

# Deep Decay: Into Dia-chronic Polychromatic Material Fictions

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Andy Weir is an artist and writer from London, UK. His current work focuses on radiological materiality and the geological repository as future-probe, developing concepts and politics of deep time in relation to discourses of the contemporary. New work on this will be shown at the Nuclear Cultures project *Perpetual Uncertainty*, Bildmuseet, Umea, Sweden, opening October 2016. Recent publications include 'Traumatic Synthetic Entourage' for *Organisms*, GAM Torino (2016); 'Thick-Diachronic Crash: Incision Into Delay' in *Realism Materialism Art* (2015); 'Cosmic Alreadymades' in *Journal of Curatorial Studies* (2014); and 'Instituting Art at the Outermost' at *Project Anywhere*, New School, New York (2014). He is Senior Lecturer in Fine Art at Arts University Bournemouth, UK, and PhD Researcher at Goldsmiths, University of London, where he completed an MFA in Fine Art and MA in Contemporary Art Theory.

## Abstract

The deep geological repository project for the long-term storage of radioactive material opens an encounter between design processes in the present and the 'deep time' of 4.46 billion year futures. Beyond debates around ethics of responsibility to future generations, this paper argues, this invokes a more radical futurity, where human thought confronts its contingency alongside nuclear timescales. Art practices play a key 'stakeholder' role in imagining repository sites, in a context where they are both rooted in materialities of stochastic decay process and necessarily subject to interdisciplinary transformation. This paper asks what specific knowledge art practices could give us in this context. What are their potentials and problems? And what could this mean for the historical conditions of 'contemporary art'? It does this through departing from the 2010 film *Into Eternity* and its production of awe-struck ineffability through cinematic allusion to massive duration. Deep radiological times are proposed instead not as 'eternity' but as 'very large finitude' (Morton), not immeasurable but as call to develop art practice through collective experimentation and technological augmentation. This extends Nick Srnicek's proposal for an 'aesthetics of the interface' as a making operational of complex data through making it amenable to the senses, and concludes with some propositions from the author's current art practice.

KEYWORDS: contemporary art; deep time; future; interface; nuclear; Srnicek



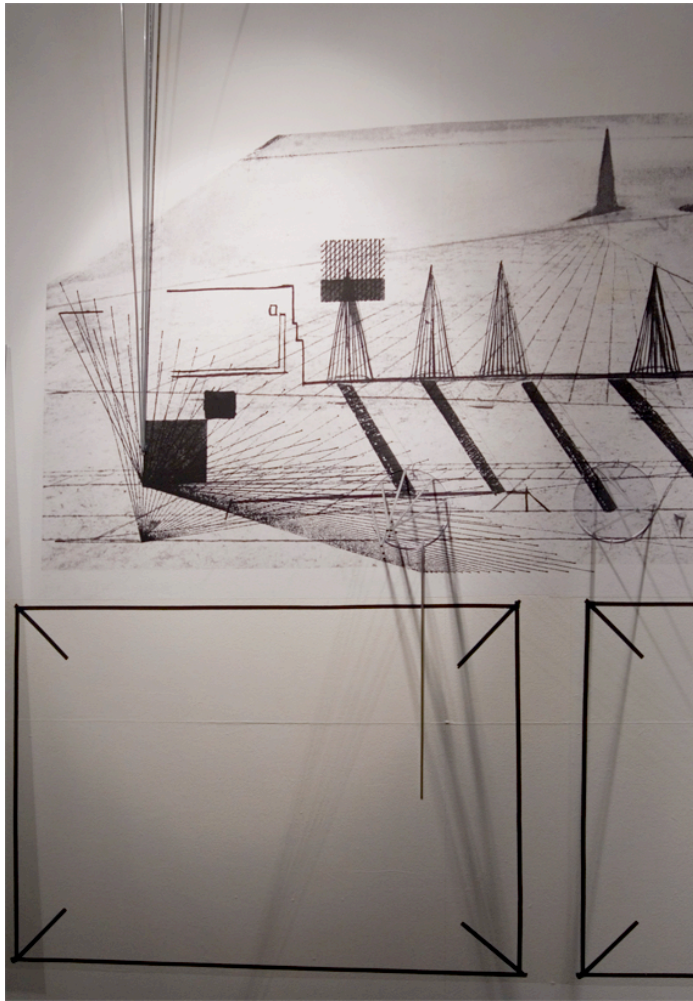
still from Michael Madsen (dir.) *Into Eternity* (2010)

It begins with a framing of formlessness. Mist or fog drifts in front of and around the camera. Surrounding forest sound is intensified, becoming part of the hum of the plant. The camera tracks slowly from road through penetrated granite or argillaceous limestone, while a disembodied voice connects the images. Its addressee is uncannily invoked, a 'you' of the future, called into being from an imagined 'we' of now. "This place should not be disturbed", it cautions through a whisper, "this place is not a place for you". Ignoring this, the camera moves on, sweeping across incised rock with mechanical crackle, sketching a landscape both invested with desire and radically indifferent to your gaze.

