

Chapter

Perspective Chapter: Experiments in Entangled Time

Karin Marie Fierke

Abstract

The purpose of this chapter is to revisit the concept, ‘To See is to Break an Entanglement,’ through an exploration of insights from a three-year project (2020–2023), ‘Mapping the Empire: The Contemporary Legacy of Historical Trauma and Forced Displacement.’ The project arose from observations that have no explanation in classical physics, and sought to explore the significance of the ‘quantum effects’ that underpin the dynamics of a particular form of systems therapy and its potential adaptation to the analysis of global entanglements of past, present and future. The chapter develops insights relating to entanglement, language and consciousness that arose from an ‘experiment.’

Keywords: time, affective resonance, entanglement, language, consciousness

1. Introduction

The past few years have seen the publication of several books and special issues about the implications of quantum theory for the social sciences [1–8] many of which ask how particular socio-political phenomena look different when lifted from the assumptions of classical physics and placed in an uncertain quantum world. My co-authored contribution with Nicola Mackay, ‘To See is to Break an Entanglement’ [9], reflected on an ‘experiment’ that at the time was at a very early stage. Just after the article was published, we received funding to do exploratory research on a project titled ‘Mapping the Empire: The Contemporary Legacy of Historical Trauma and Forced Displacement’ (MtE).

The concept ‘to see is to break an entanglement’ is significant against the backdrop of the award of the 2022 Nobel Prize in Physics to John Clauser, Alain Aspect and Anton Zeilinger for experiments with entangled photons. Within quantum mechanics, nature is not locally real, that is, particles lack properties such as spin up or spin down prior to measurement, which corresponds with observation. They also communicate and respond to one another regardless of the distance. Entanglement is thus a non-local phenomenon. The prize winners were said to have ‘proved’ that the Universe is not locally real, on the one hand; on the other hand, as noted by Charles Bennett, a quantum researcher at IBM, ‘The experiments...show that this stuff isn’t just philosophical, it’s real – and like other real things, potentially useful’ [10]. The contrast suggests that quantum entanglement is real, but not in the way that ‘real’ is usually

understood. As Niels Bohr, the father of the Copenhagen School, noted, ‘The word “reality” is a word, a word which we must learn to use correctly.’ [11].

The reality/philosophy question has haunted discussions of quantum physics [12]. The quantum social theory debate has been mired in the binary either/or of whether, when applied to the social sciences, the quantum is real or mere analogy, metaphor or metaphysics ([5], p. 44). The application of insights derived from the analysis of microscopic phenomenon to macroscopic phenomena seems to pose a question of how to scale up from one level of life, that is, the subatomic, which is the pre-occupation of quantum physicists, to another, that is, human social and political life, which is the focus of social scientists. In this respect, the language of quanta, the smallest amount, contributes to the problem, as do claims that quantum effects wash out above the macroscopic level. The MtE project is unique within the social science debate in so far as it grew out of an observation that has no explanation in classical physics.

The ‘quantum effects’ in this case arose from the dynamics of a particular form of systems therapy, which has been widely used with families and organizations. The MtE experiment, which took place over a two and a half year period, sought to adapt the method to the analysis of more global phenomena. Material entanglements [1] and entanglements in language and social structure [2] have had a central place in the quantum social theory debate. The affective resonances that arose within a mapping process, discussed below, can only be explained in terms of non-local micro-scopic entanglements, although also relevant to both materiality and language. The study thus provides a potential bridge between discussions of quantum entanglement in the natural and social sciences.

The current race to develop quantum computing and artificial intelligence has included attempts to create emotional robots [13]. The potential simulation of human emotions in machines at the very least implies that similar properties of quantum entanglement can be found within human and other life, yet, until recently, there has been resistance to the study of consciousness, including emotions, in both the natural and social sciences. The question raised by ‘to see is to break an entanglement’ is whether in seeing non-local entanglements between past and present, spaces might be opened for turning toward the loss and ‘ungrieved grief’ of centuries of empire and war and whether an act of ‘seeing,’ as a measurement, breaks an entanglement between past and present.’

In what follows, section two brings a problem of seeing and not seeing to an ‘experiment,’ exploring its broad contours. Section three examines a concept of affective resonance as a diffracted experience within the experiment. Section four illustrates several different cuts into the analysis of the collapse of affective resonances into language within a process of blind mapping. Section five then turns to a discussion of consciousness. The conclusions highlight provisional insights from the exploratory research and further avenues for potential interdisciplinary and practical development.

2. The puzzle and experiment

Several years ago, I stumbled onto a form of family systems therapy, the underlying dynamics of which have no explanation in classical physics. A central principle of systems therapy more generally is that how and where people stand—whether facing each other, or turning their backs, or alone in a corner embodies a relationship between family members. The particular approach I encountered had a further

dimension. The family constellations modality, developed by a German, Bert Hellinger in the 1960s,¹ has been used widely in the treatment of transgenerational trauma in Germany, relating in particular to the experience of World War II, and has since spread globally. Rather than working with actual family members, Hellinger brought in complete strangers who knew nothing about one another or the family of the person who was the focus of any particular constellation. The task of these volunteers was to stand in or represent a place within a system [16].

Standing in or representing a place is a form of second party experience that can be distinguished from either first party (subjective) or third party (objective) experience (see [17]). ‘Representatives’ for different family members are able, through speaking and moving within a created system, to access the feelings and dynamic relationships of the client [18], who is seeking to resolve an issue.² Through a facilitated process, the problem is disentangled and family members who were previously excluded are given a place, which ‘releases’ the problem and restores balance to the system [19].

The title of Hellinger’s seminal book, *Acknowledging What Is* [20], suggests that acknowledging ‘what is,’ even when it is staring us in the face, may be less than straightforward. In this respect, the central dynamic revolves around a question of what can be seen and what is unseen. The potential that individuals could stand within a created system and experience traces of affect relating to someone they do not know and have no knowledge of, not least because they belong to an earlier generation, only begins to make sense in the context of some notion of non-locality, quantum field, and transgenerational entanglement. If family systems are entangled non-locally, the assumed ontological separateness of individuals is an illusion, and a question arises about the existence of entanglements within other domains of experience.

The MtE project sought to explore whether the modality could be adapted to the analysis of entanglements of historical experience and contemporary memory and practice of a more social and political nature, particularly as these relate to a global legacy of historical trauma and forced displacement. What is meant by entanglement as used here is discussed in the next section. Our focus was the legacy of the past in the present, and how entanglements of memory and habit impact on what we are able to look at and what we turn away from. The Covid pandemic provided an unusual opportunity to explore the problem. The pandemic saw an unfolding field of trauma that impacted on populations globally which amplified a range of historical memories, and not least that of the Spanish Flu Pandemic (1918–1920). The run-up to Brexit was haunted by memories of British empire. In May of 2020 George Floyd’s murder at the hands of a white policeman in Minneapolis gave rise to a greater ability ‘to see’ systemic racism, which is a legacy of enslavement, and to challenge it. By early 2022, Western attention shifted away from questions of racial inequality as Russia invaded Ukraine. Different memories of experience during World War II or the Cold War framed this context, which also revealed evidence of a struggle over who would lead a future post-pandemic order, magnified by memories of various historical empires. A

¹ Hellinger’s method was influenced by other family systems methods, such as that of Virginia Satir; German phenomenology; and observations he made of Zulu healing practices in South Africa where he served as a priest for 16 years before becoming a psychotherapist (see, e.g. [14]). Mackay was trained by Hellinger and has 20 years of experience with the modality, as well as writing about it as a practitioner [15].

² For an introduction to family constellations, which includes live sessions of Hellinger working with representatives, see: <https://www.youtube.com/watch?v=wZ1oYiR5VpM>.

more recent link between a history of colonialism and a future of climate change has highlighted the relationship between past, present and future.

The methodological objective of the exploratory research was to examine the potential to adapt a particular form of systems analysis from its use within family or organizational systems to the analysis of global entanglements of past, present and future. The substantive objective of the project was to explore the legacy of historical trauma and forced displacement in the present.

2.1 A quantum experiment?

The project developed two complementary methods of analysis, both of which evolved over the 3 years as we brought insights from each to the other. A method of *tracking* involved research assistants in the exploration of the relationship between contemporary trending events, including the memories expressed by political agents within them; historical experiences of trauma, particularly in the context of various empires; and the multiplicity of future potentials at work in relation to the events in question. The method evolved over the 3 years from a more linear and local application which was gradually replaced by a non-linear approach to the analysis of global entanglements of empire. The tracking looked at empirical contexts, while developing theoretical insights about how a legacy of the past impacts on events in the present and shapes probabilities for the future.³

A complementary method of non-linear *mapping*, which is the focus of this chapter, fed off of the data developed by the trackers.⁴ Constructing a map begins with an intentional question relevant to both contemporary events and the existing historical record. An advantage of the more socio-political application of the systems method, over the family application, is the easier access to accounts of the past. The obvious problem, which is increasingly recognized by historians [21], regards the extent to which historical narratives have been impacted by, for instance, dominant national stories, which in the context of empire, facilitated an inability to see the more negative consequences. So, for instance, national histories of empire, such as the British, have highlighted the positive role of Britain's past global presence.

