the heritage field that have taken on new meaning in the shadow of the Anthropocene. Developing the grant application will provide a structure for inter-Faculty networking on these themes, while the workshop itself will act as a pilot for creative methodologies that might be applied in future pedagogy.

A site-specific workshop will be held at Othona – an off-grid community located on the Blackwater Estuary in Essex. The landscape surrounding Othona offers a microcosm of the different ecologies of care, sustainability and stewardship that have come to define the Anthropocene. At the centre of the landscape is St Peter-on-the-Wall, a seventh century chapel built using bricks and stones from an abandoned Roman Fort, and still in active use as a site of worship today. While the Othona community itself seeks to 'live in harmony with nature' – generating around 70% of its power from on-site renewable resources – this work is overshadowed by the nearby Bradwell Nuclear Power Station, decommissioned in 2002 and now entering a 'care and maintenance' phase. The workshop will explore the 'heritage' of these interwoven sites, responding to the ethos of Othona, which aims to build and maintain a 'common world' in collaboration with the natural environment.

The funded work will result in three key outputs. Led by Harper and Simensky, participants on the workshop will co-produce creative outputs documenting the heritage of Othona and the surrounding landscape. This may take the form of a small-press publication generated through photographs, drawings, poems and essays, and/or a specially produced audio piece gathering together sounds and speech from the two days. Following the workshop, and in collaboration with Faculty colleagues, the project lead will develop an outline Leverhulme Research Project Grant application on the theme of care and stewardship in the Anthropocene (c300k). This will include Othona as a case study site alongside other marginal / alternative communities dealing with the immediate impacts of rapid climate change. Finally, as an immediate academic output, Sterling, Harper and Simensky will co-author an article exploring creative approaches to critical Anthropocene research, to be submitted to *Environment and Planning D*.

How to Make a Bomb
Project Proposal
Estuary Festival 2021

Project Description

How to Make a Bomb is a durational gardening project by artist Gabriella Hirst centred on the propagation and redistribution of a nearly-extinct species of garden rose which was created and registered under the name *Rosa floribunda* 'Atom Bomb' in 1953. The project charts the various attempts by Hirst to produce new specimens of the Atom Bomb rose through grafting and cuttings. Propagated plants are distributed throughout gardens in the UK parallel to the resurgence of cold-war-era narratives and fear mongering in the media and political rhetoric. An instructional pamphlet, also titled *How to Make a Bomb*, has been produced to accompany the project.

The 'Atom Bomb' rose is the protagonist of a larger research project by Hirst, unpacking various links and associations embodied by this species, with particular focus on the structures surrounding the development and nuclear weaponry in the 1950's and the concept of nuclear colonialism. The 'Atom Bomb' rose is a vessel to explore ideas of historical global power structures enacted through gardening, a means to approach the ungraspable time scales of nuclear materials, and the coexistence of tenderness and violence within relationships between humans and plants.

From August 2019, the *How to Make a Bomb* project is hosted by [The Old Waterworks](#) (TOW) where the 'Atom Bomb' roses are propagated. TOW is poignantly in close proximity to Foulness Island, a key nuclear weapons development site, where test weapons bound for Maralinga and the Monte Bello Islands were developed in the 1950s. So far Hirst has grafted 60 scions over two years from the 'Atom Bomb' rose onto wild rose stock.

How to Make a Bomb is on show at [CAC Vilnius](#) as part of *Splitting the Atom* from 18 September to 25 October 2020. A series of botanical drawings charting Hirst's investigations are currently being compiled into a publication, to be launched in the second half of 2020.

Our proposal covers three aspects which are to be navigated throughout the two sites:

1. A temporary rose garden;
2. public event called 'The rose garden conference';
3. and a display of large scale drawings from the *How to Make a Bomb* project.

The Rose Garden

The Rose Garden is an installation of a rose bed of Atom Bomb roses and other roses with names associated with military expansion and British Nationalism. The rose bed will feature the *Rosa floribunda* 'Atom Bomb' plants, which we have been propagating at the Old Waterworks, alongside a series of other roses which chart aspects of this plants' relationship with nationalism, imperial expansion and the military (roses such as "White Cliffs of Dover", "Battle of Britain", "William and Catherine").

The rose bed could be installed in either location, either permanently or for a period of several months beginning with the opening of Estuary Festival 2021. However we feel it holds particular significance if placed in Gunners Park, considering the site's rich military history, and ecological diversity, which will sit visually in contrast and in conversation with with the controlled, ordered Rose bed. Significantly, just down the estuary towards the North Sea from Gunners Park is Foulness Island, which was integral to the development of Britain's nuclear weapons programme. Foulness is key reference site for the *How to Make a Bomb* project, which seeks to highlight this site's history and its lasting effects elsewhere, particularly in Australia where the weapons assembled at Foulness were soon after detonated.

The rose bed will provide an interesting and incongruent encounter for the park's visitors, as the traditional and orderly approach to rose gardens will be at odds with the wildlife around it and the wild dog roses within this landscape. Alongside the installation will be a lectern which will provide the visitor information on the project. The rose bed could be directly in the ground or a raised-bed could be built since we acknowledge that biodiversity and maintaining wildlife within the park is of the utmost importance.

Alternatively, the rose bed could be installed in the Cart & Wagon Shed. Since the development of the Cart & Wagon Shed will be to make a home for the local archive group and a heritage centre we propose to install a number of 'Atom Bomb' roses within the new landscaped garden space to the rear of the building. This will add to the centre's primary use of exploring and understanding the military history of the area.

This could be a temporary or permanent installation, depending upon the willingness of members of the heritage centre in tending to the plants, or upon agreement The Atom Bomb Roses could act as a 'living archive', a way to tend to, remember and consider the atomic histories of Essex, and the Shoeburyness Range, is embroiled within.

Two designs are being considered for the Rose Garden, depending on the site chosen, and the restrictions. If in Gunners Park, the preferred design option would be a simple grid in a raised bed, to highlight the militant order and structure of the installation in contrast to the surrounding biosphere. If the Cart and Wagon is chosen, a similar design could be used, or a series of concrete planters which reference the architectural forms of the military heritage buildings at Foulness. Mockups on both designs are included.

Rose Garden Conference

The rose garden will be used as a site for a 'Rose Garden Conference', (riffing off the white houses's press conferences - underscoring the inherently politically charged nature of a rose garden.) This will be a series of talks and film screenings which explore this ecological diversity and it's military history of this site- with particular focus on Maralinga, the site where Britain tested it's weaponry in Australia. Talks would include my lecture 'How to Make a Bomb', which discusses my research into the British imperial project of gardening the world through the vessel of the Atom Bomb rose, David Burn's research into Maralinga (where Britain tested it's weaponry in Australia), and a screening of the film 'Maralinga Tjarutja' by Larissa Behrendt. Other potential avenues for speakers include inhabitants of Foulness and local permaculture practitioner Graham Burnett. The program can happen outdoors with social distancing (with a screen and projector set up in the rose garden itself), or can be screened online (or both). If the conference were to be held outdoors, a formal stage with rows of chairs would be set up in the field around the rose garden, drawing upon the aesthetics of a political conference (red curtains, pulpit etc), albeit out in the middle of a wild ecosystem. The conference would thus become a temporary installation in its own right.

Drawings

To give context to *the Rose Garden*, the important research surrounding it and the history of the site, we propose to display in the Cart & Wagon Shed large prints of the *Drawings Series* which accompanies the *How to Make a Bomb* project. The drawings would be printed as A0 size colour posters hung on frames. A mix of botanical drawings and nuclear diagrams, the drawings blend the horticultural with the nuclear, touching on all aspects of the project and asking questions about the notion of gardening, on the micro and macro scale. One possibility would be to have the drawings displayed here, and the rose garden at Gunners park, to connect these two sites and encourage visitors to travel to both.

The artist and curator of the project, with the support of [Metal](#), will source the funding and install everything in time for Estuary Festival 2021 in May 2021.

The pages overleaf show mock-up sketches of the possible lay out of the roses in Gunners Park; proposed planters for the Cart and Wagon Shed; and a selection of the aforementioned drawings.

Appendix four: The Old Waterworks Public Statement: Censorship of *An English Garden*



Monday 4 July 2021

The Old Waterworks Public Statement

Censorship of *An English Garden*

We have been shocked, dismayed and incredibly disappointed by the actions taken by members of Southend's Conservative Group of Councillors regarding the censorship and ultimate removal of the *An English Garden* installation situated at Gunners Park, Shoeburyness, commissioned by The Old Waterworks and Metal for *Estuary 2021* and due to remain in situ until 31 August 2021.

The councillors made a complaint regarding the content of one of the plaques contained within *An English Garden*, claiming that it is offensive and its content unpalatable. The councillors set unrealistic ultimatums and deadlines regarding the work's removal, forcing decisions to be made in such a way that put unnecessary and unfair pressure on all those involved with the work's production. A demand was made to alter the text contained in the plaque under supervision which undoubtedly would have changed the content and meaning of the artwork, shifting the work's intentions and putting words into the artist's mouth. History is not simply a celebratory fanfare and it is everyone's right to be able to explore the nuances of this shared history and how it has ongoing impacts today.

There has been no positive engagement with the councillors who threatened to play out the dialogue across the media, bypassing all attempts of reasonable discussion. As a result, our co-commissioners, Metal, who hold the site agreement for the installation, ultimately decided that the artwork be removed earlier than anticipated. This was primarily due to ensuring the wellbeing of all those involved in the artwork's installation and exhibition for *Estuary 2021*. TOW supports and understands Metal's position in reaching this decision, however we must also acknowledge that the artist, Gabriella Hirst, disagrees entirely with this action but respects the responsibility Metal has to their staff and communities in these difficult situations.

How to Make a Bomb, the project of which *An English Garden* is a part, has been based at The Old Waterworks for nearly three years, during which extensive research has been carried out. The plaque has been informed by this research, additionally demonstrated in an artist book which accompanies the project. We invite Southend's Conservative Group of Councillors and others to read this and to discuss the project, and its breadth and nuances with us. We have reserved a copy of the book for the group at The Old Waterworks to pick up free of charge.

It was of course not the intent of the work to cause any offence to anyone, particularly residents, but to encourage those that visit the garden to contemplate the complex history of Essex in the UK's nuclear story, which is very complicated. We believe the comments within the statement sent by Councillor Moyies on behalf of Southend's Conservative Group of Councillors on Wednesday 23 June to grossly misinterpret the artwork, providing inadequate and vague justifications with no satisfactory evidence provided. Art is meant to spark debate, provoke thought and encourage new ways of seeing the world, it should not be shut down because what it proposes does not align with the views of individuals, particularly when based on extensive research and historical facts.

There have been no other negative responses throughout the duration of the installation that we are aware of with regards to *An English Garden*. TOW and our partners have welcomed the positive reaction and critical engagement from local residents and the visiting public.

Metal received all of the required permissions and followed all the necessary procedures for the work to be installed. An artwork should not be threatened with removal and censorship in the way that it was and a sensible, constructive and respectful discussion should have been possible. The Old Waterworks unequivocally stands by the work's content and in due course will respond to the Southend Group of Conservative Councillors' statement in detail in order to demonstrate its gaps and inadequacies.

The issues raised and histories evoked by the *How to Make a Bomb* project have been censored and silenced for so long, many people not even being aware of the extent of the nuclear tests in Australia to which the project refers. Therefore we will continue to seek further opportunities locally and in our public programming to discuss the issues the project raises.

Appendix five: Nuclear Culture Research Group Open Letter: The Name of the Atom Bomb Rose

Open Letter: The Name of the Atom Bomb Rose

Dear The Art Newspaper,
Cllr Ian Gilbert, Leader of Southend Borough Council;
Cllr Mulrone, Cabinet Member for Environment, Culture, Tourism & Planning, Southend Borough Council;
Scott Dolling, Director of Culture and Tourism, Southend Borough Council.

The Nuclear Culture Research Group is an international network of artists, curators, and academics in the nuclear arts, humanities and sciences, as well as nuclear professionals. We vehemently support the permanent reinstatement of the public artwork 'An English Garden' by Gabriella Hirst (Jose da Silva, The Art Newspaper, 15 July; Donna Ferguson, Observer 17 July, and Tim Burrows Guardian Opinion, 19 July). The artwork is a bed of newly propagated Rosa floribunda "Atom Bomb" on former Ministry Of Defence land, upriver from Foulness Island, designed to reflect upon the history of Britain's nuclear colonial legacy and its ongoing impact. The artwork was commissioned for Estuary 2021 by Metal and The Old Waterworks with all the formal permission procedures in place.

The garden was removed due to threats from local Tory Councillors who acted without due process, leading to an undemocratic act of censorship. We ask Southend Borough Council to make a formal public apology to the artist, and to permanently reinstate the artwork.

Withdrawing the artwork An English Garden has led to the British Nuclear Test Veterans' Association publicly supporting the reinstatement of the artwork, as well as its contribution to a more nuanced understanding of British nuclear cultural heritage. We also support the artist's proposal to expand the artwork into a larger permanent garden to include additional plant species to contextualise the artwork in relation to nuclear histories and armaments internationally.

It is vital that artists working with nuclear issues around the world can work without fear of censorship, and that nuclear culture can be debated in the public sphere. Public art can and should critically engage with complex issues from different perspectives.

Signed

Ele Carpenter, Professor of Interdisciplinary Art & Culture, Umeå University, Sweden and co-ordinator of the Nuclear Culture Research Group
Warren Harper, Director, The Old Waterworks and PhD Researcher, Goldsmiths University of London, UK

Ceri McDade, Chair, BNTVA: the Nuclear Test Veterans Charity, UK

Andi Jones, Montebello Tests Representative British Nuclear Test Veterans Association, UK

Dr Becky Alexis Martin, Lecturer in Cultural and Political Geography, Manchester Metropolitan University, UK

Lise Autogena, Professor of Cross Disciplinary Art, Sheffield Hallam University, UK

Dr Mick Broderick, Adjunct Professor of Media & Creative Arts, Curtin University and Honorary Professor of Media & Communication, RMIT University, Australia

Gair Dunlop, Senior Lecturer, Contemporary Art Practice, Duncan of Jordanstone College of Art & Design, University of Dundee, UK

Dr. Adam Broinowski, Honorary Research Fellow, The Australian National University

Dr Christopher Hill, Lecturer in History, University of South Wales, UK

Dr Jonathan Hogg, Senior Lecturer in Twentieth Century History, University of Liverpool, UK

David Mabb, Reader in Art, Goldsmiths University of London, UK

Wesley Perriman, Curator, BNTVA: the nuclear test veterans charity, UK

Dr Lisa Radford, Lecturer, Victorian College of the Arts, University of Melbourne, Australia

Dr Egle Rindzeviciute, Associate Professor in Criminology and Sociology, Kingston University London

Yhonnie Scarce, Lecturer, Victorian College of the Arts, University of Melbourne, Australia
N.A.J. Taylor, Research Fellow, Deakin University, Australia
Robert Williams, Professor of Fine Art, University of Cumbria, UK

Anna Storm Professor of Thematic Studies, Linköping University, Sweden.
Cornelius Holtorf, UNESCO Chair on Heritage Futures, Linnaeus University, Sweden
Livia Monnet, Professor of Literature, University of Montréal, Canada.
Robert Jacobs, Professor of History, Hiroshima Peace Institute, Hiroshima City
University, Japan
Peter C. van Wyck, Professor Communication Studies, Concordia University, Canada.
Dr Christian Berger, Lecturer in Modern and Contemporary Art, Johannes Gutenberg-Universität
Mainz, Germany.
Florence Fröhlig, PhD, Senior Lecturer in Ethnology, Södertorn University, Sweden.
Dr Anna Volkmar, Lecturer in Art and Technology / Leiden University Centre for the Arts in Society /
Leiden University, Netherlands
David Blandy, Artist, UK
Dr Jessica Holtway, UK
Mark Aerial Waller, Artist
Erika Kobayashi, Artist, Japan
Wallace Heim, Artist, UK
Ami Clarke, Artist/Founder Banner Repeater, Lecturer at Central Saint Martins, University of the Arts
London, and Chelsea College of Art UK
Upanishad Chakrabarti, Artist, USA / UK
Hector Dyer, Artist, UK
Merylyn Fairskye, Artist, Australia
Louise K Wilson, Senior Lecturer in Art and Design, University of Leeds, UK
Dr Helen Grove-White, Artist, UK
Aimee Lax, Artist, UK
Andy Banister, artist, Senior Lecturer in Fine Art, City & Guilds of London Art School, UK
Joe Banks, Artist, UK
Daniel Beck, Artist, UK
Dr Veronika Lukasova, Artist, UK / Czech Republic
Angenita Teekens, Artist, UK
Carlos Gonzalvo Salas, Architect, Spain
Michael Sanders, Artist, UK
Grit Ruhland, Artist, Lecturer at the Chair of Architectural Delineation, University of Dresden, Germany
Dr Andy Weir, UK
Julian Weaver, Director, Finetuned Ltd, UK
Maarten Vanden Eynde, Artist and PhD fellow, Bergen University, Norway
Professor Alan Lester, Professor of Historical Geography, University of Sussex, UK
Yelena Popova, Artist, UK
Vicki Lesley, Filmmaker, UK
James Lester, PhD student in History of Art at University of Leeds, UK
David Burns, Coordinator Media Studies, Royal College of Art, UK
Laura McLean, Curator, Australia
Dr. Juan Fernando Ródenas García, Universitat Rovira i Virgili, Spain
Kyoko Tachibana, NPO S-AIR, Japan
Michelle Harding, Secretary BNTVA, UK
Dr Dave Griffiths, Manchester School of Art, UK
John Lax, Vice Chair BNTVA, UK
Erich Berger, Director, Bioart Society, Finland
Shelly Grigg, BNTVA Trustee, UK
Jessica Hurley, Assistant Professor of English, United States
Dr Christoph Laucht, Swansea University, UK
Dr Linda Ross, Researcher and photographer, UK
David Bostwick, Trustee BNTVA: the Nuclear Test Veterans Charity, UK
Dr Suzanne Doyle, Lecturer in International Relations, University of East Anglia UK
Theresa Deichert, Heidelberg University, Germany

