

Rhizomes: Cultural Studies in Emerging Knowledge

Issue 30 (2016) » <https://doi.org/10.20415/rhiz/o30.e13>

Barad's Entanglements and Transcontextual Habitats

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Abstract

Profound intellectual pleasures engage as we come upon and live among the transcontextual habitats of Karen Barad. This essay piles issue upon issue that can be attuned to Barad's analysis of apparatus, with an eye to suggesting both uses of this work, and the playful possibilities of a boundary-object oriented feminist approach to new materialisms.

JUST DOING IT [\[1\]](#)

[1] "The coral reefs are dying!" urges Rex Weyler, cofounder of Greenpeace at "An Ecology of Ideas," a joint conference of the American Society for Cybernetics and the Bateson Idea Group at Asilomar, California, July 2012. A breathtaking projection of marine life around a coral reef takes up the wall behind him. "I've been saying this for twenty years; what will it take for people to do something? How do we talk about this so people will listen?" (Weyler, paraphrased)

[2] *Doing something. Gathering now to minimize damage and maximize flourishing. Is it happening? What sort of knowing goes along with this doing? What about our stories of dyings and endings?*

[3] Feminist physicist and philosopher Karen Barad's work occasions this special issue of *rhizomes* and my article full of questions—and this happens at a moment when 'research demonstrates' that, for example, Tylenol relieves existential dread (Randles, Heine and Stanos). Referring to this, just like that, sounds a bit ridiculous, but even though I laugh, I still take both the media ecologies involved in the circulation of such findings and the findings themselves seriously: they are clues for how to care about embodiments that matter.^[2] While I am not inclined to laugh at Weyler's presentation or his high-risk activist example, these images of beauty amid urgencies of death, as he noted himself at Asilomar, do not necessarily trigger the responses he hopes for and intends for me.

RESPONSE/ABILITY.

responsibility flows out of cuts that bind... The point is to live the questions and help them flourish. (Barad in Kleinmann *Mousse Magazine*, 81)

people are motivated to try to do something by different things and different

emotional/affective states. Whatever motivates people is fine; no need to judge that. The important thing is to build the collectives needed to try to minimize damage and maximize flourishing on earth now. (Haraway, "Speculative Gestures")^[3]

[4] In terms of affective arousal, conscious and non-conscious, just how well equipped are humans (let us say neurologically), to differentiate between their own anticipated personal deaths, other sorts of deaths experienced directly and empathetically, deaths of species including our own, and irreversible planetary damage? What conditions our/my responses, abilities to respond, and our responsibility? What does pain have to do with it all? How are doings affected?^[4] Then again, whose doings matter most in altering conditions current for climate change? Is it a million small changes in different forms of green activism across local communities? I personally know local activists utterly disheartened after years of full-time efforts at education, household restructurings (with considerable sacrifice), policy, legal, and legislative action, or attempts at such (Doherty and Clayton; Randall).^[5] What does all their and our work to 'live' the questions mean in the face of "The Koch Club," (that is, the conscientious power of fossil fuel magnates Charles and David Koch to fund members of Congress in the US to lobby for votes against climate change legislation, holding it hostage for tax cuts, austerity, defunding government)?^[6] Responses. Abilities. Infrastructures. Distributed embodiments. Pain. Denial.

[5] Register such intensities and traumas: do they become ends in themselves? Are they all too emotionally full, crowded with affiliations, loyalties, essential truths?^[7] Belief and disbelief stagger between climate change publics, amid money behind global restructurings, and even with feminist juggling acts of territories, amid objects, new materialisms, and communities of practice. In his desire for "simplicity not complexity" Weyler talks about "aligning the way we think with the way nature behaves" and attributes this solution to anthropologist and cyberneticist Gregory Bateson at one pitch of understanding. All this matters for flourishing—but how? Can simplicity and complexity befriend each other?

[6] In his offer of companionships amid systems, Gregory Bateson famously said, in "the pronoun we, I of course included the starfish and the redwood forest, the segmenting egg, and the Senate of the United States" (Bateson, G. 4). Barad, whose various analyses are the topic of this special issue, works additional topologies into such dynamic iterations: cuts that bind. Apparatus sensitive to ethical intensities that actually enlarge spaces for simplicity and complexity enfolding. Climate change has become differentially pressing in my recent life, gathering us (Bateson-style) in terms unanticipated. So this essay is my occasion for gatherings, for including Barad's gathering of thoughts with my own, for working out my own 'affirmative (re)writings' of my teacher Bateson's contributions to understanding complex systems and responsibility. I take heart from learning with Barad, learning with *her* affirmative (re)writings of Bohr and others, in meanings of an always new materialism I have come to care with and for (Dolphijn and van der Tuin). I see such gatherings entailing and sensing diffractive apparatus that work with differential detail as I also affirmatively (re)write elements emergent in Barad's inspiration from Donna Haraway, another teacher and companion among those taking up cares, and emergent from work on boundary objects by sociologist Susan Leigh Star.

[7] Some wonders and wonderings here then: how much of a physicist or mathematician does one become, to work caringly among the precisions of Barad's term intra-action, the specifics of entanglement as phenomenon described by quantum field theory, and with diffraction arrays as evidence of superpositions? What does, for example, measurement mean for those not experimentalists setting up the apparatus for the various two-slit experiments, or theoretical physicists working on the subtleties—historical, textual, and experimental—adjudicating indeterminacy and uncertainty? (Barad, *Meeting the Universe Halfway* 81-92 and esp. 247-352). Just how do visions for experimental metaphysics, which Barad works carefully to share, fit into, say, questions of climate change? Or feminist re-workings of object-oriented ontologies?

[8] This is the meditation I offer in this essay: a meditation on gatherings. This paper moves amid scales and affects to participate among transcontextual habitats, complex systems, and coordination artifacts, some of these, indeed, ourselves (Bateson-style and maybe more?) 'newly' unfolding, enfolding. Without assuming success, I gather with Barad to engage diffractive practices that allow us "to do analyses that move through the range of scales of injustice, not by pointing out similarities between one place or event and another, but by understanding how those places or events are made through one another" (Barad 246). This is activity 'we' find ourselves working out, whichever 'we' we are and whether we choose it or not. Such activity is particularly ethically complex as "the sense of righteous conviction and benevolent purpose" animating uses of sciences, humanities, social sciences for political cares also requires working with "the how and why of their resemblance to what they oppose" (Kirby 14). Transdisciplinary ecologies restructure economically in the midst of critiques of representation, patterns perhaps "annihilated by their very formulation" (Vatikiotis-Bateson). "The stakes," says Barad, "nothing less than the nature of reality" ("Quantum Entanglements" 255).

I CANNOT HELP TOUCHING MYSELF

...what is really at issue is not touching oneself per se but rather the possibility of touch touching itself... Polymorphous perversity raised to an infinite power: talk about a queer intimacy! 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. (Barad, "On Touching" 212-3)

[9] Among my transcontextual habitats are two sites where people, objects, animals, ecological processes, academic restructurings, and scales of injustice unfold, enfold, indeed are made through one another, as I find myself to be a coordination artifact among/with/in complex systems. The first I have mentioned already, the Asilomar conference at which Weyler spoke, and also at which cognitive linguist Eric Vatikiotis-Bateson demonstrated just how it is that fluctuation, entrainment, and blocked synchrony pressure a range of 'biological coordinations' among complex systems. He did this by using stop-action multimedia of the British rock group Queen at Live Aid Wembley (UK) 1985. Seeing and hearing lead singer Freddie Mercury (born Farrokh Bulsara) initiate interactions with 72,000 people pointed up vividly just how this visual and acoustic guided coordination went through phases, moving from Mercury's hands into new non-linear dynamics, systems both combined and multiple simultaneously (Vatikiotis-

Bateson).^[8] This was *my* 'ah-ha' moment at the conference, the one in which I was enlisted into the collective for which climate change kept returning among papers, talks, and projects as a gathering point, even though that was not the object of this particular talk.

[10] The other site similarly enlisting me was a doubled set of panels, Closer 1 & 2, on Object-Oriented Feminism, at the Society for Science, Literature, and the Arts (SLSA) 2012. Organized and moderated by new media and performance artist Katherine Behar and with important commentaries by Eileen Joy, scholar of edge worlds and neomaterialisms, and Rebekah Sheldon, who explores feminist speculative realisms, each session in its turn worked hard to take up object-oriented ontologies for its gatherings, one inhabited and inhabitable by and for feminisms. Behar's talk "Bigger Than You" was accompanied by a slide-show, virtually an animation, in which data points, visualized as unfocused dots, amassed, began attracting outline-profiles in affiliation-disjunctions that become increasingly lumpy rather than definitive, then started to populate clustering planes of excessive embodiment, "thwarting systems of control with vague illegibility" and "existing as a way of insisting" (Behar, "Object-Oriented Feminism 2—Closer 1: Getting Closer"; "Object-Oriented Feminism 2—Closer 2: Even Closer").

