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Title: Erratics on the road to Wigan Pier: *the creation of TouchAR*

Brass Art*

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This paper focuses on the augmented reality project TouchAR to reveal creative collaborative approaches the authors took to site, technology, ecology, and gesture in their production of interactive public realm artworks in direct response to the Covid19 pandemic. Informed by the uncanny (re-animation, the double) ontology (affect, sensing embodied encounter) and ecology (speculative fabulation, deep time), the project explores 3D scanning and AR technology as tools for transformation and engagement with ecological deep time; addressing complications involved in offering an embodied experience with AR and as a means of enchantment. The authors will discuss how they use technology to suture analogue and computational art making, explore ideas of touch and engagement with ecology in a technological society and address the deep past, present challenges and possible futures.

CCS CONCEPTS

•Human-centered computing•Human-centered computing~Visualization•Human-centered computing~Interaction design~Interaction design process and methods~Contextual design

Additional Keywords and Phrases:

augmented reality, embodiment, interaction, ecology, public space

1 Introduction

TouchAR is an augmented reality app designed for Android and Apple devices. The AR system was developed in Unity with the AR Foundation SDK that utilises a combination of image and plane detection to augment a series of artworks. The project emerged in response to the Covid-19 pandemic as art galleries and other cultural spaces were closed to the public across the UK. At the time Brass Art were working on a solo exhibition for The Turnpike Gallery, Leigh in the North West of England. In this context the idea arose to develop a multi-site public realm installation across Wigan and Leigh. The artworks would be brought to life by AR with a focus on local well-being and engagement with the environment. The TouchAR app triggers animations and sounds to augment the original collaged images that appear as posters, billboards, and vinyl decals in urban and rural spaces. Our description of the project will reveal the creative and collaborative approaches the authors took to site, technology, ecology, and gesture in their production of artworks for this public realm project.

The intrinsic purpose of the project was to test the artistic potential of AR in the public realm at a time of social isolation; to simultaneously explore the role and importance of touch within the context of a global pandemic through the use of touch screen devices. The hyper-local context and commission was devised to encourage meaningful environmental change, and attention to multiple aspects of the local environment, including its historic past and possible futures. In relation to our ongoing collaborative, artistic practice we wanted to consider how AR enhances the affective dimension of the uncanny and the human ability to work with, to attend to, and advocate for, the non-human and the more-than-human, and the embodied orientations presented by AR itself.

The collage artwork for TouchAR invites the user to download the free app to activate images with interactive augmented reality content by employing repeated fingertip touch as particle effects, sounds and code conjure an imaginative and speculative dimension. These include animated illustrations of butterflies tracking across the post-industrial setting, a leaping three-dimensional locust, bronchioles filling with silvery liquid, plants responding to touch, and fingers of flame that reignite as drawn animation. As lead artists Brass Art worked together to formulate the conceptual focus, the visual imagery, trigger images and final collages by synthesising our accumulated visual research and theoretical concerns. We chose to collaborate with software designers, developers, and 3D modellers with whom we have developed long-term creative partnerships. These wider relationships enabled us to successfully work remotely under lockdown conditions, employing iterative testing and collaboration on the aesthetics and animation of the final 3D models. The performative aspect of the artists' long-term

collaboration is vital and often conjures the uncanny double as a force – in this instance as augmented bodily fragments which exist indeterminately between presence and absence through the agency of AR.

The project necessitated clear communication and consultation with the developers on AR possibilities and feasibility. The AR system recognises a number of image markers in the artefact, whilst also being aware of the surrounding planar surfaces. Both the image markers and the planar surfaces are augmented with virtual objects and related sensory experiences. The segmentation of larger areas allows the users to experience the artwork up close and at a distance with handheld devices. Working in AR enabled us to experiment with both 3D scans of captured hand gestures and mineralogy specimens - as well as 3D modelled virtual objects - to convincingly emerge from the 2D surface of the new artefacts. One of the key challenges was to create trigger images in the artworks for AR object stability without compromising the aesthetic of the 2D artwork. The successful operation of the AR elements required repeated testing of the TouchAR app's interactive function exploring different printed surfaces and scale before final submission for approval to The App Store and Google Play.