Kate Kuaimoku, Artist, United States
Nastassja Simensky, Artist / PhD Researcher, UCL (Slade), UK
Paul R. Josephson, Professor of History, Colby College, United States
Gabrielle Decamous, Associate Professor in the Faculty of Languages and Culture, Kyushu University, Fukuoka, Japan
Yoi Kawakubo, Visual Artist, Japan
John waterhouse, Artist, UK
Jessie Boylan, Artist, Atomic Photographers Guild, Australia
Fern Potter, Freelance Development Consultant, UK
Richard Pettifer, Director/Critic, Germany
Hilary Scarnell, Southend resident, UK
Dr Ifor Duncan, Ca' Foscari University of Venice, Italy
Jon Kipps, Artist, UK
Leanne O'Connor, Artist, UK
Jack Alcock, Artist, UK
Sylak Ravenspine, Artist, UK
Samantha Whetton, Graphic Designer, UK
Anna Lukala, Artist, UK
Ruth Jones, Artist and curator, United Kingdom
Hayley Hill, Creative Producer, UK
Rowland Hill, Artist, UK
Lauren Houlton, PhD Researcher, University of Westminster, UK
Hugh Nicholson, Artist, UK
Bob Gelsthorpe, Artist & Curator, Wales
Jane Lawson, Visual artist, UK
Claudia Lastra, Executive Director, Arts Catalyst, UK
Erin Vink, Curator of Aboriginal and Torres Strait Islander art, Art Gallery of New South Wales, Australia
Claudia Contu, Curator, Italy
Julia Crabtree, Artist and Lecturer, University of Reading and Royal College of Art, UK
Sarah Pickering, Artist & Senior Teaching Fellow, The Slade School of Fine Art, UCL, UK
Michael Szpakowski, Essex based artist and writer, UK
Jon Thomson, Professor of Fine Art, The Slade School of Fine Art, UK
Alison Craighead, Reader in Contemporary Art, University of Westminster, UK
Carlos Romo-Melgar, Graphic Designer and Associate Lecturer at London College of Communication, UK
Stephen Hyatt-Cross, Artist, United Kingdom
Dr Marc Garrett, Birkbeck University, United Kingdom
Matthew Bowman, Art historian and critic / University of Suffolk, UK
Rachel Pimm, Artist, Associate Lecturer Camberwell College UAL UK
Paul Hertz, Artist, USA
Ellen Greig, Curator, UK
Alec Scragg, concerned citizen, UK
India Boxall, Creative Researcher, Scotland
Joshua Wirz, Artist, UK
Damien Robinson, Southend-based Artist, UK
Paul Eastwood, Artist, UK
Jamie Cowan, Graphic Artist, UK
Gray Wielebinski, Artist, UK
Emma Edmondson, Artist / Director of TOMA, UK
Eve Kearton, Literature student and musician, UK
Jay Drinkall, Writer, UK
Amy Sharrocks, Artist, UK
Geof Luton, Citizen
John Townsend, Southend resident
Natalie Davies, Graphic Designer/Singer, UK
Mrs Caroline Miles, Director, Scientific Resource supply co. Southend, UK
Gareth Evans, Curator, Whitechapel Gallery UK

Tim Fransen, Technical Tutor / Associate Researcher, London South Bank University, UK
Mary Perkin, Feminist & Southend Resident, UK
Dr Michael Hrebeniak, Magdalene College, Cambridge, UK
Dr Serena Cooper, Citizen, UK
Catherine Norris, Artist, UK
Dr Ally Bisshop, Artist & researcher UNSW

** Indicates required question*

1. Name *

2. Role / Affiliation / University *

3. Country *

4. Email *

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Appendix six: Nastassja Simensky, *The Long Count*, The Old Waterworks, Saturday 30-Sunday 31 July 2022.

The Long Count
Nastassja Simensky
Saturday 30 and Sunday 31 July 2022, 12-5pm



The Old Waterworks is excited to present a special weekend viewing of 'The Long Count' by artist Nastassja Simensky.

'The Long Count' is an expanding image archive that has emerged through Leaky Transmissions, a body of research and artwork shaped by the unruly entanglements of the Blackwater Estuary in Essex.

For 'The Long Count' Nastassja has been thinking with 'radio' as a means of communication, collision and interference, and using Slow Scan Television (SSTV) as a generative tool. SSTV is a picture transmission method, used mainly by amateur radio operators, to transmit and receive static pictures over the radio spectrum. Through this technology, Nastassja considers the material legacies of changing land-use and energy production in the Blackwater Estuary.

'The Long Count' is curated by Warren Harper and informed by Nastassja and Warren's shared research interest in the Blackwater Estuary. This examines the Estuary's place within the UK's nuclear story whilst considering the wider unequal implications of this story that extend far beyond the ebb and flow of its shores.

To coincide with 'The Long Count', Nastassja has collaborated with artist and musician Rebecca Lee to make 'Rings on Water', a new audio-work for Focal Point Gallery's experimental sound programme. This FPG Sounds commission continues Nastassja and Rebecca's previous collaborations and draws on their shared interest in time, listening, material culture and land-use. 'Rings on Water' takes the form of a collection of sonic fieldnotes, and includes field recordings, amateur radio and writing from 'Leaky Transmissions'. 'Rings on Water' uses a variety of recording and transmission technologies, from FM radio, magnetic tape, coil receivers, hydrophones and contact mics to traverse the protected saltmarshes and shale banks of the Dengie Peninsula and industrial arable land.

'Leaky Transmissions' is funded by Arts Council England Project Grants and supported by The Old Waterworks.

Appendix seven: Practice Dossier.

https://miro.com/app/board/uXjVNQfgyg4=?share_link_id=128251283994

Welcome to the Practice Dossier for Warren Harper's practice-based curatorial PhD research project: *The Nuclearscapes of the Blackwater Estuary and Foulness Island: Towards an Interscalar Curatorial Practice*. To access the dossier you can follow the link above.

This dossier maps out the documentation of the artworks commissioned and the production process, correspondence, fieldwork, reactions to the work, and other information that provides context for the practice-based portion of this project. The dossier also consists of different media, such as PDFs, external links and embedded videos.

Throughout my written dissertation there are links to certain parts of this dossier within the footnotes. This is a way to link the two parts of the PhD and to provide the reader reference points to the practice whilst reading the written dissertation. This dossier is also below in the appendix of the written dissertation for ease of reference, albeit in a different, more static format.

This dossier is not necessarily intended to be experienced in a particular order and the viewer is welcome to explore it in whatever way they feel appropriate. The viewer can explore the materials by following the above link and zooming in and out and using one's cursor to move around. However, I have recorded and shared one such possible route.

Where aspects of the dossier are enclosed within different colours they constitute different types of activity:

KEY

■ Public moments

■ Fieldwork

■ Contextual and place-specific research

■ 'Behind the scenes', or the process of making public

**The Nucleus of the Blackwater Estuary and Foulness Island:
Towards an Interscalar Curatorial Practice**

Welcome to the Practice Dossier for Warren Harper's practice-based curatorial PhD research project: *The Nucleus of the Blackwater Estuary and Foulness Island: Towards an Interscalar Curatorial Practice*.

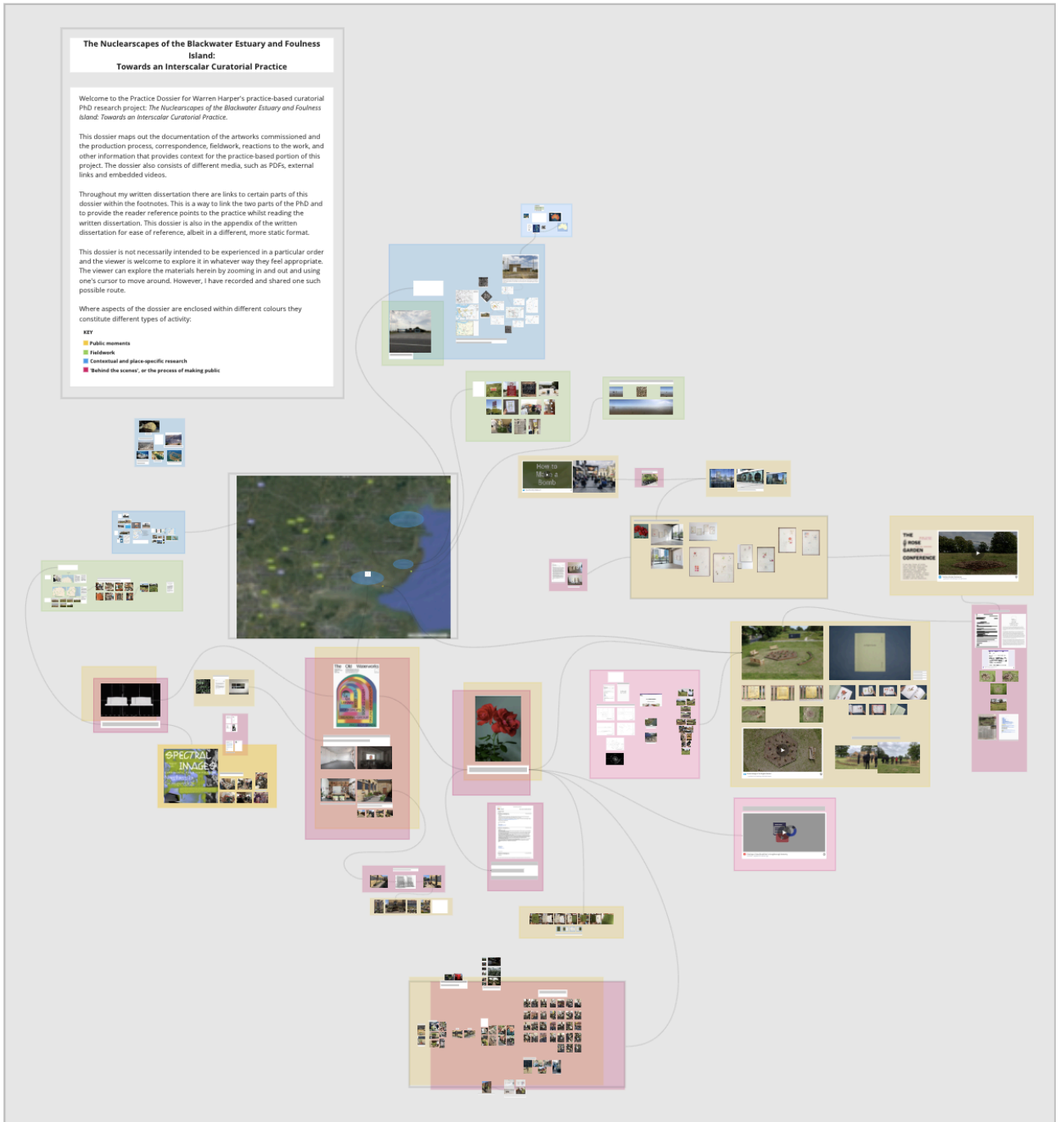
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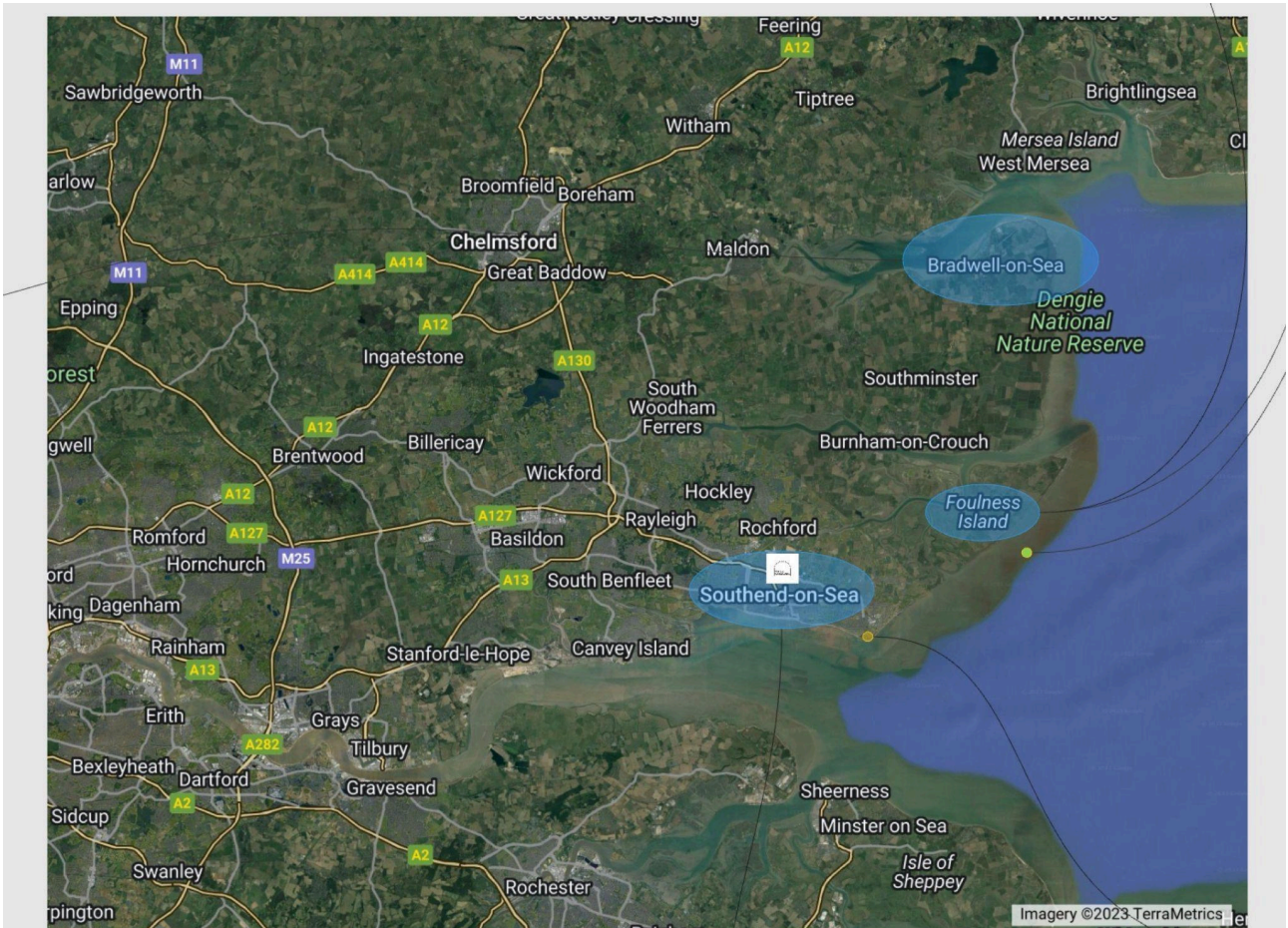
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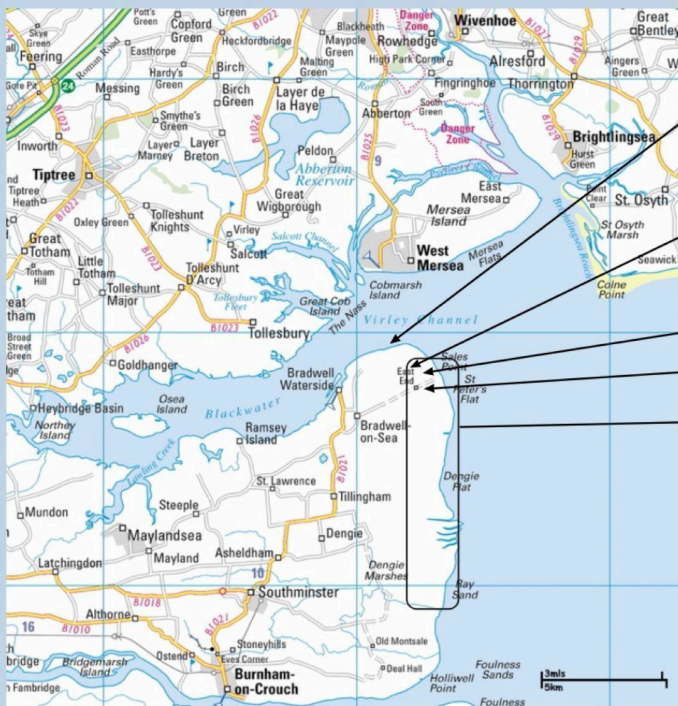
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Where aspects of the dossier are enclosed within different colours they constitute different types of activity:

- KEY**
- Public moments
 - Fieldwork
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 - 'Behind the scenes', or the process of making public







Bradwell Nuclear Power Station

Area for investigative works of the proposed new nuclear power station

The Othona Community

Chapel of St. Peter-on-the-Wall

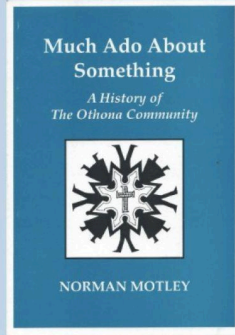
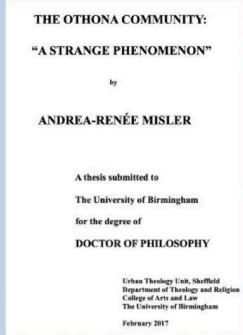
Dengie Nature Reserve (SSSI)

The Blackwater Estuary

Othona
Community and
The Chapel of St.
Peter-on-the-Wall



Source: Mark Russ, 2014

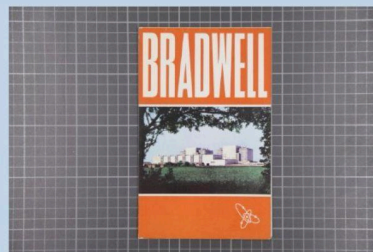
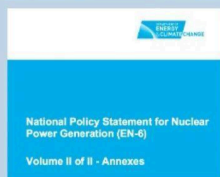


Archival
images from
Burnham
Museum

Protest in Bradwell, 1986



view from power station over the Blackwater Estuary

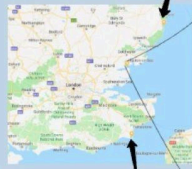


Bradwell A reactor building in the background, partially encased in its weather envelope. A World War II pill box in the foreground.

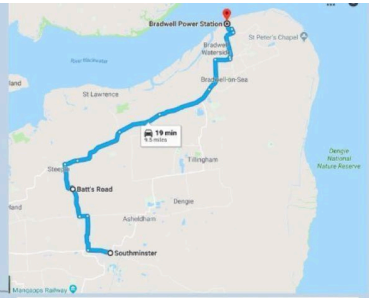
New nuclear programme and waste storage



Area where planning permission has been granted for investigative works



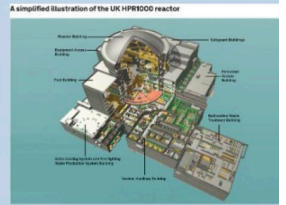
Sizewell
Dungeness



Routes to Bradwell for the storage of ILW from Dungeness and Sizewell, arriving by train at Southminster, then by road to the storage facility at Bradwell



Bradwell Final Site Clearance (FSC) from Magnox website FSC due 2095-2104



Proposed design of new reactor



Photos from the Bradwell Against new Nuclear Group (BANNG) and their visit to the investigative works relating to Bradwell B

Research trips on the Blackwater Estuary

Visit to the Blackwater Estuary 5th November



Research trip to the Estuary 17 and 18 April 2016



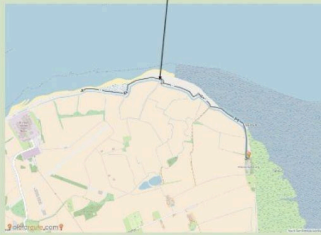
June 2019 - Meeting with Kevin Bruce, a local historian based around the Blackwater Estuary. He is a long standing member of the Othona Community and also used to work at Bradwell nuclear power station. Here he is showing myself and Natasha Simms some material from his extensive archives.



Visit to the Blackwater Estuary
5-6 November



Glass bottle found by Jimmy the Detectorist
approx. 150 years old



Walk 1 with Nastassja Simensky



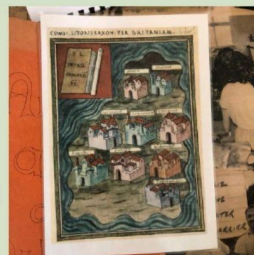
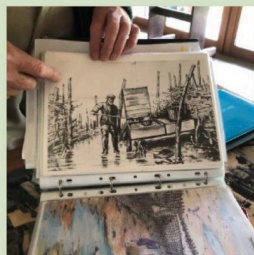
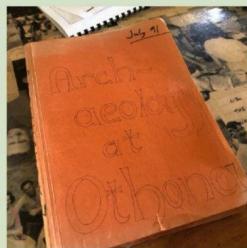
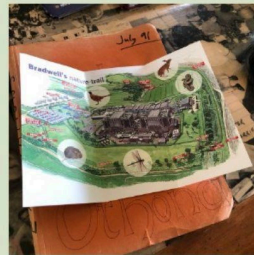
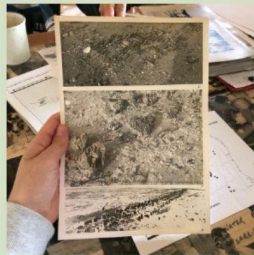
Walk 2 with Nastassja Simensky



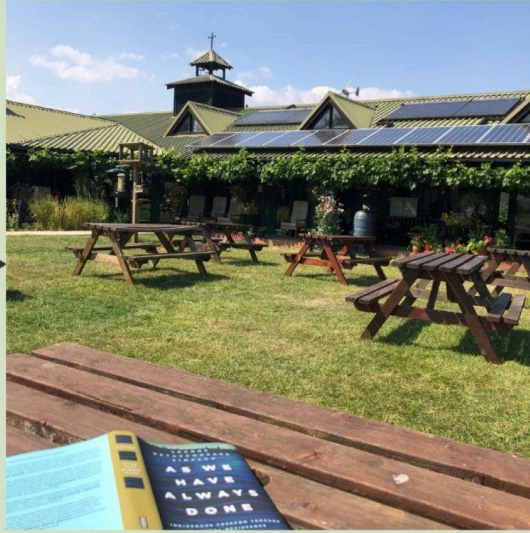
Research trip to the Estuary 17 and 18 April 2019



June 2019 -- Meeting with Kevin Bruce, a local historian based around the Blackwater Estuary. He is a long-standing member of the Othona Community and also used to work at Bradwell nuclear power station. Here he is showing myself and Nastassja Simensky some material from his extensive archives.



July 2019 -- a week spent at Othona thinking, reading and reflecting.
During this time I contributed to community activities and chores.



A workshop that was planned for the summer of 2020 with Nastassja Simensky and Dr Colin Sterling from UCL's Department of Archaeology, cancelled indefinitely due to COVID. The plan was to invite academics, artists and members of the community in and around the estuary, with the resulting material feeding into our respective research and the production of new work.

Marginal Anthropocenes: Heritage and Sustainability in Peripheral Spaces

Date: Early June 2020, date TBC

Location: Othona, Essex

"Assemblages are open-ended gatherings. They allow us to ask about communal effects without assuming them. They show us potential histories in the making."

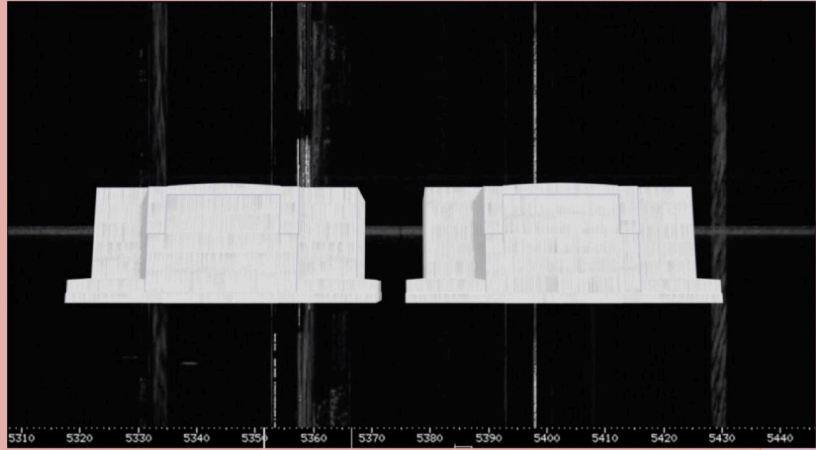
Anna Tsing, *The Mushroom at the End of the World*, 2015, p.23

The Anthropocene is often seen as a totalising concept: a way of masking the complexities and injustices of modernity under the rubric of a new 'human-made' geological epoch. Critical scholarship across the arts, humanities and social sciences has done much to challenge this narrative, mapping out alternative vocabularies, histories and ways of living in times of ecological uncertainty. To borrow from Tsing, this work demands 'open-ended gatherings' and transdisciplinary assemblages to tease out the entangled effects and potential futures of the Anthropocene as a history in the making.

This workshop will investigate the different modalities of care, stewardship, sustainability and maintenance discernible within and across a specific Anthropocene landscape; in this case the Blackwater Estuary in Essex. Our starting point will be Othona – an off-grid community established in 1946 as an experiment in Christian community, where visitors are invited to build and maintain a 'common world' in collaboration with the natural environment. A short walk along the sea front from Othona is Bradwell Nuclear Power Station, decommissioned in 2002 and now entering a 'care and maintenance' phase. Closer still can be found St Peter-on-the-Wall, a seventh century chapel built using bricks and stones from an abandoned Roman Fort, and still in active use as a site of worship and pilgrimage today. These interwoven topographies of devotion, uranium, conquest, decay and regeneration speak to the more-than-human resonances of the Anthropocene, but also to the possibilities of resistance and flourishing that still endure in its shadow.

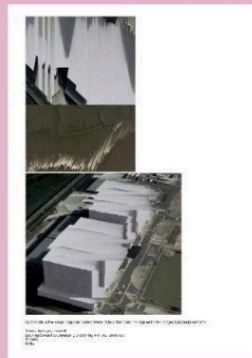
Othona and the wider Blackwater Estuary trouble many of the foundational concepts of the heritage field. Issues of care, protection, endangerment, conservation and memory look very different for those managing nuclear waste, assembling a sustainable future, or stewarding an ancient sanctuary. Through walking tours, facilitated discussions, expert talks and creative interventions, this workshop will explore the *radical temporalities* and *more-than-human processes* in play across this heterogeneous landscape. In so doing we aim to foster a generative dialogue between archaeology, heritage, geography, anthropology, environmental conservation and curatorial practice. To help achieve this goal, artist Nastassja Simensky and curator Warren Harper will lead on the co-production of a research 'artefact' documenting the conversations, occlusions, affordances and potentialities 'unearthed' in the Blackwater Estuary. This approach seeks to demonstrate the value of creative methodologies for understanding such multifaceted contexts.

Finally, our focus on the coastal region around Othona provides an opportunity to open up the problematic notion of 'marginality' to renewed critical scrutiny. As Amitav Ghosh writes in *The Great Derangement*, the Anthropocene has 'reversed the temporal order of modernity: those at the margins are now the first to experience the future that awaits us all.' But what if this future is not framed in terms of breakdown, loss and collapse, but rather as an opportunity for generative collaboration across human and non-human worlds? What happens if we take seriously those practices of care, stewardship, maintenance and community that have precisely been marginalised in and by the Anthropocene? Addressing these questions does not mean embracing a nostalgic version of the past, but rather speculating on what a *future* heritage might look like.



Nastassja Simensky, *Leaky Transmissions*

Poster concepts from designer Molly Dyson



Email invitation to participants

Poster concepts from designer Molly Dyson

 Gmail Warren Harper <warren@theoldwaterworks.com>

Leaky Transmissions Poster Concept
5 messages

Molly Rose <mollyrosedyson@gmail.com> 10 May 2021 at 10:49
To: Nastassja Simensky <nastassja@nastassja-simensky.com>, Warren Harper <warren@theoldwaterworks.com>

Hey Warren and Nastassja!
Hope you've had a nice last few weeks!

Sorry for not getting the concept for the poster to you sooner, time got away from me with a few other projects... But I have put together a concept for the poster which we can discuss during our call tomorrow :)

Here are some notes:

I propose two type faces, both have a kind of modular feel to them - segments of the letters are interchangeable and interact with one another which I thought had a soft technological/circuit feel that matched the project.

LEAKY
TRANSMISSIONS
NASTASSJA
SIMENSKY

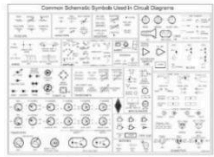
Type 1: 'Mono'

LEAKY
TRANSMISSIONS
NASTASSJA
SIMENSKY

Type 2: 'Anthony'

I was also looking at these HAM / ARRL circuit diagrams and thought it could be applied for infographic type elements, I made a very quick rough sketch:

Common Schematic Symbols Used in Circuit Diagrams



LEAKY
TRANSMISSION
MISSION

For visuals, I played around with this 'pixel sorter' effect that can manipulate images (And type) to kind of disintegrate into pixels. I thought this would be a nice match to the transference of images to sound.



I just made a few visual loops and screenshots of how that could be applied to the images Nastassja sent me.

Soooo there you have it!
Looking forward to discussing everything with you tomorrow.
Thanks,
Molly



Warren Harper <warren@theoldwaterworks.com>

Workshop Invitation -- Spectral Images - Experimental Tools For Fieldwork.

Warren Harper <warren@theoldwaterworks.com>
To: Ruth Jones <ruthkaathyrjones@yahoo.co.uk>
Cc: Nastassja Simensky <nastassja@nastassja-simensky.com> 11 August 2021 at 15:18

Dear Ruth,

Nastassja and I would like to invite you to a workshop: 'Spectral Images - Experimental Tools For Fieldwork.' The workshop is part of 'Leaky Transmissions' a new body of art and research shaped by the unruly entanglements of the Blackwater Estuary in Essex.

In this workshop led by contextual artist Laura Trevail, we will learn to build, set-up and use a Raspberry Pi with a Noir Camera. The workshop will take place online on **26 August, 2-5pm** and will be a small group of six people from The Old Waterworks and Othona.

The Pi 3B with pre-loaded SD card, Pi camera, and power cable will be posted to you in advance of the online workshop. At the end of the session you will have a hand built camera to capture images of photosynthesising plants, thermal objects and infrared - and ideas for many other tools you can rebuild a Raspberry Pi for!

It would be great if you are interested and available to take part. Please confirm whether you can or can not attend as soon as you are able.

We will send out the equipment in advance with initial set up instructions so that you can have the first stages of your Raspberry Pi set up ready for the workshop.

Many thanks and all the best,
Warren and Nastassja

Warren Harper
Director
he/him

The Old Waterworks
North Road
Westcliff-on-Sea
Essex
SS0 7AB
w: www.theoldwaterworks.com
insta | facebook | twitter

I work two days per week, Mondays and Wednesdays, so I may take a few days to respond.

The Old Waterworks is a registered charity no. 1191385.



spectral_full_ig.jpg
957K

Email invitation to participants

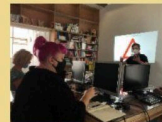


Email invitation to participants

Workshop at The Old Waterworks with Nastassja Simensky and Laura Trevail.