[11] How might each of these sites be understood as contexts and apparatus that unfold, enfold among transcontextual tangles, Barad's cares for experimental metaphysics? How might these perhaps be sites that allow us to companion others/Others of various sorts, among them collectives gathering to minimize damages and maximize flourishings? How might they enable gatherings for simplicities and complexities?

[12] 'Transcontextual tangles' is a phrase attributed to Gregory Bateson and taken up by US sociologist Susan Leigh Star and her co-authors to formulate and discuss 'boundary objects' (Bowker and Star; Star and Ruhleder; c.f. Leigh Star and Griesemer; Leigh Star)—something an object-oriented feminism finds itself demonstrating tacitly in participations amid knowledge in transfers of many sorts. Boundary objects are workaround things, concepts, processes, even routines that permit coordination, sometimes collaboration, without consensus (non-conscious and conscious). Arising from transcontextual tangles (often these are felt as paradoxical double binds ranging from the benign to the abusive), they work tanglings amid states of resolution (Bowker and Star).^[9] Boundary objects have a recursive lifespan during which their generality and their precision are relative, relational, and dynamic simultaneously. They are local, supralocalizing, and global in material topologies in which *spacetimeculture* may be mixed (hybridized certainly, I wonder when even quite technically "entangled") as they can be paradoxically both figurative and literal, abstract and concrete, developmental yet transtemporal (or torqued) (Bowker and Star 190-193).^[10] Recursions, sometimes unfolding, sometimes I speculate enfoldings, "made through one another," (Barad 246) transdisciplinary demonstrations of themselves: *boundary objects matter and boundary objects help us question with, rather than assume, ourselves amid apparatus in boundary making practices*. Barad and a boundary object-oriented feminism work to orient this essay as they and I gather together with poststructuralist social theorist Vicki Kirby's quantum anthropologies. I love how Kirby ruminates so enticingly with mathematical signs: "the contexts are within" (Kirby 27).^[11] Paradox has important labors here.

[13] Upon making it clear that "a diffractive approach has no patience for tricks with mirrors" (Barad, *Meeting the Universe Halfway* 93) and that facile analogies are among these (94), Barad lingers to savor, in loving semiosis, Haraway's tropes for "more promising interference patterns on the recording films of our lives and bodies" (Haraway, *Modest_Witness* 16).^[12]

[14] When I told friends afterward that California Governor Jerry Brown showed up at the Asilomar conference to tell stories about conversations with Bateson during Brown's first term in office in the mid-seventies, their disgust was vocal. Governor "Moonbeam", then, is now in my own circles usually thought of a failed progressive, facilitating redevelopment of Oakland after the nineties, implementing laws he disagreed with under Governor Arnold Schwarzenegger as Attorney General in his administration, and known for both budget cuts and tax hikes during a current third term as Governor. Austerity, and restructuring of the University of California's system on his watch, delegitimize Brown today for progressives for whom he was even an exciting Presidential option in the seventies, when 'an era of limits' meant both environmental controls and also reining in of the oil industry, of free trade agreements, and of big money in elections.^[13] Yet his and others' *dispersed/diffracted* presences are oddly precise, if seemingly paradoxical, indicators of ambitions for a conference very much intended by organizers to participate in building collectives that care widely, as well as precisely, about what flourishing on earth now means. Brown's reminiscences were part of the opening of the conference with the film "An Ecology of Mind, a daughter's portrait of Gregory Bateson" (Bateson, N.). Nora Bateson introduced him, the conference, and her film, leading discussion afterwards as she usually does nowadays when she travels internationally to germinate communities for action and deliberation, often initiated by but not limited to her father's work. Diffracted then is "Bateson" too: over seventy-six years researcher and paradigm setter, writer and guru, inspiration to some and problem for others, new age icon, family member, colleague, badly recorded traces on film: at Asilomar "Bateson," with and extended by Batesons in the plural, worked hard and across time for understandings, even coordinations of complex systems both intelligible and rigorous. Asilomar was crowded, indeed *haunted*, as Barad uses the term in a 2010 essay for *Derrida Today* ("Quantum Entanglements"), by selves dispersed through time and being, *touching and being touched*—appropriately arrayed then as a version of Barad's diffractive methodology (Barad, *Meeting the Universe Halfway*; Haraway, *Modest_Witness*, Barad, "Quantum Entanglements").

The diffractive methodology I use in thinking insights from different disciplines (and interdisciplinary approaches) through one another is attentive to the relational ontology that is at the core of agential realism. It does not take the boundaries of any of the objects or subjects of these studies for granted but rather investigates the material-discursive boundary-making practices that produce 'objects' and 'subjects' and other differences out of and in terms of, a changing relationality.... it is crucial that in using a diffractive methodology one is attentive to fine details of different disciplinary approaches. What is needed are respectful engagements with different disciplinary practices, not coarse grained portrayals that make caricatures of another discipline from some position outside it. My aim in developing a diffractive methodology is to attempt to remain rigorously attentive to important details of specialized arguments within a given field without uncritically endorsing or unconditionally prioritizing one (inter)disciplinary approach over another. (Barad, *Meeting the Universe Halfway* 93) ^[14]

[15] Interspersing these quotations from Barad (and my own footnoted descriptions of each constitutive apparatus) count as both demonstrations and experiments here. Indeed, varying sorts of apparatus are always creating new diffraction arrays and taking new measurements; we and Barad are *dispersed/diffracted*. Chunks of Barad's writings across a range of timespots and differential action complicate any too literal overreliance on her book as well as transcontextualize its tangles. What might in my paper at first performance appear to be an inattention to specialization, risking caricature, I venture to suggest instead are many sorting apparatus, reframings at varying grains of detail, each savoring textures of disciplinary and other precisions amid noncoherent and materializing logics (Law et al). Barad's affirmative (re)writings of Bohr I take as companions, in and through one another, to my own affirmative (re)writings of Bateson, as demonstrations that are continually 'new' (Dolphijn and van der Tuin).

[16] Transcontextual tangles are lively matter materializing too. All sorts of cybernetics and systems were gathered at Asilomar: some in generational knowledges, some in disciplinary workings, many across professions not strictly academic, all including people whose expertise had been honed in very different trajectories and who communicated at various grains of detail, while personal connections with each other and with Bateson (as the very figure of cybernetics) ratified specific kinds of authority. With hopes for being maximally inclusive across lines of differentiation, and of course only very partially and occasionally successful, the play of affiliation and disaffiliation was tense, pleasurable, odd, rhetorical, disappointed, magnanimous, performative, righteous, philosophical, artful, elusive.^[15]

[17] What sort of gathering can happen with and among "being" across so many worlds, and yet again, so few too? What sort of conversation is this and *can it be a good in itself*? What is everything and everyone doing as they non-consciously assume worlds, worlds haunting every moment and every act of affiliating and disaffiliating? I enthusiastically ran up to someone after their talk to suggest that we were doing something similar, only to receive through a strong involuntary nonverbal jolt just how powerfully insulting the very idea felt. And I found myself having already fastidiously pulled apart from someone in public performance, shamed by this reaction already done if neither wished for nor intended, uncertain what was called for in amends. Just how much of this is about response/ability? Loyalty? About critique as political or intellectual engagement or dissociation? Is it even okay to notice? (And I remember Gregory Bateson slyly joking about this exact sort of thing.) Complex systems do not respond well to quick fixes, outrages, or group loyalties, and yet are also made with all of these too.

