

Rhizomes: Cultural Studies in Emerging Knowledge

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Introduction: The Possibilities of Feminist Quantum Thinking

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[1] In the past decade, Karen Barad's oeuvre, especially the voluminous *Meeting the Universe Halfway* (2007), has attracted increasingly great attention in feminist philosophy, cultural studies and feminist science studies. Alongside scholars like Elizabeth Wilson and Vicki Kirby (see Kirby and Wilson), she has spearheaded the recent feminist exploration of complex scientific issues, and presented new less categorical ways of thinking ontology and epistemology (or indeed onto-epistemology as she refers to it) as a result. Many of the terms introduced and developed by Barad, such as 'intra-action', 'diffraction' and 'agential realism' have shifted the standard metrics of knowledge production and her theories have inspired animated discussion in emerging critical strands as varied as the new materialism in feminism, object oriented ontology, post- and transhumanism, speculative realism, environmental and digital humanities, among others. In a critical climate that is becoming increasingly 'Baradian', this special issue on the 'Quantum Possibilities' of Barad's work does not merely aim to reflect the engagements currently being made within these fields, but extends Barad's ethos of continually rethinking our critical concepts and methodologies "without taking these distinctions to be foundational or holding them in place" (Barad, "Nature's Queer Performativity" 124). Creating 'diffractive', or new 'quantum level' means of reflecting on, and engaging with Barad's work, the essays collected here stake out a new set of directions for their wide array of disciplinary identities.

[2] Speaking of 'quantum' possibilities and engagement in a humanities or social science context is, of course, not uncomplicated. In recent years, the term has become somewhat clichéd, appearing in references to social policy and international relations, as well as in discussions of science fiction and popular culture. Few of these allusions to a 'quantum' state of affairs have much in common with the actual theories behind quantum mechanics in physics. The term has acquired a life of its own, often denoting something unarguably exciting, but rationally incomprehensible. As James Der Derian puts it: "[a]ll things quantum come with caveats. Like 'atomic', the word 'quantum' has acquired a mystique attended as much by buzz as by comprehension" ("Project Q"). Der Derian wants to dispel all such mythical qualities, and engage with quantum mechanics in a more theoretically informed manner. He organises annual symposia and in-depth communication between social scientists and quantum physicists through his well-funded Project Q. Instead of producing 'mystique', he does, however, give rise to idolatry. There is an extent to which quantum reality is presented as a model or form for the social sciences to follow; "an incentive to go to the edge and beyond our disciplinary siloes" (Der Derian, 'Project Q').^[1]

[3] Der Derian's project is another example of what Barad refers to as 'analogical' or reflective treatments of quantum physics. It is born out of the current public fascination with the discipline, and it forms a reductive relationship with its scientific principles, "for the sake of accessibility, entertainment, and if one is honest, the chance to garner the authority of science to underwrite one's favorite view" (Barad, *Meeting* 6). It attempts to ignore the inevitable veil of unknowability between foreign disciplines, using the presence of real-life scientists to establish a platform of expertise, but these scientists are there more to educate than to engage with the rest of the discussion. Barad's work positions itself differently. She is not interested in 'models' or 'incentives' offered to feminism from physics, but in the 'unholy marriage' of 'others', the complex philosophysics sprung from their encounter, and as a quantum physicist-come-feminist philosopher, she is in a clear position to mediate such a communication. Niels Bohr's and Werner Heisenberg's competing principles of complementarity and uncertainty are drawn into her considerations upon identity and social justice, but these concepts are not formative—they are means to continual reformation, catalysts of possible encounters.

[4] Barad never offers a comprehensive overview or introduction to quantum physics. This has raised some curiosity. For example, Dorothea Olkowski's essay in this special issue ponders over the reasons why Barad leaves pivotal parts of quantum physics, like the wave nature of quantum phenomena, largely unaddressed. We can surmise that this is because unknowability and separation are at the core of her ontological approach and thus hers is not a project that attempts to make the unknown knowable, to parse out 'facts' as though independent of their values, or to determine set meanings. Barad does not provide us with a ready-made model of quantum reality. Her texts do not provide 'final' answers—because according to Bohr's and Heisenberg's Copenhagen interpretation of quantum mechanics, the nature of the world is, and will remain indeterminate. Barad's readers are invited to study and interpret important concepts and methods from quantum physics, but she does not provide a quantum mechanical 'truth' or set methodology.^[2]

[5] Barad thus emphasises the uncertainty and changeability of her own approach, and one of its basic premises is indeed the fact that it continually reforms itself in intra-action. In this special issue dedicated to Barad's work, we strive to maintain a similar mode of complementarity. Rather than manifesting any form of Baradian doxa, 'truth', absolute or correct approach, we explore the many ways in which a range of current scholars engage with Barad's ideas and methods. Our focus in this issue is partially on the nature of critique and academic engagement itself—and the ways in which we may respond to Barad (and each other) response-ably.

