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After the End of the World: Entangled Nuclear Colonialisms, Matters of Force, and the Material Force of Justice¹

Abstract

This essay is an invitation to take up the nature and problematics of hospitality in its materiality. It begins and ends with the Marshall Islands, at the crossroads of two great destructive forces: nuclear colonialism and the climate crisis. In the aftermath of sixty-seven US nuclear bomb “tests” visited upon the Marshall Islands, the concrete “dome” built on Runit Island by the US government was an act of erasure and a-void-ance—an attempt to contain and cover over plutonium remains and other material traces of the violence of colonial hospitality that live inside the Tomb (as the Marshallese call it). Taking the physicality of the hostility within hospitality seriously, and going into the core of the theory that produced the nuclear bomb, I argue that a *radical hospitality*—an infinity of possibilities for interrupting state sanctioned violence—is written into the structure of matter itself in its inseparability with the void.

How shall we remember you?

You were a whole island, once. You were breadfruit trees heavy with green globes of fruit whispering promises of massive canoes. Crabs dusted with white sand scuttled through pandanus roots. Beneath looming coconut trees beds of ripe watermelon slept still, swollen with juice. And you were protected by powerful *irooj*, chiefs birthed from women who could swim pregnant for miles beneath a full moon.

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Then you became testing ground. Nine nuclear weapons consumed you, one by one by one, engulfed in an inferno of blazing heat. You became crater, an empty belly. Plutonium ground into a concrete slurry filled your hollow cavern. You became tomb. You became concrete shell. You became solidified history, immovable, unforgettable.

From the poem "Dome Poem Part III: Anointed"
by Kathy Jetñil-Kijiner²

At the core of Quantum Field Theory, a theory of nature's transience, is the radical undoing of the separation between being and nothingness. Time is out of joint. It is diffracted, broken apart, exploded, scattered in multiple directions. Each moment is an infinite multiplicity where other moments are here-now in particular constellations. "Now" is not an infinitesimal slice, but an infinitely rich condensed node in a changing field diffracted across spacetime (Barad 2017a).

The Dome

Let us begin at the "end." With an island that has been given the colonializing title "the end of the Earth."³ Here we find a dome. This dome has been dubbed both the "most toxic place on Earth" and an "Edenic paradise." Here at the crossroads between nuclear and climate catastrophes is the end of the time... and the beginning.

The dome is located in the Marshall Islands, on a chain of islands called Enewetak Atoll. Few Americans have heard of Enewetak, though some recall something about Bikini. Bikini Atoll is associated in the American imagination, if it is at all, with the "first and only" thermonuclear bomb test—but it was neither the first nor the only one. The particular thermonuclear or hydrogen bomb test that got so much fanfare was 1000 times the size of the bomb dropped on Hiroshima. The eerie sci-fi cloud of the Bravo test lingers, though the fact that it was one of 23 nuclear bombs exploded at Bikini has long faded. It's not that the 67 nuclear and thermonuclear bombs that the US detonated on the Marshall Islands between 1946 and 1958 have been kept secret; on the contrary, unlike the Manhattan Project, much was

² This poem and the two other dome poems can be found on Kathy Jetñil-Kijiner's website: <https://www.kathyjetnilkijiner.com/dome-poem-iii-anointed-final-poem-and-video/>. I thank her for her kind permission to use her remarkable video performance of her powerful poem in my talk.

³ On the myth of islands, that is, "island laboratories" as isolates, see Elizabeth M. DeLoughrey (2012).

made of this Cold War spectacle that turned the island nation into a laboratory and display case for flexing military muscle. But the extent of the violence and the ongoingness of what Winona LaDuke calls “radioactive colonialism” is one of the few things radioactive that has not been absorbed; or rather, like other forms of colonialism, the temporality of radioactive colonialism is not of a past that is passed, or even decays with time, but rather, an ongoingness that is present; and at the same time, as it were, the particularity of its nuclear nature is such that it has already colonized the future as well, making evident that nuclearity in its specificity radically scrambles, if not disassembles, the imperialist universalizing sequentiality of past-present-future (LaDuke, Churchill 1985).

The majority of the 67 nuclear bombs, 43 of them, were exploded on Enewetak. Four of Enewetak’s 40 islands were completely vaporized by thermonuclear bomb tests. Two thermonuclear blasts each left two-kilometer wide craters on the edge of Runit Island. In the late 1970s, the US government, in the process of washing its hands of the radioactive mess they left in the Marshall Islands, did a rudimentary “clean up.” Four thousand US servicemen were deployed to the Marshall Islands to do the dirty work, which included putting hundreds of pieces of plutonium, the debris of a detonation gone wrong, into plastic bags and throwing them into the crater, along with other nuclear debris from the tests. This constituted a “cleanup” of approximately 0.8 percent of the total radioactive waste. The servicemen had no protective gear or education about handling nuclear waste. The crater, which is made of coral, a very porous material, was then covered over by a dome of concrete.

Alson Kelen, climate change activist, master navigator and shipbuilder, founder and director of Waan Aelōñ in Majel, former mayor of Bikini Atoll, President of the Council of NGOs, and member of the National Nuclear Commission, points out that the dome sits at a juncture, a crossroads between two great destructive forces: “The dome,” he says, “is the connection between the nuclear age and the climate change age” (Kelen 2017).⁴ For the Marshall Islands are at the leading edge of climate change. A 60-centimeter increase in sea level by the end of the century may inundate three-quarters of the country. According to USGS data, many atolls in the Marshall Islands will be uninhabitable within decades.

⁴ Full quotation: “*That dome is the connection between the nuclear age and the climate change age. It’ll be a devastating event if it really leaks. We’re not talking just the Marshall Islands, we’re talking the whole Pacific Ocean*—Alson Kelen, Marshallese community leader.” Many thanks to Thom van Dooren for pointing out the numerous titles held by Mr. Kelen.

In a 2014 *New York Times* editorial, “A Pacific Isle, Radioactive and Forgotten,” Columbia University climate change scholar Michael Gerrard, writes:

A task force of the federal government’s National Research Council warned in 1982 that the dome might be breached by a severe typhoon. But a 2013 report sponsored by the [U.S.] Department of Energy saw no reason to worry. ‘Catastrophic failure of the concrete dome,’ it said, ‘and instantaneous release of all its contents into the lagoon will not necessarily lead to any significant change in the radiation dose delivered to the local resident population.’ The reason, according to the report, was that the radiation inside the dome was ‘dwarfed’ by the radiation in the sediments in the lagoon. Thus a leak from the dome would be *no added threat because it is dirtier on the outside than the inside* (Gerrard 2014, emphasis mine).

Gerrard continues:

Runit dome embodies injustices in many ways. The fact that all these weapons were exploded there, the fact that this plutonium was left behind, the fact that the [US military] workers who worked there [to clean up a failed plutonium bomb] have not been compensated, and very importantly the fact that the entire nation is endangered by sea level rise which is caused mostly by the greenhouse gas emissions of the major emitting countries of which the US was historically number one. These are an accumulation of injustices (ibidem).

We might add to Gerrard’s list: the fact that the Marshallese have suffered and continue to suffer from very high rates of cancer as a result of radioactive fallout; the fact of severe birth defects, that Marshallese women have given birth to “jellyfish” and “grapes” as they themselves have described it;⁵ the fact that the Marshallese have the second highest rates of type 2 diabetes in the world as a result of eating Spam and other canned foods for decades after being told that the fish and fruits of their islands were too contaminated to ingest; and the fact that the Marshallese, who have been allowed by the Compact of Free Association (COFA) Treaty to move to the US and work without green cards, and without being granted citizenship, are currently the most impoverished ethnic group in the United States.