This is the opening of the 2010 film *Into Eternity*. It documents research at the Onkalo deep geological repository site in Finland, one of a number of sites currently being built or planned around the world for the long-term isolation and containment of radioactive materials. The voice points to the temporal confusion inherent to the project, opening questions of an ethics of responsibility to an unknown future. This has been discussed as a semiotics of communication across generations, through the development of 'markers' for the sites,<sup>1</sup> a task picked up and developed by artists such as Cecile Massart:

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<sup>1</sup> Sebeok, Thomas. *Communication Measures to Bridge Ten Millennia: Technical Report*. Columbus, OH: Office of Nuclear Waste Isolation, 1984; *An International Conference and Debate on the Preservation of Records, Knowledge & Memory of Radioactive Waste Across Generations*. Centre Mondial de la Paix, Verdun, France, 15-17 September 2014.



Cecile Massart. *Mémoire du Futur* (2011). Installation view - Soulaines Site, Andra, France, image courtesy the artist.

Her work, taking forms of projection, model, sketch, collaboration, and consultation, alludes to the complex nature of repository sites – bound up with contested speculative design, while rooted in the material reality of stochastic decay process and mineral ray absorption. Art plays an important role in this context, while also necessarily being subject to interdisciplinary transformation.

As Massart's work “in the prehistory of transmission”<sup>2</sup> also alludes to, however, this throw into the future can be extended further. Indeed, if repository design is to remain synchronous with the material fact of radiation, then it must be extended much further. The half-life of Uranium-238, which makes up the majority of spent nuclear fuel, for example, is 4.46 billion years. This

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<sup>2</sup> Massart, Cecile. Un Site Archive Pour Alpha, Beta, Gamma: Art. <http://cecile-massart-lisibilite-dechets-radioactifs.com/en/art-uk> (Accessed 2015-05-16), para.3.

almost mirrors the 4.5 billion years from now speculatively proposed in Jean-Francois Lyotard's 1991 work *The Inhuman* as time of the explosion of the sun, the consuming of philosophy and the terrestrial horizon.<sup>3</sup> More immediately, the next ice age is predicted in between 6000 and 20,000 years,<sup>4</sup> while the Onkalo site is designed for 100,000 years storage. Bearing the facts of these material timescales in mind, sites are designed for “without future maintenance”<sup>5</sup> probing into a future where human engineers and scientists may no longer exist to monitor and control operations. The repository landscape captured with lingering shot and track in *Into Eternity* in one ultimately of complete indifference to its photographers and their cameras. As philosopher Ben Woodard has pointed out, the radical futurity invoked by eco-crisis remains largely wedded to an anthropocentric horizon – understood in terms of ‘our children’ and future generations.<sup>6</sup> The deep geological repository, however, embodies not only a call to future generations, captured as a narrative of protection in the film, but also a more radical confrontation with the death of human thought, and so its contingency alongside nuclear timescales.

Through this projection of a future without maintenance, the site invokes a temporality indifferent to human care, that of the continuum of ‘deep time’. Its thinking and material construction is premised upon registering and modelling conditions, in the present, not entirely dependent on the priority of their human sensors. If the more radical futurity of ecocrisis, alluded to by Woodard, can be understood as the further and scientific removal of the human from the centre of the universe, then the deep geological repository registers and deepens this germ of trauma. This evokes the ‘truth of extinction’ discussed in philosopher Ray Brassier's *Nilism Unbound* as “that which levels the transcendence ascribed to the human”<sup>7</sup> - a non-anthropocentric awareness of the death of thought, which forces a disenchantment of our own privileged position at the centre of a world *for-us*. Within an art context it is useful to return to and re-emphasise this as positive speculative opportunity, an “invigorating vector of intellectual discovery rather than a calamitous diminishment”,<sup>8</sup> suggesting not the wallowing in melancholy affects of despair of annihilation and the alluring beauty of a paradoxical world-without-us, but as call for extensions of knowledge through new experimental material practice, building new collectives of augmented human and non-human agencies, and demanding reinvention of the Earth where, “cognition grasps a real not of its own making, and.. its capacities may be reshaped

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<sup>3</sup> Lyotard, Jean-Francois. *The Inhuman: Reflections on Time*. Palo Alto: Stanford University Press, 1991, pp.8-9.

<sup>4</sup> Although current climate models suggest future ice-ages have now been ‘put off’ due to the amount of human activity produced CO2 in the atmosphere.

<sup>5</sup> Smudge Studio. Containing Uncertainty: Design for Infinite Quarantine. <http://smudgestudio.org/smudge/with/uncertainty/uncertain.html>, (Accessed 2015-05-16), 2010, para.6.

<sup>6</sup> Woodard, Ben. The Deep Time of Ecological Politics. Paper given at *The Revolution of Time and Time of Revolution Conference*, Binghamton, March 2011.

<sup>7</sup> Brassier, Ray. *Nilism Unbound*. New York: Palgrave Macmillan, 2007, p.224.

<sup>8</sup> *ibid*, p.xi.

as a function of that real”,<sup>9</sup> and as Brassier summarises in more recent work, “thought is embedded in the reality which it seeks to know”.<sup>10</sup>

This leads, then, to my main question here - that of the role of art in imagining the deep geological repository as nuclear thing opened by deep time. What specific knowledge could art practices give us in this context? What are their potentials and problems? While, at the same time and inversely, how could this temporal vector perhaps point to limits of and infect that set of conditions historically known as ‘contemporary art’?