[18] *Touch touching itself* was my conference experience with 'autopoiesis,' a term I (and others) have distastefully eschewed. Too 'auto.' Too 'mirroring' even though *poiesis* maybe smells more pungent, like a ripe compost. We get the term poetry from *poiesis*, a making or becoming, or even better maybe, an activity that keeps worlds happening. Nora Bateson's film and work might be said to be poetic in these senses, eliciting companionships. Autopoiesis in second-order cybernetics is often nutshelled as 'closed systems' or as 'self-organization.' But it can also stand together with those paradoxes in which "operational closure" of a system is the very condition for both its multiple openings into environments and for its on-going development of new structures 'within' (Clarke and Hansen, 2 and 20). I was really

curious to be in the same space with the person most identified with the term, eighty-six year old Humberto Maturana, someone I remembered Bateson speaking of warmly, and others, frankly, reverently. And then I experienced why. Translated, paced, elaborated together among Maturana, his partner Ximena Dávila, and their translator, Sebastián Gaggero, what can only be called "postulates" of autopoiesis were gathered with descriptions of their current practices in Chile, with what Dávila calls 'liberating conversations' Emerging from family counseling in the face of cultural pain (Maturana), these conversational practices are used now also for humanizing organization in Chilean corporations. I felt palpably in those moments many hauntings, among them political histories, intuited or imagined as well as recalled from my own knowledges then, and since added to. (I am one of those people who, for various reasons, apparently viscerally *feels* family and parent memories as my own, a phenomenon, perhaps a skill, that intertwines historical and personal biography, sometimes trauma, now studied neurologically as a feature of memory encoding (Knabe; Holmes, Brewin, and Hennessy; Deeprose et al.; Clark, Mackay, and Holmes)). I found later verbal traces of these historical sensibilities in a 1996 memoir of this boundary object "autopoiesis" by then fifty-year old Francisco Varela, Maturana's one time student, and collaborator since the 1960s (Varela). (Varela died only five years after this memoir's publication.) Not just a word. A "notion," a "conversation," "in its strict sense, a theory of cellular organization," a "phenomenon" able to affect knowledge, and talking about it "making a fold in history." Varela recounts Maturana's "intuitions," their mutual dissatisfaction with information as if it were not biological, their attempts to come up with formulations that were "nonrepresentational," "reformulating an orientation into an 'experimental epistemology,' a wonderful term introduced by [neurophysiologist Warren] McCulloch [in the 1940s]" (Varela 62-3, 67).^[16] And Varela's retrospective placement of this boundary object as aligned "with something which only today [1996] appears more clearly configured in various fields of the human cultural endeavor and which I identify with the term ontological turn" (Varela 74). *Oh you do, do you?*

EXPERIMENTS ARE HAPPENING NOW

Indeed, new 'experimental metaphysics' research is taking place in physics laboratories in the United States and abroad, calling into question the common belief that there is an inherent boundary between the 'physical' and the 'metaphysical.'" (Barad, "Posthumanist Performativity" 812 fn14) ^[17]

[19] I am in the thick of Chapter Seven of Barad's *Meeting the Universe Halfway*, the chapter entitled "Quantum Entanglements: Experimental Metaphysics and the Nature of Nature," and the book is taking up space on the conference table around which the Campus Senate's Committee on Faculty Affairs is convening. My astrophysicist buddy on my left, met over work on a college-level APT document and gossip about the Senate's new data on Non-Tenure-Track Faculty at my university (he participated in the study which includes research scientists), delightedly questions me: "feminists care about this?" "Feminists have always cared about reality," I tease. And the administrator on my right with whom I have been meeting about another APT related issue, responds sort of carefully but laughingly to my inquiries about his stuff on possible quantum encoding of linguistic memory: "the mathematical details will really tell."^[18] In fact the three of us are laughing so disruptively that the emerita Chair of the Committee calls

us to order. Apparatus constitutive of knowledges permeate this description as many complex systems and infrastructures are implicated. It is not just the boundary between the physical and the metaphysical that "we" call into question.

[20] *And, just what kind of "space" do fine details take up?*

[21] I had not realized that "experimental metaphysics" was not Barad's own term (I blush). And when I ran into "experimental epistemology" in Varela's memoir, I turned to Google's Ngram Viewer for help (Michel et al). There the play of color and line in a dance rather different than I expected also made me laugh in a pleasure of counter-intuitions. (Or were they? All caveats about the constraints of this mapping should be noted.)^[19] An early 20th c. back and forth between 'ontological turn' and 'experimental metaphysics' was joined in the 30s by 'experimental epistemology' when 'ontological turn' virtually disappeared until the 60s when it come in to dance again in non-stop activity that overtook the other two in couples completely in the 90s (Ngram, "Autopoeisis...").

Latour's potato is precisely the use of a line to inscribe a profile into a plane of aggregated data, to create an outlined representation for the very purpose of 'consider[ing] human actions and appetites.' While in this particular instance Latour is, for once, after the human, his drawing operation applies equally to nonhuman objects and a similar linear gesture appears in object-oriented ontology, in the 'general inscriptive strategy' Ian Bogost, following Graham Harman, calls ontography.... While the potato encircles on a principle of affiliation, the list deploys a line to line things up, stressing difference through rhetorical disjunction. Yet, both are a means of enticing a form, whilst allowing irreducibility. (Behar, "Bigger Than You")^[20]

[22] This loving onion-like bit of nested affiliations was demonstrated by Behar at SLSA 2012 Milwaukee, in what I imagine as tastes and smells as well as inscriptions. Points, among their lines and profiles and bodies, work for en-blobbification that "dilates data" (Behar, "Getting Closer").^[21] At first potatoes and appetites each stand for intellectual genealogies inscribed and indeed these thread throughout this lively bit not unlike such gatherings as those you create if you input 'spinoza sublime' or maybe 'spinoza literal' for Google searches. For whom are these indeed 'new intimacies'? I search on Google for 'sympoiesis' and find myself on the trail of a particular person, tracking their talks, papers, and websites, institutional milestones, and then, after a certain year.... miss them; wondering what happened, feeling a sense of loss and worry, as well as a fantasized connection, missed. Behar speaks of outgrowing specificity and forestalling conscious focus in terms that do not *quite* align with how I am thinking about *a feminist boundary object-oriented ontology*, but then again, maybe they do.... "big data is at once confusingly close to us and our bodies, and always on the verge of becoming just junk...." (Behar, "Bigger Than You").

[23] A whispering from my left during one SLSA session of Object-Oriented Feminism: "the word system feels so cold to me" in rumination. Sibilant /es/ triggers a sudden involuntary counter-sensation of *warmth* for /es/-system, memories of Batesons, of peopling cybernetics among stories and experiences with plants and animals, at water's edge. Dispersed/diffracted in time and being, people can *feel* as boundary objects, focusing and defocusing (Gabora). I approach someone I have talked to many times

before at SLSA, with appreciations for her memories across a range of feminist interventions in science and technology, and she assures me with asperity that she has absolutely no idea who I am.

[24] (But then, just how recognizable am I really? Is this a species of Behar's "vague illegibility"? Even a dis/affiliation, "[f]orgoing both recognition and identification"? (Behar, "Bigger Than You"). I admit that with type 2 diabetes my body in time and beings *dilates*, in Behar's word associations: I spread out and in with pounds added and lost in "intensive managements," as lipid-metabolism engages those complex systems among gut microflora coming and going, hormonal and digestive communications, food environments today and in my grandparents' generation, epigenetic methylation at different lag-times, and more) (Behar, "Bigger Than You").^[22]

[25] *Stigmergy* is the word I am using nowadays for that *feeling* of being in among and as the self-organizing bits that are /es/system-ing. Usually defined very mechanically as 'indirect coordination,' it is a form of self-organization associated with insects, originally termites. Flash mobs and the political action of, say, the Occupy Movement are also named stigmergic. Boundary objects as a kind of collective consensus have stigmergic aspects (Marsh and Onof; see also Omicini and Viroli). But notice that I have shifted all this from mechanism to affect, from a description from the outside to *feeling it all happening with*. It was the affect of stigmergy triggered out of Vatikiotis-Bateson's talk, not the extreme sports of beauty and death in Weyler's, that worked to gather *me* among collectives addressing damage and flourishing, *sympoiesis: keeping the world happening WITH* (Haraway, "Sowing Worlds").^[23]

For much of her professional career, Lynn Margulis (1938-2011), a controversial visionary in biology, predicted that we would come to recognize the impact of the microbial world on the form and function of the entire biosphere, from its molecular structure to its ecosystems. The weight of evidence supporting this view has finally reached a tipping point. The examples come from animal-bacterial interactions, as described here, and also from relationships between and among viruses, Archaea, protists, plants, and fungi. These new data are demanding a reexamination of the very concepts of what constitutes a genome, a population, an environment, and an organism. Similarly, features once considered exceptional, such as symbiosis, are now recognized as likely the rule, and novel models for research are emerging across biology." (McFall-Ngai et. al. 32-34)^[24]