⁵ “The most common birth defects... have been ‘jellyfish’ babies. These babies are born with no bones in their bodies and with transparent skin... Many women die from abnormal pregnancies, and those who survive give birth to what looks like purple grapes, which we quickly hide away and bury.” This quote is attributed to Marshall Islander Lijon Eknilang who appeared before the International Court of Justice (ICJ) in The Hague in November 1995 (Cohen 2010; see also Rose Johnston & Barker 2008, 14-15, 130, 144, 147). Johnston and Barker explain that, “If these reproductive problems had existed before the testing program, they would have had proper Marshallese names, as do other illnesses...” (Rose Johnston & Barker 2008, 147).

The Politics of Matter, the Matter of Politics

Matter fell from grace during the twentieth century. It became mortal. Very soon after that it was murdered, exploded at its core, torn to shreds, blown to smithereens. The smallest of smallest bits, the heart of an atom, was broken apart with a violence that made the earth and the gods quake. In an instant, in a flash of light brighter than a thousand suns, the distance between Heaven and Earth was obliterated. J. Robert Oppenheimer, lead scientist on the Manhattan Project, remembers marking the moment by reciting a verse from the *Bhagavad Gita*: “Now I am become death, the destroyer of worlds.”⁶

There was a time when matter stood outside of time. But in the intervening years between the two world wars, physicists broke with a more than thousand year-old tradition, inherited from the Greeks, and placed matter in the hands of time. Quantum field theory (QFT)—a mixture of quantum theory, relativity, and field theory—was responsible for this radical change in the order of things.

Physicists began working on QFT starting in the late 1920s, but quickly ran into difficulties—most seriously, the so-called “infinities problem,” which was not resolved before the war. The war effort interrupted the development of the theory, at least in the West, because many of the same physicists who were hard at work on QFT were called on to work on and take the lead on the development of new military technologies. This is not a coincidence. Nuclear physics developed alongside and inside—with-in—QFT, and many of the top physicists around the world were working on QFT and nuclear physics. Skills, techniques, approaches to cracking hard problems, and more, were traded back and forth between military research and the most abstract efforts in physics. In significant ways, the war effort for physicists around the globe, was continuous with work in “pure” theoretical physics; or more precisely, it was dis/continuous in a problematizing of the

⁶ This translation is J. Robert Oppenheimer’s. Oppenheimer was the lead scientist on the Manhattan Project. The story that has been widely shared is that he uttered this verse upon seeing the first atomic bomb test. This is contested. (Thanks to Liz DeLoughrey for pointing this out.) In any case, Oppenheimer did say the following in a 1965 TV Broadcast: “We knew the world would not be the same. A few people laughed, a few people cried. Most people were silent. I remembered the line from the Hindu scripture, the *Bhagavad Gita*. Vishnu is trying to persuade the Prince that he should do his duty, and to impress him, takes on his multi-armed form and says, ‘Now I am become Death, the destroyer of worlds.’ I suppose we all thought that, one way or another.” From TV clip available online as “J. Robert Oppenheimer: ‘I am become Death, the destroyer of worlds’” (Oppenheimer).

assumed discontinuity or dichotomy between continuity and discontinuity.⁷ Tracing the entanglements of the construction of a quantum field theoretical account of nature and the development of a weapon that unleashed nature's fury goes to the core of this project. For now, I focus on exploring the radical possibilities that exist inside the theory for exploding the structures of violence that not only resulted from the theory but were integral to the practice of theorizing. If quantum physics provides useful conceptual tools for understanding the politics of matter and the matter of politics in the "nuclear age," it is in part because quantum physics and the atom bomb are directly and profoundly entangled: the theory and the bomb inhabit and help constitute each other. Just like the ontology (hauntology) it suggests, quantum theory is shot through with the political.

Quantum Field Theory: Life and Death, Time-Being, and the Structure of Nothingness⁸

During this period, the nature of time and being were together remade. No longer an independent parameter relentlessly marching forward into the future, time is neither a continuum nor a series of discrete moments that follow in succession. Time is diffracted, imploded/explored in on itself: each moment made up of a superimposition of all moments (differently weighted and combined in their specific material entanglement). And directly linked to this indeterminacy of time is a shift in the nature of being and nothingness.⁹

Newtonian physics subscribes to the Democritean notion that nature has but two elements—atoms and the void. In classical Newtonian physics, the void, is mere nothingness—it is that which literally doesn't matter. The void provides a backdrop against which that which matters—namely,

⁷ Given the troubling of dichotomies—that is, the act of cutting into two in the making of binaries—in agential realism, I regularly use a slash to signify the limit of the limit: the intra-active "cutting together-apart" between terms on either side of the slash. So for example, "dis/continuity" is to be understood as a short-hand for the reworking of the usual dichotomous or discontinuous distinction between "continuity" and "discontinuity" (see especially, Barad 2010).

⁸ The next two sections draw on my previous work on explicating QFT (e.g., see Barad 2017b).

⁹ Note that my interpretation of the energy-time indeterminacy principle is consistent with my interpretation of the indeterminacy principle for position-momentum (Barad 2007). Notably, this differs from some other interpretations. For further justification, see Karen Barad, *Infinity, Nothingness, and Justice-to-Come* (Barad, forthcoming).

matter—can be mapped in space and time; where space and time are absolute—universal fixed homogenous coordinates that have their existence independently of all matter, and of each other. And matter, discrete bits of substance, are immutable. These bits can move about, and change their motion according to the application of forces that are external to the bits of inert matter. Newton's equations are designed to account for their motion. Motion unfolds predictably against the backdrop of absolute space, while time marches forward without regard for anyone or anything. In this way, the very nature of change is theorized as matter in motion, where the movement is determined by the whims of external forces.

Twentieth-century physics challenges these notions of space, time, matter, and the void. According to quantum field theory, matter is not some given that pre-exists its interactions, and, the void is not determinately empty. Indeed, matter is always already caught up with the in/determinate dynamics of the no-thingness of the void. At the core of quantum field theory is the indeterminacy of time-being, and this gives rise to the fact that nothingness is not empty, but on the contrary, it is flush with the dynamism of the in/determinacy of time-being, the play of the non/presence of non/existence. As a result of a primary ontological in/determinacy, the void is not nothing (while not being something), but rather a desiring orientation toward being/becoming, innumerable imaginings of what might yet be/have been. Nothingness is material (even) in its non/presence.

So called "virtual particles" are the quanta of the in/determinate play of nothingness; they are and are not (there) as a result of the energy-time indeterminacy relation. Virtual particles are quantized indeterminacies-in-action. Virtual particles are not present (and not not present), but they are material. In fact, most of what matter is, is virtual. Virtual particles do not traffic in a metaphysics of presence. They do not exist in space and time. They are ghostly non/existences that teeter on the edge of the infinitely fine blade between being and nonbeing. Virtuality is admittedly difficult to grasp. Indeed, this is its very nature.

Virtuality is the material wanderings/wonderings of nothingness where every possible path is tested out. Virtuality is the ongoing thought experiment the world performs with itself. Indeed, quantum field theory tells us that the void is an endless exploration of all possible couplings of virtual particles, a "scene of wild activities."