An SSTV image as a result of the workshop



SPECTRAL

26 August
2–5pm

IMAGES

EXPERIMENTAL TOOLS FOR FIELDWORK

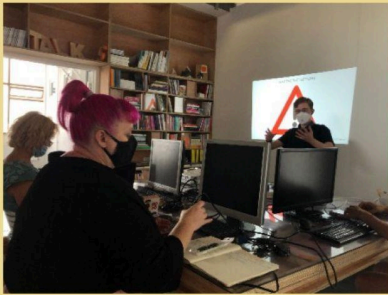
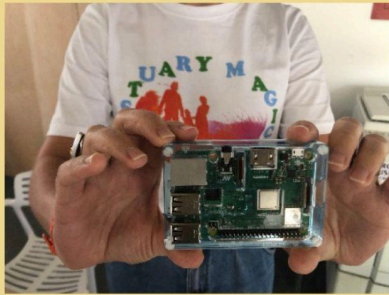
Nastassia
Simenisky

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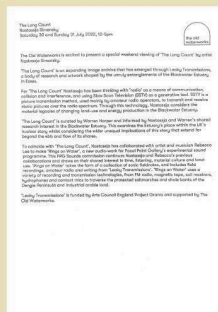
Workshop at The Old Waterworks with Nastassja Simensky and Laura Trevail.



An SSTV image as a result of the workshop.
[Link to Laura Trevail's post on Facebook about the workshop](#)



The Long Count Nastassja Simensky Saturday 30 and Sunday 31 July 2022



The Long Count
Nastassja Simensky
Saturday 30 and Sunday 31 July 2022, 12-5pm



The Old Waterworks is excited to present a special weekend viewing of 'The Long Count' by artist Nastassja Simensky.

'The Long Count' is an expanding image archive that has emerged through Leaky Transmissions, a body of research and artwork shaped by the unruly entanglements of the Blackwater Estuary in Essex.

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'The Long Count' is curated by Warren Harper and informed by Nastassja and Warren's shared research interest in the Blackwater Estuary. This examines the Estuary's place within the UK's nuclear story whilst considering the wider unequal implications of this story that extend far beyond the ebb and flow of its shores.

To coincide with 'The Long Count', Nastassja has collaborated with artist and musician Rebecca Lee to make 'Rings on Water', a new audio-work for Focal Point Gallery's experimental sound programme. This FPG Sounds commission continues Nastassja and Rebecca's previous collaborations and draws on their shared interest in time, listening, material culture and land-use. 'Rings on Water' takes the form of a collection of sonic fieldnotes, and includes field recordings, amateur radio and writing from 'Leaky Transmissions'. 'Rings on Water' uses a variety of recording and transmission technologies, from FM radio, magnetic tape, coil receivers, hydrophones and contact mics to traverse the protected saltmarshes and shale banks of the Dengie Peninsula and industrial arable land.

'Leaky Transmissions' is funded by Arts Council England Project Grants and supported by The Old Waterworks.

The Long Count
Nastassja Simensky
Saturday 30 and Sunday 31 July 2022

The Long Count
 Nastassja Simensky
 Saturday 30 and Sunday 31 July 2022, 10:30am

The Old Waterworks is pleased to present a special weekend viewing of 'The Long Count', a digital artwork by Nastassja Simensky.

'The Long Count' is an ongoing digital artwork that has emerged through a series of exhibitions, a body of research and a series of talks by the artist, in partnership with The Old Waterworks.

For 'The Long Count', Simensky has been working with 'real' as a means of communication, exploring the relationship between the digital and the physical, and the way in which the digital can be used to explore the physical world. The artwork is a series of digital images that are generated by a computer program, and are presented in a series of digital frames.

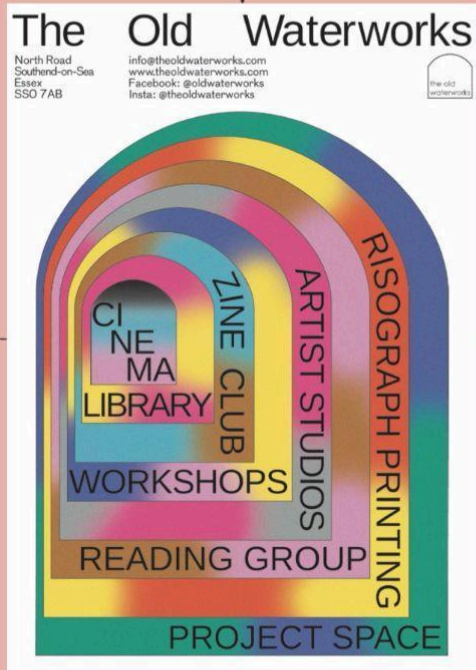
'The Long Count' is a digital artwork that has emerged through a series of exhibitions, a body of research and a series of talks by the artist, in partnership with The Old Waterworks. The artwork is a series of digital images that are generated by a computer program, and are presented in a series of digital frames.

In partnership with 'The Long Count', Simensky has collaborated with artist and musician Barbara Cook to create 'The Long Count', a digital artwork that has emerged through a series of exhibitions, a body of research and a series of talks by the artist, in partnership with The Old Waterworks.

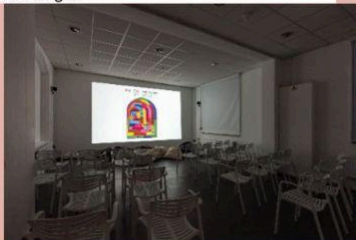
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This space at the Old Waterworks used to be dark purple in colour and in a state of disrepair, such as broken blackout blinds that could not be opened. It was used solely as a screening room. In order to expand its uses, so it could become a site for research and development activities for artists, I arranged for the room's redecoration and renovation to allow for varied usage.



The Old Waterworks' research library. My first commission as TOW director.



The garden at The Old Waterworks became the main site for *How to Make a Bomb*, situated within the context of other artist projects and research. This was another space I developed as director, alongside the library the garden was a site for practice based research and development for TOW studio artists and commissioned artists like Hirst



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The Old Waterworks

North Road
Southend-on-Sea
Essex
SS0 7AB

info@theoldwaterworks.com
www.theoldwaterworks.com
Facebook: @oldwaterworks
Insta: @theoldwaterworks





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The garden at The Old Waterworks became the main site for *How to Make a Bomb*, situated within the context of other artist projects and research. This was another space I developed as director, alongside the library the garden was a site for practice based research and development for TOW studio artists and commissioned artists like Hirst





Gabriella Hirst, *How to Make a Bomb*

08/07/2023, 12:59

Warren Harper Mail - A quick thought!



Warren Harper <warren@warrenharper.info>

A quick thought!

9 messages

Warren Harper <warren@warrenharper.info>
To: Gabriella Hirst <hirst.gabriella@gmail.com>

17 January 2019 at 04:39

Hi Gabriella,

I hope all is well and HNY! Just a quick thought --- I am working at a space in Southend-on-sea currently. We are doing some improvements to the outside, working with a permaculture practitioner in the run up to spring.

This made me think of a possible option of working together in some way. The space is up the road from Foulness Island, where you can find this: <https://historiceurope.org.uk/listing/the-list/list-entry/1411759>

It strikes me there is something in this...

Let me know your thoughts.

W

Warren Harper
www.warrenharper.info
www.iropi.org

Gabriella Hirst <hirst.gabriella@gmail.com>
To: Warren Harper <warren@warrenharper.info>

17 January 2019 at 14:32

Hi Warren,
Happy New Year to you too!
You are right there is totally something in this! What is the space? Would be great to see if there would be a way of incorporating the AB rose into the landscaping in some way?
So, where I am at right now, is I have started making contact with some nurseries in the UK who might be interested in working with me on the project - it will make it less amateur but I think at this stage that's ok, and I would like to push my propagation success rate up a bit through some expert advice.
Also, I'm about to head back to Australia for a month, I've been shortlisted for the Ian Potter Moving Image commission (totally nuts), for a film piece which I have had on the boil for a while.
Whether I get it or not, I'm super determined to not lose momentum on the AB rose project, but it's something that might mean I would need start off a set of propagation and then seek out some others to care for the plants (whereas up to this point I have been a full time mother to them!). I suppose even if I do not get it, I'm seeking out botanical structures that might be able to assist me developing this! Just throwing this out there -perhaps the permaculture practitioner you are working with has some knowledge/experience of grafting roses?
Also, I have been talking with Kaori at Art Action about having a workshop or presentation meeting of some sort on the rose later in the year, so maybe there are some things to link up here...again just thinking out loud...
Anyway, lets talk more about this. I have my interview for the film next week, but if you think its a good idea we could have a Skype/facetime chat after the 29th? It would be nice to catch up anyway.
All best!
G x

Gabriella Hirst
Warthestrasse 64
Berlin 12051
www.gabriellahirst.com

[Quoted text hidden]

Warren Harper <warren@warrenharper.info>
To: Gabriella Hirst <hirst.gabriella@gmail.com>

21 January 2019 at 04:33

Hi Gabriella,

<https://mail.google.com/mail/u/0/?ik=9fe71682d&view=pt&search=all&permthid=thread-f:162289991685886376&siml=msg-f:162289991685886376&sim...> 1/3

17 January 2019 -- 'A quick thought...'
the first email chain where I proposed
to Gabriella to site *How to Make a Bomb*
at The Old Waterworks on 17 January
2019

Warren Harper <warren@warrenharper.info>
To: Gabriella Hirst <hirst.gabriella@gmail.com>

17 January 2019 at 04:39

Hi Gabriella,

I hope all is well and HNY! Just a quick thought — I am working at a space in Southend-on-sea currently. We are doing some improvements to the outside, working with a permaculture practitioner in the run up to spring.

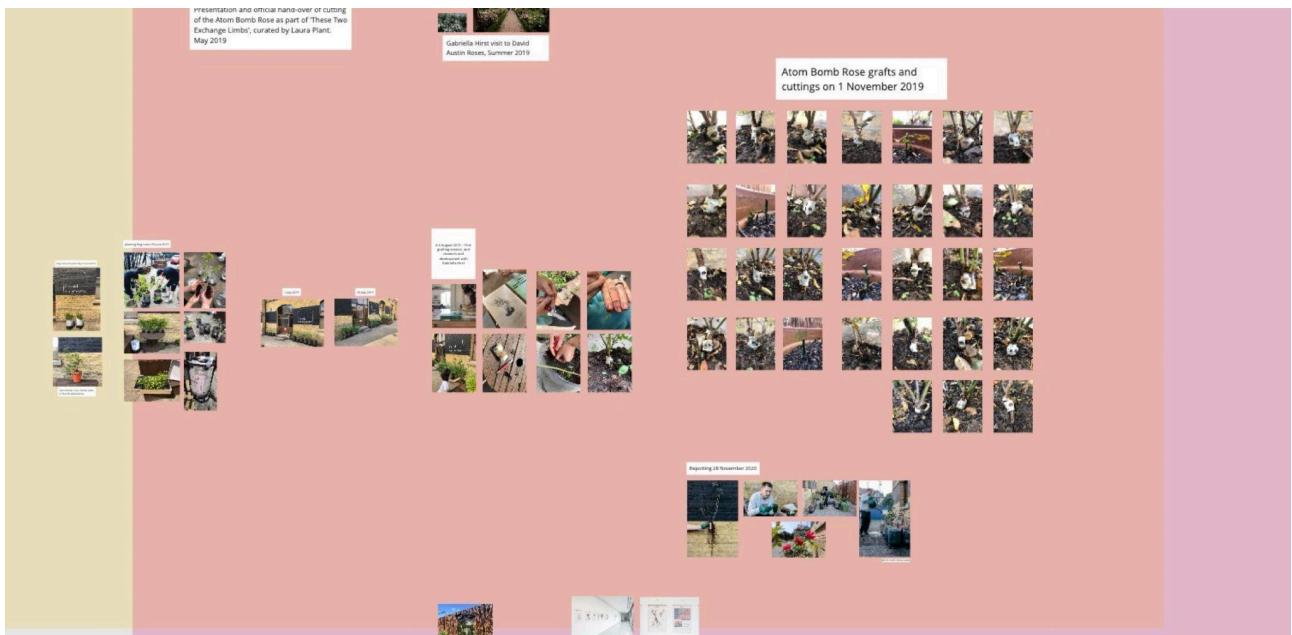
This made me think of a possible option of working together in some way. The space is up the road from Foulness Island, where you can find this: <https://historicengland.org.uk/listing/the-list/list-entry/1411759>

It strikes me there is something in this...

Let me know your thoughts.

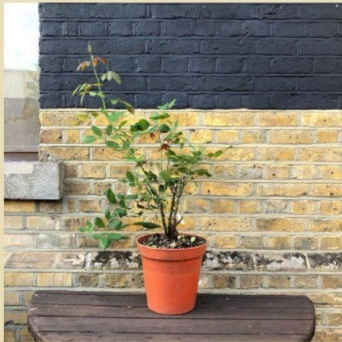
W

Warren Harper



planting dog roses 25 June 2019

Dog roses arrived Friday 21 June 2019



'Atom Bomb' rose, mother plant at The Old Waterworks



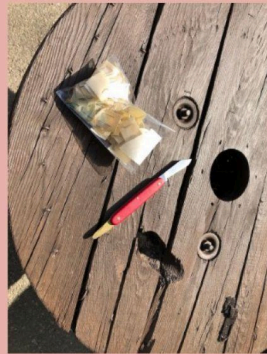
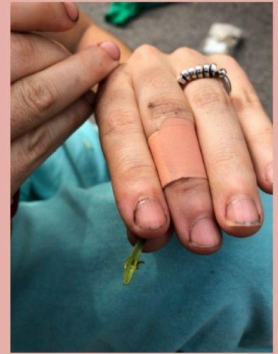
1 July 2019



25 July 2019



4-6 August 2019 -- First grafting session, and research and development with Gabriella Hirst



Atom Bomb Rose grafts and cuttings on 1 November 2019





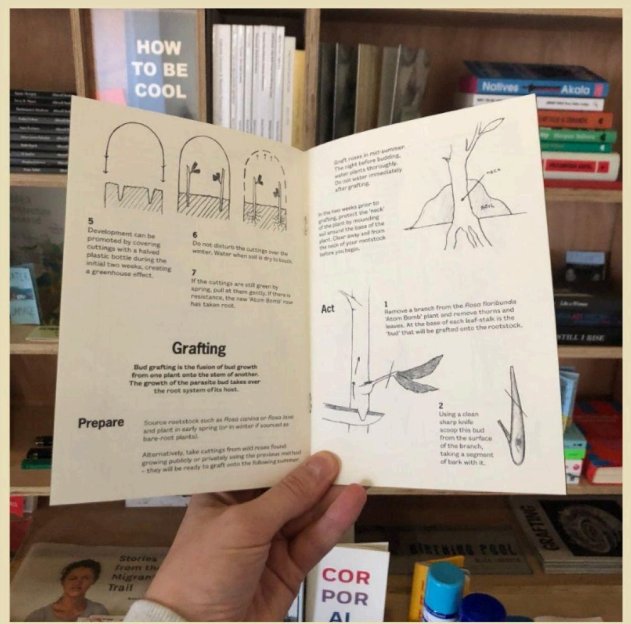
Repotting 28 November 2020



photo credit: Anna Lukala



How to Make a Bomb pamphlet (2020) (first edition), published by The Old Waterworks, designed by Design Print Bind

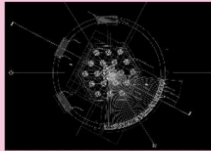
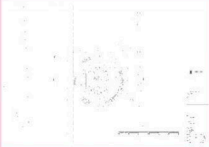


Gunners Park,
Shoeburyness.
Commission for *Estuary*
2021

PDF of Initial proposal
submitted to *Estuary* 2021



Drawing of Hirst's *An English Garden* by architectural and landscape designer Cristina Morbi
in preparation for installation



Proposed sites for
installation



Preparations for *An English Garden*
in the Old Waterworks' car park



Gunners Park, Shoeburyness. Commission for *Estuary* 2021

PDF of Initial proposal submitted to *Estuary* 2021

Email Correspondence between myself and Metal's former director Colette Bailey and project manager Michaela Freeman discussing site visits to Gunners Park

[Link](#) | [Feedback](#) | [Help](#)

(Email not visible)

Warren Harper <warren@theoldwaterworks.com> 18 September 2020 at 08:48
To: Colette Bailey <colette@metaculture.com>
Cc: Michaela Freeman <Michaela@metaculture.com>, Gabriela Hirsi <gabriela@metaculture.com>

Apologies, don't copy Gabriela in.

Hi Gabriela, please see below!

W

Warren Harper
Director
Architect

The Old Waterworks
North Road
Westcliff-on-Sea
Essex
SS3 7AB
www.theoldwaterworks.com
[Link](#) | [Feedback](#) | [Help](#)

(Email not visible)

Colette Bailey <colette@metaculture.com> 18 September 2020 at 08:53
To: Warren Harper <warren@theoldwaterworks.com>
Cc: Michaela Freeman <Michaela@metaculture.com>

Thanks so much Warren - will have a read of everything. Looking forward to making it all come to fruition!