Reading Diffractively and Response-ably

[6] The matter and mode of critique is a critical affair for a special issue "that takes as its focus positive and critical engagements with the work of Barad, drawing together a number of voices to offer a nuanced and current response to her emerging theories of ontology and materiality," as the call for papers to this issue proposed. Our aim in soliciting contributions was to encourage conversations and analyses of Barad's conceptual and methodological formulations that could develop their suggestions further,

addressing subtleties and possibilities in her work in order to avoid the doxic formulations that too conveniently emerge with the proliferation of a significant oeuvre. Accordingly, this was also a call to avoid what Katie King points to in her essay in this issue as a "retreat to punitive (critical?) parsimonies of explanation" or appeal to "political loyalties when scale, paradox, confusion overwhelm cognitive schema". Granting the complexity of Barad's agential realism and its counter-logical provocations regarding the very units of reality and analysis that we inhabit and operate with on a quotidian basis also requires what King, in line with Barad, alludes to as a sensitivity to what is being engaged *as well as* to what this engagement elicits. In the mode of reading diffractively, neither benign agreement nor oppositional antagonism is purely available as a mode of critical participation. Instead, as King suggests, we learn to work with "fuzzy appreciations for noncoherences, of rueful acknowledgement of both willful and unintended (mis)understanding, and of sensitivity to double binds," all of which can be said to constitute response-able critical practice. These are "gatherings for flourishing," according to King, or "inventive provocations" in Barad's terms (in Dolphijn and van der Tuin 50), and they imply a far deeper ethical encounter as they "help us question with, rather than assume, ourselves amid apparatus in boundary making practices" (King, this issue, emphasis removed).

[7] Opening the essay that marks his contribution to this special issue, Rick Dolphijn relays Barad's comments on the practice of critique from an interview conducted for inclusion in his co-authored text *New Materialism* (Dolphijn and van der Tuin). "Critique", Barad states, "is all too often not a deconstructive practice, that is, a practice of reading for the constitutive exclusions of those ideas we can not do without" (Barad in Dolphijn and van der Tuin, *New Materialism* 49). Instead, she suggests, it resembles something more akin to "a destructive practice meant to dismiss, to turn aside, to put someone or something down— another scholar, another feminist, a discipline, an approach, et cetera" (49). This mode of critique, as Barad points out in her own terms, is all too familiar with a logic of opposition and negation, and, in this *dialectical* mode (Dolphijn and van der Tuin, *New Materialism*; van der Tuin, "Jumping Generations"), it prioritises classification and progression over indeterminacy. In pegging down coordinates or excavating and exulting alignments, critique in the 'destructive' vein confuses authorship with the idea of a comprehensive and fixed position, and it presumes a hierarchy in time and space that stacks recent, conceivably more expansive and informed dialogue against its superannuated relatives, while presuming of the latter that they are inadequately equipped to speak of the here and now, to respond to the 'global crises' and quotidian conditions that mark the 'posthuman era' (Braidotti).^[3]

[8] A deconstructive practice by its other name is "the practice of diffraction, of reading diffractively for patterns of differences that make a difference," as Barad explains in the same interview with Dolphijn and van der Tuin (*New Materialism* 49). Bringing the relational elements of critique into focus, opening the question of how it is that positional difference is forged and sustained, the diffractive methodology that Barad advances confuses any claim to an *a priori* separation of positions that destructive critique assumes, thus simultaneously bewildering the temporal distinctions upon which it is conventionally premised:

Diffraction, both as methodology and as physical phenomenon, does not traffic in a

temporality of the new as a supercessionary break with the old. On the contrary, diffraction is a matter of inheritance and indebtedness to the past as well as the future. (Barad in Juelskjaer and Schwennesen, 13)