[26] 'Tipping points' multiply in new/old materialities enfolding. WITH WHOM and in what languages CAN we actually "question, rather than assume, the 'who' of boundary making practices, so avoiding any fetishisation and/or simplification of diffraction, entanglement or the agential cut" as this *rhizomes* special issue call for papers put it? Neither Barad nor I are simply followers of Bohr or Bateson, neither of whom are 'done' yet, and my own position on Barad is as companion in gathering, a position of affirmative care and intellectual friendship. Given that, what does it take to avoid simplification, since *avoiding itself is far too simple* an injunction for working with boundary objects and their details, paradoxically alive with affect, memory, and circulations that extend 'us'? Posthuman? Maybe '*compost!*'^[25] Boundary object: 'climate change': not just words or even a history of ideas, but a befriending sympoiesis in which all this happens *at least* because

'Observer' and 'observed' are nothing more than two physical systems intra-acting in the

marking of the 'effect' by the 'cause'; no human observers are required (though 'humans' may emerge as being part of practices.) (Barad, *Meeting the Universe Halfway* 340) ^[26]

NOT UNCERTAIN BUT IN/DETERMINATE

Oil futures and the future of oil are a question of credit and so of faith: belief in the conventional authority of the market and the credibility of the economy, economists, and politicians. The authority of the market is constituted by the accreditation, both in the literal sense of capitalization and creditworthiness in future exchanges but also in the sense of legitimation as an effect of belief or credulity. The authority of a fiction of economy such as a global financial and industrial system based on the future pricing of petroleum depends upon a planetary act of faith that far exceeds the credibility required to believe in climate change. It should not be surprising that the current financial crisis is a crisis of credit, a monetary crisis based upon the exchange of credit itself independent of physical assets, a dematerialization of money and value that requires a leap of faith and which in the absence of tangible proof tests that credibility to the limit: a sea change in the very idea of reality. (McQuillan, "Notes" 283)

[27] Why Bohr rather than Heisenberg? Why [Danish Jew Niels] *Bohr* [Nobel Prize winner in Physics 1922 and Atoms for Peace Prize 1957] rather than [German mystic Protestant Werner] *Heisenberg* [Nobel Prize winner in Physics 1932 and Romano Guardini or "Scientific and Religious Truth" Prize 1973]? Why in/determinacy not uncertainty?

[28] In the mid-nineties Barad argues "If we follow Bohr, the meaning of superpositions is clear. If we fill students' heads with the rhetoric of uncertainties and disturbances, they will be mystified.... What do you say to your students when they ask questions like: Does a superposition represent our ignorance?" (Barad, "A Feminist Approach" 63). This, from her 1995 book chapter "A Feminist Approach to Teaching Quantum Physics," was published while Barad was Associate Professor in theoretical physics at Pomona College, then working on both a Mellon Foundation Grant on computational physics and an Irvine Foundation Grant on the cultural studies of twentieth-century physics. Her 3D computer animation "Quarkland" had just come out on the interactive CD for best selling physicist Stephen Hawking's, *A Brief History of Time* (Barad; Hawking, Mervis, and Hairman). Barad goes on:

'Getting the numbers out,' the defining feature of contemporary physics culture, is an ideal attributed to a uniquely American style of doing physics.... In the aftermath of World War II, this approach to doing physics became hegemonic worldwide.... Students are well aware of the fact that there was a time when the subject of physics legitimately included questions about meaning and interpretation.... As students become acculturated, they accept the fact that the main course of calculational techniques is the only thing on the menu; that they will never be served the full richness of the quantum theory. (Barad, "A Feminist Approach" 64)

[29] In the footnote she adds: "At this point the more reflective student will often become disillusioned and leave physics. Perhaps it is due to the fact that women students, students of color, and other marginalized students are more likely to be reflective, since their survival depends upon it, that contributes to their higher attrition rates." (Barad 72 fn16)

[30] My slogan in a feminist classroom (following my teacher Bateson) is "*don't eat the menu instead of the meal!*"—don't be literal when the richness of what we have here is worth "affection"—those feelings of frustration and confusion students (and I) find so overwhelming at times and are sure mean *I am not doing this right*. But then I switch the slogan around when I ask them to *feel out* something like what physicist and philosopher of science Evelyn Fox Keller calls *The Mirage of a Gap between Nature and Nurture* (Fox-Keller) (a volatile topic in my field of women's studies) represented in a thought experiment such as this one:

[31] *Think of a printed menu side by side with the meal it describes in a fancy restaurant. Which one do you want to eat? Then think of a verbal menu but with pictures of the food included in, say, Denny's, and that meal. Then think of a menu of nothing but pictures, perhaps in a tourist place somewhere in the world, and its meal. Then think of a place to eat where they display all the food in plastic forms out in front and you point to what you want, and they bring the real food version of that to you. (Or one where they dish out real food in front on a plate, but you wouldn't eat that, it's been sitting around, even if it does give you an idea of what you could eat there.) Then think of going to the automat, where you look into a little window to see the food, and open and take what you want to eat. The menu is now the meal. (What about those fancy places where they blindfold you and you do not know what you are eating until it is in your mouth: in what ways does it matter to identify it as you chew and swallow?)*

[32] Being welcomed to the full richness of the quantum theory is both a being and a doing. Cuts are connections. Some menus are about meals and are not meals, and ... some are. We gather as and with and alter apparatus and their cuts, altogether constitutive, agential. And we need all the experimental metaphysics we can get, and more, to go with and beyond human intention and systems of control as we gather now to minimize damage and maximize flourishing as the earthbound and as the children of compost (Latour). What do we need to gather? First, we need to care for in/determinacy. In other words, for the differential details various of us have spent lives working for, among 'us.' Us means not only Bateson's living patterns, from the starfish's invertebrate radial symmetry to redwood cloning timelines to recursive epigenesis, mechanism and structure in a segmenting egg to those human affiliations of power and state and love that we could wish for in the Senate of the United States. 'Us' gathers sympoietically too all these boundary objects storing and performing our details and affects as well as quantum entanglements of electron and memory and even hybrids and objects as human, nonhuman, inhuman... and compost.

The inhuman is not the same as the nonhuman. To my mind, these terms speak to very different questions and different differences. While the "nonhuman" is differentially (co)constituted (together with the "human") through particular cuts, I think of the inhuman as an infinite intimacy that touches the very nature of touch, that which holds open the space of the liveliness of indeterminacies that bleed through the cuts and inhabit the between of particular entanglements. It is only very recently that I have dared to speak about this publicly. (Barad in Kleinmann 81) [\[27\]](#)

[33] Boundary objects touch and store and perform differential details and agential cut/tings, details of understandings among mattering math and its 'contexts within.' Quantum memory is engineered today in

intimate spaces for details with contexts: these would be literal not mystical possibilities too as non-separable encodings among embodiments, figuring in what might come to count as experimental metaphysics (Kitto et al; Kitto, Bruza, and Gabora; Gabora). Demonstrated then in boundary object-oriented ontologies are such multiple experiments happening: in some the apparatus is just being set up, in others measurement just occurred, and in still others interpretations are still contesting. Leigh Star's title for a last paper is both serious and funny, "This is Not a Boundary Object," because the term itself as well as its many effects in coordination, works with paradox, keeps on generating, travels through communities of practice, is at times itself the subject of policing or the object policed as well as names that which can be policing and policed, works among the tacit, unconscious, entrained. Exactly *not* right here would be the claim that "if it means everything, it really means nothing," the sort of response that signals when scale, paradox, confusion overwhelm cognitive schema and the response is a punitive parsimony of explanation, moral panic in media ecologies, or rationalizations of carbon faiths.

AN INTIMACY OF AGENTIAL CUTTINGS AND COMPOST

[34] Last night a South Asian Indian feminist physicist with whom I went to graduate school in Chicago, now a researcher and teacher at the University of Hyderabad, worried on my Facebook Timeline: "Katie, I just taught my gender science and technology course, and my students were so unhappy. They say as humanities and social science students they find the scientific approach foreign to their background and want only to do case studies to make a general statement. Now I am unhappy at their hostility. Are gender studies students generally hostile to the scientific method? I can understand that on some basic level science is a masculine construct, but I do not think that is why!" A science communication friend, also a Non Tenure Track faculty person (this position and how we name it in a restructuring university matters), posted next on this thread that her experience was exactly the opposite: her science students have a distaste for social science and humanities methods she says. (And I know from many conversations over beer near our University of Maryland how hard she works not just with these students, but with scientists she does editorial and research work with, to share, explain, and demonstrate why the characteristic apparatus for particular kinds of projects make their agential cuts where they do.) An independent science studies scholar and researcher who travels for work, even while she still lives in the bankrupt mid-western city whose university she did not get tenure at, posted then how she addressed similar experiences on two fronts: to get those who do not yet have curiosities in natural worlds to care for them and thus for science as a way of knowing, while also demonstrating why agential cuttings done by feminists matter. The person who once taught me markup language in the long ago days of her work as an information technologist, now a minister and caring for a mother with Alzheimer's in their family home in the northeast, pointed out how important multiple vocabularies and thought processes are for being involved in the political lives of the human (including humanities) and natural sciences, since otherwise one appears to be simply fearful or unable. These Facebook friends are some of my companion beings in their contexts of sensitivity and enabling, some of us who gather among knowledge worlds.