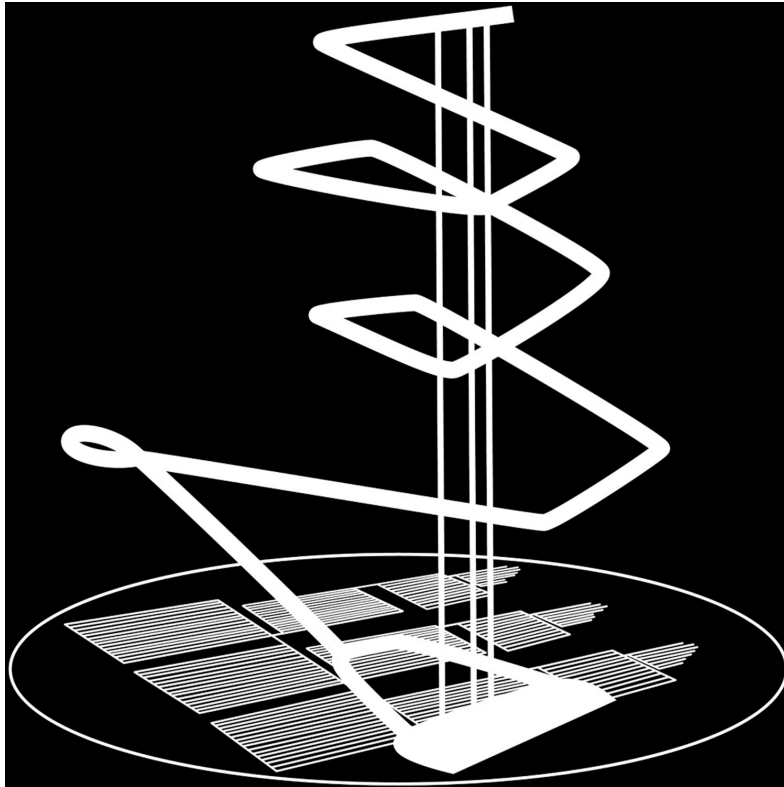
The deep geological repository has acted as lure for a number of artistic projects. Artist duo Smudge Studio, for example, have approached Onkalo in their project *Containing Uncertainty* (2010). Their work suggests a fascination with the site, described as a space of imagination “at the edges of cognition”,<sup>11</sup> alluding to the problems and pleasures of grasping cosmic scales in the human mind. The work is fragmentary and multiple in its approach, reflecting this difficulty in cognising the space. It includes short essays, discussions, bullet point lists, Gneiss bedrock, copper bracelet, bentonite clay models, and this schematic diagram of the repository architecture:

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<sup>9</sup> Mackay, Robin; Pendrell, Luke and Trafford, James. (eds.). Introduction. *Speculative Aesthetics*. Falmouth: Urbanomic, 2014, pp.1-6.

<sup>10</sup> Brassier Ray. Delevelling: Against Flat Ontologies. In *Under Influence – Philosophical Festival Drift, 2014* Channa. van Dijk et al. (eds), Omnia. 64-80, 2015, p.77.

<sup>11</sup> Smudge Studio. *Containing Uncertainty*, <http://smudgestudio.org/smudge/with/uncertainty/uncertain.html> (Accessed 2015-05-16), 2010.



*Containing Uncertainty*, smudge studio, 2010. artist schemata of Onkalo repository, 6' x 10' vinyl, created for the exhibition *Landscapes of Quarantine*, Storefront for Art and Architecture, 2010, courtesy the artists.