A growing literature has argued that this positive take on empire has made it difficult to see or acknowledge the suffering imposed on colonized populations [21–26]. While existing historical narratives might not provide a complete picture, the unseen elements of a system become more evident in the process of the mapping itself. The historical experiences explored by the trackers revealed material practices of horrific violence. The affective resonances of these experiences were the subject matter of the maps. The conversation within an active map makes it possible to observe how different parts of a system stand in relation to each other, who or what is seen or unseen, the affective dynamics of the system, how the separate parts triangulate (to make certain other parts unseen), as well as obstacles that stand in the way of acknowledging the unseen and giving them a place.

What does this have to do with quantum entanglement and why call it an experiment? First, as already suggested, the initial puzzle arose from an experience of *quantum effects*. Quantum effects are said to wash out at the macroscopic level due to quantum decoherence, by which a system's behavior changes from that which

³ The Research Assistant trackers hailed from diverse global locations, including India, China, Vietnam, Egypt, South Korea, Nigeria, Germany and Scotland.

⁴ We refer to the method as *Dynamic Entangled Memory Mapping* [9].

can be explained by quantum mechanics to that which can be explained by classical mechanics. The question is whether the effects disappear altogether or are simply unobservable in daily life. The experiment provided a modality and an apparatus for observing an otherwise unobservable and non-local phenomena over a sustained period of time.⁵ The 'quantum effects' would seem to point to the superposition of entangled states that exist in physically separated locations, past and present, which in the process of the mapping are 'measured' as they collapse into language.

Second, an entangled *complementarity* is evident in several aspects of the experiment, starting with the engagement of two complementary methods, one more oriented to the observable material world, and the other to unobservable entanglements of consciousness. Further, the emphasis on presence and non-presence, seen and unseen, resonates with Bohr's claim that complementary opposites are both mutually exclusive and intertwined, which makes it difficult to observe two parts of an entangled pair simultaneously. Presence and non-presence is an entangled relationship which means any account that deals only with the directly observable will be incomplete.

Third, the mapping process involved analysis of the affect, bodily movements and/or language of the 'mappers,'⁶ or those who represented positions within a given map. To insure that any patterns emerging from the process could be understood to arise from a system or field rather than individual interpretation, the experiment was undertaken *blind*. Consistent with the definition of a blind experiment, information that would influence the participants in the mapping was withheld until any one session was completed.

An *experiential* method is difficult to grasp without having had the experience. Readers may be inclined to assume that the words or gestures of the mappers express their subjective consciousness as individuals, but this is *not* the case. Instead, in stepping into a created system, the mappers become temporarily entangled with a category of socio-political experience which they represent and speak from. Recognizing that most people have traumas in their family histories, arising from larger social and political phenomena, the ethical criteria emphasized the importance that the mappers had priori training, including analysis of their own family entanglements, in order to minimize the potential to be overly triggered by stepping into a more global map.⁷ In this respect, the individual, as part of a holographic world, does not disappear altogether, but the blindness of the process minimized the role of individual interpretation, thereby maximizing the potential to analyze the extent to which the collapse of affective resonance into language within the maps arose from an holographic field. During the mapping process, the individual participants knew neither the context,

⁵ The blind group mapping took place once a month over a two and a half year period. An online application of the method made it possible to continue with the group work during the pandemic. Word-for-word transcripts were made from recordings of the sessions. Due to the terms of participants consent, the data underpinning this research cannot be made publicly available.

⁶ Use of the term 'mappers,' rather than 'representatives,' as is common with family constellations, was an attempt to avoid a potential misreading through Barad's [1] quantum critique of representation.

⁷ Prior experience with and training in the family constellation method was identified as an ethical requirement for participation in the mapping. This background also meant they had some idea of what to expect, given the palpable energy circulating through any one map. In the rare case that a mapper experienced distress, a designated therapist provided an individual post-mapping session to further separate individuals from their experience within the map.

the question, nor the category they represented, which were only introduced to the transcripts after a session was completed.

In setting up a map, the focus of family constellations on individuals within a family system was replaced by categories of memory (e.g. the Siege of Leningrad, the U.S. Civil War, World War II, the Opium Wars), of experience (e.g. forced displacement, hunger and scarcity, war, enslavement, genocide), of emotion (e.g. grief or unrieved grief, betrayal, guilt, shame, compassion), of collective identity (e.g. particular states, present populations, children), of happenings (e.g. Brexit, climate change, invasions) or belief (e.g. profit as belief, safety, collective agreements not to know), which are derived from an intentional question, the formulation of which drew on the contemporary and historical data compiled by the trackers. At face value, there is no reason to believe that the blind engagement of what on the surface appear to be abstract categories would be anything except a chaotic jumble of words. The surprising and significant observation regards the extent to which, as illustrated in Section 4, patterns that emerged from the maps revealed the broad contours of the topic in question, as well as unseen aspects.

The emergence of patterns from a blind conversation is difficult to grasp and easily conflated with words that evoke negative connotations in Western culture, related, for instance, to parapsychology or talking to the dead. The created maps revolved around categories of experience and memories related to *socio-political phenomena*, rather than individuals, whether alive or dead, and as such express something qualitatively different, i.e. affective resonances or traces of past experience that remain alive, and are threaded through socio-political experience in the present. In this respect, as the physicist/social theorist Karen Barad notes, memory is 'written into the fabric of the world' ([27], p. 260) rather than being purely a property of individual mind. In the next section, I set the stage by thinking about the entanglement of the present with affective resonances of the past.

3. Entanglements of trauma

There is a growing literature on artificial intelligence and the potential that robots, i.e. machines, might be endowed with properties of emotion and consciousness, yet we lack sufficient understanding of how the assumptions of quantum entanglement, which makes such an endeavor conceivable, works in sentient life. Much of the research relating to the latter has focused on the human brain and subjective consciousness. A focus on machines, individuals and the brain would seem to resonate more with the assumptions of classical Newtonian physics, which has sidelined the sentient aspects of life. Quantum mechanics is said to provide a better point of departure for taking emotions seriously. In a discussion of quantum decision theory, Alexander Wendt ([2], p. 167) makes the point that emotions do not follow a classical logic; neuroscientific studies have confirmed that reason and emotion are deeply intertwined in decision making.

The compatibility is not only evident in regard to the reason/emotion relationship. Emotions are *indeterminate*, often changing as frequently as the weather in Scotland. The indeterminism of quantum mechanics highlights randomness and chance, and multiple possible outcomes and thus the importance of probability rather than singular cause. Emotions are *complementary*, often existing in oppositional pairs, which cannot simultaneously be seen and thus express a relationship of presence and non-presence. Hate can mask love. The attribution of blame can mask guilt. Grief

may be masked by anger. The manifestation of any one will be subject to a measurement by participant observers. Emotions are also both individual and *relational*—they are experienced or expressed in relation to others, and are heavily shaped by histories, language, memory and habit, particularly as one moves toward their circulation in a global space. Global relations, often forged through war and practices of mutual harm, of betrayal, humiliation, and fear are themselves entanglements, despite the apparent fragmentation. For example, the anthropologist Gregory Bateson has noted that the humiliation of Germany at Versailles (1919) set the stage for all that has happened since. His main point was to highlight that emotional patterns matter [28]. ‘Hurt’ or trauma, particularly when it is silenced and hidden away, can be radioactive in its persistence. While positive emotions of compassion or love involve ‘seeing’ an other, the ‘ungrieved grief’ that accompanies trauma often gives rise to a tendency to turn away and to not see or know, as the emotions, whether guilt, shame or grief, may be too difficult for all parties involved to sit with [29]. The silence that so often surrounds historical traumas is part of the ‘radioactivity,’ i.e. persistence over generations, of *non-local entanglements* of past and present. The purpose of this section is to briefly set the stage by exploring a notion of non-local affective entanglements with the past, which maintain a resonance in the present, i.e. the ‘quantum effects.’ The subject matter connects to diverse interdisciplinary literatures, but, as space does not allow for a comprehensive review, the objective is to make sense of the affective dynamics of the mapping process.

3.1 Time and affective resonance

‘Seeing’ and ‘not seeing’ may be a spatial relationship but may also be temporal, non-local and non-linear. Linear constructions of time draw lines between past, present and future. Past ‘events’ may be known factually, but are separated out and relegated to a bygone era where they exist in a linear relationship to the present as something that no longer is. Theoretical mathematicians, physicists and cosmologists have argued that linear notions of time as flowing forward, separated neatly into past, present and future, rest on an illusion [30]. In discussing superposition and entanglement, which she identifies with diffraction, Barad argues that ‘different times bleed through one another’ [31].