The quantum vacuum is more like an ongoing questioning of the nature of emptiness than anything like a lack. The ongoing questioning of itself (and indeed, "it" and "self") is what generates, or rather is, the structure of noth-

ingness. The vacuum is no doubt doing its own experiments with non/being. In/determinacy is not the state of a thing but an unending dynamism.

The fact that the void is not empty, mere lack or absence matters. The question of absence is surely as political as that of presence. When has absence ever been an absolute givenness? Is it not always a question of what is seen, acknowledged, and counted as present, and for whom? The void—a much-valued apparatus of colonialism, a crafty insidious imaginary, a way of offering justification for claims of ownership in the “discovery” of “virgin” territory—the particular notion that “untended,” “uncultivated,” “uncivilized” spaces are *empty* rather than plentiful, has been a well-worn tool used in the service of colonialism, racism, capitalism, militarism, imperialism, nationalism, and scientism.¹⁰

QFT: A Touchy Subject, or the Finitude and Transience of Matter in its Infinite Un/doing

Birth and death, it turns out, are not the sole prerogatives of the animate world; so-called inanimate beings also have finite lives. “Particles can be born and particles can die,” explains one physicist. In fact, “it is a matter of birth, life, and death that requires the development of a new subject in physics, that of quantum field theory. [...] Quantum field theory is a response to the ephemeral nature of life” (Zee 2010, 3-4).

When it comes to quantum field theory, it is not difficult to find trouble—epistemological trouble, ontological trouble, a troubling of kinds, of identities, of the nature of touching and self-touching, of being and time, to name a few. It is not so much that trouble is around every corner; according to quantum field theory, it inhabits us and we inhabit it, or rather, trouble inhabits everything and nothing—matter and the void.

How does quantum field theory understand the nature of matter? *Pace* Democritus, particles do not take their place in the void; rather, they are constitutively inseparable from it. And, as we just saw, the void is not vacuous. It is a polyrhythmic structured nothingness, a dynamic play of the indeterminacy of non/being. The void, or what quantum physicists call the “vacuum,” is an extravagant inexhaustible exploration of virtuality, where virtual particles are having a field day performing experiments in being and time.

¹⁰ For a further elaboration of this point, see Barad “Troubling Time/s” (Barad 2017b).

Let us start with the electron, one of the simplest particles. According to classical physics, it is a point particle—a particle of zero dimensions and devoid of structure. Now, even the simplest bit of matter causes all kinds of difficulties for quantum field theory. For, as a result of time-being indeterminacy, the electron does not exist as an isolated particle but is always already inseparable from the unruly activities of the vacuum. In other words, the electron is always (already) intra-acting with the virtual particles of the vacuum in all possible ways.

For example, an electron will emit a virtual photon (the carrier of the electromagnetic force) and then reabsorb it. This possibility is understood as the electron electromagnetically intra-acting with itself: that is, touching itself, since touch is but an electromagnetic intra-action, and photons are the quanta of electromagnetic fields. Part of what an electron is, is its self-energy intra-action.

But this single exchange of a photon with itself is not a process that happens in isolation either. All kinds of more involved things can and do occur in this frothy virtual soup of indeterminacy that we ironically think of as a state of pure emptiness. For example, in addition to the electron exchanging a virtual photon with itself (that is, touching itself), it is possible for that virtual photon to enjoy other intra-actions with itself: for example, the virtual photon can metamorphose/ transition—change its very identity. For example, an electron can emit a virtual photon that then transforms into a virtual electron-positron pair, that subsequently annihilate each other and morph back into a single virtual photon before it is reabsorbed by the electron. (A positron is the electron's antiparticle—it has the same mass but the opposite charge and goes backward in time. Even the direction of time is indeterminate.) And so on.

This “and so on” is shorthand for an infinite set of possibilities involving every possible kind of intra-action with every possible kind of virtual particle it can intra-act with. That is, there is a virtual exploration of every possibility. And this infinite set of possibilities, or infinite sum of histories, entails a particle touching itself, and the particle that transmits the touch transforming itself, and then that touch touching itself, and transforming, and touching other particles that make up the vacuum, and so on, ad infinitum. An alchemical orgy of sorts! (Not everything is possible given a particular intra-action, but an infinite number of possibilities exists.) Every level of touch, then, is itself touched by all possible others. Particle self-intra-actions entail particle transitions from one kind to another in a radical undoing of kinds—queer/trans*formations or trans*mutations. Hence the electron is an

encounter with the infinite alterity of the self. *Matter is an enfolding, an involution, it cannot help touching itself, and in this self-touching it comes in contact with the infinite alterity that it is.*

What is being called into question here is the very nature of the “self,” and in terms of not just being but also time. That is, in an important sense, the self is dispersed/diffracted through time and being.

Commenting specifically on the electron’s self-energy intra-action, the physicist Richard Feynman, who won a Nobel Prize for his contributions to developing QFT, as well as being a chief scientist who helped engineer the Manhattan Project, expressed horror at the electron’s monstrous nature and its perverse ways of engaging with the world: “Instead of going directly from one point to another, the electron goes along for a while and suddenly emits a photon; then (horrors!) it absorbs its own photon. Perhaps there’s something ‘immoral’ about that, but the electron does it!” (Feynman 1985, 115, my emphasis).¹¹ This self-energy/self-touching term has also been labeled a perversion of the theory because the calculation of the self-energy contribution is infinite, which is an unacceptable answer to any question about the nature of the electron (such as what is its mass or charge?). Apparently, touching oneself, or being touched by oneself—the ambiguity/undecidability/indeterminacy may itself be the key to the trouble—is not simply troubling but a *moral* violation, the very source of all the trouble.

The “problem” of self-touching, especially self-touching the other, is a perversity of quantum field theory that goes far deeper than we can touch on here. The gist of it is this: this perversity that is at the root of an unwanted infinity, that threatens the very possibility of calculability, gets “renormalized” (obviously—should we expect anything less?!). How does this happen? Physicists conjectured that there are two different kinds of infinities/perversions involved in this case: one that has to do with self-touching and another that has to do with nakedness. That is, in addition to the infinity related to self-touching, there is an infinity associated with the “bare” point particle, that is, with the metaphysical assumption we started with that there is only an electron—the “undressed,” “bare” electron—and the void, each

¹¹ NB: My agential realist reading of QFT is not identical to Feynman’s (here presented for a “general audience” not for the purposes of finding a rigorous interpretation of the theory) or any others, just as my agential realist interpretation of quantum mechanics is unique, and one of a number of (competing) interpretations of quantum physics. For more on my agential realist interpretation of QFT and my quantum field theoretical further elaboration of agential realism see Barad, *Infinity, Nothingness, and Justice-to-Come* (Barad, forthcoming).

separate from the other. Renormalization is the systematic cancellation of infinities: an intervention based on the idea that the subtraction of (different size) infinities can be a finite quantity. Perversion eliminating perversion.

The cancellation idea is this: the infinity of the “bare” point particle cancels the infinity associated with the “cloud” of virtual particles; in this way, the “bare” point particle is “dressed” by the vacuum contribution (that is, the cloud of virtual particles). The “dressed” electron—the electron in drag—that is, the physical electron, is thereby renormalized, that is, made “normal” (finite). (I am using technical language here, except for the bit about “drag”!) Renormalization is the mathematical handling/taming of these infinities. That is, the infinities are “subtracted” from one another, yielding a finite answer. Mathematically speaking, this is a *tour de force*. Conceptually, it is a queer theorist’s delight. It shows that all of matter, matter in its “essence” (of course, that is precisely what is being troubled here), is a massive overlaying of perversities: an infinity of infinities.