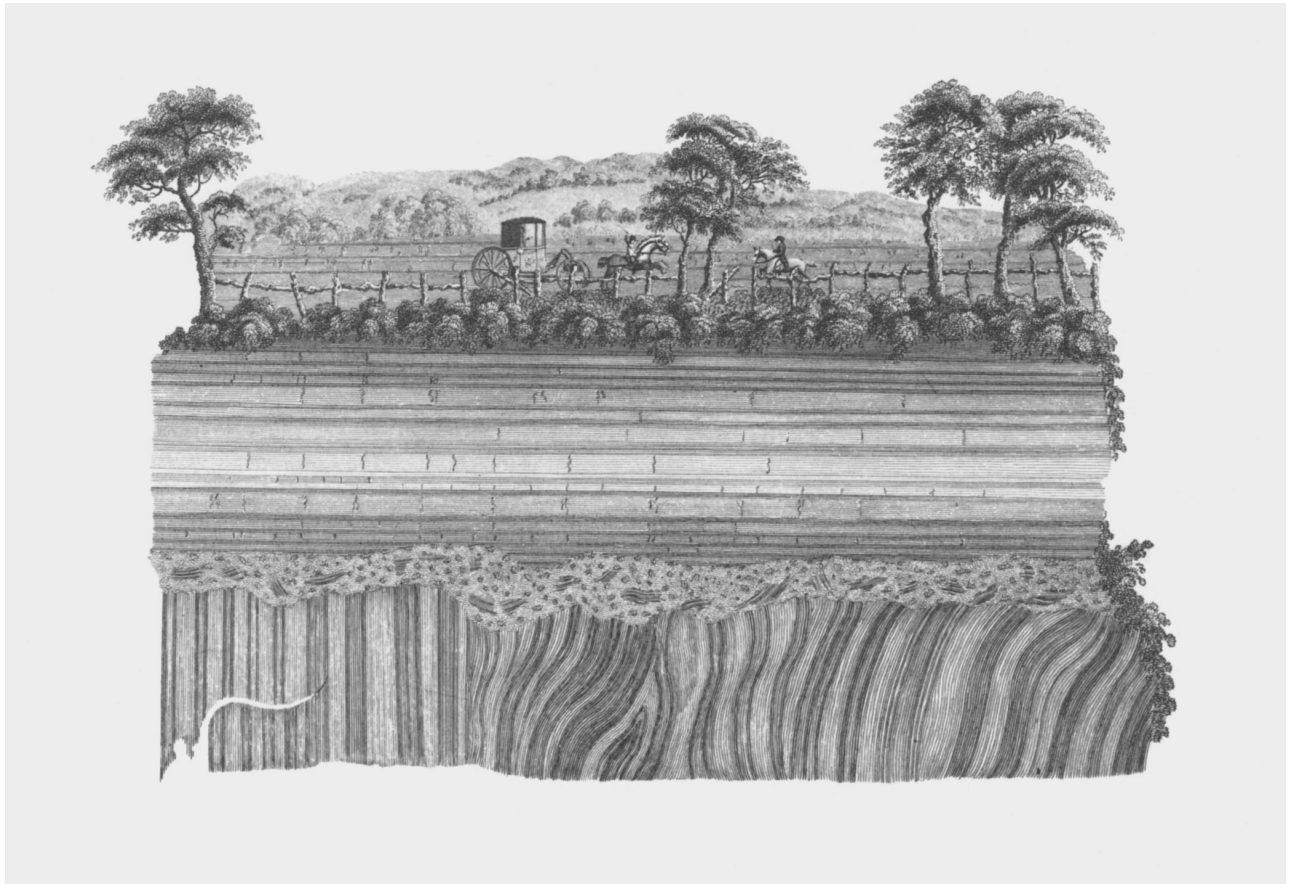
What is it though that is attempted to be grasped through these allusions? The repository, as Gabrielle Hecht has argued of 'nuclearity' generally,<sup>12</sup> and as Smudge Studio here suggest, is a complex and contested 'thing' with wide ranging political effects, "designating something as nuclear - whether in technoscientific, political or medical terms - carries high stakes. Fully understanding those stakes requires layering stories that are usually kept distinct".<sup>13</sup> As Hecht's analysis shows, these stories are of asymmetric, power-inflected relations between intertwined human and non-human entities, including topologies of inside and outside, global markets, sandstone, ore, Neodymium, mined yellowcake, the occupational health of mine workers in eastern Gabon, colonial exploitation, and so on, which coalesce around the materials-for-storage. The deep geological repository, as site of activity and its operational conditions, presents a specific kind of problem, one that studying necessitates what Jussi Parikka has called for in a media archaeology that he aligns with art practice, "the investigation of the mineral and substrate materialities *as well as* the materialities of production, management of global labour processes,

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<sup>12</sup> The concept is developed by Gabrielle Hecht in her analysis of the African Uranium trade. It captures the asymmetrical and exclusive politics of regulation, acknowledging the social contexts and networks of implication for the designation and treatment of materials as nuclear, as well as the shifting and contested divide between nuclear and non-nuclear, "Nuclearity...is a contested technopolitical category. It shifts in time and space. Its parameters depend on history and geography, science and technology, bodies and politics, radiation and race, states and capitalism. Nuclearity is not as much an essential property of things as it is a property *distributed among things*." Hecht, Gabrielle. *Being Nuclear: Africans and the Global Uranium Trade*. Cambridge, MA: MIT Press, 2012, p.14.

<sup>13</sup> *ibid*, p.4.

and various other materialities that are always entangled”.<sup>14</sup> Such entangled materialities include my focus here - relations between human thought in the present, and the immense scales of so-called deep time - stretching back, while extending into projected and contested futures.



Engraving after a drawing by John Clerk of Eldin (1787) of the unconformity at Jedburgh: Plate III in the *Theory of the Earth Volume 1*, by James Hutton, image wikicommons.

Uses of the term *deep time* can be traced to late 18<sup>th</sup> Century geology, attributed to James Hutton’s analysis of the geochemistry and angular unconformity at Siccar Point in Scotland. In his *Deep Time of the Media*, Siegfried Zielinski discusses an illustration from Hutton’s 1778 *Theory of the Earth*, which shows slate deposits plunging into the depths of the Earth, arguing that, through the visualisation of immense timescales, this image can be considered as stunning as Copernican depictions of the solar system in dislodging the Earth from the centre of the universe, “the idea of geological deep time is so foreign to us we can only understand it as metaphor”,<sup>15</sup> Zielinski goes on to argue. These points are not unconnected, to be ‘stunned’ by deep time is to focus on

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<sup>14</sup> Parikka, Jussi. Decay Ecology: For An Alternative Deep Time. In *O-Zone: A Journal of Object Oriented Studies, Issue 1: Object/Ecology*, Spring 2014, p.11.