The literature on socio-political memory includes claims that contemporary populations use memory for purposes of the present (e.g [32]) or in the realization of future projects (e.g. [33]). While not denying the importance of the observation, the mapping sought to explore non-local entanglements between historical *experiences* of trauma by segments of populations, and performances of *memory* in contemporary socio-political contexts, a distinction that emerged from the development of the tracking method. While important for analytical purposes, the distinction disguises the extent to which memory arises from an accumulation of past experience, which in its continuous performance, sediments aspects of the past, thereby thickening memory and habits relating to it. The experience/memory distinction, relates to a further distinction between *affect*, which usually refers to an experience of sentience, and the articulation of *emotion* in the political performance of memory and in language, which are often also entangled. The following unpacks these distinctions to make some sense of the ‘bleeding’ of socio-political trauma across time within the ‘experiment.’

‘To see is to break an entanglement’ rested on a claim that not only individual memories of trauma, but also social memories are entangled with both sensory

imprints of past trauma and language [9]. Commenting on a century of study of traumatic memories, the psychiatrist Bessel van der Kolk [34] argued that semantic memories may coexist with sensory imprints, which often remain stable over time, but may return when triggered by reminders. Sensory imprints of trauma appear as fragments, rather than narratives, and are expressed in images, physical sensations and intense emotions [35]. Traumatic memories are also more persistent in their recurring presence than ‘normal’ everyday memory; they intrude without welcome and often in response to triggers in the environment that resemble an earlier trauma. In cases of complex trauma, woven over extended periods of time, the intrusions become part and parcel of a relational world, structured around types of habitual experience and the use of language [36].

Bateson’s point about patterns of hurt suggests that sensory imprints are not exclusive to individuals but infuse experiences of traumatic memory that are more socio-political. Given the association between sensory imprints and the physical body, a concept of *affective resonance* is more useful for understanding a sentient experience that crosses over and through individual bodies, in which past and present bleed through each other. Within the context of the maps, the words, facial expressions or bodily movements of the participants expressed traces or fragments of traumatic historical experience, although, it should be emphasized, without re-experiencing the historical trauma itself. The affective resonance did not arise from personal experience, but rather expressed a diffracted resonance of past social experience in the present. Diffraction in its basic form is the bending of light around an obstacle. The two-slit experiment at the heart of quantum physics used a diffraction grating, to reveal the entanglement of particles and waves, and the importance of the observer and their apparatus for what is seen. Diffraction patterns highlight the presence of waves in matter, which is less about where difference appears than mapping where the effects of difference appear [37].

The 2020 article made a further claim that ‘articulations within the context of a created map express a form of wave-function collapse and a pattern of diffracted entanglement by which the attributes of a system become visible or “seen” as the vibrational frequencies surrounding a particular represented space, and the affect that arises from it, are transformed into language and thus become available for analysis.’ [9] Within the spacetime of the blind maps, the affective resonances experienced by the mappers might be said to work on the same principle as the forced-resonance tuning fork experiment, in which a vibrating tuning fork forces a stationary tuning fork into resonant vibration when placed beside it [38]. In stepping into a map, the participants come into resonance with the diffracted interference of the category of experience that they represent, where the boundaries of linear time are erased; as they speak from a position of blindness, the affective resonance is ‘measured’ in the collapse into language.

The experiment also revealed the greater complexity of multiple differently positioned mappers accessing past entangled states blindly. A cloud, which stores the memories of computer systems, might provide an analogy. The entangled mappers resonate with information stored in a cloud-like space—a sort of supercomputer in the cosmos—which is an interesting contrast to the efforts of physicists to use supercomputers to simulate the universe,⁸ a contrast that suggests the former may not be that far-fetched. The theoretical physicist David Bohm [39] refers to an implicate order, a seamless quantum field, of all that has been, with all potentials, habits and memories recorded in spacetime. Bohm contrasts the wholeness of this implicate order with the fragmentation of the macroscopic explicate order, with which it is

⁸ Examples include NASA’s Pleiades supercomputer or Japan’s ATERUI II.

entangled. The mapping provides a means to observe the relationship between the potentials within this larger quantum field and the active presence of fragmented entanglements within the world.

In so far as the diffracted affect relates to past experience, whether dispossession, famine, scarcity or enslavement, which is larger than individuals, the resonances arise from a *field* of experience which may or may not be contiguous with the 'collective memory' of a state or culture. The basic assumption of a system or field, while taking diverse forms in the literature, is that the whole coordinates the relationship between parts. In the context of the maps, patterns of affect emerge from the whole rather than the intentions or consciousness of the individuals involved. The biologist Rupert Sheldrake suggests that what he refers to as 'morphic resonance' is the past 'pressed up' against the present, which is potentially present everywhere ([40], p. 161). The resonance arises from past patterns of activity that influence the fields of subsequent and similar systems, which involves a kind of action at a distance in both space and time. Morphogenetic fields are probability structures within which the most common past types, sedimented in memory and habit, combine to increase the probability of a recurrence of that type ([40], p. 157).

At stake is a presence of the past expressed through memory and habit. Epigenetics suggests a potential that traumas from earlier generations may reappear in the bodies of successor generations, often triggered by environmental conditions that resemble an earlier trauma [41–44].⁹ Transgenerational trauma has become a widespread concern, particularly in relation to entanglements of race in the U.S. [45]; or as evidenced in a PBS documentary about Pike Island, a sacred Native American space at the meeting point of the Minnesota and Mississippi Rivers, which was transformed into a concentration camp in the aftermath of the U.S.-Dakota War of 1862 [46]. Ruth Davern, the granddaughter of a previous owner of the Island, explores the roots of her family, who fled persecution in Ireland at the hands of the British, only to participate in similar processes of exploitation by European settlers in the U.S.

It is not that work on the more social and political dimensions of transgenerational trauma is new; the problem has been a tendency to turn away from it. Gabriella Schwab discusses the engendering of silence in relation to the transgenerational trauma passed on to German children by those who perpetrated or accommodated the horrors of the Nazi regime [47]. Ngugi wa Thiong'o refers to a similar problem of transgenerational memory in post-colonial Africa, in relation to the millions of unmourned victims of a system of enslavement and colonialism [48]. How grief is processed or not has implications for how further relations unfold [49], and whether traumatic entanglements are reinforced or seen and broken.

A concept of affective resonance points to something like a sensory imprint, not in the individual body but within the world as a living organism, bristling with hurt accumulated through repeated practices of harm, also to nature, and expressed in non-local affective resonances, which can be more clearly seen within the created system of a map. The key question raised by 'to see is to break an entanglement' is whether in seeing these entanglements, a space might be opened for turning toward the loss and 'ungrieved grief' of centuries of empire and war and whether an act of 'seeing,' as a measurement, breaks an entanglement between past and present.

⁹ Epigenetics shifts attention to the influence of environment on bodies and specifically on the expression or suppression of genes. Over the past decade, the interface between environment and biology has increasingly been used to understand the intergenerational transmission of trauma.

4. Language

The analysis of affect, resonance and field in the previous section raises a difficult question about how we know what we know and why it is important to know. What happens in the collapse of the affective resonances, within the context of a given map, into language? What happens in the shift from a more classical understanding of language as representing, mirroring or corresponding to ‘things’ in the world to its role in the constitution of non-local relationships between entangled *phenomena*? To examine a phenomenon is to ask ‘what it is like’ [50, 51] to be in a state of X, in relation to other phenomena, which is to move from an exploration of essence to experience and meaning within a particular entangled moment that is unfolding between past, present and future. The question is what we can know from the process of mapping, or how to make sense of the relationship between an intentional question, as an apparatus, and the words expressed by the blind mappers in the unfolding of a particular map.

There is little agreement among physicists about the nature of ‘reality,’ and its relationship to language, including mathematical language, and, for instance, whether reality *is* a mathematical structure ([52], italics added), or the world is physical but mathematics is a way of representing it [53]; or that interpretation and storytelling are prior to mathematical formalism ([54], pp. 5, 17). Bohr’s claim that we are ‘suspended in language’ [11] suggests that every aspect of human communication involves the use of language, which in the case of physics extends to mathematical tools, but is not exclusive to them ([55], p. 2). The physicist Stig Stenholme identifies a family resemblance between Bohr’s thought on language and that of the philosopher Ludwig Wittgenstein [55]. From this perspective, the scientific apparatus, as the unit of description, functions in much the same way as everyday language, playing a role in the constitution of limited systems rather mirroring universal ones. As such, the relationship between language and reality is both/and rather than either/or. Mathematics captures something real, but, in so far as this is ‘useful’ [10] also modifies that reality, e.g. in the form of MRI’s, AI or quantum computing.

The French philosopher Michael Bitbol explores the relevance of Wittgenstein’s philosophy for physics, starting with a distinction between factual propositions and mathematical propositions [56]. He identifies the latter with the performative use of particular rules, norms or signs, the meaning of which is conferred by their relation to phenomena. Rather than mirroring isolated objects or forms, whether empirical or platonic, respectively, the mathematical language invokes a ‘system of propositions’ that is constitutive of phenomena [57]. The use of language is a measurement that brings into being a realm of possibility, which does not represent *a* reality, but rather that allows one to act or speak *as if* such a correspondence has been established ([56], p. 192). In the physics laboratory, the apparatus produces the conditions that the scientist, who is entangled with it, seeks to explore, including obstacles, which are then read through the semantic grid that is imposed by the project ([56], p. 193). A similar process, I would argue, happens within the experimental conditions of the mapping.