To summarize, quantum field theory radically deconstructs the ontology of classical physics. The starting point ontology of particles and the void—a foundational reductionist essentialism—is undone by quantum field theory. According to QFT, perversity and monstrosity lie at the core of being—or rather, it is threaded through it. All touching entails an infinite alterity, so that touching the other is touching all others, including the “self,” and touching the “self” is a matter of touching the stranger within. *Even the smallest bits of matter are an unfathomable multitude. Each “individual” always already includes all possible intra-actions with “itself” through all possible virtual others, including those (and itself) that are noncontemporaneous with itself. That is, every finite being is always already threaded through with an infinite alterity diffracted through being and time.* Indeterminacy is an un/doing of identity that unsettles the very foundations of being and nonbeing. The void in its dynamics of indeterminacy marks an interruption, an undoing of self: the outside—the void allegedly surrounding all matter—is constitutively inside matter “itself.”

Of Hospitality

Questions of colonialism and hospitality are thoroughly entangled, and nuclear colonialism is no exception. At a time when Western countries, settled through invasion and colonization, are erecting fences and criminalizing refugees (people fleeing for their lives often as a direct result of violence perpetuated by first world countries unleashing war, colonialism, climate

change, and other harms against the refugees and their homelands), and hospitality itself is considered a crime (as in the recent sentencing of US citizens who left jugs of water in the desert for migrants attempting to cross the southern border of the US, the Spanish fireman who faces 20 years in an Italian prison for rescuing migrants at sea, and the Stansted 15 who were convicted for intervening in the forced return of refugees), evidence of the entanglement of colonialism and hospitality saturates the daily news. This phenomenon is not something new, but rather constitutes an ongoing violence that condenses around questions of hospitality and who is a welcome guest. And while the inclination to insist on absolute hospitality may be a ripe temptation, it is crucial that we remember that hospitality has also been a mechanism of invasion and conquest.

The rhetorics of hospitality were also part of the atmospherics of nuclear violence visited upon the Marshall Islands. In an important report on the fallout—the “hardship, pain, suffering, and... damages”—that resulted from the US nuclear weapons tests on the Marshall Islands, the authors of *Consequential Damages of Nuclear War: The Rongelap Report*, Barbara Johnston & Holly Barker write:

The Rongelap Report tells the story of the myriad of changes that occur to a community whose lives and lands are heavily contaminated with radioactive fallout. In 1946, after evacuating the people of Bikini and nearby atoll communities in the Marshall Islands, the United States detonated two atomic weapons: the same type of bomb that was dropped on Nagasaki in 1945. In 1947 the United Nations designated the Marshall Islands a US trust territory. *Over the next eleven years, this US territory played host to another sixty-five atmospheric atomic and thermo-nuclear tests.* The largest of these tests, code named Bravo, was detonated on March 1, 1954. This 150megaton hydrogen bomb was purposefully exploded close to the ground. It melted huge quantities of coral atoll, sucking it up and mixing it with radiation released by the weapon before depositing it on the islands and inhabitants in the form of radioactive fallout (Johnston & Barker 2008, 15, 17, my emphasis).

This paragraph is dense with triggers. Just for starters, there is the stunning temporality of the establishment of this “trust” whereby the United Nations designates the US as trustee of the Marshall Islands after the US exploded two nuclear bombs there in 1946. But for now I’d like to focus on a phrase that stands out for its irony, and leaves the reader tripping at the threshold of its invitation to examine it further; the phrase is: “played host.” It says: “Over the next eleven years, this US territory played host!” This is not insignificant phrasing! This “playing at being a host”—not being a host but “playing” at it—seems to point to a troubling of the legitimacy of

the “host.” Indeed, it seems that it is in the nature of the idiom itself that “playing host” seems to call into question what constitutes (actually) being a host.

Tripping over the threshold of this phrasing we cannot not ask: Who is hosting whom here? Zooming out a bit but staying with this same uncanny sentence, what cannot go unnoticed is the horrifying nature of this particular welcome: “[T]his US territory played host to another 65 atmospheric atomic and thermo-nuclear tests.” In other words, on a literal reading: the host was a territory given to one entity by another entity to whom it didn’t belong. The territory in question was legally designated as belonging to the US, by an institution dealing in international law. Who, then, were the guests? They were, as we read, none other than “another 65” nuclear and thermonuclear bombs—talk about hospitality!

The idiom of “playing host” here, not only calls into question who it is that is doing the hosting (by proxy: the US), but also points to the performative nature of the ghastly repetitions of incalculable violence that constitute the “host” as such. Hence, the notion of “playing” at “hosting” harkens to the multiple and compounding injustices, or rather, a superposition of injustices that result from this so-called *hospitality*, including but not limited to the permanent uninhabitability, that is, the made-inhospitable nature of the very islands that were interpellated into this role.

Clearly the reference to this unconventional and explosive relationship of alleged “hospitality” or indeed, hostility—which, Derrida notes, is etymologically inside the very definition of hospitality—begs a very important question that takes us to the ethical core of relations among entities, whether individuals or nation states: What is the basis for “playing host”? What are the conditions of possibility for hosting? Does not the very notion of hosting, of being a host rather than playing host, already entail some privileged relation to not only place, but to a specific place where one welcomes guests? What, then, constitutes an ethical and just relation of hospitality?

Derrida’s interrogation of the notion of hospitality takes as its core concerns the questions of politics and ethics. And yet, it remains to ask how hospitable Derrida’s analysis of hospitality is to the situation at hand? To put it even more directly: Does Derrida trip over the threshold he sets between linguistic and physical forms of violence in his examination of nuclearity? What are we to make of his near exclusive focus on textuality that winds up eliding both the destructive force of physical violence and the possibilities of its interruption in their materiality? If we go to the core of the matter, to the very site of this destructive potentiality—literally, not metaphorically—

might we come to understand that the possibilities of a radical hospitality inhabit that destructive potentiality and are written into the very materiality of the world? Let's begin by reviewing some key aspects of Derrida's analysis.

Using a deconstructive analysis, Derrida demonstrates the aporia of hospitality (Derrida 1999; 2002; 2005a; 2005b). On the one hand, he argues, in offering absolute or unconditional hospitality the host gives up sovereignty—the exclusive authority over the place and its bodies, including the sovereign's—and becomes hostage to the guest who becomes the host's host (Westmoreland 2008, 7). Indeed, in the case of the Marshall Islands and other “tropical paradises,” where hospitality is epitomized, extremized and exoticized, it is this very tension between sovereignty and hospitality that is at issue and as Oceanist scholar Paul Lyons points out, under colonial relations it is the indigenous host who is under siege: “the greater the colonial impulse, the more such hospitality is recoded into settler/colonist's terms, or even turned into evidence against hosts regarded as amiable beyond their means” (Lyons 2006, 11; see also Williams & Gonzalez 2017).¹² And, furthermore, the difficulty is not solved by turning to conditional hospitality, for conditional hospitality both depends upon absolute hospitality as its condition of possibility and necessarily operates through exclusion, through the imposition of a limit in delimiting who is welcome where and when (that is, juridical considerations), thereby defying its own commitment to hospitality. As such conditional and unconditional hospitality are not oppositional, but rather simultaneously constitute and inhabit one another (Westmoreland 2008). Hence, the im/possibility of hospitality.