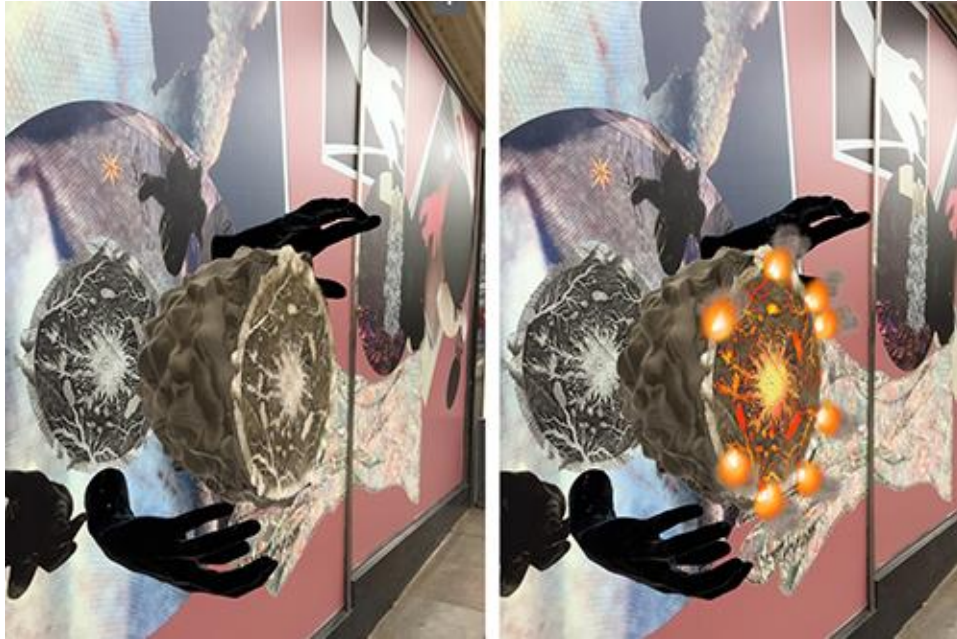


Figure 1: *TouchAR* (2021) installation detail, vinyl on glass. Castlefield New Art Space, Wigan. Image ©: Brass Art

The animation of the AR objects, insects and disembodied organs suggests a vital force, an intensity as described by political theorist Jane Bennett as lively bodies in 'Powers of the Hoard' [Bennett, 2012]. She recognises that there is both enchantment and an uncanny aspect to the task of addressing the agency of objects (thing-power). She also outlines Spinoza's assertion that, "*every body (person, fly, stone) comes with a conatus or impetus to seek alliances that enhance its vitality*" - 'actants', to use Latour's term, with agency in the world. Similarly, the experience of activating the AR objects in the artwork can be both enchanting and uncanny in bringing to light that which should remain hidden and bringing to life that which had seemed dead.

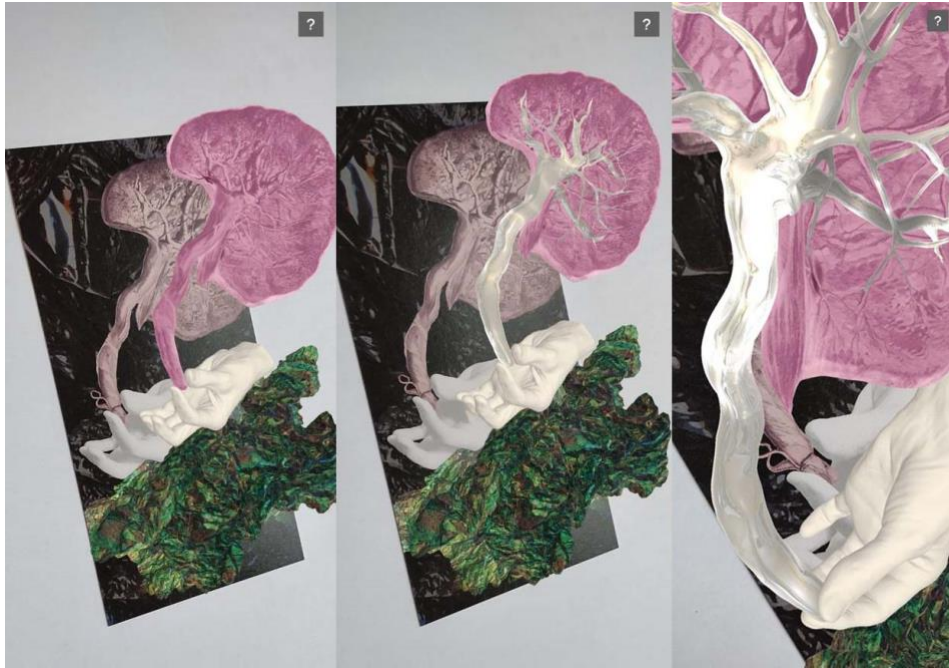


Figure 2: TouchAR (2021) documentation of AR on postcards. Dimensions 9.8cm x 21cm. Image ©: Brass Art