The intentional question of a particular map, like, the semantic grid of the scientist, positions the investigation of a phenomenon. As the apparatus, the question is entangled with the facilitator and other participants, even while the latter neither know what they represent or the context with which they engage. Nor do they control what emerges from the field or system. The dynamic captured within any one map cannot be said to represent an independent ‘reality’ (the worlds ‘as it is’) but provides the broad contours of a positional phenomenon in space and time, which reveals unseen aspects (of ‘what is’) in the world.

The following three illustrations make distinct cuts into the analysis of the non-local entanglements arising from the maps. The first explores the *replication* of an unfolding system of propositions relating to World War II memory, based on the collapse of affective resonances into language within successive maps over the period of a year in the lead up to the Russian invasion of Ukraine in 2022. The second provides a *visualization* of a non-local field expressed within a particular map, and discusses its relationship to the material context at a particular moment in time. The third illustration provides a *narrative construction* of a map from a single day, which emerged from stringing together the fragments of the blind conversation. The memory of World War II is only a single category of experience within a vast amount of data, which due to the terms of participants consent, cannot be made publicly available. The analysis provides a glimpse of the working of memory both within specific maps and as it unfolded across the maps and over time, and what this potentially says about the relationship between the physicality of the non-local affective resonances, language and materiality.

While material and physical are often conflated, a distinction can be made between the former as ‘made of matter’ and the latter as having a ‘real existence’ that can be measured and represented mathematically, an example being an electromagnetic field that is physical but not material [58]. In the present analysis, a similar distinction might be made between the present material reality of war and the physical resonances of memory, which in our case are measured through the blind mapping rather than mathematically.

Where do the textual analyses and visualizations below come from? In setting up any one map, a letter was assigned to the participants, which corresponded with the category of experience they represented. After the exercise, and prior to analysis, the letters were replaced with the categories of memory and experience within the map. Each of the transcripts was then processed, line by line, to clarify the relationship between the represented space and the words spoken by the mappers. Visual maps of each session were also created using a Miro tool. The illustrations provide three different cuts into the blind maps, which provide a glimpse of what can be known through the seeing of the otherwise unobservable relationship between the physical and non-local affective resonances and the contours of an unfolding material context.

4.1 The unfolding phenomenon of World War II memory

The following analysis, drawn from a series of maps, structured around different intentional questions at specific points in time over a year, reinforces two insights in particular. First, as suggested in the last section, in stepping into a map, the mappers become entangled with non-local affective resonances surrounding a particular category, of memory in this case, which has been assigned to them in advance, but is unknown to them while in the maps. Second, what collapses into language is less as an essence of the ‘event’ World War II, than a phenomenon, surrounded by an affective resonance, which is active in the unfolding of a context, prior to, during and in the aftermath of the invasion. Given that the context is not static, but continuously changing, replication does not take the form of seeing the same result, given that any one map is a limited system, revolving around an intentional question at a specific moment in time. The replication is evident in the expression of potentials that can be recognized as ‘what it is like’ to be World War II. For instance, in the example below, the identification of World War II memory with war (1/27/22), rather than diplomacy, or with revenge and humiliation, rather than compassion, is consistent with

knowledge of the phenomenon, which would not be the case if the contrasts appeared in reverse. The memory of World War II has a sense and a use, which is neither fixed nor arbitrary.

The table below illustrates fragments of ‘what it is like’ to be World War II memory that are replicated *across successive blind maps* in the year preceding and month following the Russian invasion of Ukraine. Each item in this brief sampling of memory fragments is preceded by the date of the map and the intentional question that was its point of departure and context (**Table 1**).

The table illustrates an unfolding system of propositions that is consistent with our knowledge of the phenomenon of World War II memory, the affective resonance

<p>Feb25,21 (<i>What historical memories are animating the aftermath of the British withdrawal from the EU against the backdrop of pandemic?</i>): The memory of World War II is wary, particularly of emotions and what they might do. The memory holds hidden agreements [59].</p>
<p>Mar25,21 (<i>What needs to be acknowledged in order to take the aggression out of the relationship between the EU and the Westminster government following Brexit?</i>): A dynamic potential for the re-emergence of World War has been unleashed, with the breakdown of old agreements for peace in Europe. The grief surrounding the memory of World War II needs to be acknowledged, but it remains hard to do so. The memory of World War II animates everything in the map [60].</p>
<p>June24,21 (<i>How is memory shaping the structure of the post-pandemic agreements?</i>): Russia wants to play a game with the memories of World War II...The memory of World War II is full of potentials but it is not yet clear which potential the post-pandemic agreement will activate [61].</p>
<p>Jan27,22 (<i>What needs to be seen in order to neutralise the threat of a Russian invasion of Ukraine?</i>): The memory of World War II doesn't see the usefulness of diplomacy and wants a place for war. There is a strong threat of Russian invasion. The memory of World War II is being dressed up, but it is unclear whether it will play a role in battle or provide a framework for academic analysis of the conflict. The memory is in any case being prepared for an entrance on the stage. Bringing in World War II will start a fire. From the perspective of World War II, multiple memories and potentials inform the context...World War II memories are animated by revenge and humiliation, which are becoming stronger and more dangerous...The memory of World War II invokes a predictable recurrence of the past, which arises from a particular way of thinking in the world that is lacking in compassion [62].</p>
<p>Feb24,22 (<i>What would support and facilitate a shift into seeing a collective agreement for peace?</i>): War is happening in Europe again...The past and present political environment has been organized around a heavily militarised aggressive game, and, while it would be desirable to change this, there is a lack of agency and a powerlessness...Seeing a more global safety and a future for children requires looking at memories of war. Past sacrifice and memories of war are being used for political purposes rather than being acknowledged and grieved [63].</p>
<p>Mar24,22 (<i>Does witness to and grieving memories of WWI and WWII support a humanitarian response in Ukraine?</i>): The memory of Stalin connects to the memory of the Siege of Leningrad and the Nazi invasion, which have a solid place and resonate with the larger map. NATO is on the periphery, watching but not reacting. It is unclear how the context will unfold, but Putin is like a gamemaster, not necessarily in charge but pulling the cards and making up the story. The memory of the Siege of Leningrad is within him, making him feel very big*. The memory of the Nazi Invasion, which impacts on the sovereignty of land, provides the distorted lens through which Putin sees others. For NATO, the memory of the Nazi invasion is only a single part of a larger whole, relating to other memories of atrocity during World War II. A numbness of emotions is pervasive and everything is focused on the Nazi invasion, which seems to provide cohesion but is fragmented and experienced differently from different angles, with no common thread. Unacknowledged guilt underpins the memory of the Nazi invasion. Introducing guilt into the map connects the memory of Versailles to the memory of Nazi invasion [64].</p>
<p>*Putin, who is from Leningrad, hadn't yet been born at the time but his brother died in the siege.</p>

Table 1.
Memories of World War II: Sampling across successive maps from February 2021 to March 2022.

surrounding it, and its working in the world. In successive maps, the ‘hidden agreements’ (1/21) reappear as the ‘breakdown of old agreements for peace in Europe’ (2/21), which, in both maps is linked to Brexit, followed later by the potentials for a new post-pandemic agreement (6/21). Over time, further entailments of World War II memory unfold. The memory ‘wants a place for war’ rather than diplomacy and is ‘being dressed up’ for entrance on the stage (1/22). Specific memories (3/22) arise from multiple positions (6/21, 1/22) but also empower Putin (3/22), who initially wants ‘to play a game with the memories’ (6/21) and after the invasion becomes ‘like a gamemaster’ (3/22). The memory is infused with emotions, from grief, which needs to be acknowledged (3/21), to revenge and humiliation, which animates the memory (1/22), to numbness (3/22), to unacknowledged guilt and a lack of compassion (3/22). The memory, which invokes a ‘predictable recurrence of the past’ (1/22), is used strategically for ‘political purposes’ (2/22) and provides cohesion while remaining fragmented at the level of experience (3/22).

The system of propositions within the maps overlap with the empirical context and as such captures the broad contours of the latter. For instance, Putin did put the memory to use in justifying the defensive nature of his ‘special military operation,’ pointing to ‘Nazi’s’ in Ukraine. NATO, consistent with its position in the early days of the war, stands at the sidelines without responding to the invasion. The clustering of memories of Stalin, the Siege of Leningrad, and Nazi invasion reflects an historical relationship. The memory of Versailles, which the French President Macron brought in at an early stage of the conflict, received little support and faded from use; as the map from 24 March 2022 (above) suggests, not seeing the memory of Versailles has implications, which I return to below.

4.2 Analysis of single maps

Two types of analysis were brought to the individual maps, as illustrated in the following examples. The first provides a *visualization* of the represented spaces and how the ‘blind’ mappers engaged within a specific map a month before the Russian invasion. The eyes on the symbols point either toward or away from other parts within the whole, which indicates what each can see or not see. As already stated, prior to the exercise, the mappers were assigned a letter that corresponded with the category of experience they represented. After the exercise, the letters were replaced with the categories presented in the illustration below. In the brief summary that follows, each of the positions is placed in quotation marks to indicate that it is a space within the map. Again, as it is so difficult to comprehend, it is worth reinforcing the point, which is relevant to all three illustrations, that the blindness of the process meant that the mappers had no knowledge of the context or the particular categories that they represented within the map (**Figure 1**).