¹² The heart of Paul Lyon's essay is the ethico-political responsibility of non-native scholars to engage in “a shared understanding of hospitality” that “requires a recognition that ignorance rather than discursive proprietorship is the necessary and defining condition of the malihini, and that this entails both active listening and, giving the discursive history, introspection about motivations for researching and writing about the region at all” (Lyons 2006, 15, 14). It is noteworthy that this notion of hospitality entails responsibility on the part of the guest; as such it cuts against the grain of colonialist notions in very important ways. In this, my first attempt to bring attention to the historical and ongoing nuclear violences wrought against the Marshall Islands and its inhabitants, as well as those forced to leave, I recognize that this essay falls short in many ways and there is so much more I need to learn. My stakes are as follows. As a physicist, I am attempting to disrupt colonial practices of violence that are written into physics and to make available for decolonial practices ethico-political possibilities, especially in terms of relations to the other, in particular, relations of hospitality, through and in which the physics [of QFT] is constituted of which it speaks. Indeed, classical Newtonian physics' notion of the void, to cite one particular aspect, was a formative and enabling part of European modernity with which colonialism is imbricated. This is expanded upon in my forthcoming book.

Derrida makes an important distinction between questions of justice from those of law, aligning the former with unconditional hospitality and the latter with conditional hospitality (Derrida 2002; 2005c). He points out that hospitality figured in the classic or law-governed conditional sense, is always already a matter of violence and injustice. Derrida explains: “No hospitality, in the classic sense, without sovereignty of oneself over one’s home, but since there is also no hospitality without finitude, sovereignty can only be exercised by filtering, choosing, and thus excluding and doing violence. Injustice, a certain injustice, and even a certain perjury, begins right away, from the very threshold of the right to hospitality” (Derrida 2002, 55). Hence, while the classic sense of hospitality raises vital questions of place and the relation to place as well as that of sovereignty, which are no doubt relevant, indeed, of critical importance here, Derrida warns about a kind of hostility, indeed violence, inside hospitality so conceived.¹³

At the same time, we might also wonder whether all acts of exclusion constitute a violence or a violation, and indeed, whether they are all of the same order of offense or have the same effect? Might it not be a violation, perhaps even a greater violation, to not allow for the possibility that some acts of exclusion might be enacted in the pursuit of justice-to-come rather than injustice? Decolonial refusals of hospitality as part of a politics of resistance to the ongoing violence of settler colonialism are one such possibility that must not be excluded from consideration (Williams and Gonzalez 2017).

These are large questions. Here I want to take up a particular aspect of this question of the multiplicity and differential force of various orders and kinds of violences and entertain the following question: Are not the acts of violence alluded to in the passage by Johnston & Barker, of a different order than those of which Derrida speaks? The fact that the authors’ naming of acts of great physical violence as that of “playing host”—indeed, playing host to atom bombs!—refers to the *literal*, indeed, *material* blasting of place and sovereignty out of the water, thereby reveals the hostility of hospitality at its core in a way that the “exercise of force in language itself” does not touch (Derrida 2005c, 238).¹⁴ If we follow Derrida on hospitality, he likens the

¹³ Hostility is part of the etymology of hospitality. This is multiply in play in the case at hand. Importantly, hospitality is not only a modality in which colonialization is exercised (e.g., witness the coerced cooperation of the Bikinians), but another crucial aspect of this politics of hospitality is the colonization of the very notion of hospitality.

¹⁴ It is not my task in this paper to make a case, in general, that for Derrida *force* is a very restricted term tied to a certain linguisticism, contrary to his stated interest in

important distinction between law and justice to that of conditional and unconditional hospitality, respectively. Unlike law, which is instrumentalized in terms of norms, interpretations, and calculations, “justice is the experience of the incalculable, of *having to calculate with the incalculable*: it is at play in those singular moments where we cannot determine the outcome or just decision in a given situation, not only because there is no given rule to be applied, but because the rules, in their very basis, are in question” (Sinnerbrink 2006, 489).¹⁵ Justice is therefore always-to-come [*avenir*], which as Derrida emphasizes in “Force of Law,” is not to say that we can therefore absolve ourselves from the responsibility to actively pursue justice; on the contrary, justice in the form of justice-to-come is an infinite pursuit, an ongoing ethical practice.

destabilizing the opposition between *nomos* and *physis*, that is, law and nature (e.g., positive law and natural law). It will suffice for my purposes here to point out a few important moments in the text that indicate the limited scope of his considerations. Significantly, at the beginning of his lecture on “Force of Law,” Derrida insists that one must attend to the “risks of substantialism” by recalling the “differential character of force,” which he says “is always a matter of differential force, of difference as difference of force, of force as différance or force of différance (différance is a force *différée-différente*); it is always a matter of the relation between force and form, between force and signification, of ‘performative’ force, illocutionary or perlocutionary force, of persuasive force and of rhetoric, of affirmation of signature, but also and above all, of all the paradoxical situations in which the greatest force and the greatest weakness strangely exchange places [*s’échangent étranagement*]. And that is the whole story, the whole of history” (Derrida 2005c, 234-5). Furthermore, one of his earliest points about injustice is (point B) the fact that he is forced to address himself in a language that is not his own, and he goes on to say: “At the beginning of justice there will have been *logos*, speech or language, but this is not necessarily in contradiction with another incipit, which would say, ‘In the beginning there will have been force.’ What must be thought, therefore, is this exercise of force in language itself, in the most intimate of its essence, as in the movement by which it would absolutely disarm itself from itself” (Derrida 2005c, 238). And furthermore: “The very emergence of justice and law, the instituting, founding, and justifying moment of law implies a performative force, that is to say always an interpretative force and a call to faith ... the operation that amounts to founding, inaugurating, justifying law, to *making law*, would consist of a *coup de force*, of a performative and therefore interpretative violence...” (Derrida 2005c, 241). He then goes on to say: “Discourse here meets its limit—in itself, in its very performative power. It is what I propose to call here the *mystical*. There is here a silence walled up in the violent structure of the founding act; walled up, walled in because this silence is not exterior to language” (Derrida 2005c, 242). The notion of the void in this paper is distinct from Derrida’s; it is not a mere limit to discourse.

¹⁵ This quote is Sinnerbrink’s translation of a quote in “Force of Law” (Derrida 2005c, 244).

Indeed, in this case, it is abundantly evident, explosively so, that law is not an antidote to injustices, that legal redress is not only not sufficient to block or address the harm, but on the contrary, *it is law itself* that is doing violence, but not merely by defining terms and giving interpretations (which is Derrida's focus), but rather, by a *legally sanctioned* power to apply a force so great that it actually vaporized islands, ultimately producing a form of dispossession and displacement we might call "nuclear refugeeism." This brings to the fore a crucial question: How hospitable is hospitality for addressing questions of violence, not merely the violence of choosing but the unleashing of the forces of nature? Indeed, these forces of violence are surely not of the same order, let alone of the same magnitude.