[35] Meanwhile *Science News*, magazine for the Society for Science and the Public, just web-published

its exposé "Ratio for a good life exposed as 'nonsense': Highly touted measure of emotional health criticized as math disaster," a debunking of the math used to claim a model of non-linear dynamics for ratios of positive to negative emotions in the Fredrickson positive emotions laboratory, now at the University of North Carolina. Critique of award-winning US social psychologist Barbara Fredrickson's (and co-author Chilean organizational psychologist Marcial Losada's) mathematical modeling was just published in *American Psychologist*, the same journal that published their co-authored original research in 2005 and Fredrickson's reply yesterday, and which has said there will be no retraction of that research. Fredrickson acknowledges that the mathematical models are now properly suspect, but also insists that so many other forms of evidence since support her work, that she is confident of the findings generally speaking. Among the co-authors of the debunking analysis are an MA student Nicholas Brown of the University of East London, and mathematician and physicist Alan Sokal of New York University. Sokal was among those spearheading the so-called Science Wars of the nineties, especially known for a hoax paper he published in the Marxist political journal *Social Text* in 1996: "Transgressing the Boundaries: Toward a Transformative Hermeneutics of Quantum Gravity." For pro-science conservatives, the hoax constituted a wholesale debunking of postmodernism as an ideology of anti-reason and anti-science itself.^[28] Fredrickson's and other work on so-called positivity or resiliency has been critiqued by feminists as being caught up in a university-industry-state research apparatus justifying understandings of individual agency fundamental to neoliberal restructuring and austerity politics. Many people are un/comfortable with Fredrickson's connections to Buddhist philosophy. *Quite a tangle you might say.*^[29]

[36] I have already footnoted Fredrickson as an example of work I would collect as 'experimental metaphysics' myself. This is exactly the sort of hype I would (ruefully perhaps) laugh at, both how Fredrickson's findings are differentially mobilized, as well as the media social panic elements, even while I would also take it all very seriously, as I do the Tylenol research, and as I do other clues for how to care as embodiments that matter. (Just what matters can be both serious and funny.) These are exactly the kinds of transcontextual tanglings I see entailing diffractive apparatus that work with differential detail, and that deal in boundary objects. Laughing can be a response *with* complex systems of play and of fuzzy appreciations for noncoherences, of rueful acknowledgement of both willful and unintended (mis)understanding, and of sensitivity to double binds. Such humors are among the bits and pieces for gatherings for flourishing, and for what Bruno Latour calls "geostories" as in "Which language shall we speak with Gaia?" (Latour). Latour wants ontologies that will not work to reconcile or combine all entities and worlds, but rather "*distribute* agency as far and in as *differentiated* a way as possible" (Latour). When Kirby directs our attention to how "the sense of righteous conviction and benevolent purpose" animating uses of sciences, humanities, social sciences for political cares, also requires working with "the how and why of their resemblance to what they oppose," she explains quantum anthropologies (and Barad's work) as enfolded possibilities, and implicitly raises the question of what we are to do with boundary objects (Kirby 14). Boundary object-oriented ontologies do not simply retreat to punitive (critical?) parsimonies of explanation (although they are pressured to go there for sure), to moral panics traveling as social critique in media ecologies, or resort to political loyalties when scale, paradox, confusion overwhelm cognitive schema. (Give those people some Tylenol!)

[37] Parsimonies of explanation among cuts we have enacted already (representation and its gaps, the work my buddies and I know how to do properly and have done already, calculations that make things happen, urgencies sent out with social panic) are not working now. We need Barad's diffractions and experiments, we need agential 'cuttings' of many kinds, their apparatus even 'composted.' Re/cut, 'we' (gathering with ngrams as well as gut microflora, with methane fountains as well as Bretton Woods, with cannabinoid receptors as well as quantum memory) have new jobs. We practice instead in/determinacy. When an agential cut in a particular apparatus measures a determinant feature, other features remain indeterminant. Beyond denials here: this does not mean they too cannot be measured, or that they are unreal, or that they constitute an essentialist limit to human understanding, or that they operate as the very meaning of the human.

[38] That is to say, they create intimacies of agential cuttings... and compost....

Works Cited

- Barad, Karen and Adam Kleinmann. "Interview of Karen Barad by Adam Kleinmann." *Special dOCUMENTA (13) Issue of Mousse Magazine* 34, no. 13 (2012): 76-81.
- Barad, Karen. "A Feminist Approach to Teaching Quantum Physics." *Teaching the Majority: Breaking the Gender Barrier in Science, Mathematics, and Engineering*. Ed. Sue V. Rosser. New York: Columbia Teachers College, 1995. 43-75. Print.
- Barad, Karen. "On Touching—the Inhuman That Therefore I Am." *differences* 23, no. 3 (2012): 206-23.
- Barad, Karen. "Posthumanist Performativity: Toward an Understanding of How Matter Comes to Matter." *Signs* 28, no. 3 (2003): 801-31. Reprinted in *Material Feminisms*. Eds. Stacy Alaimo & Susan J. Hekman, Bloomington: Indiana, 2008. 120-54. Print.
- Barad, Karen. "Quantum Entanglements and Hauntological Relations of Inheritance: Dis/Continuities, Spacetime Enfoldings, and Justice-to-Come." *Derrida Today* 3, no. 2 (2010): 240–68.
- Barad, Karen. *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*. Durham: Duke University Press, 2007. Print.
- Barad, Karen. *What Is the Measure of Nothingness? Infinity, Virtuality, Justice / Was Ist Das Maß Des Nichts? Unendlichkeit, Virtualität, Gerechtigkeit*, Documenta (13), 100 Notes-100 Thoughts/100 Notizon-100 Gedanken (Book 33). Kassel:Hatje Cantz, 2012. Print.
- Bateson, Gregory. *Mind and Nature: A Necessary Unity*. New York: Dutton, 1979. Print.
- Bateson, Nora. "An Ecology of Mind, a Daughter's Portrait of Gregory Bateson." Bullfrog Films, 2011.
- Behar, Katherine (Chair). "Object-Oriented Feminism 2—Closer 2: Even Closer." Conference session 8 (K): "Object-Oriented Feminism 2—CLOSER 2: Even Closer" at the Society for Literature, Science, and the Arts (SLSA) Annual Conference: Non-human; Milwaukee WI, 30 September, 2012.

Behar, Katherine (Chair). "Object-Oriented Feminism 2—Closer 1: Getting Closer." Conference session 7 (K): "Object-Oriented Feminism 2—CLOSER 1: Getting Closer" at the Society for Literature, Science, and the Arts (SLSA) Annual Conference: Non-human; Milwaukee WI, 30 September, 2012.

Behar, Katherine. "Bigger Than You." Paper for conference session 7 (K): "Object-Oriented Feminism 2—CLOSER 1: Getting Closer" at the Society for Literature, Science, and the Arts (SLSA) Annual Conference: Non-human; Milwaukee WI, 30 September, 2012.

Bélanger, Jocelyn J., Marc André K. Lafrenière, Robert J. Vallerand, and Arie W. Kruglanski. "Driven by Fear: The Effect of Success and Failure Information on Passionate Individuals' Performance." *Journal of Personality and Social Psychology* 104, no. 1 (2013): 180-95.

Blacoe, William, Elham Kashefi, and Mirella Lapata. "A Quantum-Theoretic Approach to Distributional Semantics." Paper presented at the Proceedings of NAACL-HLT Association for Computational Linguistics, Atlanta, Georgia, 9–14 June 2013.

Bowker, Geoffrey C., and Susan Leigh Star. *Sorting Things Out: Classification and Its Consequences*. Cambridge: MIT, 1999. Print.

Clark, Ian A., Clare E. Mackay, and Emily A. Holmes. "Positive Involuntary Autobiographical Memories: You First Have to Live Them." *Consciousness and Cognition* 22, no. 2 (2013): 402-06.

Clarke, Bruce, and Mark B. N. Hansen. *Emergence and Embodiment: New Essays on Second-Order Systems Theory*. Durham: Duke University Press, 2009. Print.