It was our intention to site the work in the context of a hyper local environment following an invitation to develop a public realm artwork for Wigan and Leigh. Unusually, the collaged images were sited outdoors – in regenerated wetland walks, a bird hide, a town centre, a shopping arcade – as indicators of transformed landscapes and the re-introduction of flora and fauna to local post-industrial wetlands, reimagined via stylised representations of both terrestrial and celestial thresholds.



Figure 3: TouchAR (2021) street view, vinyl on glass, Castlefield New Art Space, Wigan. Image ©: Brass Art

Our interest in ecological regeneration and the deep past of the carbon landscape of Wigan began with reports of the recent revival of ancient peatlands and the re-introduction of native species wiped out by the toxic waste of the industrial revolution. These conjoined towns in the North West of England are best known as the site of George Orwell's sociological essay on working conditions, *The Road to Wigan Pier* (1937). Writing his diary on 12 February 1936, Orwell reflects a volatile landscape of instability that echoes the Jesuit polymath Athanasius Kircher's 17th C studies of the sun and the earth, and his descent into Vesuvius, "*Long walk along the canal (one-time site of Wigan Pier) towards some slag-heaps in the distance. Frightful landscape of slag-heaps and belching chimneys. Some of the slag-heaps almost like mountains – one*

just like Stromboli. [...] All the 'flashes' (stagnant pools made by the subsidence of disused pits) covered with ice the colour of raw umber" [Orwell, 2010].

At the time of a 1971 TV documentary 'The Road From Wigan Pier', the landscape was still devoid of vegetation, blighted by sodium chromates, towering burning slag heaps and toxic 'flashes'- one of which would later become the Pennington Flash wetlands. Now it is impossible to separate the deep time reservoirs of ancient solar energy of the stratified coal seams from the repercussions of its irresponsible excavation and the global long-term environmental effects of burning fossil fuel. David Farrier reminds us, "*Deep Time is not an abstract, distant prospect but a spectral presence in the everyday. The irony of the Anthropocene is that we are conjuring ourselves as ghosts that will haunt the deep future.*" [Farrier, 2016]



Figure 4: TouchAR (2021) Installation view, vinyl on glass. The Turnpike Gallery Leigh. Image ©: Helen Stalker

1.1 Touch Informs the Body

In a world-wide pandemic the human instinct to reach, to grasp, to hold (one another – things – the world) was pathologized and undone as a form of connection. Brass Art perceived this rupture in the myriad global images which circulated. Darian Leader cast the imbrication of biological life and emotional life as fundamental, noting the psychoanalytic consequences to society that might arise when these are torn apart [Leader, 2016]. We wanted to develop our thinking on gesture and touch in relation to the many images that appeared in global media of bodies encased in plastic, or discarded gloves. Hands stand in for the human subject and allow us to manipulate the world, – the appearance of hands in virtual platforms situate the first-person perspective and allow for spatial orientation. One of the complications of creating AR interactivity responding to touch, is that we have the world at our fingertips on our devices and the insatiable need to consume content. User fingertip gestures have been commodified and homogenised in the past 15 years with the recognition that, "our interactions with digital interfaces are changing, with increasingly complex functions facilitated by a new level of haptic choreography, the goal being to integrate seamlessly sensation, cognition, and computation." [Provan, 2013]

Our habitual phone actions centre on cradling, pinching, touching, tapping, pointing, and swiping – an over-intense engagement with the virtual realm that may lose connection with personal interactions and gestures. Our initial aims were to both enable an encounter with the artists' hands reaching out into 'real' space, and to harness these habitual daily actions for engagement with an enchanting, unsettling, transformation of the user's world. As public buildings opened, one library worker described her encounter with the artwork - "*What a brilliant way to bring art to the town centre! I've never seen anything like this before, it really brings things to life.[...] I come out here to look at it as often as I can.*"