[9] Evelien Geerts and Iris van der Tuin provide a clear example of the temporal implications that Barad relates here. In their incisive interpretation of Slavoj Žižek's critique of Barad's agential realism offered in their contribution to this special issue, Geerts and van der Tuin take up his claims in *Less Than Nothing* to interpret the structure of sexual difference laid out in feminists' Luce Irigaray's and Simone de Beauvoir's writings through and beyond their Oedipalisation in contemporary cultural theory or feminist historiographies of feminist generations. Here the perceived antimonies of Beauvoir's and Irigaray's variants of feminist liberatory politics are reworked and the continuities in their approaches, rather than dialectical dissimilarities, are underlined. This mode of diffractive reading, as Geerts and van der Tuin declare, requires "another kind of critical consciousness" (Haraway, *Modest Witness* 273, cited in Geerts and van der Tuin, this issue) different from the one of direct confrontation evident in Žižek's take on Barad's agential realism. What the authors deliver is a reading that emphasises the "cross-fertilization" of these feminists' approaches to alterity that also finds its voice in Barad's work.

[10] For the editors of the 2014 *Parallax* special issue, "Diffraction: Onto-Epistemology, Quantum Physics and the Critical Humanities", diffraction appeals "as alternative vocabulary and different technology for critical inquiries" (Kaiser and Thiele 165).^[4] Unlike the confrontational habits of Žižek's particular method of critique, diffractive reading is more constructive in its approach, as Geerts and van der Tuin's essay demonstrates. It pays attention to difference without dismissal or correction, thus reconsidering (the *how* of) positional hierarchy and refusing to foreclose position:

Diffraction as a physical phenomenon is acutely sensitive to details; small differences can matter enormously ... diffractive readings must therefore entail close respectful responsive and *response-able* (enabling response) attention to the details of a text; that is, it is important to try to do justice to a text. It is about taking what you find inventive and trying to work carefully with the details of patterns of thinking (in their very materiality) that might take you somewhere interesting that you never would have predicted. (Barad in Juelskjaer and Schwennesen, 13)

[11] The impetus for this diffractive methodology, with its careful attentiveness to the details of a text, to the positions of others that works *with* rather than directly against their suggestions, can be located with the notion of intra-action that lies at the heart of the relational ontology Barad elaborates. Distinguished from inter-action, or the coming together of two entities whose identities pre-exist their encounter, "intra-action recognises that distinct entities, agencies, events do not precede, but rather emerge from/through their intra-action" (Barad, "Quantum Entanglements" 267 fn1). According to Barad, then, "*intra-actions* – don't produce (absolute) separation, they engage in *agential separability*—differentiating and entangling (that's one move, not successive processes)" (265, original emphasis). This paradoxical movement of simultaneous "differentiation and entangling", of separation *and* connection, is counterintuitive to our usual understanding of things or identities having discrete boundaries and qualities proper to them, independent of other entities. What it suggests is that "[d]istinct agencies are only distinct in a relational, not an absolute sense, that is, agencies are only distinct in relation to their mutual entanglement; they

don't exist as individual elements" (267 fn1).

[12] Thus, contrary to readings of entanglement that understand it in terms of the non-differentiated or primarily interconnected status of 'things', Barad presents a more complicated picture, and it is one that makes specific demands regarding participation and accountability in performing inquiry:

Entanglements are not a name for the interconnectedness of all being as one, but rather specific material relations of the ongoing differentiating of the world. Entanglements are relations of obligation—being bound to the other—enfolding traces of othering. Othering, the constitution of an 'Other', entails an indebtedness to the 'Other', who is irreducibly and materially bound to, threaded through, the 'self'—a diffraction/dispersion of identity. 'Otherness' is an entangled relation of difference (*différance*). (Barad, "Quantum Entanglements" 265, original emphasis)

[13] What becomes clear in this quotation, and as Barad discusses across her oeuvre (see also *Meeting; "On Touching"*), is that the work of critique carries an ethical premise; it is an *ethico-onto-epistemological* practice with consequences for 'what matters' also in the way we engage with others. Importantly, and perhaps most difficult to swallow, is what intra-action makes of this relation *to* the other, namely, its assertion that any other is at once "threaded through" the self. As diffraction insists, this "threading through" does not make the other coincident with the self. This is not a matter or practice of making 'self same' reproductions of one's own identity. Rather, "[e]thicality entails noncoincidence with oneself" (Barad, "Quantum Entanglements" 265). Thus, in the vein of Derrida's suggestions for hospitality (Derrida; Caputo), intra-action/entanglement/agential separability does not simply promise an ethicality that arrives from without our individual undertakings – the stranger at the door whom we 'must' welcome—it also pronounces the ethicality that calls from within, denoting an openness to an Other that is already, inextricably, iteratively constitutive of our own being. It thereby renders us unknowable to ourselves, and always and already partially positioned (c.f. Haraway, "Situated Knowledges").