Deepröse, Catherine, Shuqi Zhang, Hannah DeJong, Tim Dalgleish, and Emily A. Holmes. "Imagery in the Aftermath of Viewing a Traumatic Film: Using Cognitive Tasks to Modulate the Development of Involuntary Memory." *Journal of Behavior Therapy and Experimental Psychiatry* 43, no. 2 (2012): 758-64.

Dempster, Beth. "Sympoietic and Autopoietic Systems: A New Distinction for Self-Organizing Systems." Paper presented at the the International Society for Systems Studies Annual Conference, Toronto, Canada, July: Living Systems Analysis Special Integration Group, 2000.

Doherty, Thomas J., and Susan Clayton. "The Psychological Impacts of Global Climate Change." *American Psychology* 66, no. 4 (2011): 265-76.

Dolphijn, Rick, and Iris van der Tuin. *New Materialism: Interviews & Cartographies*. Ann Arbor, Open Humanities Press, University of Michigan Library, 2012. Print.

Fredrickson, Barbara L., Karen M. Grewen, Kimberly A. Coffey, Sara B. Algoe, Ann M. Firestone, Jesusa M. G. Arevalo, Jeffrey Ma, and Steven W. Cole. "A Functional Genomic Perspective on Human Well-Being." *Proceedings of the National Academy of Sciences* (July 29, 2013).

Gabora, Liane. "Revenge of the 'Neurds': Characterizing Creative Thought in Terms of the Structure and Dynamics of Memory." *Creativity Research Journal* 22, no. 1 (2010): 1-13.

Gilbert, Scott F., Emily McDonald, Nicole Boyle, Nicholas Buttino, Lin Gyi, Mark Mai, Neelakantan Prakash, and James Robinson. "Symbiosis as a Source of Selectable Epigenetic Variation: Taking the Heat for the Big Guy." *Philosophical Transactions of the Royal Society B: Biological Sciences* 365, (2010): 671-78.

Gilbert, Scott F., Jan Sapp, and Alfred I. Tauber. "A Symbiotic View of Life: We Have Never Been Individuals." *The Quarterly Review of Biology* 87, no. 4 (2012): 325-41.

Haraway, Donna. "Re: Conversation with Eduardo Viveiros de Castro at Gestes Spécultatifs / Speculative Gestures, Cerisy Colloquium, at Cerisy-la-salle, France." Message to Katie King. June 2013. Email.

—. "Cosmopolitical Critters, SF, Multi-Species Muddles." Paper presented at the Gestes Spécultatifs / Speculative Gestures, a colloquium, Cerisy-la-salle, France, 2013.

—. "Sowing Worlds: A Seedbag for Terraforming with Earth Others." *Beyond the Cyborg: Adventures with Donna Haraway*. Eds. Margret Grebowicz, Helen Merrick and Donna Haraway. New York: Columbia University Press, 2013. 137-146. Print.

—. *Modest_Witness@Second_Millennium.Femaleman@_Meets_Oncomouse™: Feminism and Technoscience*. New York: Routledge, 1997. Print.

—. *SF: Speculative Fabulation and String Figures / SF: Spekulative Fabulation Und String-Figuren*, Documenta (13), 100 Notes-100 Thoughts/100 Notizen-100 Gedanken (Book 99). Kassel: Hatje Cantz, 2011. Print.

Hawking, Stephen, Jim Mervis, and Robit Hairman. "A Brief History of Time: an Interactive Adventure." Milpitas: Creative Labs, 1994.

Helmreich, Stefan. "Extraterrestrial Relativism." *Anthropological Quarterly, Special Collection: Extreme: Humans at Home in the Cosmos* 85, no. 4 (2012): 1125-40.

Hogness, Rusten, and Donna Haraway. 6 Oct 2013. Personal communication.

Holmberg, Eric, and Alexia Campbell. "Koch: Climate Pledge Strategy Continues to Grow." *Investigative Reporting Workshop* (July 1 2013).

Holmes, Emily A., Chris R. Brewin, and Richard G. Hennessy. "Trauma Films, Information Processing, and Intrusive Memory Development." *Journal of Experimental Psychology: General* 133, no. 1 (2004): 3-22.

Keller, Evelyn Fox. *The Mirage of a Space between Nature and Nurture*. Durham: Duke University Press, 2010. Print.

Kim, Meeri. "What Your Nose Knows May Be a Matter of Your DNA [Genetics Can Determine Why We Smell Certain Odors Differently, Studies Find]." *The Washington Post*, 2 August 2013, A3.

King, Katie. "Networked Reenactments: How Television, Museums, and Universities Tried to Find Audiences in the Nineties." Paper presented to the Washington Area Group for Print Culture Studies, Library of Congress, Washington, D.C., 7 March 2008. Talksite: «<http://netreen.blogspot.com/>»

King, Katie. "SI Tranimal: My Distributed Animality." Paper presented at the Zoontotechics (Animality / Technicity) Conference, for the Centre for Critical and Cultural Theory at Cardiff University, Wales, 14 May 2010. Talksite: «<http://sltranimal.blogspot.com/>»

King, Katie. *Networked Reenactments: Stories Transdisciplinary Knowledges Tell*. Durham: Duke University Press, 2011. Print.

Kirby, Vicki. *Quantum Anthropologies: Life at Large*. Durham: Duke University Press, 2011. Print.

Kitto, Kirsty, Brentyn Ramm, Laurianne Sitbon, and Peter Bruza. "Quantum Theory Beyond the Physical: Information in Context." *Axiomathes* 21, no. 2 (2011): 331-45.

Kitto, Kirsty, Peter D. Bruza, and Liane Gabora. "A Quantum Information Retrieval Approach to Memory." Paper presented at the Proceedings of the 2012 International Joint Conference on Neural Networks (IJCNN 2012), Brisbane Convention Centre, Brisbane, Qld, 2012.

Knabe, Susan. "An Inadequate Knowledge of the Duration of Other Bodies' Tracing the Affective Legacy of Genocide in Aids Cultural Production." Thesis: Macquarie University, 2007.

Latour, Bruno. "Which Language Shall We Speak with Gaia?" Holberg Prize Symposium: 'From Economics to Ecology', Paris, 4 June, 2013.

Law, John, Geir Afdal, Kristin Asdal, Wen-yuan Lin, Ingunn Moser, and Vicky Singleton. "Modes of Syncretism: Notes on Noncoherence." *Common Knowledge* 20, no. 1 (2013): 172-92.

Lewis, Charles, Eric Holmberg, Alexia Campbell, and Lydia Beyoud. "The Koch Club: Koch Millions Spread Influence through Nonprofits, Colleges," *Investigative Reporting Workshop* (July 1 2013).

Mangan, Katherine. "How Gates Shapes State Higher-Education Policy." *The Chronicle of Higher Education* (2013). «<http://chronicle.com/article/How-Gates-Shapes-State/140303/>»

Marsh, Leslie, and Christian Onof. "Stigmergic Epistemology, Stigmergic Cognition." *Cognitive Systems Research* 9, no. 1-2 (2008): 136-49.

Maturana, Humberto Romesín. "Fundamental Relativity." Plenary address at "An Ecology of Ideas," a joint conference of the American Society for Cybernetics and the Bateson Idea Group at Asilomar, California, July, 2012.

Mayer, Jane. "Koch Pledge Tied to Congressional Climate Inaction." *The New Yorker Blog*, 30 June 2013. Web. «<http://www.newyorker.com/news/news-desk/koch-pledge-tied-to-congressional-climate-inaction>»

McFall-Ngai, Margaret, Michael G. Hadfield, Thomas C. G. Bosch, Hannah V. Carey, Tomislav Domazet-Lošoe, Angela E. Douglas, Nicole Dubilier, Gerard Eberl, Tadashi Fukami, Scott F. Gilbert, Ute Hentschel, Nicole King, Staffan Kjelleberg, Andrew H. Knoll, Natacha Kremer, Sarkis K. Mazmanian, Jessica L. Metcalf, Kenneth Neelson, Naomi E. Pierce, John F. Rawls, Ann Reid, Edward G. Ruby, Mary Rumpho, Jon G. Sanders, Diethard Tautz, and Jennifer J. Wernegreen. "Animals in a Bacterial World, a New Imperative for the Life Sciences." *Proceedings of the National Academy of Sciences* 110, no. 9 (2013): 3229-36.

McQuillan, Martin. "Notes toward a Post-Carbon Philosophy." *Telemorphosis: Theory in the Era of Climate Change*. Ed. Tom Cohen. Ann Arbor Open Humanities Press, 2012. 270-92.