<sup>15</sup> Zielinski, Siegfried. *Deep Time of the Media*. Cambridge, MA: MIT Press, 2008, p.8.

the attendant sense of human awe and wonder at such cosmic timescales, “the mind seemed to grow giddy looking so far into the abyss of time”,<sup>16</sup> while metaphor suggests limiting knowledge by drawing it back into existing linguistic categories. This affect of wonder, reflected in the opening of *Into Eternity*, intensified and elongated through slow track of the camera, the hushed narration, and the enveloping flatline drone with punctual crackle, is of course important in the context of Hutton’s Enlightenment deflating of Biblical time scales. Solely being struck dumb by an image of the vastness of time, however, suggests, from our current situation, neither a productive position from which to gain knowledge nor to act.<sup>17</sup>

Rather than journeying ‘into eternity’, in reality, the deep time of the radiological is neither infinitely vast nor immeasurable. The Uranium-238 half-life of 4.46 billion years has been measured, based on the probability of its nucleus to decay over time. This is a time that is difficult to imagine but it is not infinite. It is in fact, to use a term deployed by philosopher Timothy Morton, a “very large finitude”.<sup>18</sup> Morton uses this term to describe what he calls the ‘hyperobject’ as a specific kind of object “massively distributed in time and space”.<sup>19</sup> We are immanent to hyperobjects, a claim Morton describes as their quality of ‘viscosity’ – we can have no critical distance from them as we are already immersed within their range. The hyperobject cannot be exhausted by perception, and the more we struggle to distance ourselves from it, the more ‘stuck’ we become.

While the hyperobject can be read as a finite object that is too vast to comprehend individually without technological augmentation, we can build tools to think it as complex abstraction – in this case, deploying techniques such as probability modelling and measuring ionizing emission. Such abstractions suggest an important role for aesthetics beyond creating stunning images. Political theorist Nick Srnicek has proposed this in his argument for the importance of an ‘aesthetics of the interface’ in mapping (what could be described as the hyperobject of) current neoliberalism. Srnicek argues for developing Fredric Jameson’s project of the cognitive mapping of capitalism in two stages. Firstly, in an age of algorithmic finance, pre-emptive data capture, off-shore networks, and so on, we must use available tools of technology and mathematics

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<sup>16</sup> Hutton, James. Cited in Gould, Stephen. J. *Time’s Arrow, Time’s Cycle: Myth and Metaphor in the Discovery of Geological Time*. Cambridge, MA: Harvard University Press, 1987, p.62.

<sup>17</sup> As recent arguments suggest, both the framework of knowledge-production and the imperative to ‘act’ as humans are themselves undermined by deep time and the Anthropocene, requiring further critical discussion. See Zylinska’s call for a ‘minimal ethics’ (Zylinska, Joanna. *Minimal Ethics for the Anthropocene*. Ann Arbor: Open Humanities Press, 2014) and Anderson’s criticism of claims to ‘save’ the planet or ‘solve’ ecocrisis (Anderson, Kayla. *Ethics, Ecology, and the Future: Art and Design Face the Anthropocene*. *Leonardo*, Vol. 48, Number 4, 2015, 338-347).

<sup>18</sup> Morton, Timothy. *Hyperobjects: Philosophy and Ecology After the End of the World*. University of Minnesota Press [e-book edition], 2013, loc.945.

<sup>19</sup> *ibid*, loc.772.



(computer algorithms, simulation models, econometrics, statistical analyses) to “extend cognition beyond sensible parameters of the human”.<sup>20</sup> Secondly, to avoid being simply washed over by masses of intractable big data in a form of the technological sublime, we need a modulator between this technological representation of complex objects and the human cognitive system. It is here that he proposes aesthetics as “what sensibly mediates between individual phenomenology and our cognitive maps of global structures”.<sup>21</sup> An aesthetics of the interface derives from mathematical representation, rendering it not as impenetrable noise but as cognitively tractable, suggesting “the expansion of sensible possibilities beyond human limitations”<sup>22</sup> and inviting the challenge “to design interfaces in such a way that they offer the possibility of manipulating complex systems...the aesthetics of the interface is the mode of operationalising this complex knowledge into local phenomenologically amenable representations’.<sup>23</sup>

In the context of the repository, its enmeshing in deep timescales can be read not as immeasurable but as a call to augment and develop aesthetics through collective experimentation and technologies. Stuck, art practices cannot separate from the hyperobject to make an image of it in its entirety, but are opened by it, drawing from it.<sup>24</sup> The interface does not claim to separate and make an image *of* the hyperobject, but is immanent *to* it, nor does it suggest a flat equivalence between connected entities. It is provisional, open to collective modification, and platform for extended human, (or non-humanistic) thought. It can be understood not just as object but, as method, and art practices can be proposed as developing experimental interface-methodologies for the deep geological repository. Artist duo Thomson & Craighead for example have proposed a nuclear semiotic totem as temporary index, counter for representing the decay rate of nuclear waste products,<sup>25</sup> developing recent projects using art as scaling device between big data and subject-amenable representations, including *Hello World*, a constantly updated measure of current world population:

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<sup>20</sup> Srnicek, Nick. Navigating Neoliberalism: Political Aesthetics in an Age of Crisis, paper delivered at *The Matter of Contradiction: Ungrounding the Object*, Vassivière, France, 8-9 September 2012, p.1.