As the map unfolded, ‘Ukraine’ was apprehensive, stating it was looking for an ally, but did not think it had one. ‘Russia in the present’ was aware of the memory of the ‘Versailles Treaty 1919,’ which suggests the potential influence of the memory on Russia. None of the other categories were looking at the memory of the ‘Versailles Treaty,’ which is consistent with the larger context of the invasion. Memories of ‘World War II’ and ‘Cold War,’ which are clustered at this stage and aware of each other, are the greater influence on the map as a whole. ‘NATO’ is aware of the ‘threat of Russian Invasion,’ which is angry, and of the ‘threat of nuclear war,’ and states that it is both in danger and dangerous. The ‘threat of nuclear war,’ which is aggravated, could see an affinity between the ‘memory of



Figure 1.
27Jan 2022: What needs to be seen in order to neutralize the threat of a Russian invasion of Ukraine? [65].

World War II’ and the ‘threat of Russian invasion,’ which are both experiences of invasion. ‘Diplomacy’ wasn’t interested in the ‘threat of Western Expansion’ but can see it, which is interesting in light of NATO arguments that minimized the significance of its Western expansion [66]. ‘Diplomacy’ describes itself as feeling ‘sociopathic’ (lacking in empathy, anti-social) which is compatible with the failure of diplomacy in the run-up to the invasion.

This is just a brief snippet from an early stage of a session that continued for an hour and a half. As the mapping progressed, and further objects, representing other categories were brought in, the relationship between the different spaces further unfolded. Among these, memory of the Ukrainian famine (Holodomor, 1932–1933) and the Siege of Leningrad (1941–1944) shifted the lens bringing attention to the role of hunger and scarcity as well as profit (during the famine, wheat was Stalin’s ‘Gold’). The Siege had a solid place within the map and resonated with it. It also made Putin feel ‘big,’ which is interesting in light of his family history and the resemblance between Hitler’s tactics in Leningrad and Putin’s in Mariupol and elsewhere. Consistent with the economic sanctions against Russia and Putin’s later attempts to obstruct grain shipments from Ukraine, which raised concerns about global food supplies and famine, diplomacy played into food scarcity. The introduction of guilt formed a connection between memories of Versailles and Nazi invasion, which points to the role of punishing sanctions on Germany in paving the ways for Hitler’s rise and World War II. NATO wasn’t seeing either aspect of the context, but, based on the map, needed to. The larger trans-map analysis of World War II memory above shows a repeated inability to see an earlier legacy of memory, against the dominance of World War II memory. The pattern was repeated in a later map, on 24 March.

The analysis of the unseen memories in the last paragraph highlights several points. First, not only the memories that are directly articulated by leaders in the present were important; others memories woven into a longer past had an unseen

but active physical presence. It further highlights the positional experience of the different actors involved in the conflict. Second, further memories are diffracted through the dominant one. The memories together reveal long-standing and criss-crossing patterns of hurt and complicity. Third, the physical reality of past experience expressed in memory infuses a material context of war.

The illustration above provides a visualization of ‘seeing’ within a particular map at an early stage of its unfolding, which intersects with and replicates positional memories expressed in other maps. The third example illustrates the *narrative* construction of a map from the day Russia invaded Ukraine, a month later, which provides a more cohesive story. The full decoded transcript from that day is too long to include here; the summary answer more directly shapes the narrative to the question. It is interesting that the full decoded transcript began with ‘War is happening in Europe again.’ (Table 2).

It is hard to account for the philosophical nature of the narrative that emerged from stringing together the fragments of a particular blind conversation or where it comes from.¹⁰ Interestingly, it points to a problem that has defined the study of international relations, that is, the desirability of more global security, contrasted with the reality of state action driven by insecurity, commonly referred to as the ‘security dilemma.’ However, in contrast to more traditional accounts, the narrative highlights

Question: *What would support and facilitate a shift into seeing a shared global collective agreement for peace?*

Answer: Addressing the absence of trust, which is the heart of the problem. Trust requires turning toward ungrieved grief, with its roots in the past, but grief is presently being used as a political football. There is a need to let go of a sense of safety that arises from fragmentation (*a world divided into states*) in order to give a place to holistic (*global*) safety*. The past and present political environment has been organized around a heavily militarised aggressive game, and, while it would be desirable to change this, there is a lack of agency and a powerlessness. This environment has been a source of grief for past and present populations, and has given rise to an irreversible accumulation of unacknowledged guilt. Because the fragmentation of populations has been seen in the past as a solution, it has left them continuously responding to triggers that repeat old patterns. Seeing a more global safety and a future for children requires looking at memories of war. Unacknowledged guilt is continuously reproducing itself in new forms, and a new post-pandemic agreement is emerging from this. The media, the military-industrial complex, global institutions and scientific observers are watching what is going on but through a lens influenced by beliefs that peace comes through war. Present populations can’t yet see what is coming as a result of the Russian invasion of Ukraine. The past is in the process of being repeated and there is a need to gain insight from what has happened before, i.e. looking at the past, rather than seeing the present as unique through a lens of unacknowledged guilt. The emphasis on fragmented safety is energised through war and madness and Russia could destroy us all. This sense of fragmented safety becomes a means to mobilise present populations to escalate war as a way of doing something, but is antagonising Russia into self-destruction and destruction of the world. While Russia appears to be the agent of destruction, belief in the sanctity of fragmentation (*sovereignty*) contributes to the present chaos. Past sacrifice and memories of war are being used for political purposes rather than being acknowledged and grieved. Profit as belief goes hand in hand with the fragmentation, but will eventually bring about its own death. The threat of nuclear war is a potential that arises from the fragmentation of the political environment. The threat of environmental destruction is endangering the future of children, who want the ungrieved grief to be grieved in order to restore a balance. Creating a place for a holistic safety would contribute to seeing the situation more clearly and to compassion. While it seems too late to acknowledge the guilt (*given that it appears irreversible*), from the perspective of ungrieved grief there is a choice and it is never too late. From the perspective of a global collective agreement for peace a totally new approach is needed; the proposed mobilization of present populations won’t help the situation [63].

* *Italicized points in parentheses have been added by the author for purposes of clarification.*

Table 2.

Sample question and answer from blind mapping on the day that Russia invaded Ukraine.

¹⁰ Given the huge amount of detail involved in wading through any one transcript line by line, it would be impossible from within the process of analysis to make this up.

the importance of memories of war and ungrieved grief, which is a function of the apparatus.¹¹

The various cuts into the analysis suggest that consciousness is a property of a *system*, which is entangled with the apparatus of measurement, i.e. an intentional question. The system is not static but expresses an unfolding series of propositions which resonate with ‘what it is like’ to be a particular kind of experience at a moment in time and space. The non-local affective resonances arising from the blind maps provide a window into a material reality that has been woven by political actors in memories of historical experience, which cannot be separated from the drawing of boundaries in a context of war. They further raise a question about the tendency to separate materiality from consciousness. Like the particle and wave, the two exist in a complementary relationship. The final section shifts to an exploration of preliminary insights regarding the nature of consciousness as it emerged from the ‘experiment.’

5. Consciousness

The quantum mind/consciousness debate in quantum mechanics, which has been underway for more than a century, began with a question about the role of the observer and consciousness in measurement [67]. Despite these origins, there has been a resistance within physics [68], no less than the social sciences [2], to tackling the hard problem of consciousness. While the simulation of human consciousness in artificial intelligence is a rapidly expanding field, quantum consciousness is often conflated with new age mysticism and thus discredited, although this is beginning to change.¹² Within biology, there is growing evidence of, for instance, the place of quantum effects in photosynthesis, by which plants turn sunlight into fuel (e.g. [71, 72]), or the role of the Earth’s magnetic field in providing a ‘quantum compass’ for migratory birds in navigation ([73], p. 2). The physicist Matthew Fisher [69, 70] has proposed that the nuclear spins of phosphorus atoms may act as rudimentary ‘qubits’ in the human brain that enable the brain to function like a ‘quantum computer.’

Our experiment did not set out to explain consciousness but rather to observe the ‘quantum effects’ and to identify patterns of non-local entanglement between past and present arising from a blind process over several years. Having said that, the exercise raised significant questions about the nature of consciousness. The first regards the frequent reference in the literature to consciousness as an individual subjective experience (e.g. [6], pp. 323–342; [68, 74]). The analysis above of ‘what it is like’ [50] to be a particular kind of experience, i.e. of war, does not deny the importance of subjective consciousness or the role of the brain in processing, but shifts emphasis from the mechanism of the ‘container’ to experience. ‘What it is like to be in a state’ is a problem of experience which is more than individual experience, or for that matter, human experience; it was indeed used by the philosopher Thomas Nagel in relation to bats [50] and arguably applies to any category of experience. ‘What it is like’ to be in a state is a property of field or system, which in the first instance is holographic and non-local rather than subjective.