Have a great weekend.

(Email not visible)

Warren Harper <warren@theoldwaterworks.com> 18 September 2020 at 08:56
To: Colette Bailey <colette@metaculture.com>
Cc: Michaela Freeman <Michaela@metaculture.com>, Gabriela Hirsi <gabriela@metaculture.com>

Great, yes, very exciting! You too!

W

Warren Harper
Director
Architect

The Old Waterworks
North Road
Westcliff-on-Sea
Essex
SS3 7AB
www.theoldwaterworks.com
[Link](#) | [Feedback](#) | [Help](#)

(Email not visible)

Gabriela Hirsi <gabriela@metaculture.com> 18 September 2020 at 09:04
To: Warren Harper <warren@theoldwaterworks.com>
Cc: Colette Bailey <colette@metaculture.com>, Michaela Freeman <Michaela@metaculture.com>

Hi!

Thanks for the info and for putting this together Warren, and hello Colette and Michaela, great to be in touch!

We great talking with Warren about the proposal, sounds like there are some really exciting possibilities here and both are such a great local organisations (couldn't be there in person to see Gunners Park with you the other day (as Warren mentioned, I'm currently in Berlin for a couple of months) but I will be back later in the year and I have spent a fair amount of time in nearby areas, including Foulness Island, with Warren, over the past months working on HTAG).

Two designs are being considered for the Rose Garden, depending on the site chosen, and the restrictions. If in Gunners Park, the preferred design option would be a simple grid in a raised bed, to highlight the militant order and structure of the installation in contrast to the surrounding biosphere. If the Cart and Wagon is chosen, a similar design could be used, or a series of concrete planters which reference the architectural forms of the military heritage buildings at Foulness. Mockups on both designs are included.

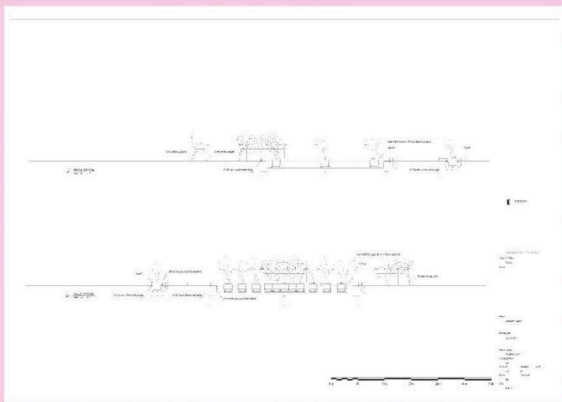
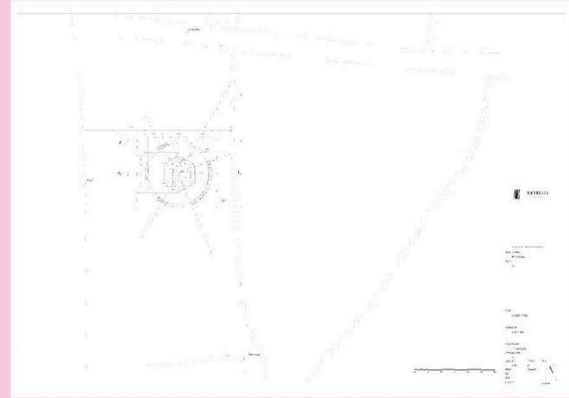
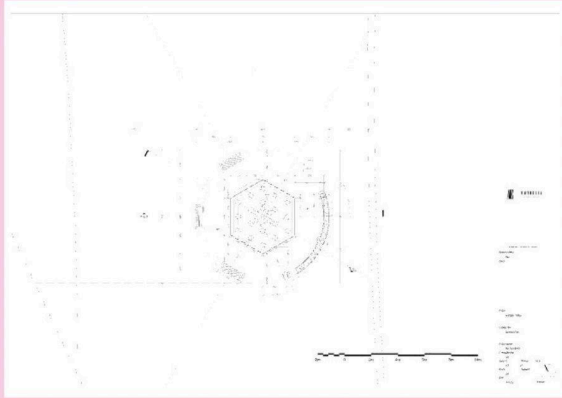
Rose Garden Conference

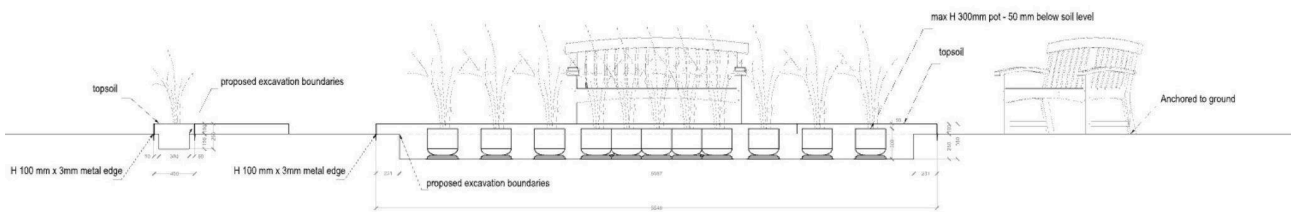
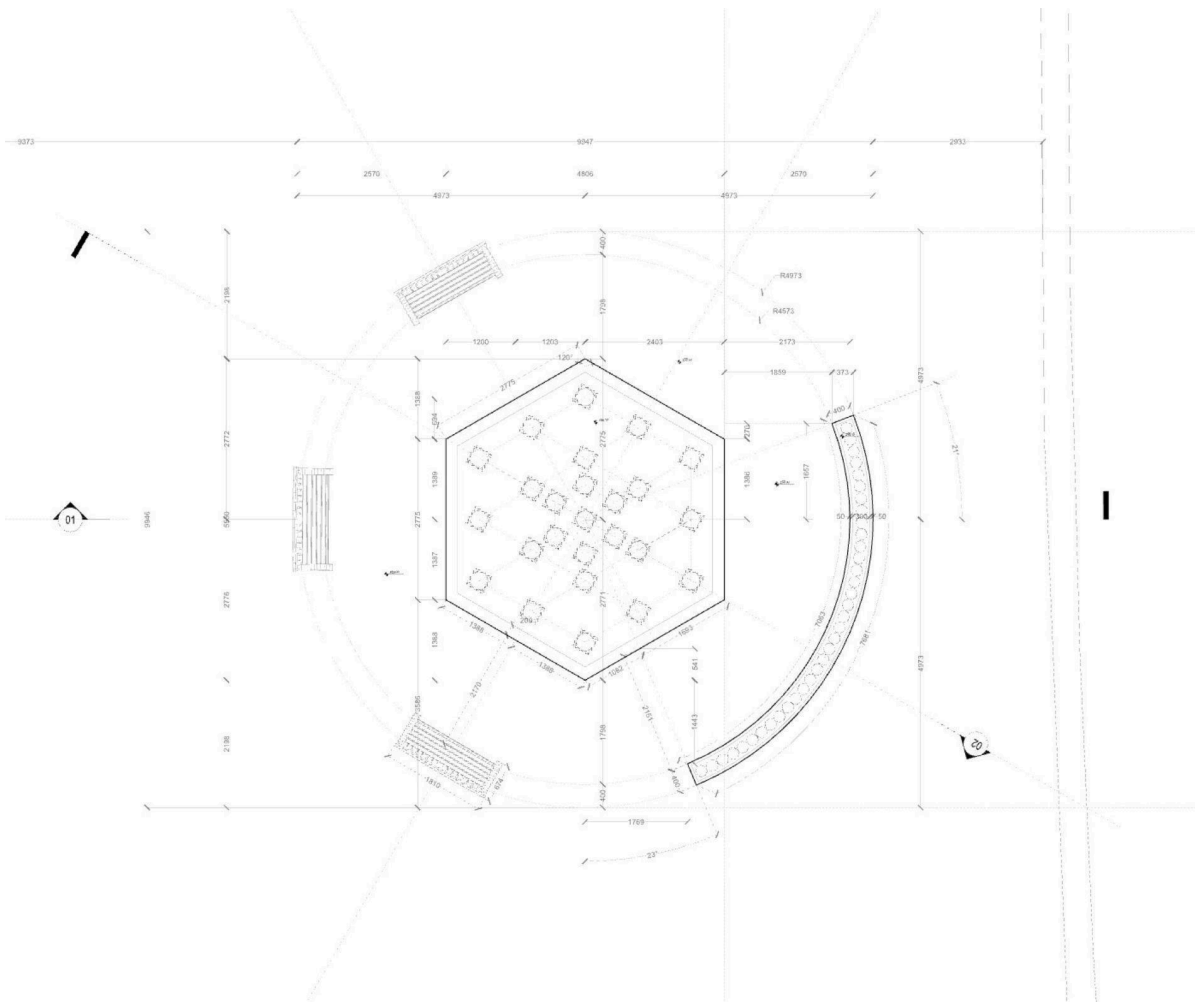
The rose garden will be used as a site for a 'Rose Garden Conference', (riffing off the white houses's press conferences - underscoring the inherently politically charged nature of a rose garden.) This will be a series of talks and film screenings which explore this ecological diversity and it's military history of this site - with particular focus on Maralinga, the site where Britain tested it's weaponry in Australia. Talks would include my lecture 'How to Make a Bomb', which discusses my research into the British imperial project of gardening the world through the vessel of the Atom Bomb rose, David Burn's research into Maralinga (where Britain tested it's weaponry in Australia), and a screening of the film Maralinga Tjanjari by Larissa Behrendt. Other potential avenues for speakers include inhabitants of Foulness and local permaculture practitioner Graham Burnett. The program can happen outdoors with social distancing (with a screen and projector set up in the rose garden itself), or can be screened online (or both). If the conference were to be held outdoors, a formal stage with rows of chairs would be set up in the field around the rose garden, drawing upon the aesthetics of a political conference (red curtains, pupit etc), albeit out in the middle of a wild ecosystem. The conference would thus become a temporary installation in its own right.

Drawings

To give context to the Rose Garden, the important research surrounding it and the history of the site, we propose to display in the Cart & Wagon Shed large prints of the Drawings Series which accompanies the How to Make a Bomb project. The drawings would be printed as A0 size colour posters hung on frames. A mix of botanical drawings and nuclear diagrams, the drawings blend the horticultural with the nuclear, touching on all aspects of the project and asking questions about the notion of gardening, on the micro and macro scale. One possibility would be to have the drawings displayed here, and the rose garden at Gunners park, to connect these two sites and encourage visitors to travel to both.

Drawing of Hirst's *An English Garden* by architectural and landscape designer Cristina Morbi in preparation for installation





An English Garden

Friday 21st May 2021 to
Monday 30th August 2021





Proposed sites for installation



Preparations for *An English Garden* in the Old Waterworks' car park

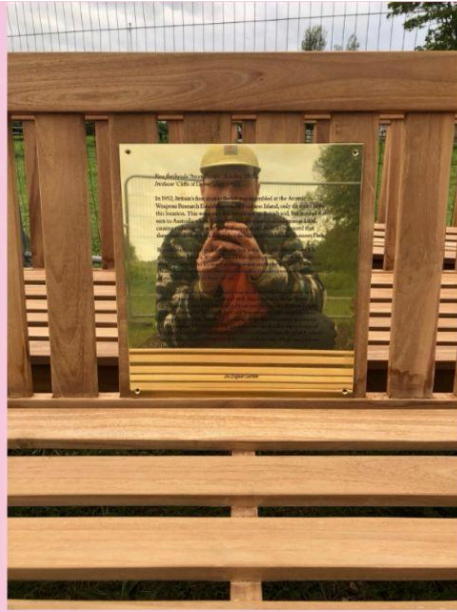
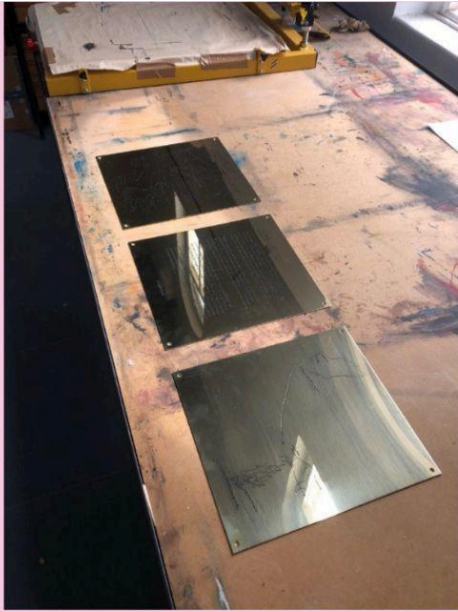
The installation of *An English Garden*



13 May 2021
Scanning for unexploded ordnance devices at Gunners Park, due to the site being on ex-MOD land (above)
Breaking ground (below)







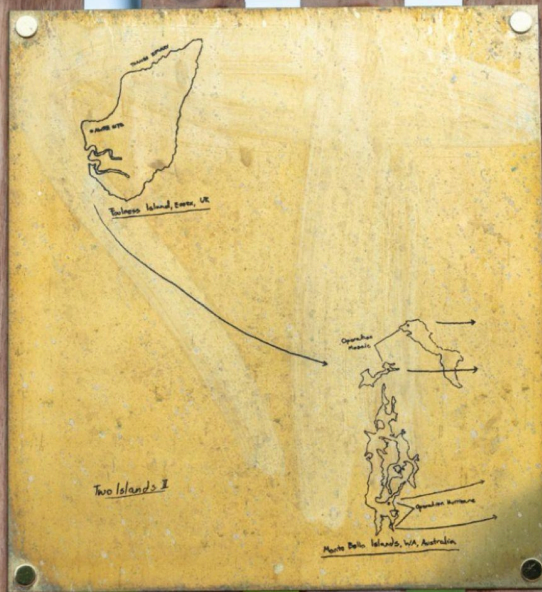
Rosa floribunda 'Atom Bomb' (Kordes, 1953)
Iridaceae 'Cliffs of Dover' (Fay, 1952)

In 1952, Britain's first atomic device was assembled at the Atomic Weapons Research Establishment on Foulness Island, only six miles from this location. This weaponry was tested not on British soil, but instead was sent to Australia where it was detonated on unceded Indigenous Land, causing enduring devastation and contamination. It is rumoured that these early devices were dispatched from Barge Pier here in Gunners Park.

Britain continues to proliferate nuclear arms: in 2021, the current UK government lifted a 30-year ban on the development of new nuclear weapons, vowing to increase its nuclear armament by 40%. In doing so a choice has been made to direct considerable resources towards industries of violence instead of those of care.

An English Garden reflects Britain's historical and ongoing identity as a colonial nuclear state. It is planted with *Rosa floribunda* 'Atom Bomb', a rare variety of rose that was originally created by breeder Reimer Kordes in 1953, during the height of the Cold War arms race. These plants have been propagated in Southend from one of the few remaining specimens of the original 1953 variety. The garden is a reminder that the red rose of England is entangled with an Imperial past of 'gardening the world', which has continued into a dangerously over-armed present. These are gardens that must be tended to.