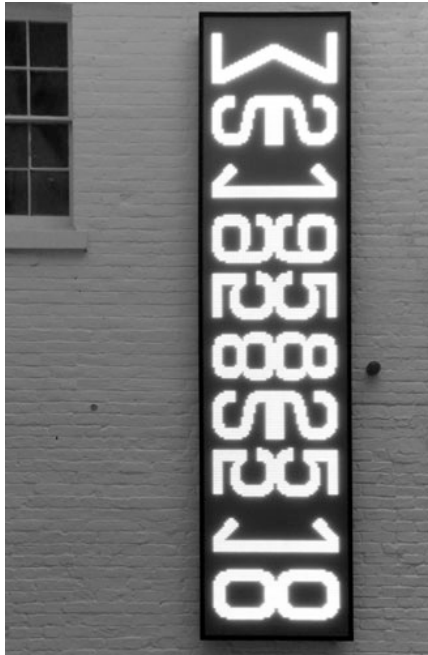
<sup>21</sup> *ibid*, p.5.

<sup>22</sup> *ibid*, p.8.

<sup>23</sup> *ibid*, p.10.

<sup>24</sup> “The earth as a mediating polis can only be thought through aesthetics derived from, not imposed upon, the computation of possible geometries, subdivisions, doubles, inversions, localizations, and Hubble-scale adoptions from the outside.” (Bratton, Benjamin. Some Trace Effects of the Post-Anthropocene: On Accelerationist Geopolitical Aesthetics, *e-flux Journal* 46, 06/2013, <http://www.e-flux.com/journal/some-trace-effects-of-the-post-anthropocene-on-accelerationist-geopolitical-aesthetics/> (Accessed 2015-05-16), para.2.)

<sup>25</sup> Triscott, Nicola. ‘Nuclear Culture in Japan’. <http://nicolatriscott.org/2014/08/11/nuclear-culture-in-japan-part-1-actinium-programme-sapporo-hokkaido/> (Accessed 2015-05-16), 2014 ; For new work by the artists developed since this text was written, see <http://www.carrollfletcher.com/exhibitions/52/overview/>



Thomson & Craighead, *Hello World* (2014)

Such work opens the question of how to draw on statistical data without only repeating the affective stun of Hutton's image. An immediate reaction invoked by the work is to be struck with awe at the relation between oneself and immense global scales, an effect that could be described as the 'Anthropogenic sublime'.<sup>26</sup> This opens the question however, of 'what next?' – how can this impact be drawn upon and extended without being instantiated as a limit?<sup>27</sup> It is here that the aesthetics of the interface is important - aesthetics not as art's description by philosophy, but as the (not entirely exhausted by human) aesthesis of sensing, considering aesthetic experience as structured by material regimes, and having political force - What kinds of subjectivities could be addressed by, modulated and organised around this encounter?

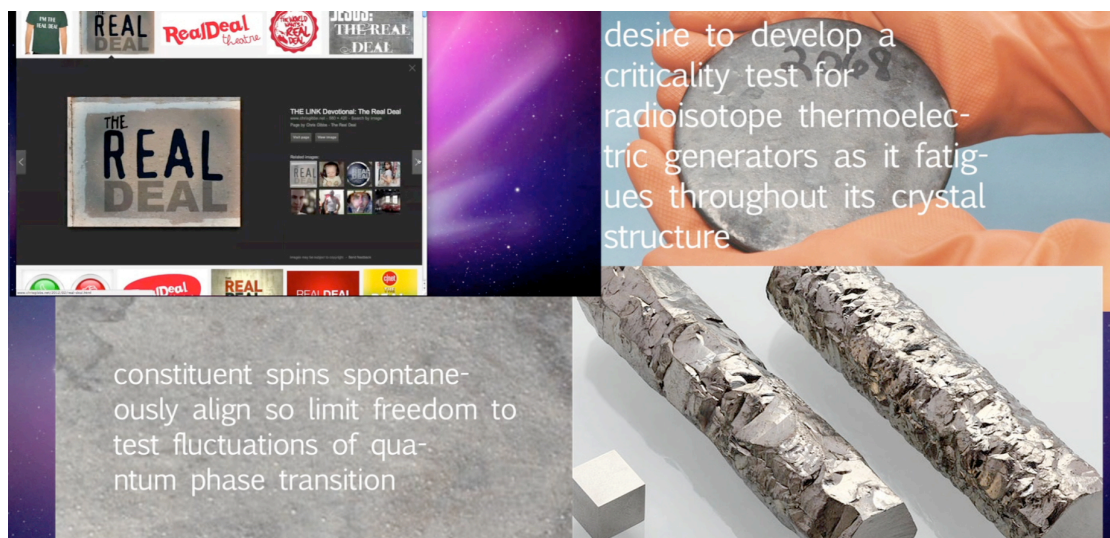
Concluding here suggests opening up to further research, as art practices take on tasks of developing such aesthetics, expanding this interface role through specific propositions. I will finish with two examples taken from my own current work. Firstly, *The Plureal Deal*, is a project, which sets itself the aim of hypothesising a material history of Plutonium, tracing a timescale