Ironically, Derrida's tendency to focus on linguistic forms of violence while eliding the violence of physical forces is perhaps no more blatantly evident than in his "No Apocalypse, Not Now," a text wherein he purports to directly address issues of nuclear weapons and nuclear war. Derrida not only seems blind¹⁶ to the historical fact of "a continuous nuclear war" (Kato 1993; DeLoughrey 2009)—the exploding of more than 2000 nuclear weapons and nuclear colonialism, violence largely perpetuated upon indigenous lives and habitats—but he seems in this particular paper to have lost track of a *general textuality*, and in the name of "nuclear criticism" to be walled in by this academic form, and busy reinforcing an enclosure of representationalism where his concern is with the absolute destruction of literature, the archive, the name, and not the planet itself. (Indeed, Derrida's subtitle points to the structure of his paper with his substitution of "missile" with "missive": "No Apocalypse, Not Now [full speed ahead, seven missiles, seven missives]"). Derrida goes on for nearly a page with a diatribe about the unreality of nuclear war, about its singular existence as an anticipatory fantasy, thereby doing violence to the history and ongoingness of nuclear war and colonialism primarily visited upon indigenous lives and habitats worldwide:

In our techno-scientifico-militaro-diplomatic incompetence, we [in the humanities] may consider ourselves, however, as competent as others to deal with a phenomenon whose essential feature is that of being *fabulously textual*, through and through. Nuclear weaponry depends, more than any weaponry in the past, it seems, upon structures of information and communication, structures of language, including non-vocalizable language, structures of codes and graphic decoding. But the phenomenon is fabulously textual also to the extent that, for the moment, a nuclear war has not taken place: one can only talk and write about it. ...Unlike the other wars, which have

¹⁶ I am not unaware of the ableist nature of this way of putting the point, but rather, I use it in this case to point to the materiality of the blinding violence of the bomb itself.

all been preceded by wars of more or less the same type in human memory... nuclear war has no precedent. It has never occurred, itself; it is a non-event. The explosion of American bombs in 1945 ended a "classical," conventional war; it did not set off a nuclear war. The terrifying reality of the nuclear conflict can only be the signified referent, never the real referent (present or past) of a discourse or a text. ...For the moment, today, one may say that a non-localizable nuclear war has not occurred; it has existence only through what is said of it, only where it is talked about. Some might call it a fable, then, a pure invention: in the sense in which it is said that a myth, an image, a fiction, a utopia, a rhetorical figure, a fantasy, a phantasm, are inventions. It may also be called a speculation, even a fabulous specularization. ...*a nuclear war is for the time being a fable, that is, something one can only talk about.* ..."Reality," let's say the encompassing institution of the nuclear age, is constructed by the fable, on the basis on an event that has never happened (except in fantasy, and that is not nothing at all, an event of which one can only speak... an invention also because it does not exist and especially because, *at whatever point it should come into existence, it would be a grand premiere appearance* (Derrida 1984, 23-24, my emphasis).

This paragraph, in its component parts, and in its entirety, is breathtaking.¹⁷ I cannot not see-hear videos of the numerous nuclear weapons "tests" I've watched, overlaid upon the time-lapse video of the sequence of more than 2,000 nuclear explosions around the globe from 1945-1998, created by Japanese artist Isao Hashimoto when I read this.¹⁸ What definition of war would preclude these events in their individuality, or certainly when taking account of the accumulated effects of more than 2,000 reiterations of these horrific acts of violence? Which one of these explosions did/does not have its casualties, if not in terms of human life (at least in the immediate aftermath) then to habitats, entire islands, animals, plants, and in time, to

¹⁷ It is not without relevance that later in the article Derrida writes "Nuclear war has not taken place, it is a speculation, an invention in the sense of a fable or an invention to be invented in order to make a place for it or to prevent it from taking place (as much invention is needed for the one as for the other), and for the moment all this is *only literature... nuclear war is equivalent to the total destruction of the archive*" (Derrida 1984, 28, my emphasis). Ultimately, for Derrida, in his inquiry into the possibility of total nuclear war, what it comes down to is "the Apocalypse of the Name" (Derrida 1984, 31). If *general textuality* is to be understood as the world in its materiality, which some of us have argued, and not mere words on a page, then the deconstruction of nuclearity—indeed, not merely the matter of the force of law but also of the forceful unlawfulness of the alleged "law" of force (in particular, of nuclear forces)—has posed as something of a limit case for Derrida whose analysis here seems to undeniably pivot on textuality as literature. I want to acknowledge my conversation about this article with Daniela Gandorfer, and also thank her for a more detailed discussion of "Force of Law."

¹⁸ Hashimoto's video is called "1945-1998", www.ctbto.org/specials/1945-1998-by-isao-hashimoto/.

human lives exposed to radiation? Derrida's anticipatory futurism is not only a denial of nuclear war in its ongoing and specific historicity, but it reiterates the violence of nuclear colonialism in its practices of erasure. "Anticipatory" comes as a shockwave upon the mind; it is not merely the wrong temporality, but an ironic spatial placement on a timeline that has been blasted to bits. To place the apocalypse before us, to think that it lies only in our imagination, that we are haunted by its possibility still unrealized, is to reiterate not only a very particular telling of time and history, but a particularly privileged "we," complicit in regimes of erasure.

Which brings us back around to the sentence we've been focusing on that has the "US territory" (sic) "playing host" to the guests—who are nuclear bombs. Surely this ironic turn of phrase is a purposeful displacement and grotesque distortion of the actual historical host-guest relationship entailed in what is also nothing less than a deep perversion of the notion of hospitality. For was it not the Marshallese people whose hospitality goes unmentioned and yet at the same time is forceably performed for the world in staged news reels made by the US Navy?¹⁹ The Bikinians were "asked"—that is, *forced*—to leave their island "for the good of mankind," as the US Commodore Ben H. Wyatt "explains" in the recording. As Jeffrey Sasha Davis points out: "At the time of the Bikinians' removal, the US Navy and US media constructed the Bikinians as a primitive, nomadic people living in nature, who could legitimately be moved to any other 'natural' atoll. ...This labeling of the atoll as 'natural' served to erase the social history of the Bikinian people in their place" (Davis 2007, 216).

So the question of hospitality is far from beside the point! And yet, it leaves us with the crucial question: How can we take account of the aporia of hospitality so that it can meaningfully address a situation such as this, where violence is not merely about "filtering, choosing, and thus excluding and doing violence" as Derrida argues in *On Hospitality* (2002, 55) but where a great force of nature has been unleashed? This is surely not to dismiss Derrida out of hand. Derrida's stakes in raising this question are quite high. It is in the context of his discussions of immigration, political asylum, statelessness, deportation, incarceration, refugeeism, xenophobia, and nationalism that Derrida asks if hospitality is possible and what it might mean. And surely these issues could not be more important at this current moment of time, robustly entangled, as they are, to nuclear and climate issues: we are

¹⁹ MGM newsreel, "Bikini—The Atom Island" (1946), <https://www.youtube.com/watch?v=zri2knpOSq>.

here at the crossroads (as has so often been the case—indeed, when has it not?). And yet, we can see from this example that *the question of hospitality, if it is to constitute an accounting of the incalculability of justice, must be asked in relation to material nature of forces in their differential materiality, including those that literally blow apart worlds.*²⁰

Quantum Physics and Entangled Relations of Response-Ability

Significantly, the Marshallese refuse the name “dome” and have named this concrete structure the Tomb. Tombs contains one’s ancestors. This Tomb contains (and doesn’t contain!) the future as well as the past. It marks an untimeliness, a time out of joint. The structure of this covered over “void,” blasted into a “void,” inside a “void” (as the colonists would have it) is a hauntology—an inheritance of practices of erasure and a-void-ance. This nothingness is flush with (al)chemical and nuclear wanderings, the infinite ongoing reiterative transformations, of time-being.

While hauntings are understood by some as one or another form of subjective human experience—the epistemological revivifications of the past, a recollection through which the past makes itself subjectively present—according to QFT, *hauntings are material*. They are the dynamism of the in/determinacy of time-being, constitutive of matter itself—indeed, of everything and nothing, in their inseparability. Hauntings, then, are not mere subjective rememberings of a past (assumed to be) left behind (in actuality), but rather, *hauntings are the ontological re-memberings, a dynamism of ontological indeterminacy of time-being in its materiality* (Barad 2017, 113).