¹¹ For an expanded analysis of the dynamics and difference between fragmented and holistic safety, and a thought experiment regarding the ‘Safety Paradox,’ see ref. [29].

¹² Critics have referred, e.g., to ‘hocus pocus’ and ‘pixie dust in the synapses’ [69, 70]. The emphasis on mysticism arguably relies on a misreading of Asian traditions such as Buddhism and Daoism [7].

The 'experiment' highlighted the positional nature of consciousness. In the illustration, the range of propositions belonging to the memory of World War II take multiple forms within an unfolding context, even while remaining a phenomenon that is recognizable as 'what it is like' to be World War II. Further, how World War II was experienced at the time, or its memory in the present, is a function of many different positions, whether as a victim or perpetrator of invasion, famine, rape, etc. where the individual experience was part of a larger social positioning, which was differentiated within and across states in Europe, but also refers to war as an experience across time and space. The maps suggest that affective resonances arise from categories of human experience, within a context of relationships. Consciousness is a product of experience which, through repetition is both shaped by and shapes memory, habit and practice, as well as the meaningful potentials that arise from them. Traces of past experience persist as affective resonances. The collapse of these resonances into language within the blind maps makes it possible to examine the positioning of particular experiences vis-à-vis multiple other experiences at specific moments in space and time.

A second question regards the apparent contradiction that the mappers were 'seeing' or witnessing within a 'blind' map. The consciousness that emerges from a given map does not express a subjective individual state but a non-local entanglement between past experience and present memory. The second party experience of consciousness reveals patterns of diffracted affect, i.e. traces of affect diffracted as the past 'presses up' against the present [40] in the material world, which are also diffracted through the maps [9]. The perplexing problem in regard to our 'experiment' regards a second party experience that is not a first party experience because of the 'blindness,' on the one hand, and in light of the holographic and positional nature of experience within the maps, on the other hand. Consciousness is not a property of separate individuals per se, although expressed in its particularity by them; it is a holographic property of memory, which can be found in life all the way up and all the way down, although specific to species [40].

The mapping is potentially useful, not as a tool of calculation, like the mathematical formulae of physics, but rather as a tool for expanding and changing consciousness. As the project evolved, the investigators noted a change in themselves and how they were viewing the subject matter, often in a more visceral manner, which gave rise to a question of how other participants were impacted by their involvement. In order to better understand the 'witness effect,' we asked both trackers and mappers to regularly reflect on their experience. During the first year, the more empirical research of the trackers was understood to be in a totally different category than the mapping. The one involved reading and writing; the other involved blind engagement within the maps. However, having monitored the 'witness effect' of both, the two experiences do not appear to be qualitatively different. The consciousness that emerges from the maps is more concentrated and a function of a particular intentional question, but is only an intensified experience of everyday consciousness. Both are manifestations of the entangled nature of mind and consciousness with the material world and with language, as distinct from a tendency to identify mind with the mechanism of the individual brain.

Does the holographic entanglement of consciousness and memory suggest that seeing in one place percolates out, expanding the potential for the larger world to see? The question was highlighted by an exploration of memories of slavery and Civil War in 2017, against the backdrop of the U.S. 'politics of hate' and the Trump presidency, several years before the funded research began. Over a series of blind maps, we saw the emergence of a pattern: The mappers could not look at the person who represented the

category of slavery, which reflected a more widespread tendency to turn away from this shameful aspect of the U.S. past. The mapping process facilitated a shift into seeing the slavery position within the maps. A month later, the events in Charlottesville, VA, unfolded and have since been referred to as a marker of a new conversation in the U.S. about this history [75]. We questioned whether the correlation was pure coincidence. Charlottesville was a manifestation of violence that has been there all along; the difficulty of facing or reconciling with this past over decades and a century since the Civil War is the core problem. To address a problem requires acknowledgement that it exists, which may be difficult when ‘collective agreements not to know’ [29] stand in the way of seeing the loss and suffering that often hides behind them. Denial and silence accompany trauma of all kinds and can carry into future generations.

As exploratory research, the MtE project sought to develop tools for analyzing the affective dynamics of seen and unseen within the maps, which expressed non-local quantum entanglements. However, measuring non-local impacts is far more problematic. In any case, neither the blind mapping process nor potential non-local impacts can be understood in classical causal terms, of a scientist manipulating variables. Indeed, given the emphasis on acknowledging ‘what is’ the point is to achieve a more complete view and, in so far as seeing breaks an entanglement, contribute to opening spaces for reflection and agency that are less burdened by traumatic entanglements with the past.

During the first year of the exploratory research, we became aware, both conceptually and experientially, of the extent to which we were part of the uncertain world surrounding us. From a quantum perspective, the scientist or analyst is a participant observer who is bound up with the apparatus of observation and what is seen is a function of the positioning of both. Those involved in the tracking and the mapping began to see the world in a different way, just as in the midst of the chaos of the pandemic, potentials for acknowledging past harm, some of which have been turned away from for centuries, began to be seen, e.g. in demands for reparations or the return of stolen artifacts to post-colonial spaces or the linkages between colonialism in the past and climate change in the future. Whether and how the two processes intersected non-locally remains an open question.

The affective resonances within the maps, and the palpable experience of them,¹³ provided evidence that something interesting was happening, even while it was impossible to say precisely what. The group mapping began with an assumption that the blind nature of the exercise would minimize individual interpretation, and indeed, given that the mappers did not know what they or others represented, it is safe to say that this was the case. In the aftermath of a session, once the question and the positions became known, there was, however, a tendency for individuals to place their own transgenerational legacies within a larger global socio-political context, thereby increasing consciousness of their relationship to land in different parts of the world, and of earlier collective experiences of dispossession, scarcity or war, among others. There was also a greater sense that things in the present are entangled, not only with something older but also with that which has been denied life or is yet to come. Looking back also made it possible to look forward, raising questions about the legacy of the past and present in the future.

A frequent theme of the anonymous survey data was one of hopefulness arising from participation in the project, although the enhanced awareness of suffering in the world was sometimes tinged with futility, particularly for the trackers. The hopefulness, I would suggest, arose in part from a feeling that the act of witnessing is itself

¹³ Specific protocols were developed for entering and leaving the maps in order to minimize the possibility that participants would carry resonances into their daily lives.

important. But the sense of empowerment was also due to experiences of seeing and feeling the world from different positions in global space, and thus a perspective that is larger than the narrow positional perspective each of us carry as individuals. The mapping experience was akin to stepping into someone else's shoes; the shoes in this case did not belong to individuals but categories of collective experience across global space and time. The experience of trackers, as already suggested, was not qualitatively different, as captured in one reflection:

At an early stage...the choices of tracking events and historical memories were heavily influenced by my own background. It was also easy to get very emotional or to be influenced by historical traumas which are more likely to have resonances with my own experiences. As the tracking unfolded, I started to shift to topics that I am not familiar with...Through the witness of other people's traumas, I found myself become less emotional both in terms of looking at historical traumas and the present situation – I don't know whether this is good or bad. But by looking at traumas from multiple perspectives and traumas of people unlike me, I have a feeling of stretching, which means I feel that my body and my memories themselves become records and carriers of various traumas through 'seeing.' But this process is quite different from the process of traumatization as I am not personally traumatized. For me, it is more like a process of biological recording as if I have become an automatic memory component of a larger social scheme [76].

Both types of experience potentially gave rise to a more visceral sense of 'seeing' particular kinds of historical and present experience, including the experience of 'what it is like' to be unseen. This 'witness effect' potentially provides a point of departure for developing pedagogical tools that might increase sensitivity among a broader population, and particularly more privileged populations, thereby minimizing a tendency, noted by one of the mappers, to blame victims for their suffering, or to fail to see our own complicity in global practices that are a source of suffering, e.g. the use of child labourers in Cobalt mining in Africa which is integral to the development of green technologies. The cumulative effect of participating in the project over an extended period of time was greater awareness of the entanglement of multiple historical empires, and of practices of appropriating land and what this has meant for occupants of the land, who were dispossessed and/or enslaved, among others. The practices are not purely a thing of the past, but bleed into the present, not least in relation to continuing practices of land appropriation, displacement, deforestation and the extraction of natural resources. As was recognized at the COP27 gathering in 2022, there is a link between colonialism and climate change, and victims of the former are suffering more directly from the latter as a result of this history. The failure to act decisively to address either as we walk blindly to the brink of environmental catastrophe itself suggests an unwillingness to 'see' the problem or the implications for future generations.

6. Conclusions

As exploratory research, the focus was less on testing or falsification than proof of concept. The analysis above suggests three preliminary insights:

- Memories and habits of past trauma are a legacy that we find it hard to look at. The mapping process provides a way to step into affective resonances of past trauma, diffracted in the present, to 'see' their continuing presence.

- The collapse of the non-local affective resonances into language within the blind maps expresses a limited system, or the positioning of phenomena in space and time. The lines of difference within the maps provide insight into what is seen and unseen and the working of memory within the world.
- Consciousness is a property of a holographic field of experience rather than individuals per se.