[14] The ethical charge of unknowability is, as Barad points out in our earlier quotation, a matter of response-ability, and following Haraway, "not something that you just respond to, as if it's there already. Rather, it's the cultivation of the capacity of response" (Haraway in Kenney 257). That is, in the absence of any ability to anticipate what it is that will be encountered, as though this could constitute a full and knowable position or identity (even one's 'own') that could be recognised in advance, ethical relation is, in simple terms, a practice of remaining open to difference. This difference, however, is not so simple. It is never totalizable, never wholly discernible, but rather unceasingly cross-cut and cross-cutting, or diffractive. As such, in any critical practice, each meeting, a different encounter, is an encounter with difference and this difference, being "threaded through" self and Other, reveals all encounter as (self-)transformation. Thus, Barad's diffractive methodology finds critical practice to contain both attentiveness to the detail of an argument (in order to *do justice* to it) as well as an uncanny proximity to that which we engage—a relation of entanglement which, even if tensile and complicated (entanglement involves simultaneous attraction *and* repulsion, as Barad points out ("Transmaterialities" 397); its constitutive capacity also involves cutting across or interrupting), necessarily implicates, reiterates, and transforms our 'own' positions, rendering them immanently dynamic, incomplete, co-authored, non-innocent,

contaminated, and indebted.^[5] The ethical gesture of critique, *par excellence*, would then be to do justice to this relation without attempting to veil or repair its complicated, at times challenging and uncomfortable, suggestions, nor regulate or emend the shifts in theoretical and methodological perspective and practice that it calls *through* us to enact. It proposes a critical approach that neither sanctions nor censures, but rather accounts for indeterminacy.

Diffractional Practices

[15] With diffractive reading, the limit of another's difference cannot be determined or fixed, thus the capacity to claim alliance or to be said to have read a concept, theory, methodology, or body of work 'correctly,' is, at its core, compromised. Although our contributors come from specific disciplinary backgrounds, and specific academic cultures, we will not attempt to define them—but it is in some cases useful to distinguish certain disciplinary differences or points of fruitful connection. A significant number of our contributors are actively involved with, and along with Barad, have become formative voices in the current wave of scholarship identifying itself as feminist new materialism. This movement tends to emphasise material relationships between entities, rather than separate bodies. It thus presents an opportunity "to think about materiality without the usual accompaniment of essentialism, where matter is understood as an inert container for outside forms" (Hird, 227). Matter, according to the new materialists, only truly exists relationally, and if we want to develop a deeper understanding of the world, we should investigate the processes of material formation, the 'mattering', rather than the 'final' forms.

[16] The focus on relationality and ontological processes is to some extent shared by all authors in this special issue, but not all approach it from the same perspective. Some, like Kathrin Thiele and Dorothea Olkowski, have backgrounds in different forms of Deleuzian feminism. As an acknowledged influence on contemporary new materialist conceptual frameworks, the suggestions delivered by Deleuze's materialist philosophy have been adroitly and inventively taken up within this field (see for example Dolphijn and van der Tuin, *New Materialism*; Bennett; Ringrose and Rawlings; Mazzei).^[6] Correspondences between Deleuzian thought and Barad's agential realism (more specifically) have been forthcoming, and Thiele, Olkowski and others in this issue join a recent and increasing assembly of scholars whose discussions are occupied by their resonances, differences, and applications (see Garoian; Thiele, "Of Immanence and Becoming"; Fox and Aldred; Lenz Taguchi; Dolphijn and van der Tuin, "A Thousand Tiny Intersections" for examples). The connection between Gilles Deleuze's conception of ethical sense as that which calls us "to become worthy of what happens to us, and thus will and release the event" (*Logic of Sense* 149-50) and Barad's conception of 'response-ability' is highlighted in Thiele's essay in this volume. Here she finds an important continuation of this Deleuzian ethical formula, which is "thickened by taking account of the feminist lesson of diffraction" and its emphasis on differences that *matter* (rather than pure difference). Similarly interested in Deleuze and Guattari's quest for immanence, Rebekah Sheldon reads the philosophers' notion of concepts (the plane of immanence of concepts) alongside Barad's understanding of measurement in order to explore the physicist's approach to the role of meaning. In a rare move, Sheldon unfolds the affective dimensions of meaning's materiality and finds its vitality to be complementary to virtuality, wherein, she argues, a different reading of Deleuze and