Furthermore, as I have elaborated in a paper entitled “Troubling Time/s and Ecologies of Nothingness: Re-turning, Re-membering, and Facing the Incalculable” (Barad 2017b) which sets out to explore justice-to-come as a material set of im/possibilities with-in (*of!*) the world, what the world calls out for is an embodied practice of tracing the entanglements of violent histories (as can be seen in a diffractive reading of QFT with the time-hopping tale of a Nagasaki bomb survivor as told by Kyoko Hayashi in her novella *From Trinity to Trinity*). In the face of colonial practices of erasure and a-void-ance

²⁰ I am indebted to Daniela Gandorfer and Zulaikha Ayub for our conversations about points made in this section of the paper. As Daniela Gandorfer emphasized: It is insufficient to draw a parallel or an analogy between hospitality and justice, or even to too quickly equate them through a transitive relation whereby both hospitality and justice are said to define or be equated with deconstruction itself. See her eloquent response to my paper at the Princeton Reading Matters Conference, Nov 2018.

(such as we also find in the histories, and ongoing lived realities, of violences that entangle Nagasaki to the indigenous lands of what is called the US Southwest), the pursuit of justice entails an embodied practice of remembering—which is not about going back to what was, but rather about the material re-configurings of spacetime mattering in ways that attempt to do justice to account for the devastation wrought as well to produce openings, new possible histories/futures by which time-beings might yet have found/find ways to endure.

In my continuing project of working to bring forward the radical possibilities for living-being otherwise that are always already with-in quantum physics (itself), (which is not to deny the destructive possibilities to understand them as inhabiting one another), I have also written about quantum entanglements in relation to hauntological relations of inheritance. It is worth keeping these key points in mind concerning the material questions of justice when we turn our attention back to questions of hospitality in light of the insights we have learned about QFT:

Only by facing the ghosts, in their materiality, and acknowledging injustice without the empty promise of complete repair (of making amends finally) can we come close to [hearing the silent speaking, the speaking silence of the ghosts]. The past is never closed, never finished once and for all, but there is no taking it back, setting time aright, putting the world back on its axis. There is no erasure [of past violences] finally. The trace of all reconfigurings are written into the [iterative] enfolded materialisations of what was/is/to-come. Time can't be fixed. To address the past (and future), to speak with ghosts, is not to entertain or reconstruct some narrative of the way it was, but to respond, to be responsible, to take responsibility for that which we inherit (from the past and the future), for the entangled relationalities of inheritance that 'we' are, to acknowledge and be responsive to the noncontemporaneity of the present, to put oneself at risk, to risk oneself (which is never one or self), to open oneself up to indeterminacy in moving towards what is to come. ...Only in this ongoing responsibility to the entangled other, without dismissal (without 'enough already!'), is there the possibility of justice-to-come (Barad 2010).

Conclusion: Radical Hospitality and the Material Force of Justice

Let's return to the Dome: a slab of concrete covering over a void that was blasted into the midst of a "void." Or at least it (the latter "void") was a "void" in the eyes of the US government which viewed the Marshall Islands as "uninhabited or nearly so," an untouched paradise, marked as infinitely distant from the modern technological world in space and in time. Then there is the

void created by the denotation of a nuclear bomb—a crater, a bit of nothingness blasted into the “void” that is the island of Runit. A void within a void. And then there is the literal coverup: the pouring of concrete on top of the void, a conscious attempt at a-void-ance of responsibility following on the heels of the dumping of plutonium and other radioactive materials into the void. Uninhabitability inhabiting the uninhabited. A tomb inhabited by ghosts, material traces of the violence of colonial hospitality. The void as archive: the structured nothingness that is far from empty or de-void of meaning.²¹ This covering over, this attempt to dress up the naked infinities of the layering of violence upon violence, the incalculable brutality of superpositions of nuclear and climate catastrophes, the effects of militarism, colonialism, nationalism, scientism, modernism, racism, and capitalism, speaks to the specific structures of nothingness in their entanglement; in this case, a void within a “void” at the “end of the Earth” (in space) that signals the “end of the Earth” (in time).

Colonialism often finds its justification in terms of the void—that which is deemed “uninhabited” and “uninhabitable”—with its alleged invitation to colonial habitation, or inhabilitability for the colonized, as the case may be—and the consequent a-void-ance of responsibility. Radioactive colonialism manufactured in the form of a structured nothingness—a nothingness alive with ghosts, an island “void” whose nonhuman inhabitants include pieces of a bomb that broke with its violent inheritance, by breaking itself apart rather than exploding on command (!), live inside the crater that its kin created.

Questions of co-habitation co-exist/co-habit with those of uninhabitability, a strange hospitality. Which brings us back around to the questions raised earlier: How hospitable is hospitality and its deconstruction for addressing questions of violence, not merely the violence of choosing, delineating, interpreting, and defining (on behalf of the law), but the great *physical* violence entailed in unleashing forces of nature?²²

²¹ I am indebted to Daniela Gandorfer for suggesting the additional point about the archive. She also adds that the conference on nuclear criticism which is the occasion for Derrida’s “No Apocalypse” might be taking it that nothing is at stake (especially given the many times Derrida uses the word “nothing” and the instances in which this word occurs are noteworthy!), when the fact is that the very structure of nothingness cannot help being at stake.

²² My analysis is not limited to nuclear forces, or even physical force; they could be so-called “social forces” or “political forces,” for example—as if they were (somehow) ontologically distinct from each other and nuclear forces, which is precisely what is in question; in any case, in my analysis, forces are considered in their materiality. For one thing, QFT is not only about nuclear forces; rather, QFT is a general theory of forces and understands forces, in general, as quantum fields.

Derrida, in *Of Hospitality*, deconstructs the juridical, aka conditional, notion of hospitality and in particular its foundation in notions of property and the sovereign self. That is, he demonstrates how a notion of hospitality founded on these Eurocentric notions of self and relatedly that of property, entails their undoing. Perhaps one of the most telling sentences that Derrida writes about hospitality is in the form of a question: “Is not hospitality an interruption of the self?” (Derrida 1999, 51). (Echoing the bomb’s interruption of itself!) The “self” is constituted through the incorporation of the Other within the “self.” The Other interrupts, irrupts within/through/as the constitution and deconstitution of the self. In conversation with the work of Emmanuel Levinas, Derrida harkens to Levinas’s notion of the infinite within the finite in terms of hospitality: the “essence of what is or, rather, of what *opens* beyond being is hospitality,” or as he explains further, “[b]ecause it opens itself to—so as to welcome—the irruption of the idea of infinity in the finite, this metaphysics is an experience of hospitality” (Derrida 1999, 46).²³

Is this not precisely what we learned that QFT says of matter itself, or rather doesn’t QFT push this matter more forcefully than Derrida? *Is not matter a matter of hospitality, in its very constitution, in its very un/doing of “it/self”?* Is there not *an irruption of the infinite within the finite*, an intrusion of “an unlimited number of unknown others to an unlimited extent”²⁴ such that *the nature of matter entails in its very structure the undoing of identity, individuality, essence?*

According to QFT, there is no a-void-ing the fact that the void is far from empty. Indeed, nothingness is an infinite plentitude, not a thing, but a dynamic of ontological indeterminacy that cannot be disentangled from (what) matter(s). Hence, according to QFT, *even the smallest bits of matter are an enormous multitude*. Each “individual” is made up of all possible histories of virtual intra-actions with all others; or rather, according to QFT, there is no such thing as a discrete individual with its own roster of properties.²⁵

²³ For Levinas, first philosophy, metaphysics, is ethics, not ontology. For agential realism, ethics, ontology, and epistemology are not separable, hence, my neologisms “onto-epistemology” and “ethico-onto-epistemology” (Barad 1996; 2003).