The conceptual focus on affective resonance, entanglement, language and consciousness would benefit from a more interdisciplinary engagement around questions raised by the experiment.

The continuing analysis of data from the MtE project may bring further insights, including the potential practical significance of the work, and whether the maps are primarily a tool of analysis or might be developed for pedagogical or 'therapeutic' use. In regard to the latter, the modality raises a question of whether 'seeing' in the context of the maps potentially provides 'release' of resonances of past trauma from present experience, making it possible to deal with the present more on its own terms. In the family constellation model, release results from giving a place to the unseen parts, thereby restoring balance to a family system, which is an important component of the therapy. A further example from the individual treatment of trauma is possibly comparable and provides a way to think about the potential importance. EMDR (Eye Movement Desensitization and Reprocessing) can very quickly desensitize and reprocess an individual's bodily experience of trauma. Through the reprocessing of memories of negative events, the individual no longer experiences high levels of distress associated with a particular memory. The reprocessing integrates the traumatic material, separating it from the present, thereby restoring a potential for agency [35]. The question is whether 'seeing' global entanglements of 'ungrieved grief' from centuries of empire, and giving it a place within the maps, similarly provides 'release' from affective resonances of past trauma, thereby reprocessing and taking some of the distress out of engaging with legacies of the past in the present.

Second, given the fragmented nature of traumatic memory, might the reconstruction of the blind conversations in narrative form itself represent a form of reprocessing, similar in intention to truth and reconciliation commissions, but without the accompanying risk of re-traumatization, and/or open spaces for ethical reflection and agency? As the geographer Karen O'Brien notes, telling a different story may be critical to enhancing individual and collective agency to generate transformative change ([77], p. 75). The problem, as suggested by the MtE project, regards the difficulty of opening spaces to 'see' differently, given a tendency to turn away from the suffering that often hides behind assumptions and 'agreements' embedded in everyday language. In so far as traumatic memory intrudes and triggers powerful and defensive reactions, it can be an obstacle to seeing the present on its own terms, which is necessary for exercising autonomy and agency.

The topic of the project is very large in scope but no more so than the magnitude of the problems we presently face as a planet. Further research might develop methods that facilitate the opening of potentials for a change of consciousness and a transition to another way of living together in the world. The experiment was not about the manipulation of variables separate from us but rather the potential to turn toward seeing the self and others, whether individual or collective, from a different angle, with a more complete view such that the unseen might be seen and given a place. Unacknowledged harm in the past remains a toxic influence not only in the present

but potentially on the future as well. To acknowledge the presence of the past is itself to break entanglements with ‘collective agreements not to know’ [29], which stand in the way of restoring balance to a dangerously imbalanced global system. Entanglement is not by definition positive or negative; both potentials exist but are different in kind. The issue is less one of being entangled or not, but rather the ability to acknowledge ‘what is,’ and the extent to which this recognition opens a space for global conversation [78] and agency in addressing the legacy of human inequality and the destruction of nature, which is blindly propelling us toward the precipice of climate emergency.

Acknowledgements

The Mapping the Empire project was funded by the U.S. Human Family Unity foundation through a donation to the University of St. Andrews. The research was undertaken with Nicola Mackay who has complementary expertise as a systems therapist with training in medical physics. The present analysis grows out of the project but the chapter was written solely by the author as a first step of the project evaluation.

Thanks

I would like to thank the Human Family Unity Foundation, Nicola Mackay and all of the mappers and trackers for their contribution to the project, including Ahmed Abozaid, Andrew Milne, Phuong Anh Nguyen, Adagbo Onoja, Joost Pietschmann, Mary Kay Reinemann, D. Lauren Ross, Aarushi Sharma, Denise Stallcup, Alison Strandberg, Lorraine Tolmie, Shambhawi Tripathi, Sayre Vickers, Kirsty Walsh, Karen Withaus, Chaeyoung Yong, and Yang Yuanfuyi, several of whom also, along with David Sylvan and Nadine Voelkner, provided insightful comments on various drafts of the chapter. Thanks also to Roberta Weber, who, during a acupuncture session in 2015 pulled me off the therapy table and into a family constellation which gave rise to my curiosity and to exploration of that curiosity in the years since.

Author details

Karin Marie Fierke
University of St. Andrews, St. Andrews, Scotland

*Address all correspondence to: kf30@st-andrews.ac.uk

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References

- [1] Barad K. Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning. Durham, NC: Duke University Press; 2007. DOI: 10.1215/9780822388128
- [2] Wendt A. Quantum Mind and Social Science: Unifying Physical and Social Ontology. Cambridge: Cambridge University Press; 2015. DOI: 10.1017/CBO9781316005163
- [3] Zanotti L. Ontological Entanglements, Agency and Ethics in International Relations: Exploring the Crossroads. London: Routledge; 2019. DOI: 10.4324/9781315227764
- [4] Kurki M. International Relations in a Relational Universe. Oxford: Oxford University Press; 2020. DOI: 10.1093/oso/9780198850885.001.0001
- [5] Murphy MPA. Quantum Social Theory for Critical International Relations Theorists: Quantizing Critique. London: Palgrave Macmillan; 2020. DOI: 10.1007/978-3-030-60111-9
- [6] DerDerian J, Wendt A. Quantizing international relations: The case for quantum approaches to international theory and security practice. *Security Dialogue*. 2020;**51**(5):399-413. DOI: 10.1177/0967010620901905
- [7] Fierke KM. Snapshots from Home: Mind, Action and Strategy in an Uncertain World. Bristol, UK: Bristol University Press; 2022. DOI: 10.46692/9781529222647
- [8] Voelkner N, Zanotti L. Ethics in a quantum world. *Special Issue of Global Studies Quarterly*. 2022;**3**(2):1-5. DOI: 10.1093/isagsq/ksac044
- [9] Fierke KM, Mackay N. Mint: To see is to break an entanglement: Quantum measurement, trauma and security. *Security Dialogue*. 2020;**51**(5):450-466. DOI: 10.1177/0967010620901909
- [10] Garisto D. The universe is not locally real, and the physics Nobel prize winners proved it. *Scientific American*. 6 October 2022. Available from: <https://www.scientificamerican.com/article/the-universe-is-not-locally-real-and-the-physics-nobel-prize-winners-proved-it/>
- [11] Peterson A. Mint: The philosophy of Niels Bohr. *Bulletin of Atomic Scientists*. 1963;**19**(7):8-14. DOI: 10.1080/00963402.1963.11454510
- [12] Ball P. Beyond Weird: Why Everything you Thought you Knew about Quantum Physics Is ... Different. London: The Bodley Head; 2018. DOI: 10.7208/chicago/9780226594989.001.0001
- [13] Stock-Homberg R. Mint: Survey of emotions in human-robot interactions: Perspectives from robotic psychology on 20 years of research. *International Journal of Social Robotics*. 2022;**14**:389-411. DOI: 10.1007/s12369-021-00778-6
- [14] Mayer C, Viviers R. Mint: Constellation work and Zulu culture: Theoretical reflections on therapeutic and cultural concepts. *Journal of Sociology and Social Anthropology*. 2016;**7**(2):101-110. DOI: 10.1080/09766634.2016.11885706
- [15] Mackay N. Your Invisible Inheritance: Releasing the Hidden Legacy of Ancestral Trauma. London: Rebel Magic Books; 2020
- [16] Bilger B. When Germans make peace with their dead. *The New Yorker*. 2016.

Available from: <https://www.newyorker.com/magazine/2016/09/12/familienaufstellung-germanys-group-therapy>

[17] Scott JW. Mint: The evidence of experience. *Critical Inquiry*. 1991;17(4):773-797

[18] Ulsamer B. *The Healing Power of the Past: The Systemic Therapy of Bert Hellinger*. Nevada City, NE: Underwood; 2005

[19] Cohen DB. *Systemic Family Constellations and the Use with Prisoners Serving Long-Term Sentences for Murder or Rape [Thesis]*. San Francisco, CA: Saybrook Graduate School and Research Centre; 2008

[20] Hellinger B, ten Hovel G. *Acknowledging What Is: Conversations with Bert Hellinger*. Phoenix, AZ: Zieg, Tucker and Co., Inc.; 1999

[21] Satia P. *Times Monster: History, Consciousness and Britain's Empire*. London: Allen Lane; 2020

[22] Andrews K. *The New Age of Empire*. London: Allen Lane; 2021. DOI: 10.1080/17449855.2023.2175951

[23] Gildea R. *Empires of the Mind: The Colonial Past and the Politics of the Present*. New York: Cambridge University Press; 2019

[24] Armitage D. *The Ideological Origins of British Empire*. Cambridge: Cambridge University Press; 2010. DOI: 10.1017/CBO9780511755965

[25] Bell D. *Reordering the World: Essays on Liberalism and Empire*. Princeton, NJ: Princeton University Press; 2016. DOI: 10.23943/princeton/9780691138787.001.0001

[26] Inca O. *Colonial Capitalism and the Dilemmas of Liberalism*. Oxford: Oxford University Press; 2018