Guattari's concept becomes available. Lastly, Andie Shabbar's essay draws on Deleuzian conceptions of affect and assemblage, in its reading of Baradian intra-action, finding myriad points of communication and mutual elucidation that are worked through her analysis of queer bathroom graffiti.

[17] Barad's work encounters a more foreign 'other' in Graham Harman's, Levi Bryant's and Martin Savransky's essays, as they come from a somewhat separate strand of new materialist thinking, emerging from a reassessment of the Kantian and analytic philosophical tradition, and aligning themselves with speculative realism and object-oriented philosophy/ontology/onticology.^[7] As Harman recognises in his essay in this issue, Barad's agential realism and speculative realisms like his own "seem destined to be explicit opponents in contemporary philosophy, though there is no reason why this opposition needs to be a hostile one". Since these two strands of realism/materialism regrettably seldom meet, especially not on such friendly and genuinely response-able terms,^[8] we think it pertinent to outline some of the differences between feminist new materialism and object-oriented materialism, although we do also recognise that there is no single approach within either movement. The feminist and object-oriented strands have developed from somewhat different philosophical traditions, although at first glance they appear similar. Both profess to construct a 'posthumanist' or non-anthropocentric approach to ontology and matter. Both also emphasise inter- (or intra-) action. They approach these concepts from different frameworks, however. Whereas the new materialism in feminism is usually said to have developed out of Deleuzian feminism and third-wave feminist reaction to late-twentieth century and poststructuralist 'anti-biologism' or constructivism, marking a subsequent 'return' to ethical agency and the materiality of the body,^[9] object-oriented materialisms come out of a resistance to philosophical correlationism, an emphasis on non-hierarchical views of matter, and a Latourian commitment to delineating a non-anthropocentric, knowable and more 'real' account of reality.

[18] As Hanna Meißner points out in her essay here, Barad's project is pointedly one that explores "the possibilities of making a better world, a livable world, a world based on values of co-flourishing and mutuality" ("Erasers" 450), and to some extent, it could be argued that Barad and the majority of feminist new materialists are more concerned with developing a viable new materialist relationality, methodology and ethics, whereas the object-oriented materialists tend to focus on metaphysics, and more abstract break-downs of causal and ontological relations.^[10] This being said, both feminist and object-oriented materialisms emphasise the ontological depth and ethical urgency of their projects and both construct ontology, ethics (and epistemology) as inseparable. The difference is rather on the level of analysis, and the specific forms of matter being addressed. The most obvious difference lies perhaps in the perspective on the 'thing', the full ontological integrity of which is a central component of most object-oriented materialisms, whereas in feminist new materialism there is no durable or essential 'thingness'—all matter is continually reconstituted—and the specificity of individual objects (along with subjects) finds a complicated genesis through transcorporeal connections (Alaimo; Neimanis and Loewen Walker) and relational assemblages (see for example Bennett).

[19] Bryant's essay in this issue shows very effectively how Barad's work may open up an important dialogue between these two new materialist approaches. Carefully exploring his own and Barad's

ontological frameworks, he gives a series of scientific and real-life examples, including anecdotes about genetics, contaminated organic environments, space travel, and his sea-faring grand-father's affinity with the Atlantic ocean, in which both a Baradian emphasis on quantum entanglement and the indurability of matter, and a more individualised focus on separate 'things' may be possible. Indeed, Barad recognises the *existence* of 'things', although she does not consider them as ontologically separate concepts—they can never be separated out from, or fixed in, their relational position in spacetime:

Differences percolate through every 'thing', reworking and being reworked through reiterative reconfigurings of spacetime-matterings—the ongoing rematerialisings of relationalities, not among pre-existing bits of matter in a pre-existing space and time, but in the ongoing reworkings of 'moments', 'places', and 'things'—each being (re)threaded through the other. Differences are always shifting within. (Barad, "Quantum Entanglements" 268 ftn9)