1.2 Sensing Bodies in Space

In a previous commission ¹ we undertook material and archival research on gestures, examining classical symbolism in the historic collection of Chetham's Library, Manchester. Through our sculptural approach we translated the 2D representations of hands in the books and prints of the collection using maxillofacial casting and 3D laser technology to generate highly detailed scan data of our hands. These gesturing hands are seen to invite, direct, emphasise, caress and pinch, extending the reading of an idea on the page into an invitation for further thought. Leader reflects upon embodied experience and describes hands as 'instruments of executive action'. He notes that rhetorician Quintilian pointed out ways that hands could, "*request, promise, summon, dismiss, threaten, entreat, show aversion or fear, question and deny, and that Quintilian could tell from reading Cicero's speeches what gestures the orator would use – in other words his 'sermo-corporis'.*" The

¹ Gestured installation, Chetham's Library Museum, Manchester. Arts&Heritage commission

Speech of the body or gestures that were most compelling for us were those found within the satirical tableaux of William Hogarth's prints (1697-1764) held in Chetham's collection. Their dark humor and prescience resonate with the social and political scenarios witnessed during the stages of the pandemic, and these are enduring images in our continuing practice.



Figure 5: Athanasius Kircher, *Mundus Subterraneus* (1678). William Hogarth, *A Harlot's Progress* (1732), *Marriage A-la-Mode* (1745). Image ©: Brass Art.

In TouchAR the disembodied hands stand-in for us as artists. We use them to suggest agency, power, control and their supplication. They reach out and offer up virtual objects that hover magically in their midst, or unfold upon further investigation. With the touch of a finger, users can animate an engraving of the sun's imagined surface, or the earth's fantastical interior, both photographed from original 17th century scientific textbooks held at Chetham's Library and written by Kircher. His vast range of knowledge and scientific speculation included electro-magnetism, bioluminescence, geology, weather systems, eclipses, herbs, and the use of early microscopes. The juxtaposition of these elements in his treatise created a visually rich collection for us to consider in relation to our own sensing bodies in space. This imagining of both interior geologies and external atmospherics echoes the question posed by Erin Manning in 'Politics of Touch', "*Might we conceive of touch as a reaching out toward the everyday, toward the textuality and the movement of our bodies, of our lives, of our diverse experiences on the earth?*" [Manning, 2006]

Amongst Kircher's masterworks, *The Great Show of Light and Shadow (Ars Magna Lucis et Umbrae, 1646)*, and *Subterranean Worlds (Mundus Subterraneus, 1664)* book-end our collective interest in the world as it is described, represented, and understood. In his engraving of *Solaris* he depicts a globe pocked by pools of fire and a corona of smoke plumes. By taking this image into 3D modelling software for the TouchAR project we recognised it could not escape comparison with visualisations of the Covid-19 viral form. Regardless of the prohibition of touch, *Solaris* is held aloft by our virtual 3D hands, and must be activated by the user to smoke and rotate. Kircher's proposal that volcanoes are, "nothing but the vent holes and breath pipes of nature," both demystifies the geologic process and suggests a fantastical breathing earth. With TouchAR users can affect worlds-in-miniature and simultaneously recognise the potential to transform the immediate post-industrial landscape. If we borrow ecofeminist Donna Haraway's concept of 'Speculative Fabulation' as a, "*mode of attention, a theory of history and a practice of worlding*" [Haraway, 2016], then we can engage with a more entangled practice of attending *to* and living *with* other species and more-than-human elements around us.

1.3 Erratic objects

The gigantic 20 tonne boulder in University of Manchester quad is an unusual phenomenon with deep time credentials. Discovered during road excavations in 1888, compositional analysis suggests that the hunk of prehistoric lava (andesite) was transported 80 miles on a glacier during the Ice Age 20,000 years ago. This glacial erratic (from the Latin *errare* -to wander) has been part of Manchester Museum's collection since excavation. We encountered it when we mined the same mineralogy store for rock specimens to 3D scan for a Museum commission². It's displaced ancient bulk remained in our subconscious and resurfaced, brought to light in a second excavation, to feature in the artwork collage for TouchAR.