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<sup>26</sup> Williams, Alex. At The Dawn of the Anthropocene. Paper delivered at *War Against The Sun*, MUTE, London, 26<sup>th</sup> May 2013. Robert Macfarlane, in a recent introduction to the Anthropocene, (Generation Anthropocene: How humans have altered the planet for ever. *The Guardian*, Friday 1<sup>st</sup> April 2016) describes human response to the immensity of ecological crisis through reference to Sionne Ngai's term 'stuplime', capturing an affect that is stupefying (and also, in Ngai's work, 'stupid', which suggests a further potentially undermining strategy actually against the sublime, *Ugly Feelings*. Cambridge, MA: Harvard University Press, 2009, p.249). Such variations suggest, as Macfarlane's project of constructing a crowdsourced Anthropocene Glossary illustrates, the need for new language and concepts drawing on and going beyond existing discourses such as the sublime.

<sup>27</sup> A question addressed in this case, for example, through the specific aesthetic form of the ritualistic totem.

from cosmic origins of Uranium to billion of year futures from within existing narratives and fictions of ‘the Real’, taken from contemporary corporate promotional culture.<sup>28</sup>



Andy Weir, still from *The Plureal Deal* (2016), courtesy the artist

In attempting to trace Plutonium futures, the work leads to encounters and discussions with repository teams on how such long-term futures are projected. These include computational and mathematical models alongside other strategies such as risk analysis and scenario planning, algorithmically predicting and staging potentially interruptive events. The material history of the future refracts into multiple provisional ‘partial models’,<sup>29</sup> with the interface acting as collecting platform for their laying out and critical reflection.

Secondly, *Pazy-goo*, a goeey, collectively modifiable Uranium-glowstick waving Pazuzu, the Sumero-Asyriian demon of contagion, epidemic and dust, is proposed as an intervention into

<sup>28</sup> A stuplime aim emphasising its stupidity as strategy perhaps.

<sup>29</sup> Setting up a relation with Francois Laruelle’s description of ‘fictions’ as partial models alongside the Real (Laruelle, Francois. *Photo-Fiction – A Non-Standard Aesthetics*. Minneapolis: Univocal 2012). In this case avoiding reducing the future to specific singular models, for example, in using simulation to legitimate non-intervention in geohydrological process, while, at the same time, not making its reality ungraspable.

the deep geological repository marker project, addressed to the future.



Andy Weir, *Pazū-goo: 3D Printed Deep Geological Repository Marker for a Future Posthuman Palaeoarcheologist* (c.700 BC – 4.6 x 10<sup>9</sup> AD), courtesy the artist

Through workshops and shared instructions, designs are 3D printed in Nylon 12, encased in clay tablets and flushed into local water supplies, perhaps later discovered as artefacts, or left to slowly degrade and form new molecular configurations through ingestion and drift. Addressing the question of what it might mean to extend the marker project to an indifferent future without maintenance leads to a focus away from intergenerational communication and onto the literal materiality of the work itself. Through additive printing, Nylon powder is layer-fused from object code, exhibited, then thrown into waste. Following waste circuits, microplastics persist, ingested and accumulated into the bodies and tissues of marine organisms, bloating gastrointestinal tracts. The work continues life as bioplastic assemblage, becoming part of five trillion plastic particles in the Earth's oceans, while Pazuzu is figured as demonic scavenger of this molecular body:

Each particle of dust carries with it a unique vision of matter, movement, collectivity, interaction, affect, differentiation, composition and infinite darkness – a crystallised data base or a plot ready to combine and react... Pazuzu specialises in scavenging the stratified Earth and its biosphere in the form of dust, which then is uplinked to alien currents flowing in the universe.<sup>30</sup>

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<sup>30</sup> Negarestani, Reza. *Cyclonopedia: Complicity with Anonymous Materials*. Melbourne: re.Press, 2008, pp.88, 113.

Premised on the strangeness of its guiding idea that waste could just be hidden away in a passive 'Earth' separated from an unaffected 'humanity',<sup>31</sup> the repository marker makes the implausible claim of containing a specific site and duration, proposing to mark a barrier that can't really exist. *Pazu-goo*, on the other hand, parasites on local sites to become an 'anti-marker'. The anti marker focuses on leakage, non-containment and the speculative potential of future transformations of humans in dynamic relation and alliance with other entities across scales. This is practiced not as metaphor or sign, but through its own performative materiality, drifting from dump to sea, navigating from local sites towards a universal ungrounding current of deep time.