[20] 'Phenomena' is the term Barad draws from Bohr's 'philosophy physics' to account for the nature of specificity, and it is a strange, perhaps even unnerving, simultaneous genesis and stabilizing of differences that she relates. Constitutive of reality, phenomena are not independently existing referents, but rather agential intra-actions through which boundaries are enacted, although never finalised. Thus, Barad refers to "'things'-in-phenomena" ("Posthumanist Performativity" 817), or an "exteriority within" phenomena (825), wherein "the very particularity of what materialises is at once an instance of the whole" (Hinton 179).

[21] It is the enduring nature of these intra-active instantiations of entities that takes focus in Savransky's essay, where he encounters Barad's ethics of worlding through what he considers to be her problematic claim that "[r]elations do not follow relata, but the other way around" (Barad, *Meeting* 136-37). For Savransky, if relata are thus derivative, relations are constitutive, but generalizable to the point of being able "to account for the adventures of *any* enduring entity", and this translates an ethical risk. If "intra-active processes of relating bring their own relata into being" then relata are contemporarily enacted and potentially reducible to relation.^[11] This raises questions of whether obligations to the "actual world" can be inherited, and how we account for constraints "on the becoming of phenomena itself", especially in view of Savransky's concern that, with Barad's argument, responsiveness works only in one direction—reality/relata may submit to the "practical demands" made by dynamic practices of inquiry/relation that, in their turn, are not adequately accountable for the way they formulate their objects and relations. According to Savransky (following Alfred North Whitehead), relations carry "the same concreteness as relata" (Whitehead 157), which turns our ethical concerns towards "modes of mattering" and patterns of relationality that "may enable" in a manner more akin to what he considers to be Barad's core ethics of worlding.^[12]

[22] Harman also finds continuity between Barad's agential realism and his object-oriented speculative realism on the basis of their mutual distrust of any *a priori* separation of thinking human subjects and "dead physical matter". His engagement with Barad in his contribution to this issue takes up with the relational ontology that she proposes, to read it with and against the grain of an object-oriented philosophy. Employing his own conceptual terms to describe strategies of 'undermining', 'overmining',

and 'duominging' in critical practice, he works with Barad's claims to read these through a non-identical lens that finds a different emphasis in her understanding of atomism and its potential towards, or away from, a reductive individualism. Here, Harman demonstrates clearly the messy activity of critique: he is in agreement with elements of Barad's discussion as these align with his particular object-oriented sensibilities, while also at odds with certain commitments he identifies in her explanations as this perspective is put to work. With an object-oriented lexicon in the foreground of his critical mediations, nevertheless in reading Harman's interventions we do not have a sense of disproportionate authority in one direction or another (object-oriented ontology or agential realism), nor do we find an overfamiliarity that makes their differences difficult to distinguish. Harman's assessment of Barad's reading of specificity is an apt demonstration of the way the critical apparatus works. From such a perspective, certain issues in Barad's text come to light for Harman, while other suggestions remain hidden or absent, as diffraction suggests. That is to say, no critical practice presumes clear vision.

[23] This last point is one to which Meißner draws our attention in her assessment of the commitments underscoring Barad's posthumanist "epistem-onto-logy" (this issue). Zooming in on the constitutive *exclusions* that intra-activity entails, Meißner underscores Barad's point regarding the irrevocable openness of all identity, wherein agential cuttings are an un/doing: a "making determinate by simultaneously making indeterminate". Brought to bear on her claim that the humanism Judith Butler inherits in her understanding of discourse means that she "fails to recognise matter's dynamism" (Barad, *Meeting* 65), Meißner asks how such failure can be assessed. Working with Barad's diffractive apparatus, she argues that the physicist's point does not recommend that Butler's theory is to be rejected, nor call for its improvement so that it may offer "a *complete* vision" (Meißner, this issue, original emphasis). Rather, "the assessment of failure appears as an attribute of any theory; it is the acknowledgement that theories necessarily produce exclusions when visualizing particular realities". Theories can thus be read as "sighting devices" which are always limited, prompting a feminist ethics of knowing that calls attention to such limits.