Michel, Jean-Baptiste, Yuan Kui Shen, Aviva Presser Aiden, Adrian Veres, Matthew K. Gray, William Brockman, The Google Books Team, Joseph P. Pickett, Dale Hoiberg, Dan Clancy, Peter Norvig, Jon Orwant, Steven Pinker, Martin A. Nowak, and Erez Lieberman Aiden. "Quantitative Analysis of Culture Using Millions of Digitized Books." *Science* 14, no. 6014 (2011): 176-82.

Ngram. "Autopoiesis, Autopoietic, Symbiotic, Symbiosis, Biosphere — Google Ngram Viewer." Michel, Jean-Baptiste, et al 2011. Quantitative Analysis of Culture Using Millions of Digitized Books. *Science* 14 (6014):176-182.

Ngram. "Experimental Metaphysics, Experimental Epistemology, Ontological Turn, New Materialism — Google Ngram Viewer." Michel, Jean-Baptiste, et al 2011. Quantitative Analysis of Culture Using Millions of Digitized Books. *Science* 14 (6014):176-182.

Omicini, Andrea, and Mirko Viroli. "Coordination Models and Languages: From Parallel Computing to Self-Organisation." *The Knowledge Engineering Review* 26, no. 1 (2011): 53–59.

Parry, Marc, Kelly Field, and Beckie Supiano. "The Gates Effect: The Bill & Melinda Gates Foundation Has Spent \$472-Million (So Far) on Higher Education. Why Many in Academe Are Not Writing Thank-You Notes." *Chronicle of Higher Education*. 14 July 2013. «<http://chronicle.com/article/The-Gates-Effect/140323/>»

Piatelli-Palmarini, Massimo, and Juan Uriagereka. "The Immune Syntax: The Evolution of the Language Virus." *Variation and Universals in Biolinguistics*. Ed. Lyle Jenkins. Oxford: Elsevier, 2004. 341—77.

Randall, Rosemary. "Loss and Climate Change: The Cost of Parallel Narratives." *Ecopsychology* 1, no. 3 (2009): 118-29.

Randles, Daniel, Steven J. Heine, and Nathan Santos. "The Common Pain of Surrealism and Death: Acetaminophen Reduces Compensatory Affirmation Following Meaning Threats." *Psychological Science* 24, no. 6 (2013): 966–73.

Star, Susan Leigh, and James R. Griesemer. "Institutional Ecology, 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39." *Social Studies of Science* 19, no. 3 (1989): 387-420.

Star, Susan Leigh, and Karen Ruhleder. "Steps toward an Ecology of Infrastructure: Design and Access for Large Information Spaces." *Information Systems Research* 7, (1996): 111-34.

Star, Susan Leigh. "This Is Not a Boundary Object: Reflections on the Origin of a Concept." *Science, Technology & Human Values* 35, no. 5 (2010): 601-17.

Vann, Katie, and Geoffrey Bowker. "Instrumentalizing the Truth of Practice." *Social Epistemology* 15, no. 3 (2001): 247-62.

Varela, Francisco J. "The Early Days of Autopoiesis." *Emergence and Embodiment: New Essays on Second-Order Systems Theory*. Ed. Bruce Clarke and Mark B. N. Hansen. Durham: Duke University Press, 2009. 62-76.

Vatikiotis-Bateson, Eric. "Biological Coordination and the Construction of Reality." Plenary address at "An Ecology of Ideas," a joint conference of the American Society for Cybernetics and the Bateson Idea Group at Asilomar, California, 9-13 July, 2012.

Weyler, Rex. "Real Wealth: Examining Human Overshoot and Earth's Systems." Plenary address at "An Ecology of Ideas," a joint conference of the American Society for Cybernetics and the Bateson Idea Group at Asilomar, California, 9-13 July, 2012.

"Jerry Brown." *Wikipedia*. «http://en.wikipedia.org/wiki/Jerry_Brown»

"Sokal Affair." *Wikipedia*. «https://en.wikipedia.org/wiki/Sokal_affair»

Notes

1. Working as a transdisciplinary scholar can be tricky: one can take neither authors nor audiences nor citation pools for granted. Neither is any proper question answered by saying you should have read what I have read. In that spirit I intersperse chunks of Barad with contextualizing information to share what I am actively learning myself. I assume here that readers have differential and on-going knowledges of the work of Karen Barad, considering that other essays in this special issue will take up their own range of details, and hoping to companion well with them. Not assuming we all already know each other, in my text I try to characterize personal names briefly. Audiences of all kinds today are in the middle of actively diverging in practices as well as unpredictable in their circulations. Indeed, "author-ness" and its responsibilities to authorship and authority are dispersed, distributed, mixing up many collectives, playing among boundary objects whether they know it or not.
2. "Tylenol" makes its first appearance here in my essay, in order to take to heart the results of this ingenious Randles study which indicates that, with less physical, emotional, or social pain, subjects are able to be less punitive in response to others when their expectations are not met: let's offer it to lawmakers! See more about such "experimental metaphysics" in fn. 4. For more about media ecologies see King *Networked Reenactments*.
3. From a conversation between US feminist theory and technoscience scholar, Donna Haraway, and Brazilian anthropologist, Eduardo Viveiros de Castro, taking place at Gestes Spécultatifs /

Speculative Gestures, Cerisy Colloquium, at Cerisy-la-salle, France, June 2013, and reported by email to the author on 25 July 2013. See Haraway, "Cosmopolitical Critters."

4. Various footnotes here take seriously just what some kinds of "experimental metaphysics" could mean across knowledge worlds and invite you into a circulation of their details. Learning to care for others' details is an always-uneven skill, a set of affects and learnings, and a messy ethical practice among those agential cuts and apparatus Barad teaches us about. See for example Fredrickson et al., "A Functional Genomic Perspective on Human Well-Being." I will discuss further the work of the Fredrickson lab at the end of the paper, as well as mentioning again the Tylenol study then too (Randles, Heine, and Santos). For a fascinating anthropological analysis of comparative relativisms in specific contexts see Helmreich.
5. How do we mourn the Anthropocene: the era in which human alteration of the planet becomes destructive? Will mourning help us gather to minimize damage? How do those already doing this work cope with fear and disillusionment?
6. The second largest private corporation in the country, Koch Industries and its various entities (and presumably its oil trading corporate comrades) are funding academic restructuring and educational reform, research out of universities and nonprofits used to legitimate policy and legislative in/action, and are looking to buy influential newspapers (Holmberg and Campbell; Lewis et al.; Mayer). See also McQuillan. Koch's impact on climate change legislation and research in the US dwarfs many grassroots efforts. See also Mangan, and Parry, Field, and Supiano. Nevertheless, it is heartening to see the example of Sweden for admittedly complicated efforts that do include changes at the level of household as well as state: go Google "Sweden out of garbage" to see media circulation of the impact of reducing household waste in Sweden.
7. Fear and its affections, and just how singular are sensations? See Bélanger et al and Kim, I've become concerned with the effects of parsimonies of explanation on political critique, and the role essentializing critiques play to circumscribe response and to rein in uncertainty. For discussion of "learning to be affected" see King "SL Tranimal."
8. As Queen and Mercury figure in my last book (King, *Networked Reenactments*), I was of course taken right up!
9. "Boundary objects are those objects that both inhabit several communities of practice and satisfy the informational requirements of each of them...plastic enough to adapt to local needs and constraints...yet robust enough to maintain a common identity across sites. They are weakly structured in common use and become strongly structured in individual-site use. These objects may be abstract or concrete.... The creation and management of boundary objects is a key process in developing and maintaining coherence across intersecting communities.... [They] arise over time from durable cooperation among communities of practice... [&] resolve anomalies of naturalization..." (Bowker and Star, 297)
10. See also Vann and Bowker. Reflective analysis of 'the transcontextual syndrome' led feminist theorist Susan Leigh Star to this concept 'boundary objects,' which, in a last essay before her sudden death in 2010, she defined as "organic infrastructures" that address "'information and work requirements' as perceived locally and by groups that wish to cooperate" (Star 602). Star refers to Gregory Bateson when she reflects on the origins of the concept of a boundary object: "As I delved deeper into the relations between developers and users, it became clear that a kind of communicative tangle was occurring. I used the work of Gregory Bateson, who had studied these sorts of communicative mishaps under the heading of 'double binds.' As with Bateson's work on

schizophrenics, and what he called 'the transcontextual syndrome,' the messages that were coming at level one from the systems developers were not being heard on that level by the users and vice versa. What was obvious to one was a mystery to another. What was trivial to one was a barrier to another. Yet, clarifying this was never easy. The users liked the interface when they were sat in front of it. Yet, they did not know how to make a reliable working infrastructure out of it. They would ask the ... team, who would reply in terms alien to them. I began to see this as a problem of infrastructure—and its relative nature" (610).