Art can be an experimental platform for building multiple 'dia-chronic material fictions' that think the deep geological repository as futurology, excavating its political stake. From one perspective, this is important as artists are stakeholders in an ongoing industry consultation process, demanding critical reflection on what this could mean beyond the instrumentalisation of making seductively stunning images. From another perspective, our understanding of the 'contemporary' of contemporary art is subject to traumatic reconfiguration, amplified alongside inhuman scale, refracted through multiple interface methods. Finally, developing thinkers such as Parikka who proposes that "concrete and long-term investment in geological times of media as crucial for processes of subjectivation"<sup>32</sup>, we can consider what it means to think production and circulation of these fictions as constitutive of radical, processes of subjectification, opened and cut across by deep time.

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<sup>31</sup> Ben Woodard, writing on the repository project, picks up on the striking "oddness of a purportedly permanent solution in a purportedly dead Earth", not only in creating this artificial binary between 'human' and 'waste' but also denying any power to matter and the Earth to propagate new forms of life (Woodard, Ben. *On An Ungrounded Earth: Towards a New Geophilosophy*. New York: punctum, 2013, p.67.)

<sup>32</sup> Parikka, Jussi. Decay Ecology: For An Alternative Deep Time. In *O-Zone: A Journal of Object Oriented Studies, Issue 1: Object/Ecology*, Spring 2014, p.7.

## Bibliography

Anderson, Kayla. Ethics, Ecology, and the Future: Art and Design Face the Anthropocene. *Leonardo*, Vol. 48, Number 4, 2015, 338-347.

Brassier, Ray. *Nibil Unbound*. New York: Palgrave Macmillan, 2007

Brassier Ray. Delevelling: Against Flat Ontologies. In *Under Influence – Philosophical Festival Drift, 2014* Channa. van Dijk et al. (eds), Omnia. 64-80, 2015.

Bratton, Benjamin. Some Trace Effects of the Post-Anthropocene: On Accelerationist Geopolitical Aesthetics , *e-flux Journal* 46, 06/2013, <http://www.e-flux.com/journal/some-trace-effects-of-the-post-anthropocene-on-accelerationist-geopolitical-aesthetics/> (Accessed 2015-05-16)

Gould, Stephen. J. *Time's Arrow, Time's Cycle: Myth and Metaphor in the Discovery of Geological Time*. Cambridge, MA: Harvard University Press, 1987.

Hecht, Gabrielle. *Being Nuclear: Africans and the Global Uranium Trade*. Cambridge, MA: MIT Press, 2012.

*An International Conference and Debate on the Preservation of Records, Knowledge & Memory of Radioactive Waste Across Generations*. Centre Mondial de la Paix, Verdun, France, 15-17 September 2014.

Laruelle, Francois. *Photo-Fiction – A Non-Standard Aesthetics*. Minneapolis: Univocal 2012.

Lyotard, Jean-Francois. *The Inhuman: Reflections on Time*. Palo Alto: Stanford University Press, 1991.

Macfarlane, Robert. Generation Anthropocene: How humans have altered the planet for ever. *The Guardian*, Friday 1<sup>st</sup> April 2016

Mackay, Robin; Pendrell, Luke and Trafford, James. (eds.). Introduction. *Speculative Aesthetics*. Falmouth: Urbanomic, 2014.

Morton, Timothy. *Hyperobjects: Philosophy and Ecology After the End of the World*. University of Minnesota Press [e-book edition], 2013.

Negarestani, Reza. *Cyclonopedia: Complicity with Anonymous Materials*. Melbourne: re.Press, 2008.

Ngai, Sianne. *Ugly Feelings*. Cambridge, MA: Harvard University Press, 2009.

Parikka, Jussi. Decay Ecology: For An Alternative Deep Time. In *O-Zone: A Journal of Object Oriented Studies, Issue 1: Object/Ecology*, Spring 2014.

Sebeok, Thomas. *Communication Measures to Bridge Ten Millennia: Technical Report*. Columbus, OH: Office of Nuclear Waste Isolation, 1984.

Smudge Studio. *Containing Uncertainty*, <http://smudgestudio.org/smudge/with/uncertainty/uncertain.html> (Accessed 2015-05-16), 2010.

Srnicsek, Nick. *Navigating Neoliberalism: Political Aesthetics in an Age of Crisis*, paper delivered at *The Matter of Contradiction: Ungrounding the Object*, Vassivière, France, 8-9 September 2012.

Triscott, Nicola. 'Nuclear Culture in Japan'. <http://nicolatriscott.org/2014/08/11/nuclear-culture-in-japan-part-1-actinium-programme-sapporo-hokkaido/> (Accessed 2015-05-16), 2014.

Williams, Alex. *At The Dawn of the Anthropocene*. Paper delivered at *War Against The Sun*, MUTE, London, 26<sup>th</sup> May 2013.

Woodard, Ben. *The Deep Time of Ecological Politics*. Paper given at *The Revolution of Time and Time of Revolution Conference*, Binghampton, March 2011.

Woodard, Ben. *On An Ungrounded Earth: Towards a New Geophilosophy*. New York: punctum, 2013.

Zielinski, Siegfried. *Deep Time of the Media*. Cambridge, MA: MIT Press, 2008.

Zylinska, Joanna. *Minimal Ethics for the Anthropocene*. Ann Arbor: Open Humanities Press, 2014.