[24] Just, as Barad concedes, "there are multiple interpretations of quantum physics" ("Quantum Entanglements" 267 fn2), there are multiple readings of Barad's quantum metaphysics and the contributions forming this issue deliver on these differences. Olkowski's essay turns Barad's philosophical apparatus around and reconsiders her ethico-onto-epistemology through the lens of an additional set of considerations from quantum physics. The insistence on the 'real' applicability or 'real' relevance of Barad's work is important also in Harman's and Bryant's essays, as well as in the essays by Ino Mamic, Myra Hird, Ulf Mellström and Andie Shabbar. Whereas Mellström and Shabbar explore Barad's applicability in different gendered and intimate environments – the relationality emerging in communities of 'hardcore masculinity' and the affective relationality present in queer bathroom graffiti – Mamic and Hird construct encounters that at first may appear awkward companions with agential realism. Mamic uses a Baradian framework to contextualise the social constructions and emancipatory outcomes of Catholic grassroots movements, specifically sister Rita Agnese Petrozzi's Cenacolo communities for individuals suffering from drug addiction or general social marginalisation, whereas Hird reflects on Barad's theory of posthuman entanglement through a 'deep time' perspective on waste and

landfills. In many ways Hird's argument resonates with Bryant's discussion of the different effects of DDT in laboratory versus more complex or real-life organic environments. However, the two authors come to very different conclusions. For Bryant, the shocking discovery of DDT's devastating effects on the environment (and its human inhabitants) once it was moved out of the laboratory space serves as proof of its individual agency; "[o]ntologically, we can only understand how something like this is possible if entities like DDT enjoy some minimal autonomy from their relations, enabling them to migrate or enter into another set of relations". On the other hand, Hird's analysis of the effects and interactions between contaminants and toxins in landfills leads her to conclude, echoing Barad, that "the world experiments with itself" and nothing, none of its inhabitants—toxins, bacteria, or humans—remain the same from one moment to the next.

[25] Continuing a similar query of the individuality of ethics, and the agency inherent in inquiry, and working with a similar problematic regarding human epistemological privilege that takes the focus of Meißner's essay, Joseph Rouse provides a systematic analysis of Barad's discussions of the brittlestar as phenomena (in her extended Bohrian sense) to make suggestions for the ways in which a certain type of humanism resides within her formulation of posthumanist agency. For Rouse, human difference is distinguished by ethicality and theoretical ability consonant with our capacity for conceptually-articulated response. However, this difference does not automatically equate to privilege as Rouse argues, because conceptually organised and ethical responsiveness is not *lacking* for one-dimensionally normative organisms, such as the brittlestar. Rather, in a conditional way, they are *constitutively excluded*: they literally do not *matter* "in the context of that iteratively reconfigured phenomenon" (Rouse, this issue). Understanding ethical and conceptual apparatus as unique to human difference does not, therefore, need to be counter-effective for Barad's posthumanist ethics.

[26] As this outlay makes clear, Barad's work carries an ability to communicate across the divide; to speak to scholars from a variety of philosophical and academic traditions (regardless of whether they agree with her or not), and this is one of the reasons why her work is so important. Like the quantum physics she negotiates, and whether we read her as feminists, as scientists, as environmentalists or as posthumanists, her theories make "the inescapable entanglement of matters of being, knowing and doing" incredibly poignant (*Meeting*, 3). The essays comprising this special issue each mark, in their unique way, the possibilities that Barad's agential realism and its methodological provocations conjure. Many of the readings of Barad's work delivered here diffractively encounter different traditions, theories, and subject matter that elicit some unanticipated, promising, and indeed exciting reformulations of their focus or field. Each discovers a position in relation to Barad's work in the telling; one that is sensitive to, or demonstrates, some element of the intricate, convoluted, and transformative nature of diffractive critical encounter. It was neither a wish for automatic agreement, nor repetition of received interpretations of Barad's conceptual lexicon, but rather a hope for nuanced and constructive meetings with her work that motivated our proposal for this special issue—and this aim has been duly fulfilled. We are indebted to our authors for their careful efforts that have now found fruition in the publication of this volume, and to the editors of *Rhizomes* for their patience and assistance in its delivery. In this process we have certainly experienced the "collaborative alliance with traction" that Barad speaks of as the work of "honoring our

differences" and "working collaboratively with and through" these in a "shared commitment" to unfold this engagement with her work ("Intra-active entanglements" 16). With this in consideration we would also like to thank Kim Hajek and Kamillea Aghtan for their expert input and meticulous proofreading, and Michael O'Rourke for his inspiration and initiative in bringing us together. Finally, and overwhelmingly, we extend our deepest gratitude to Karen Barad for providing us with the rich, challenging, generous, unconventional and incredibly significant insights of agential realism that have had, and continue to have, an impact across our myriad inquiries—and are nothing less than transformative.