11. "It is as if the context is somehow within these individual [mathematical] signs, as if they are quantum 'entities' that have a specific, delimited locality as well as a global presence or efficacy." (Kirby 27).
12. Barad's diffraction conversations with Haraway begin in the introduction to 2007's *Meeting the Universe Halfway*. She includes this citation from Haraway's text at the start of chapter two (see Barad, *Meeting the Universe Halfway* 71).
13. 'Limits' then targeted appropriate technology, nuclear proliferation, population growth, the death penalty, and more recently unfair business practices promoting risky mortgages. But although socially liberal in supporting civil rights and funding the arts, Brown's tax proposals overall have always been regressive ones, fiscally conservative, and his environmental strengths tended to be in individual initiatives such as tax incentives for roof-top solar panels (Wikipedia, "Jerry Brown").
14. Barad positions her methodology as different than homologies among fields, worked instead as enfolded materialities rather than representations, at the end of her Diffractions chapter in *Meeting the Universe Halfway*.
15. I might be said to affiliate with elements of what some call second-order cybernetics because I studied with Gregory Bateson as an undergraduate in the early seventies. But I have my own published and unpublished readings of Bateson's writings, traces of interactions and studies with him during what was a specific complex period. The grain of detail I operate in includes personal conversations with Bateson now imperfectly recalled as well as the common evidence of words on pages. That such affiliation is very much full of passionate materialities matters here, from remembering a person's smell and tone of voice to the reading between the lines of what you think someone was hinting at, just on the verge of writing as already talking about, and more. Many of my memories are of Bateson speaking warmly (or not) of people he was collaborating with, meeting, reading and so on. I remember the books on the family shelves, especially the ones he thought I might like. I remember him speaking warmly of Humberto Maturana, but never using the term "autopoiesis" for example, or referring to systems of any kind as "closed," both also features for some of second-order cybernetics.
16. With the fall of the Allende government Varela was dismissed from the university and threatened by night patrols. Their manuscript was rejected for international publication for close to ten years, during which it circulated through the hands of international scholars coming to and from Chile, published by the Chilean university press, but the original English text did not come out for close to ten years, after the idea had already become popular. "It forms part of a historical sensibility which autopoiesis intuited in 1970-71...there are no personal creations without a context.... That knowing, doing, and living are not separate things and that reality and our transitory identity are partners in a constructive dance... not a philosophical mode, but rather a reflection of the life of all things." Varela, "The Early Days of Autopoiesis":74.
17. From Barad's break out essay of 2003, first published in the US feminist journal *Signs*, and also as

a chapter in the new materialisms collection edited by English and environmental humanities scholar Stacy Alaimo and her Texas political science colleague Susan Hekman.

18. While this is not my colleague's research, this is one possible example of such an approach: Blacoe, Kashefi, and Lapata. See also Kitto, Bruza, and Gabora; Kirsty Kitto et al. For something adding the sympoiesis: Piatelli-Palmarini and Uriagereka.
19. Ngrams depend on Google's collection of digitized texts that in 2011 included about 4% of all books printed. I limited my searches to the English language and this includes only materials between 1800 and 2008.
20. Used with permission. Behar's apparatus notes her sources thus: "Bruno Latour, Pablo Jensen, and Tommaso Venturini, "The Whole is Always Smaller Than Its Parts: A Digital Test of Gabriel Tarde's Monads" *British Journal of Sociology* (manuscript of accepted paper): 13. Bogost borrows "ontography" from Graham Harman, who discovered the term in a short story, "Oh Whistle and I'll Come to You, My Lad" by M. R. James. Graham Harman, "Ontography: The Rise of Objects," 14 July, 2009. Available online: «<http://doctorzamalek2.wordpress.com/2009/07/14/ontography-the-rise-of-objects/>» (accessed September 15, 2012). Ian Bogost, *Alien Phenomenology, Or, What It's Like to Be a Thing*. Minneapolis: University of Minnesota Press, 2012: 38." Behar takes the bit on human appetites from the end of the Preface to Spinoza's *Ethics*.
21. Behar, "Object-Oriented Feminism 2—Closer 1: Getting Closer." This was the amazing "line" up: (from the program): "Session 7 (K): Object-Oriented *Feminism 2—CLOSER 1: Getting Closer*; Chair: Katherine Behar

"CLOSER 1: Getting Closer" explores how humans and things are drawn close through practices. Using object-oriented feminism as a mode of inquiry, this panel asks how practices constitute relationships between humans and things. Across the arts, sciences, humanities, and everyday life, objects and practices compose themselves in particular, sometimes peculiar, arrangements. We human and nonhuman things rely on and reframe each other in relationships of practice, performance, ritual, habit, use, and abuse. But how do human and nonhuman things organize into and through practices? When we get together with objects, are we, in fact, getting closer?

- Katherine Hayles. *The Technogenetic Spiral*
- Timothy Morton. *Closer than Hands and Feet: Plato's Cave and the Proximity of Things*
- Patricia Ticineto Clough. *As a Child I Prayed: Inhabiting the Other Dimensions of a Childhood Faith*
- Katherine Behar. *Bigger Than You*

Big data refers to the massive quantity of records that are captured, amassed, and mined in the wake of digitally structured actions. This paper arrives at the nonhuman by following big data as it restructures the human. Beginning with the work that humans—in the conventional sense individual subjects—do as the producers of big data, we'll see how, big data unproduces and deindividualizes its subjects to become transhuman objects, calling to question conventional wisdom that humans are defined entities, and that individual and collective performances are a central binding pillar of social existence through which bodies are drawn into relations of power and pathos. Comparing the bigness of big data with the bigness of obesity, we find both use similar strategies to contend with unwieldiness. Through managerial gestures of reduction, and what Lauren Berlant calls "actuarial rhetoric," these nonhuman objects rearticulate the human object as a pattern, both diffuse and engorged, emerging temporally and temporarily in statistics and profiles. Such big forms lead, entropically, toward generality. Profiles blur, identity loses

specificity, and being is rendered vague. Drawing on Elizabeth Grosz's politics of imperceptibility, the paper concludes by questioning the big as a political form.

• *Responses by Eileen Joy; Rebekah Sheldon.*

22. From Behar's script, which describes how "In an era of biopower, big data and obesity require intensive management" (Behar, "Bigger Than You").
23. "Finally, and not a moment too soon, sympoesis displaces autopoiesis and all other self-forming and self-sustaining system fantasies. Sympoesis is a carrier bag for ongoingness, a yoke for becoming with, for staying with the trouble of inheriting the damages and achievements of colonial and postcolonial naturalcultural histories in telling the tale of still possible recuperation." (Haraway, "Sowing Worlds" 145-46). See also Dempster; Ngram, "Autopoiesis..."
24. From a "game-changing" paper, getting symbiosis to the very heart of the *Proceedings of the National Academy of Sciences*, circulated in enthusiastic emails to over sixty transdisciplinary colleagues from one whooping in triumph! "Read, cite, circulate! I think the transdisciplinary, worldly implications in this work are fundamental." See also Gilbert et al; Gilbert, Sapp, and Tauber.
25. 'Compost' in preference to posthuman: wording gifted by science writer Rusten Hogness to conversations among and for "children of compost." Hogness seriously jokes that the only allowable "post" for ecoactivisms should be compost! Such a composite or mixture, a bringing together, fosters sf futures, speculative feminist gatherings. This compost, with its nutrients feeding sympoetic connections concerned with an overpopulated planet, also draws upon conversations with Vinciane Despret, Donna Haraway, Maria Puig de la Bellacasa and others. Such agential cuttings entangle responsibilities entailed by this preference for compost to posthuman, children to objects, poly-parenting to procreating. They imagine ahead earth-wide impacts on multi-species flourishing in commitments made by new generations to share among the children of compost rather than give birth themselves (Hogness and Haraway). See also Haraway, "Terrapolis is full of companion species."
26. Barad speaks to our responsibility to what is real beyond assumptions about "piddling laboratory measurements," "beyond an epistemological conception of objectivity," "beyond questions of human knowledge" to explore measurement in "re(con)figurations" in *Meeting the Universe Halfway* (340).
27. See also Barad, *What Is the Measure of Nothingness?*
28. For more on the Science Wars of the nineties see King, "Networked Reenactments"; King, *Networked Reenactments*.
29. And notice the mid 90s as a convergence point for Varela's memoir and for Barad's teaching essay, coming out then at the very height of the Science Wars and this particular form of debunking, exemplified by Sokal.

Cite this Article

<https://doi.org/10.20415/rhiz/030.e13>