An English Garden



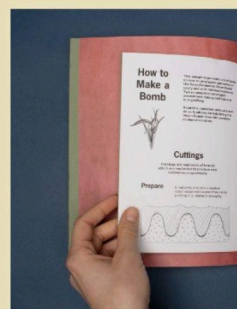
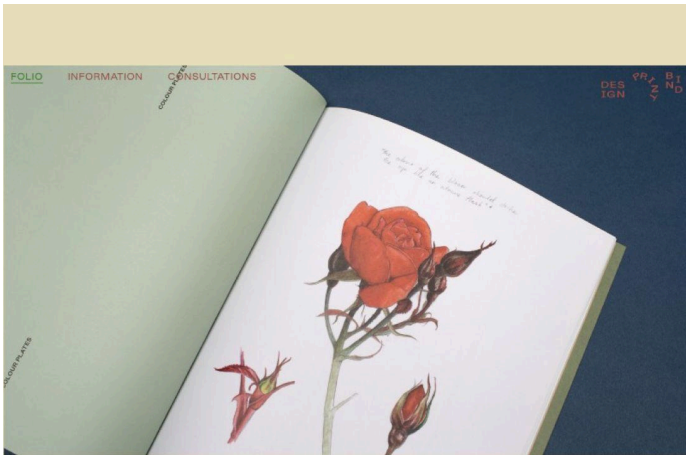
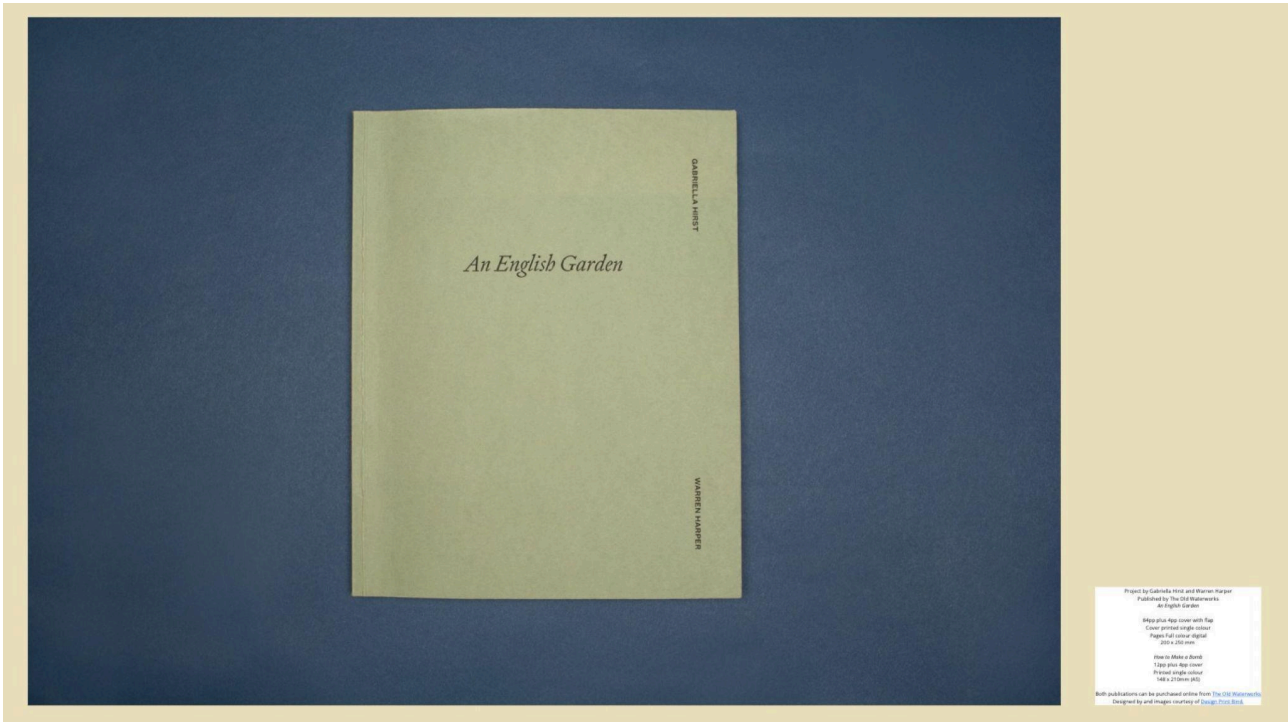


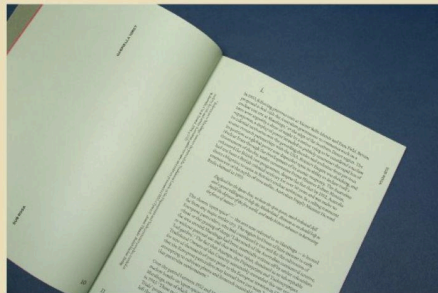
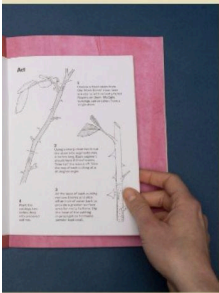
 Drone footage of 'An English Garden'
Updated 19-06-2023 @ 14:50 GMT-04:00



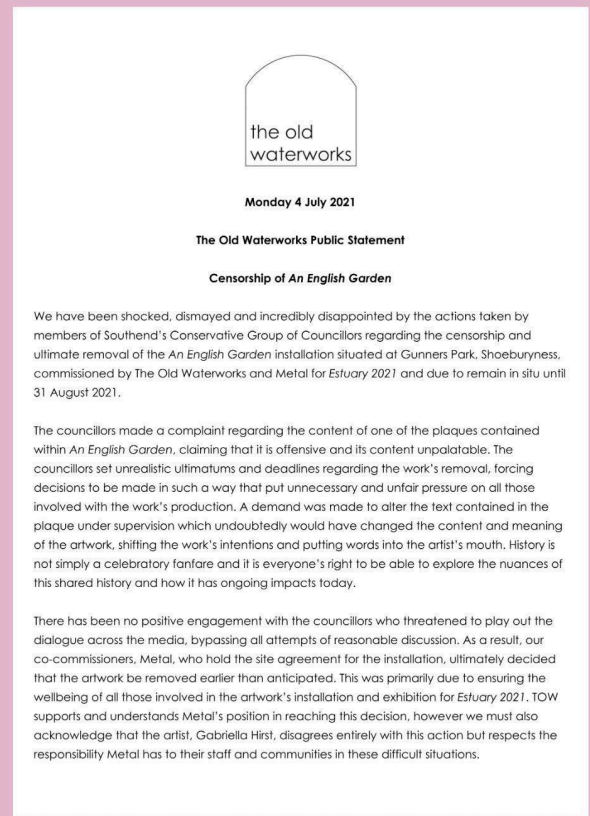
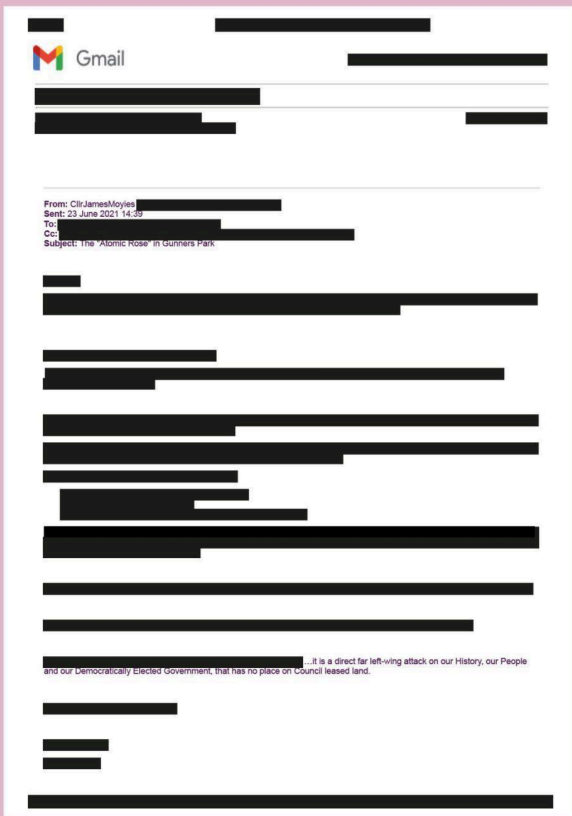
Speaking with journalists at Estuary 2021's press preview







The forced removal of *An English Garden*



...it is a direct far left-wing attack on our History, our People and our Democratically Elected Government, that has no place on Council leased land.

Open Letter: The Name of the Atom Bomb Rose

Dear The Art Newspaper,
Cllr Ian Gilbert, Leader of Southend Borough Council;
Cllr Mulrone, Cabinet Member for Environment, Culture, Tourism & Planning, Southend Borough Council;
Scott Doling, Director of Culture and Tourism, Southend Borough Council.

The Nuclear Culture Research Group is an international network of artists, curators, and academics in the nuclear arts, humanities and sciences, as well as nuclear professionals. We vehemently support the permanent reinstatement of the public artwork 'An English Garden' by Gabriella Hirst (Jose da Silva, The Art Newspaper, 15 July; Donna Ferguson, Observer 17 July, and Tim Burrows Guardian Opinion, 19 July). The artwork is a bed of newly propagated Rosa floribunda "Atom Bomb" on former Ministry Of Defence land, upriver from Foulness Island, designed to reflect upon the history of Britain's nuclear colonial legacy and its ongoing impact. The artwork was commissioned for Estuary 2021 by Metal and The Old Waterworks with all the formal permission procedures in place.

The garden was removed due to threats from local Tory Councillors who acted without due process, leading to an undemocratic act of censorship. We ask Southend Borough Council to make a formal public apology to the artist, and to permanently reinstate the artwork.

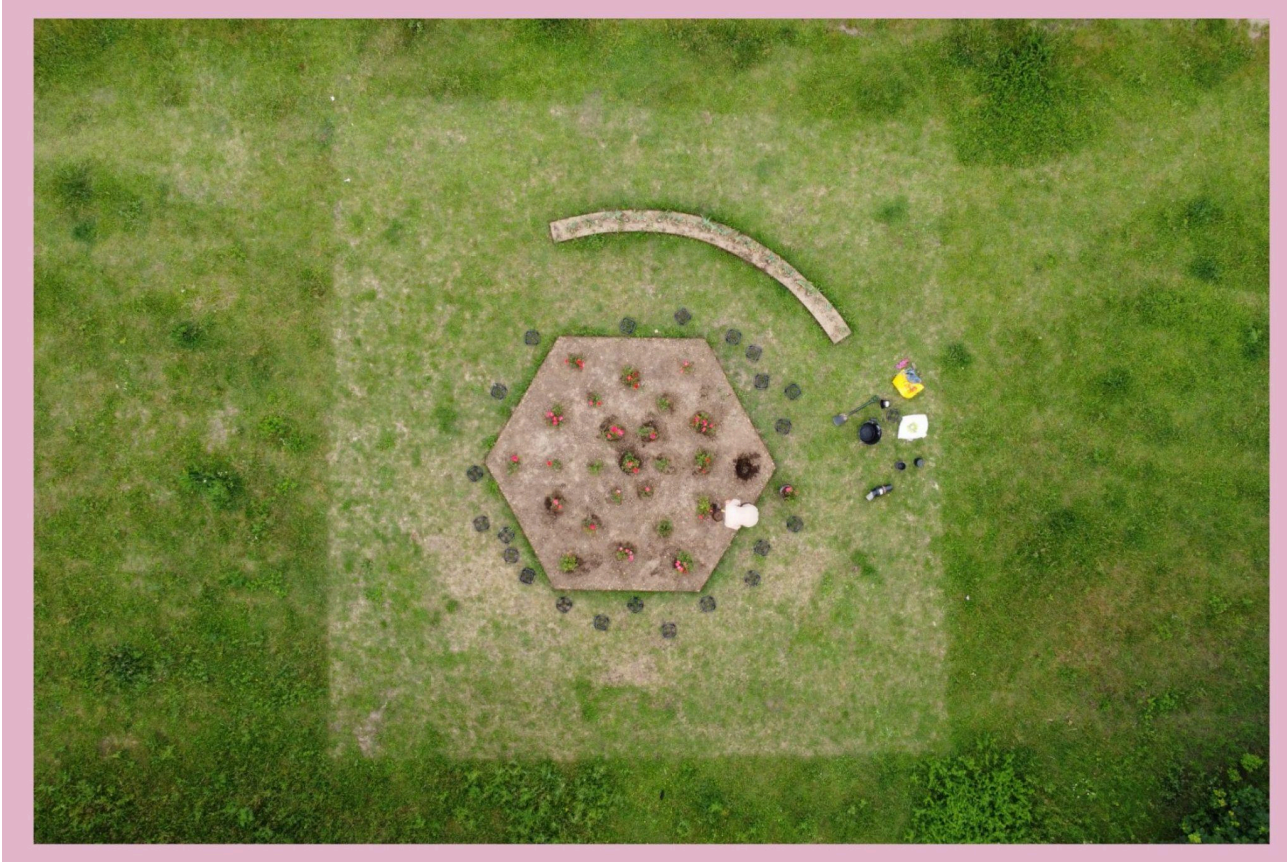
Withdrawing the artwork 'An English Garden' has led to the British Nuclear Test Veterans'



Open Letter: The Name of the Atom Bomb Rose

Updated 17-07-2023 @ 21:36 GMT-04:00







Site of *An English Garden*, February 2022.



LEFT Gabrielle Hirst's installation, *An English Garden*, in Gunners Park, Southend. Connor Turvey

BELOW The site after the removal of the artwork, which attracted criticism from local councillors. Sophia Evans for the Observer

'Not in this town': how a rose garden artwork led to an explosive ultimatum

Tory councillors are accused of bullying as installation on nuclear colonialism is removed from Southend park

Donna Ferguson

An Australian artist has accused a group of Conservative councillors of using "bullying strategies" to silence and censor her work after an installation she created to highlight Britain's "identity as a colonial nuclear state" was removed from a park in Essex.

The councillors threatened to "take action against the work" if it was not removed, according to Metal, the arts organisation that commissioned and then removed the installation from Gunners Park in Southend.

Gabrielle Hirst's *An English Garden* consisted of benches and a row of flowerbeds planted with Atom Bomb roses, a rare variety of rose created at the height of the cold war arms race in 1953, alongside Cliffs of Dover Irises.

A plaque on the bench explained this and highlighted the assembly, at a site nearby, of Britain's first atomic bomb and the devastation caused by its detonation on unceded Indigenous land in Australia. The

plaque also stated that Britain continues to proliferate nuclear arms, following the government's decision to lift a 30-year ban on the development of new nuclear weapons this year, and increase its nuclear armament by 40%. It described the country as having an "historical and ongoing identity as a colonial nuclear state".

On social media, Hirst said she and Metal, which had co-commissioned the installation with artists' charity the Old Waterworks, had been given a 48-hour ultimatum to remove the work before the councillors planned to intervene to censor the "offending" plaque. She added that the councillors had threatened to subject them to a national media campaign that would frame the work as "a direct far-leftwing attack on our history, our people and our democratically elected government". She wrote: "Seemingly, said government and its global-scale nuclear arsenal was not considered robust enough to endure the airing of historical facts and critique via a rose garden art installation."

James Moyles, one of the Conservative councillors for Southend who objected, told the *Observer* the plaque was "offensive". His two main objections to it were: "Using public money on public land to display a left-wing rant which accused our current government of investing in industries of hate, rather than care"; and

"attacking our country as currently being a colonial nuclear state". "The rest of the text has other contentious statements that I do not like, but these were the two main reasons that it had to be altered or removed."

Moyles, a Brexiter who was a regional director of the Vote Leave campaign in 2016, added that if Metal had not complied with his request, "I planned to take action by sticking a piece of laminated paper with a different message next to the offensive plaque. I planned to get national coverage." He said he felt the issue had been resolved "amicably".

Metal said that it decided to remove the work after being subjected to "intense pressure" over a 48-hour period by the group of councillors. The Old Waterworks said it was "shocked, dismayed and disappointed" by the councillors' actions but understood Metal's decision.

Colette Bailey, artistic director of Metal, told the *Observer* she thinks what the councillors did amounts to censorship: "The threat of bringing media attention to their profound misreading and misinterpretation of the work was part of their campaign to increase the pressure on the commissioning and artistic partners."

She said the launch of such a media campaign would have highlighted the councillors' "fundamental misreading" of the work and distort its "actual

meaning", and decided on removal to protect the mental health and wellbeing of her staff from issues that might arise from the councillors' actions.

In response, Moyles said: "The notion that anyone needed their wellbeing or mental health protecting is nonsense. It was a few benches and flower beds, in a meadowland park, with an offensive plaque."

Hirst, who said she understood Metal's decision but did not agree with it, said the work critically reflected on Britain's nuclear and colonial legacy. "When correspondence between Metal and the councillors was forwarded to me, I was incredulous at the bullying strategies used to silence my artwork," she told the *Observer*. "It is alarming that a space of critique and contemplation could be removed at the behest of a small number of councillors, to silence a statement they find disturbing. I'm astounded at the implication that art should not be able to scruti-

nise topics such as British colonialism and nuclear armament."

She added that veterans who were present during the British nuclear testing programme in the 1950s and 60s have voiced their outrage at the work's censorship: "I'm not alone in finding the realities, histories and future of nuclear weaponry frightening. And for me, this artwork is trying to work through a big topic, using a rose bed, to hold space for working through topics which are shrouded in fear and secrecy."

Ian Gilbert, the Labour leader of Southend council, said the council had not funded the exhibition and did not manage the park. "Fundamentally, it's not a council decision, which is why I think it's so inappropriate that [opposition] councillors have brought this pressure to bear."

He regrets that Metal felt it was necessary to remove the work and said the council plans to meet the organisation and discuss a way forward. "I don't believe in censorship of art, and I think you're on a slippery slope if you believe that artists are allowed to say anything that's critical of the government of the day."

Moyles denied the allegations of threatening or bullying behaviour and said he had not been in direct contact with Hirst. He added that the land is owned by the council but leased to Essex Wildlife Trust.