Notes

1. We want to note that we wholeheartedly respect and admire Der Derian's Project Q. It has been one of the most ambitious and important means of communication between the sciences and humanities in academia in recent years. Without initiatives like this, the current surge of quantum thinking would not have been possible.
2. As Barad points out in *Meeting the Universe*, the notion that quantum physics can give us some form of 'truth' about how we should conduct ourselves in the world is misconceived, partly because it is not an ethics, but also because it never presents anything resembling a concept of 'truth': "[t]he interpretative issues in quantum physics (i.e., questions related to what the theory means and how to understand its relationship to the world) are far from settled. When questions about the philosophical implications of quantum physics arise, no definitive answers can be given in the absence of the specification of a particular interpretation" (6).
3. Barad formulates her objection with critique in another way in this interview, published in 2012 for the Danish journal *Kvinder, Køn & Forskning*, where she points out the limitations of an approach that assumes a linear and hierarchizing temporality. She argues: "Also, very importantly, it forgets the necessary mutual exclusions that are constitutive of phenomena, and buys into and enacts a linear temporality that closes down rather than opens up what is to come. Critique may provide some important insights at first glance, but critique isn't an acceptable stopping point of analysis. ... The presumed exterior and oftentimes superior positionality of critique doesn't have the kind of political traction that is so needed". (Barad in Juelskjaer and Schwennesen 14).
4. The contributions to this special issue of *Parallax* trace the onto-epistemological and critical possibilities emerging with a close reading of Barad's engagement with diffraction, providing lucid and detailed accounts and examples of diffraction in and for "a praxis of analysis" (Kaiser and Thiele 166). Thus the discussions in the issue highlight and extend elements of diffractive methodology that we outline in the current introduction. Barad is a contributor, and a number of examples of diffractive reading are included. For an example of diffractive reading located elsewhere, see van der Tuin, "A Different Starting Point" and Mazzei.
5. For further elaborations of this thinking on critique see also Kirby, "Natural Conversations" and Hinton and Liu.
6. See Hinton and Treusch.
7. Considering the continual disagreements about appropriate designation and terminology within this movement, we will refer to it simply as 'object-oriented materialism'. Graham Harman's preferred term for his approach was initially object-oriented philosophy, but he now uses object-oriented ontology, which originally was coined by Levi Bryant. However, at this point Bryant

distances himself from both of these terms, in favor of 'onticology' (See Bryant's essay in this issue).

8. The two forms of new materialism have also developed in area-specific factions throughout global academia. Whereas, due to some highly successful funding bids and feminist initiatives in Europe, the feminist new materialism has a strong seat in some US institutions, the UK, the Netherlands, Germany, Sweden, Finland and Poland, the object-oriented new materialism has more representation in other US and Canadian institutions, and countries like France, Australia, New Zealand, the Middle East and South-East Asia. Whereas the term 'new materialism' may primarily refer to feminist strand of materialism in Santa Cruz and Utrecht, it tends to be used in reference to object-oriented ontology in the English and philosophy departments of Melbourne and Sydney.
 9. See Sellberg and Hinton and Treusch. For a focus on the developments of recent feminist materialisms, see Alaimo and Hekman's introduction to *Material Feminisms*.
 10. This is, of course, a great simplification. As Bryant points out in his essay in this issue, and his own approach, 'onticology', is in certain regards more closely aligned with Barad's than Harman's, in its emphasis on the continuous relational reformation of 'things'. Bryant even refers to onticology as an 'agential realism'.
 11. Savransky puts Whitehead's ideas of 'actual entities' (relata) and 'society' (relations) into dialogue with Barad's understanding of human-as-phenomena to unfold this relata-relation exchange differently. When it is understood in terms of co-modification, relation is caught up in the specificity of relata and therefore it cannot be reduced to general principles.
 12. For another approach to the relationship between Whitehead's and Barad's ontologies, see Sehgal, "Diffractive Propositions".
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