[27] Barad K. Mint: Quantum entanglements and hauntological relations of inheritance: Dis/continuities, spacetime enfoldings and justice-to-come. *Derrida Today*. 2010;3(2):240-268. DOI: 10.3366/drt.2010.0206

[28] Bateson G. *Steps to an Ecology of Mind*. Chicago: University of Chicago Press; [1972]2000

[29] Fierke KM, Mackay N. Mint: The safety paradox: Unknown knowns, ungrieved grief and collective agreements not to know. *International Relations*. 2023. online first. DOI: 10.1177/04711782231187499

[30] Kuhn RL. *The illusion of time: What's real? Spaceflight*. 2022. Available from: <https://www.space.com/29859-the-illusion-of-time.html> [Accessed: August 29, 2023]

[31] Barad K. Mint: Troubling time/s and ecologies of nothingness: Re-turning, re-memembering and facing the incalculable. *New Informations*. 2017;92(5). DOI: 10.3898/NEWF

[32] Eyerman R. *Memory, Trauma, Identity*. London: Palgrave Macmillan; 2019

[33] Kratochwil F. *Praxis: On Acting and Knowing*. Cambridge: Cambridge University Press; 2018

[34] Kolk Bvd. Mint: Trauma and memory. *Psychiatry and Clinical Neurosciences*. 1998;52(S1):S52-S64. DOI: 10.1046/j.1440-1819.1998.0520s5S97.x

[35] Kolk Bvd. *The Body Keeps the Score: Mind, Brain and Body in the Transformation of Trauma*. London: Penguin; 2014

- [36] Fierke KM. Bewitched by the past: Social memory, trauma and international relations. In: Bell D, editor. *Memory, Trauma and World Politics*. Basingstoke: Palgrave; 2006
- [37] Barad K. Mint: Diffracting difference: Cutting-together-apart. *Parallax*. 2014;**20**:168-187. DOI: 10.1080/13534645.2014.927623
- [38] Ooe, H., et.al. Mint: Resonance frequency-retuned quartz tuning fork as a force sensor for noncontact atomic force microscopy. *Applied Physics Letters*. 2014, 105, 043107 DOI: 10.1063/1.4891882
- [39] Bohm D. *Wholeness and the Implicate Order*. London: Routledge; [1980] 2002. DOI: 10.4324/9780203995150
- [40] Sheldrake R. *Presence of the Past: Morphic Resonance and the Habits of Nature*. London: Icon Books; 2011
- [41] Walters KL, Beltran RE, Huh D, Evans-Campbell T. Dis-placement and dis-ease: Land, place and health among American Indians and Alaska natives. In: Burton LM, Kemp SP, Leung MC, Matthews SA, Takeuchi DT, editors. *Communities, Neighborhood, and Health: Expanding the Boundaries of Place*. Philadelphia, PA: Springer Science+Business Media; 2011. pp. 163-199. DOI: 10.1007/978-1-4419-7482-2
- [42] Lehrner A, Yehuda R. Mint: Cultural trauma and epigenetic inheritance. *Development and Psychopathology*. 2018;**30**(5):1763-1177. DOI: 10.1017/s0954579418001153
- [43] Yehuda R, Lehrner A. Mint: Intergenerational transmission of trauma effects: Putative role of epigenetic mechanisms. *World Psychiatry*. 2018;**17**(3):243-257. DOI: /10.1002%2Fwps.20568
- [44] Jablonka E. Mint: Cultural epigenetics. *The Sociological Review*. 2016;**64**(1-suppl):42-60. DOI: 10.1002/2059-7932.12012
- [45] Menakem R. *My Grandmother's Hands: Racialized Trauma and the Pathway to Mending our Hearts and Bodies*. Las Vegas: Central Recovery Press; 2017
- [46] PBS. *Stories I did not Know*. 2021. Available from: <https://www.pbs.org/show/stories-i-didnt-know/> [Accessed: May 22, 2023]
- [47] Schwab G. *Haunting Legacies: Violent Histories and Transgenerational Trauma*. New York: Columbia University Press; 2010
- [48] Ngugi wa Thiong'o. *Something Torn and New: An African Renaissance*. New York: Basic Books; 2009
- [49] Hutchison E, Bleiker R. Grief and the transformation of emotions after war. In: Ahall L, Gregory T, editors. *Emotions, Politics and War*. London: Routledge; 2015. DOI: 10.4324/9781315765068
- [50] Nagel T. Mint: What is it like to be a bat? *Philosophical Review*. 1974;**83**(4):435-450
- [51] Block N. Mint: On the confusion about a state of consciousness. *Brain and Behavioral Sciences*. 1995;**18**:227-247. DOI: 10.1017/s0140525x00038188
- [52] Tegmark M. *Our Mathematical Universe: My Quest for the Ultimate Nature of Reality*. London: Allen Lane; 2014
- [53] Carroll, S. S02E01 Is Consciousness Emergent? Mind Chat. You Tube
- [54] Fuchs C. *My Struggles with the Block Universe: Selected Correspondence, January 2001–May 2011; 2014–2015*.

Available from: <https://arxiv.org/pdf/1405.2390.pdf> [Accessed: July 10, 2023]

[55] Stenholm S. *The Quest for Reality: Bohr and Wittgenstein, Two Complementary Views*. Oxford: Oxford University Press; 2011. DOI: 10.1093/acprof:oso/9780199603589.001.0001

[56] Bitbol M. Mint: Mathematical demonstration and experimental activity: A Wittgensteinian philosophy of physics. *Philosophical Investigations*. 2018;**41**(2):188-203. DOI: 10.1111/phin.12187

[57] Wittgenstein L. *On Certainty*. Wiley-Blackwell; 1975

[58] Ron Davis, physicist. Available from: <https://www.quora.com/Is-there-a-difference-in-the-meaning-of-physical-and-material> [Accessed: July 13, 2023]

[59] Based on unpublished preliminary data analysis of transcripts from the Mapping the Empire Project: 7GT240421

[60] Based on unpublished preliminary data analysis of transcripts from the Mapping the Empire Project: 8GT250321

[61] Based on unpublished preliminary data analysis of transcripts from the Mapping the Empire Project: 10GT240621

[62] Based on unpublished preliminary data analysis of transcripts from the Mapping the Empire Project: 14GT270122

[63] Based on unpublished preliminary data analysis of transcripts from the Mapping the Empire Project: 15GT240222

[64] Based on unpublished preliminary data analysis of transcripts from

the Mapping the Empire Project: 16GT240322

[65] Based on unpublished preliminary data analysis from the Mapping the Empire Project: 14GM270122

[66] NATO. *NATO-Russia Relations: the facts*. 2023. Available from: https://www.nato.int/cps/en/natohq/topics_111767.htm [Accessed: July 10, 2023]

[67] Tarlacı S, Pregnolato M. Mint: Quantum neurophysics: From non-living matter to quantum neurobiology and psychopathology. *International Journal of Psychophysiology*. 2016;**103**:161-173. DOI: 10.1016/j.ijpsycho.2015.02.016

[68] Tegmark M. Why Consciousness is one of the most Divisive Issues in Physics Today, 2022. Available from: <https://www.youtube.com/watch?v=Lul6M13F-ao> [Accessed: July 14, 2023]

[69] Fisher M. Mint: Are we quantum computers, or merely clever robots? *International Journal of Modern Physics B*. 2017;**31**. DOI: 10.1142/S021797921743700019

[70] Fisher M. Mint: Quantum cognition: The possibility of processing with nuclear spins in the brain. *Ann. Physics*. 2015;**362**:593-602. DOI: 10.1016/j.aop.2015.08.020

[71] Arndt M, Juffmann T, Vedral V. Mint: Quantum physics meets biology. *HFSP Journal*. 2009;**3**(6):386-400. DOI: 10.2976/1.3244985

[72] Lloyd S. Mint: Quantum coherence in biological systems. *Journal of Physics: Conference series*. 2011:302. DOI: 10.1088/1742-6596/302/1/012037

[73] Ouellet, J. A New Spin on the Quantum Brain. *Quanta Magazine*.

2016. Available from: <https://www.quantamagazine.org/20161102-quantum-n> (Accessed: May 22, 2023]

[74] Bitbol M. *Mint: La Conscience a-t-elle une origine? Des neuroscience à la pleine conscience: une nouvelle approche de l'esprit*. Paris: Flammarion; 2014

[75] PBS. *A Year Ago Charlottesville Shined a Light on White Supremacists and Sparked Overdue Conversations*. 2018. Available from: <https://www.pbs.org/newshour/show/a-year-ago-the-charlottesville-rally-shined-a-light-on-white-supremacists-and-sparked-overdue-conversations> [Accessed: May 11, 2023]

[76] Based on unpublished preliminary data analysis from the Mapping the Empire Project: YY/19/07/22

[77] O'Brien K. *You Matter More than you Think: Quantum Social Change for a Thriving World*. Oslo, Norway: cChange Press; 2021

[78] Fierke KM, Jabri VM. Global conversations: Relationality, embodiment and power in the move toward global IR. *Global Constitutionalism*. 2019;8(3):506-535. DOI: 10.1017/S2045381719000121