² Still Life No.1 (2011), Dark Matters exhibition, Whitworth Art Gallery, Manchester



Figure 6: TouchAR (2021) collage artwork. Image ©: Brass Art

Taking our cue from the original geological term *terrains erratiques*³ we built collaged landscapes of objects which also contained the AR triggers. We understand these erratic boulders as objects functioning as symbolic markers of deep time by dint of their displacement, and often used as a marker of human events in their new location, dredged from an entirely different environment in the deep past. In *Erratic Imaginaries*, Jane Hutton posits, “*It is through this conflation of vastly different timescales that erratics bridge a seemingly unbridgeable divide between geological time and human action*”. It is between these two registers of knowing, unmoored and floating in the ‘space’ of the artwork, that the Manchester glacial erratic provides a genealogical and geological link with Kircher’s scientific and speculative imaginings of the earth’s volcanic innards or the sun’s erupting surface.

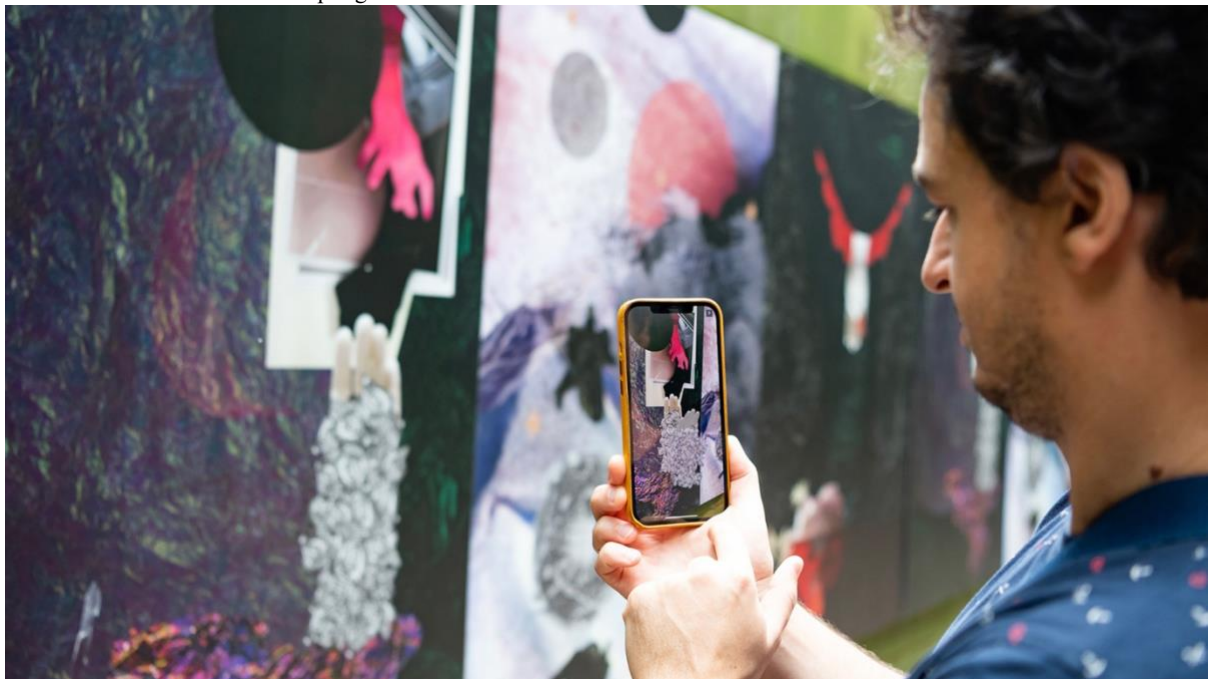


Figure 7: TouchAR (2021) public interaction with AR artwork. Pennington Flash Nature Reserve. Image ©: Livia Lazar

This method of extending Kircher’s geologic imagery included bringing images of large erratic boulders into a spatial relationship with karstic limestone, valued for its fantastical landscape-in-miniature quality. The latter is highly prized as a ‘scholar stone’; a microcosm of the exterior natural world evoking and enabling contemplation and harmonious reflection from the interior of a house, studio, or study. Sculptural forms we re-presented as collage components were dramatically

³ Geologist Jean de Charpentier originated the phrase *terrains erratiques* referring to the whole landscape as erratic – meaning has since shifted to refer only to the rocks as erratics (1841)

changed in scale, others had their surfaces wrapped with dichroic cellophane to refract iridescent light and create visual disturbances. The quality of the different elements – black polyethylene, archival artefacts, 3D scans, dichroic film, tapestry details, glass fragments, NASA imagery, anatomical illustrations, and photocopies – create unsettling encounters from different visual and temporal registers. This strategic use and mis-use of materials and technologies enabled us to think through possible transformations in relation to embodiment, matter, and the scale of gestures. A collaborative method specific to TouchAR draws on the formation of erratics - of elements drifting and colliding, displaced and re-placed - allowing the convergence of artistic approach into digital landscapes of sur-reality; the collage-making process appropriate for a world in flux, allowing for multiple iterations and possibilities.