²⁴ This is Penelope Deutscher’s way of putting the notion of unconditional hospitality to Jacques Derrida in her interview with him; in particular, she writes: “So an unconditional hospitality would have to be offered to an unlimited number of unknown Others, to an unlimited extent” (Deutscher 2001).

²⁵ Indeed, the very notion of property is in question when it comes to quantum physics; which troubles the core of Western law in its dependence on metaphysical individualism, and capitalist modes of production and exploitation.

In fact, *the “other”—the constitutively excluded—is always already with-in: the very notion of the “self” is a troubling of the interior/exterior distinction.* Matter in the indeterminacy of its being un/does identity and unsettles the very foundations of non/being. Together with Derrida, we might then say, “Identity ... can only affirm itself as identity to itself by opening itself to the hospitality of a difference from itself or of a difference with itself. Condition of the self, such a difference *from* and *with* itself would then be its very thing ... *the stranger at home*” (Derrida 1993, 10, 28; my emphasis).

What is being called into question here is the very nature of the “self”; all “selves” are not themselves but rather the iterative intra-activity of all matter of time-beings. *The self is dispersed/diffracted through being and time.* In an undoing of the inside/outside distinction, it is undecidable whether there is an implosion of otherness with-in or a dispersion/explosion of self throughout spacetime-mattering.

While for Emmanuel Levinas the stakes are the ethical constitution of the *human* subject, “submitting subjection to the idea of infinity in the finite” (Derrida 1999, 22), what we find here is that *this structure of hospitality is a matter of the very nature of matter itself (in an undoing of “it” and “self”), and not limited to the human; indeed, crucially, this structured relationality precedes the differential constitution of human in opposition to some other.* In other words, what is at issue here is not a matter of extending the range of Levinas’s thinking or his conclusions to the nonhuman or otherwise-than-human, but rather, it is in *the very nature of nature’s radical hospitality that the self’s constitutive outside interrupts and irrupts within the self,* and this dynamism of ontological indeterminacy precedes and undoes any delineation, including that of “the human.” In an important sense then a notion of *radical hospitality coming through QFT breaks with Derrida’s conceptions of conditional and unconditional hospitality, breaking open* not only some alleged preexisting distinction between human and its others, but also *the very walls of deconstruction’s circumscription within the limits of discourse;* for as Derrida says in “Force of Law”:

Discourse here meets its limit—in itself, in its very performative power. There is here a silence walled up in the violent structure of the founding act; *walled up, walled in* because this silence is not exterior to language (Derrida 2005c, 242, my emphasis).²⁶

²⁶ I am grateful to Daniela Gandorfer and Zulaikha Ayub for bringing this passage to my attention (see Derrida 2002, 55).

But self-referentiality is not the same as self-touching. Silence may not be exterior to language, but this is not a walling in. Not only does *the dynamism of in/determinacy* undo any such walling up, walling in, but it *is always already in touch with matter*, or rather, *it is matter in its inseparability from the speaking silence of the void* (not some walled in silence—full stop).

The fact that *this structure of hospitality* is not limited to the human but rather *is in the very nature of nature* is vitally important. For it means that the self—or should we say “itself,” which is not “itself”—*is not merely interrupted by human others but also by a host of other others, including the hauntological relationalities of inheritance and the hauntological wanderings/wonderings of nothingness*. In the example we’ve been discussing this would include the irruptions of the forces of capitalism, colonialism, and militarism, but *also an infinite set of possibilities for their undoings*. This is no small matter! *Inside the nucleus of the atom is an implosion of violent legacies, sedimenting historicities of colonialism, racism, extractivist capitalism, militarism, neocolonialism, and also the seeds of their downfall and possibilities for living and dying otherwise*. In other words, the very forces that hold the nucleus together and their (violent) undoing (such as in the splitting of an atom and a branching chain reaction that leads to the explosive nature of a nuclear device), as well as *their (deconstructive) undoing (e.g., possibilities for justice-to-come, for interrupting state sanctioned violence in the use of nuclear weapons)*, are written into the very nucleus, the core, of an atom. The deconstructive element lives inside the forces of violence in their im/possible un/doing. Nature deconstructing itself, such that nature is always already/has never been separable from culture, from the implosion that is natureculture.

The classical Newtonian notion of the void might have served as a much-valued apparatus in the service of colonialism. But according to QFT the void is not the background against which something happens, something matters, something appears, but rather, an active constitutive part of every “thing.” As such, *even the smallest bits of matter—are haunted by, indeed, constituted by, the indeterminate wanderings of an infinity of possible time-beings—a radical hospitality*, “an unlimited number of unknown others, to an unlimited extent.” According to QFT, matter is an ongoing transmutation, an undoing of self, of identity, where the “other” is always already within. *Matter is a matter of hospitality—the possibility/impossibility of radical hospitality—in its very constitution, in its very un/doing of “itself.”*²⁷

²⁷ Now, given this point about matter, together with what we have also learned about matter as a matter of justice, that is, justice-in-its-materiality, it is not the case that matters

Each bit of matter, each moment of spacetime mattering, is shot through with an infinite set of im/possibilities for materially reconfiguring worlds and past/futures/presents; surely these matters are nothing less than matters of justice. *Is matter's un/doing not the mark of the force of justice that is written into the fabric of the world?* Which is not say that the world is always already just by its very nature, but rather to say that *a force of justice is available with-in every moment, every place, every bit of matter* (Barad 2017a). For therein lies the infinite possibilities for defeating the entangled forces of violence and for imagining and bringing forth what comes after the end of the world—that is, in the aftermath of the downfall of a multitude of entangled structures of violence that must be brought to an end.

Entire worlds inside each point, each specifically configured. In the case at hand, there is an implosion of world politics—devastation, dispossession, displacement, nuclear and climate refugeeism—inside a tiny island nation.

After the end of the world—the world of capitalism, militarism, racism, the ending of these structures of violence even if realized only locally and momentarily, if only for the time-being—in the aftermath of the downfall of hegemonic ways of thinking founded on the binarism of us/them, when instead of drawing lines in the sand, the practice will have been/is one of looking to the wind, like the Marshallese indigenous practice of wave-piloting, riding the diffraction patterns of difference/differencing/différance-ing guiding us along alternative paths, transformative alchemical wanderings/wonderings (Tingley 2016). This is an invitation to a practice of *radical hospitality*—an opening up to all that is possible in the thickness of the Now in rejecting practices of a-void-ance, taking responsibility for injustices, activating and aligning with forces of justice, and welcoming the other in an undoing of the colonizing notion of selfhood rather than as a marker of not us, not me.

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of justice and matters of hospitality are to be understood as analogous or parallel or equivalent concepts. Rather, matters of justice together with those of hospitality *as radical hospitality* (as elaborated in this section) are structurally related material fields/forces. Many thanks once again to Daniela Gandorfer and Zulaikha Ayub for discussions on this point. See also Daniela Gandorfer's response to my paper and (Derrida 2002, 55).

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