'I think you're on a slippery slope if artists can't criticise the government'
Ian Gilbert, Labour leader of Southend council

THE

ONLINE SATURDAY
23 OCTOBER 2021



ROSE

TALKS AND SCREENINGS

GARDEN

10.00(BST) 20.00(EST)

CONFERENCE

A one day forum of talks and screenings which bring focus upon two seemingly opposed topics: gardening and global armaments. It will invite artists, writers and activists to share their insights into both the nuclear and the botanical.



The Rose Garden Conference

Updated 19-06-2023 @ 14:49 GMT-04:00



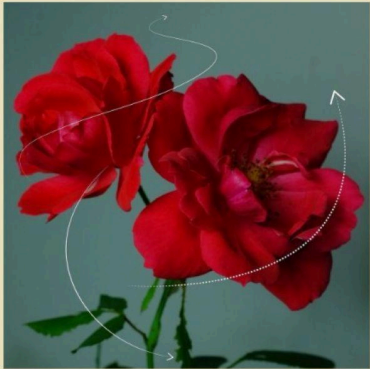


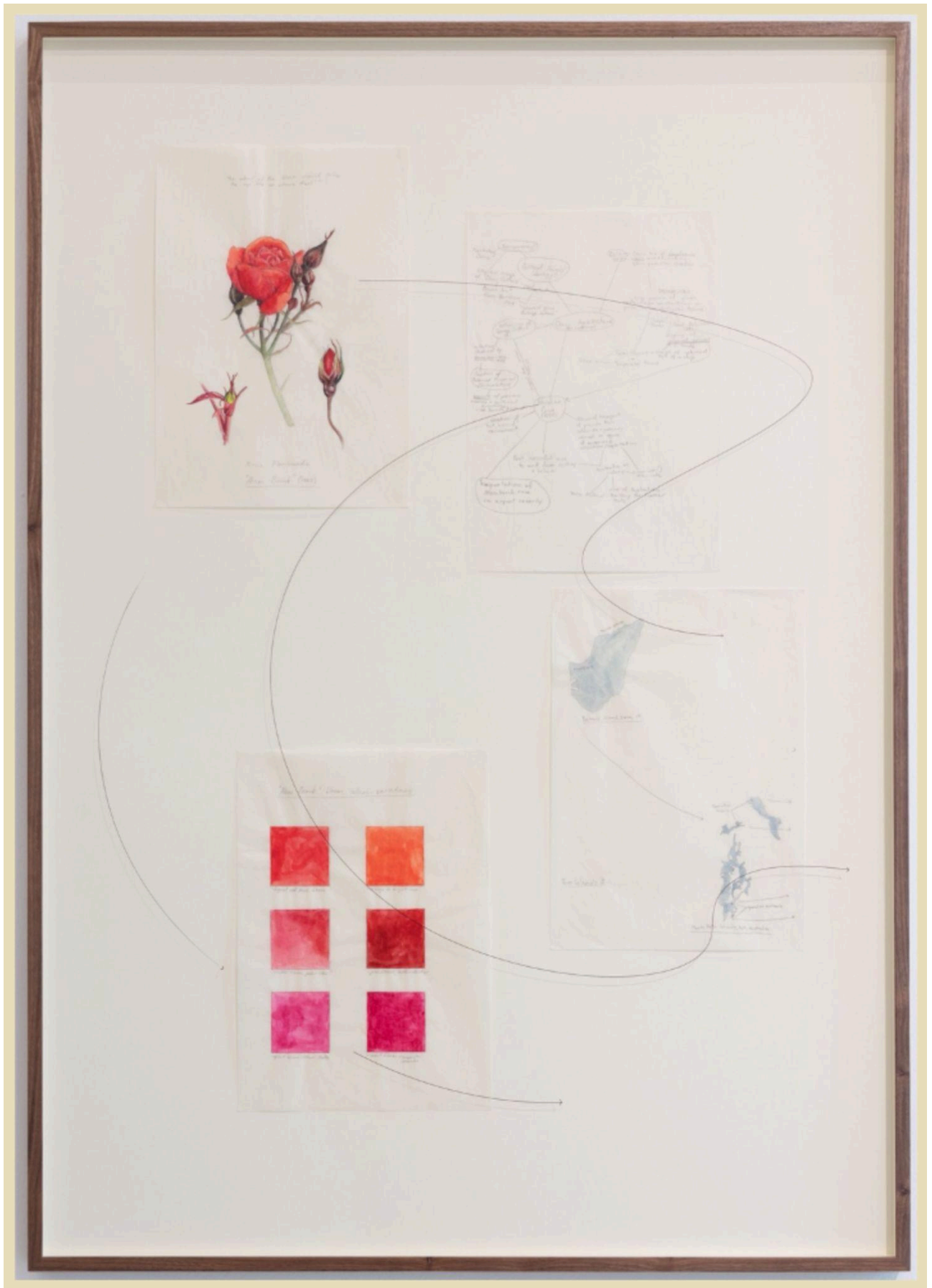
Behind the scenes shots, preparing to hang the work. photo credit: Warren Harper

Sub Rosa (2021), as part of *Tip of the Iceberg* at Focal Point Gallery



Sub Rosa (2021), as part of *Tip of the Iceberg* at Focal Point Gallery









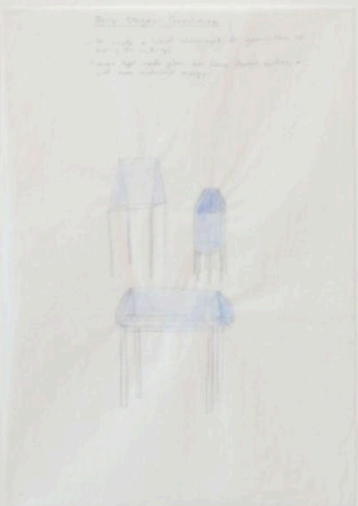
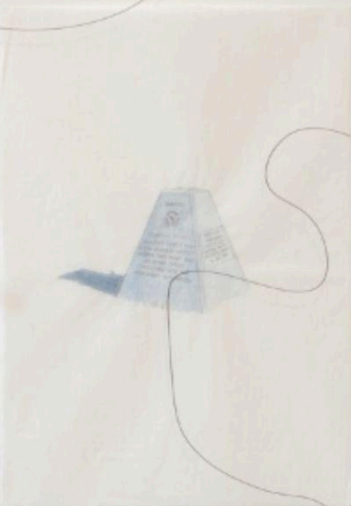
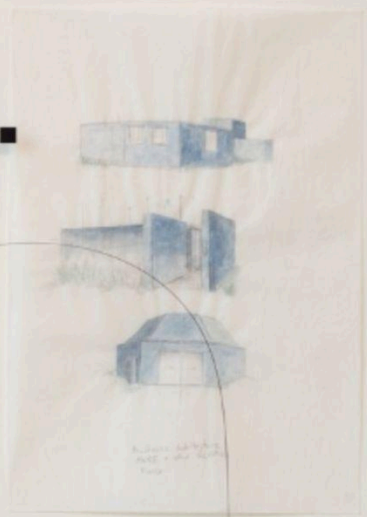






- Venice, Palazzo Ducale
- Venice, Basilica di Santa Maria della Salute
- Venice, Teatro della Fenice
- Venice, Palazzo Ca' Cappello
- The Venetian Lagoon

• The Venetian Lagoon is a UNESCO World Heritage Site. It is a unique and beautiful landscape, and a must-visit destination for anyone interested in architecture and history.



The chair is a simple, functional design. It features a high back and a seat with a slightly curved shape. The legs are thin and straight, providing a stable base. The overall aesthetic is minimalist and modern.



The dog roses after they arrived at The Old Waterworks in August 2021, where I repotted them in preparation for their installation at Focal Point Gallery.





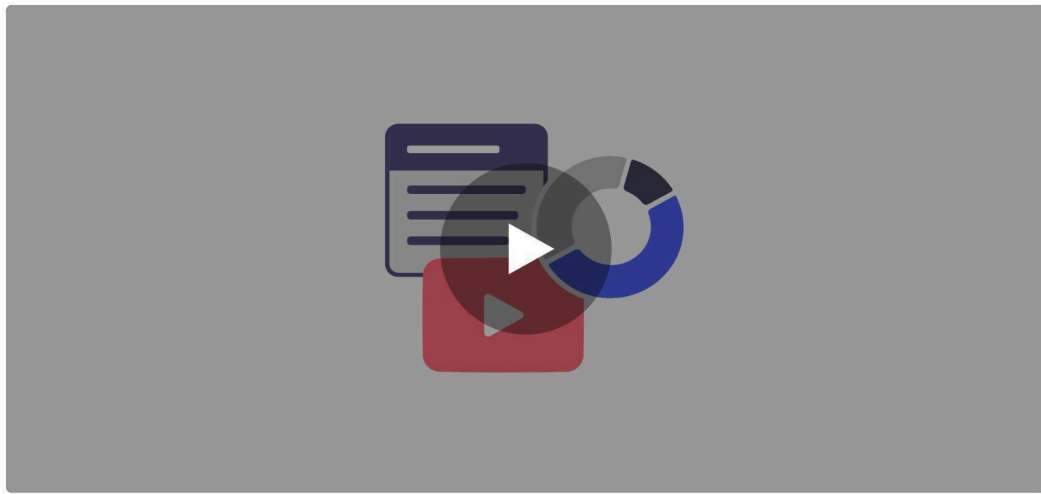
A row of 50 dog roses outside Focal Point Gallery as part of group exhibition *Tip of the Iceberg*. These roses were grafted as part of the workshop in September 2021, recording below, and participants collected their roses from The Old Waterworks in January/February 2022.



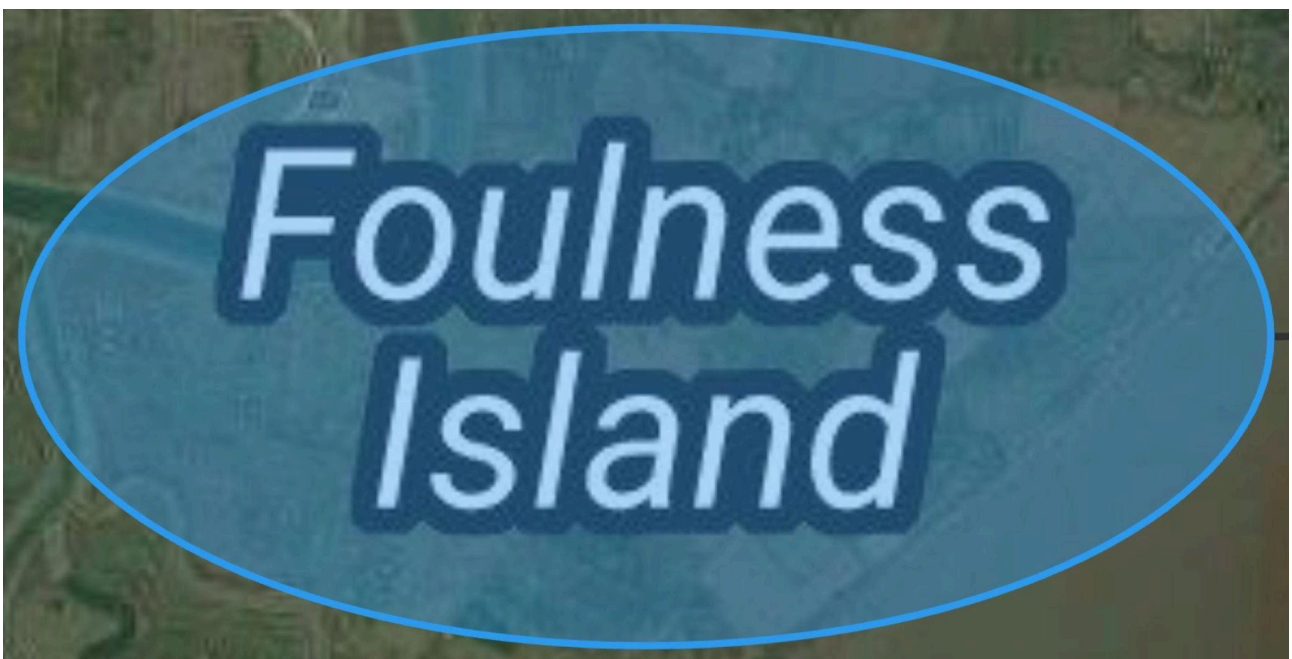
How to Make a Bomb workshop at FPG
Updated 19-06-2023 @ 17:13 GMT-04:00



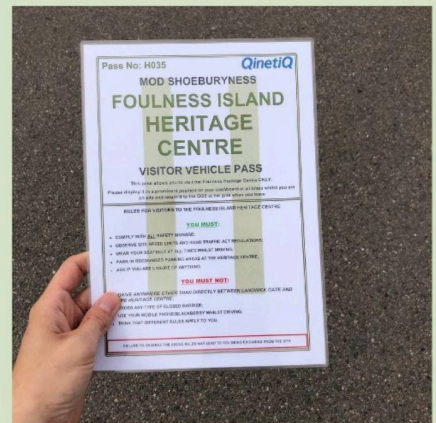
Planting an 'Atom Bomb' Rose at Loughborough University

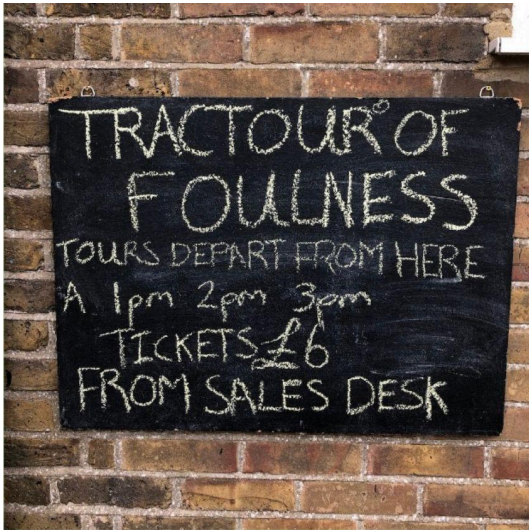


 Planting an 'Atom Bomb Rose' at Loughborough University
YouTube | Updated 7 minutes ago

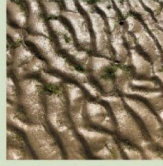


Sunday 5 August
2019.
Research trip to
Foulness Island and
the Foulness
Heritage Centre
with Gabriella Hirst





Walking the Broomway with artist and curator James Ravinet. Led by local guides Brian and Toni Dawson. 29 June 2019.