Developmental biologist Scott Gilbert reminds us that, *“Life is a creative inheritance of gifts passed down through deep time, gifts exchanged in the present again and again through niche creation, symbiosis, parasitism, eating and being eaten”*. [Ginn et al, 2018] Creating a public engagement project in the middle of a pandemic necessitated hope for the future. In the development of our visual language, including two large window installations, we integrated imagery of previously extinct native species of flora and fauna reintroduced through the renewal of local wetlands at Pennington Flash. The imagery included an interpretation of the Manchester Argus butterfly which flutters and disperses through finger-tip touch, and the carnivorous Sundew which enfolds around its whimpering prey. At Pennington Flash a young local boy (Dylan, aged 9) engaged with the artwork - *“I really love it, especially the butterflies who fly away. I don’t know where they go but I want to follow them.”* (2021)



Figure 8: TouchAR (2021) Installation view, vinyl on glass. The Turnpike Gallery, Leigh. Image ©: Brass Art.

1.4 Speculative Landscapes

TouchAR was developed for a particular location, and sited in wetland parks, abandoned urban shop fronts and galleries in the conjoined local borough of Wigan and Leigh. This remains an area of considerable social deprivation, and The Turnpike Gallery engages the local audience with big themes around ecology, and transformation of the post-industrial landscape through an extensive art education programme, partnering with Lancashire Wildlife Trust, Carbon Landscape and community groups. Responding to the reintroduction of species and ecological regeneration comes with an awareness of the deep past, present responsibilities, and a possible future, bound with a cognisance of what Katherine Yussuf calls our, *“subterranean geological debt”*. [Ginn et al, 2018] Helen Stalker, Director of The Turnpike Gallery and commissioner of TouchAR stated, *“It’s a stunning piece of work which has evolved through the strangest of times. It’s emblematic of how the natural world can inspire, disturb and heal us. This artwork tells us that even the local biodiversity on our doorstep can reveal itself to be magical.”*



Figure 9: TouchAR (2021) public interaction with AR artwork. Pennington Flash Nature Reserve. Image ©: Brass Art

Aside from the local connection to George Orwell's writing, it is less well-known that the borough of Wigan and Leigh is twinned with the French city of Angers in the Loire, home to the medieval masterwork, The Tapestry of the Apocalypse. The tapestry, woven between 1377-1382, is a source we have returned to over a period of 20 years. Although the title can be read purely as a cataclysmic world-ending, it refers to the Book of Revelation. The 84 panels - commissioned and produced in a century full of political and religious crises, cycles of war and epidemics - reveal images of hope and endurance. Our interest was focussed on the methods used for indicating thresholds between terrestrial and celestial realms; the liminal space of visions and portents. These tangled visions of earthly convulsions and disturbances are fringed by scallop-edged clouds, stylised ribbons of water and fire, and stars pinning the woven scenes. We incorporated elements of these as visual components, and as trigger points for the AR app.

These speculative landscapes open up an undercurrent of instability in terms of geological ruptures, deep time, petrochemical byproducts and ecological crises – indications of “*the fractured timespace of our present planetary moment*”. [Ginn et al, 2018] How artists might reconfigure these entanglements, contaminations and affective disturbances is critical to our sense of being *in* and *of* the world. From within the environmental humanities scholars, “*reframe deep time as more than unsettling, uncanny and dangerous*”, by positioning enchantment, violence and haunting as alternative ‘modes of encounter’. To actively focus attention on a particular encounter or engaged experience is a process of worlding; an attending to our presence and actions within a shared world and an embodied response to being in the world together. Haraway defines this practice of worlding as engaging in speculative fabulation - the unfolding of new possibilities and trajectories for sensing and making sense of what is already there, together.

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