Foulness Island: Atomic Weapons Research Establishment



AWE gates, August 2019.
photo credit: Warren Harper

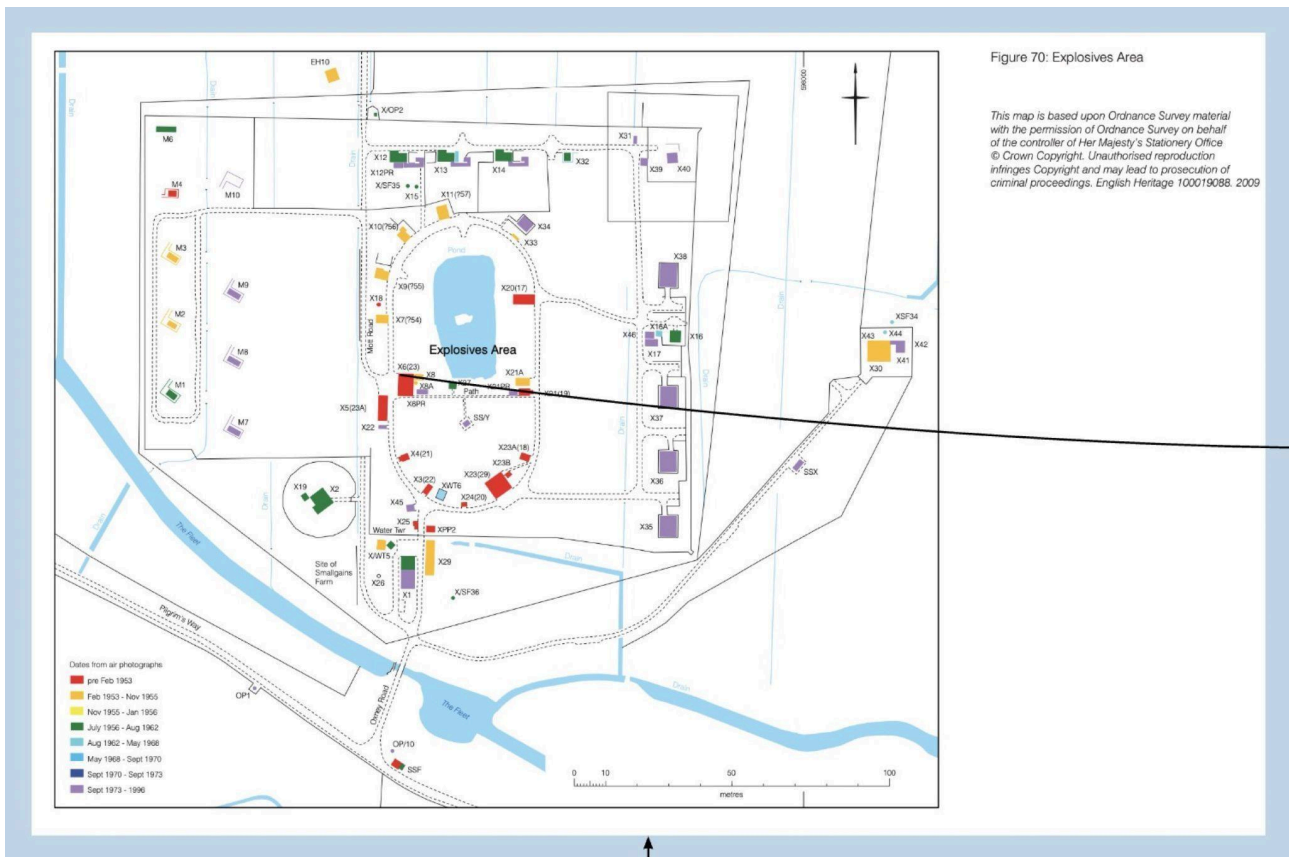
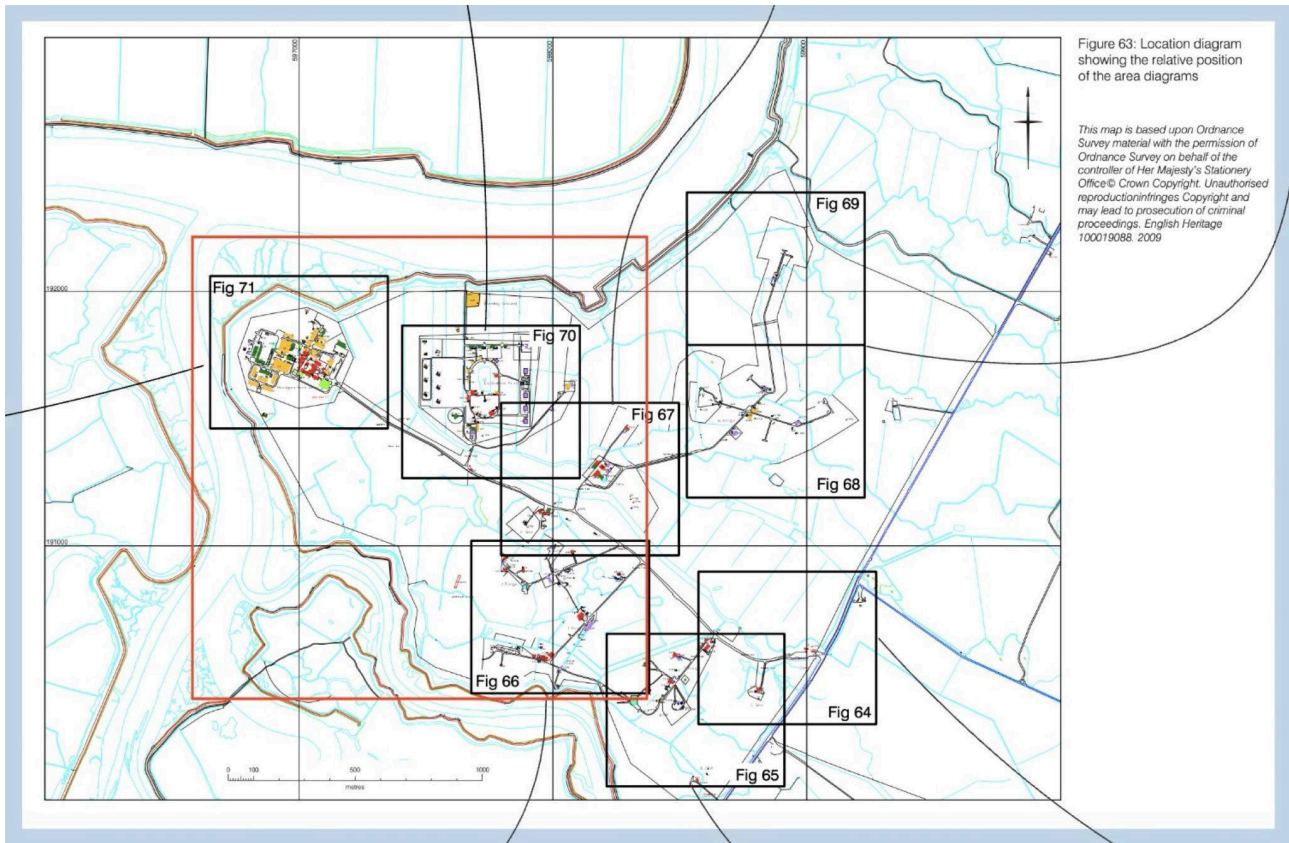
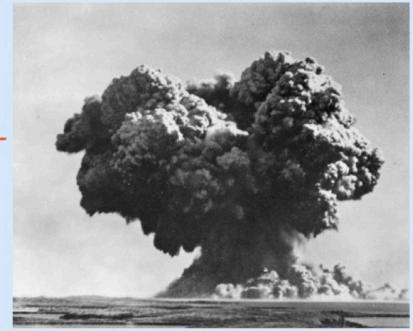




Figure 5: Explosives Preparation Laboratory X6, was 23, late in 1947 Superintendent Roy Pilgrim respecified the design of this building for its role in the atomic bomb project. In 1952, the United Kingdom's first live atomic device was assembled in this building. (c) English Heritage DP035925



Operation Hurricane, 1952

Monte Bello Islands



Annex 2: Australian Nuclear and Uranium Sites

Australian Nuclear and Uranium Sites map, version 2017, australianmap.net



Annex 1: Nuclear Test Explosions in Australia

Figures from ARPANSA. (n.d.) 'British nuclear weapons testing in Australia.' <www.arpansa.gov.au/understanding-radiation/sources-radiation/more-radiation-sources/british-nuclear-weapons-testing>. Note: the yield figures are recorded with some discrepancy in other sources, such as the 2003 *Report of Veterans Entitlements* or the figures given in the 1985 Royal Commission report. Additional details from: William Robert Johnston. (2006) 'Database of nuclear tests, United Kingdom.' <<http://www.johnstonsarchive.net/nuclear/tests/UK-ntests1.html>>.

Shot	Location	Date	Type of Nuclear Test	Estimated Yield (Kilotons)
Hurricane	Monte Bello	3 October 1952	Atmospheric, water surface, barge	25
Totem 1	Emu Field	15 October 1953	Atmospheric, tower	9.1
Totem 2	Emu Field	27 October 1953	Atmospheric, tower	7.1
Mosaic 1	Monte Bello	16 May 1956	Atmospheric, tower	16
Mosaic 2	Monte Bello	19 June 1956	Atmospheric, tower	98
Buffalo R1/One Tree	Maralinga	27 September 1956	Atmospheric, tower	12.9
Buffalo 2/Marcoo	Maralinga	4 October 1956	Atmospheric, surface	1.4
Buffalo 3/Kite	Maralinga	11 October 1956	Atmospheric, airdrop	2.9
Buffalo 4/Breakaway	Maralinga	22 October 1956	Atmospheric, tower	10.8
Antler 1/Tadje	Maralinga	14 September 1957	Atmospheric, tower	0.93
Antler 2/Biak	Maralinga	25 September 1957	Atmospheric, tower	5.7
Antler 3/Taranaki	Maralinga	9 October 1957	Atmospheric, balloon	26.5

Area 1: Nuclear Test Discharge to the Sea

Approximate 1952-1963: The British nuclear testing programme in Australia, 1952-1963. The table below provides a summary of the nuclear tests conducted during this period.

Year	Test Name	Location	Yield (kt)	Notes
1952	Operation Hurricane	Monte Bello Islands	8	First nuclear test in Australia
1953	Operation Pegasus	Monte Bello Islands	10	First hydrogen bomb test in Australia
1956	Operation Totem	Monte Bello Islands	10	First thermonuclear test in Australia
1957	Operation Puma	Monte Bello Islands	10	First hydrogen bomb test in Australia
1958	Operation Zebra	Monte Bello Islands	10	First hydrogen bomb test in Australia
1959	Operation Nomad	Monte Bello Islands	10	First hydrogen bomb test in Australia
1960	Operation Buffalo	Monte Bello Islands	10	First hydrogen bomb test in Australia
1961	Operation Kangaroo	Monte Bello Islands	10	First hydrogen bomb test in Australia
1962	Operation Flint	Monte Bello Islands	10	First hydrogen bomb test in Australia
1963	Operation Bluebird	Monte Bello Islands	10	First hydrogen bomb test in Australia
1964	Operation Bullseye	Monte Bello Islands	10	First hydrogen bomb test in Australia
1965	Operation Sunbeam	Monte Bello Islands	10	First hydrogen bomb test in Australia
1966	Operation Mallet	Monte Bello Islands	10	First hydrogen bomb test in Australia
1967	Operation Taurus	Monte Bello Islands	10	First hydrogen bomb test in Australia
1968	Operation Vulcan	Monte Bello Islands	10	First hydrogen bomb test in Australia
1969	Operation Starfish	Monte Bello Islands	10	First hydrogen bomb test in Australia
1970	Operation Hardtack	Monte Bello Islands	10	First hydrogen bomb test in Australia
1971	Operation Greenhouse	Monte Bello Islands	10	First hydrogen bomb test in Australia
1972	Operation Castle	Monte Bello Islands	10	First hydrogen bomb test in Australia
1973	Operation Borealis	Monte Bello Islands	10	First hydrogen bomb test in Australia
1974	Operation Canopus	Monte Bello Islands	10	First hydrogen bomb test in Australia
1975	Operation Isora	Monte Bello Islands	10	First hydrogen bomb test in Australia
1976	Operation Taurus	Monte Bello Islands	10	First hydrogen bomb test in Australia
1977	Operation Vulcan	Monte Bello Islands	10	First hydrogen bomb test in Australia
1978	Operation Starfish	Monte Bello Islands	10	First hydrogen bomb test in Australia
1979	Operation Hardtack	Monte Bello Islands	10	First hydrogen bomb test in Australia
1980	Operation Greenhouse	Monte Bello Islands	10	First hydrogen bomb test in Australia
1981	Operation Castle	Monte Bello Islands	10	First hydrogen bomb test in Australia
1982	Operation Borealis	Monte Bello Islands	10	First hydrogen bomb test in Australia
1983	Operation Canopus	Monte Bello Islands	10	First hydrogen bomb test in Australia
1984	Operation Isora	Monte Bello Islands	10	First hydrogen bomb test in Australia
1985	Operation Taurus	Monte Bello Islands	10	First hydrogen bomb test in Australia
1986	Operation Vulcan	Monte Bello Islands	10	First hydrogen bomb test in Australia
1987	Operation Starfish	Monte Bello Islands	10	First hydrogen bomb test in Australia
1988	Operation Hardtack	Monte Bello Islands	10	First hydrogen bomb test in Australia
1989	Operation Greenhouse	Monte Bello Islands	10	First hydrogen bomb test in Australia
1990	Operation Castle	Monte Bello Islands	10	First hydrogen bomb test in Australia
1991	Operation Borealis	Monte Bello Islands	10	First hydrogen bomb test in Australia
1992	Operation Canopus	Monte Bello Islands	10	First hydrogen bomb test in Australia
1993	Operation Isora	Monte Bello Islands	10	First hydrogen bomb test in Australia
1994	Operation Taurus	Monte Bello Islands	10	First hydrogen bomb test in Australia
1995	Operation Vulcan	Monte Bello Islands	10	First hydrogen bomb test in Australia
1996	Operation Starfish	Monte Bello Islands	10	First hydrogen bomb test in Australia
1997	Operation Hardtack	Monte Bello Islands	10	First hydrogen bomb test in Australia
1998	Operation Greenhouse	Monte Bello Islands	10	First hydrogen bomb test in Australia
1999	Operation Castle	Monte Bello Islands	10	First hydrogen bomb test in Australia
2000	Operation Borealis	Monte Bello Islands	10	First hydrogen bomb test in Australia
2001	Operation Canopus	Monte Bello Islands	10	First hydrogen bomb test in Australia
2002	Operation Isora	Monte Bello Islands	10	First hydrogen bomb test in Australia
2003	Operation Taurus	Monte Bello Islands	10	First hydrogen bomb test in Australia
2004	Operation Vulcan	Monte Bello Islands	10	First hydrogen bomb test in Australia
2005	Operation Starfish	Monte Bello Islands	10	First hydrogen bomb test in Australia
2006	Operation Hardtack	Monte Bello Islands	10	First hydrogen bomb test in Australia
2007	Operation Greenhouse	Monte Bello Islands	10	First hydrogen bomb test in Australia
2008	Operation Castle	Monte Bello Islands	10	First hydrogen bomb test in Australia
2009	Operation Borealis	Monte Bello Islands	10	First hydrogen bomb test in Australia
2010	Operation Canopus	Monte Bello Islands	10	First hydrogen bomb test in Australia
2011	Operation Isora	Monte Bello Islands	10	First hydrogen bomb test in Australia
2012	Operation Taurus	Monte Bello Islands	10	First hydrogen bomb test in Australia
2013	Operation Vulcan	Monte Bello Islands	10	First hydrogen bomb test in Australia
2014	Operation Starfish	Monte Bello Islands	10	First hydrogen bomb test in Australia
2015	Operation Hardtack	Monte Bello Islands	10	First hydrogen bomb test in Australia
2016	Operation Greenhouse	Monte Bello Islands	10	First hydrogen bomb test in Australia
2017	Operation Castle	Monte Bello Islands	10	First hydrogen bomb test in Australia
2018	Operation Borealis	Monte Bello Islands	10	First hydrogen bomb test in Australia
2019	Operation Canopus	Monte Bello Islands	10	First hydrogen bomb test in Australia
2020	Operation Isora	Monte Bello Islands	10	First hydrogen bomb test in Australia
2021	Operation Taurus	Monte Bello Islands	10	First hydrogen bomb test in Australia
2022	Operation Vulcan	Monte Bello Islands	10	First hydrogen bomb test in Australia
2023	Operation Starfish	Monte Bello Islands	10	First hydrogen bomb test in Australia
2024	Operation Hardtack	Monte Bello Islands	10	First hydrogen bomb test in Australia
2025	Operation Greenhouse	Monte Bello Islands	10	First hydrogen bomb test in Australia



Monte Bello Islands

The British nuclear testing programme in Australia, 1952-1963



Monte Bello Islands



Operation Hurricane, 1952





uranium ore

Rössing Uranium Mine, Namibia



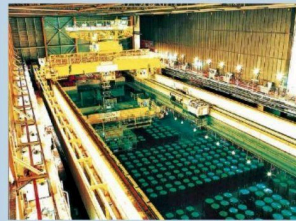
Planetary Relations



Ranger Uranium Mine, Australia



Magnox designed reactor,
Tōkai Nuclear Power Plant,
Japan



THORP, Sellafield



Montebello Islands
off coast of Western Australia

**The Nucleus of the Blackwater Estuary and Foulness Island:
Towards an Interscalar Curatorial Practice**

Welcome to the Practice Dossier for Warren Harper's practice-based curatorial PhD research project: *The Nucleus of the Blackwater Estuary and Foulness Island: Towards an Interscalar Curatorial Practice*.

This dossier maps out the documentation of the artworks commissioned and the production process, correspondence, fieldwork, reactions to the work, and other information that provides context for the practice-based portion of this project. The dossier also consists of different media, such as PDFs, external links and embedded videos.

Throughout my written dissertation there are links to certain parts of this dossier within the footnotes. This is a way to link the two parts of the PhD and to provide the reader reference points to the practice whilst reading the written dissertation. This dossier is also in the appendix of the written dissertation for ease of reference, albeit in a different, more static format.

This dossier is not necessarily intended to be experienced in a particular order and the viewer is welcome to explore it in whatever way they feel appropriate. The viewer can explore the materials herein by zooming in and out and using one's cursor to move around. However, I have recorded and shared one such possible route.

Where aspects of the dossier are enclosed within different colours they constitute different types of activity:

KEY

- Public moments
- Fieldwork
- Contextual and place-specific research
- 'Behind the scenes', or the process of making public

