

# Complexity Theory and Ecofeminism: Looking At a Coalition

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**Sharon Woodill**, during her undergraduate studies of jazz, began working with complexity theory as an analytical tool for examining the development of jazz musicians in communities of practice. During her graduate studies, she examined the conceptualization of domination in ecofeminist discourse and the uptake of complexity theory in such a context. Currently in an Interdisciplinary PhD program at Dalhousie University, she is concerned with the potential of complexity theory for cross-paradigm communication in the context of epistemic discrepancies between science and religion.

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## Abstract

Complexity theory may provide a helpful conceptual toolbox for understanding interpenetrated social and material systems of oppression as posited by ecofeminism; however, successful coalition demands careful consideration of the epistemic implication of complexity theory. Curdled logic can facilitate the epistemic move from monism to plurality that such a coalition would require.

## Résumé

La théorie de la complexité offrirait une boîte à outils conceptuelle utile pour comprendre les systèmes sociaux et matériaux impénétrables de l'oppression tels que présentés par l'éco-féminisme; toutefois, une coalition fructueuse demande une considération de l'inclusion épistémique de la théorie de la complexité. La logique tordue peut faciliter le mouvement épistémique du monisme à la pluralité que ce genre de coalition demanderait.

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## Introduction

My work is concerned with seeing: with looking, with thinking, with perceiving, with understanding, with creating, with being. There is a tradition of feminist thought concerned with looking: Marilyn Frye's (1983) "loving perception," Donna Haraway's (1988) "persistence of vision," Dorothy Smith's (1989) "women's perspective" and Luce Irigaray's (1985) exposé of "the blind spot" - just to name a few. In these works, the vision metaphor functions to highlight the epistemological configurations between oneself and others and to expose the complicated patterns of social interactions and constructions. I draw on this metaphor from the feminist tradition because of its specific concern with ethical social organizing practices, and I seek to contribute to this work from a slightly more contemporary context.

My work is a grain of sand, a tiny contribution to an overall accumulation. I often wonder how many more works of vision it will take to reach a critical mass, a tipping point leading to the emergence of new and stable perceptual practices: perceptual practices that can accommodate intricate, complex, multi-dimensional, paradoxical, general and simultaneously specific coherences of realities. I hope to inspire an expansion of perception while being cognizant of feminist precautions against the privileging of the Western gaze that reduces multiplicitous subjects to a single unified whole and projects an "ethnocentric universalism" as a standardized analytic device (Mohanty 2004, 21). I do not, however, wish to exorcise perception from its historical script - Western or otherwise - for such a move would necessarily require a "god-trick" and a shift to a view from nowhere (Haraway 1988, 589). I seek an improved depth perception, so to speak, to encourage competent navigation of the more ambiguous spaces of being.

From this context, this paper explores a coalition of theories: ecofeminism and

complexity. Complexity theory, originating from the physical sciences, is a theory of self-organizing systems that develop via feedback loops with their environment. Such systems are dynamic, adaptive, unpredictable, and to a great degree, describe the being and becoming quality of the natural world. Ecofeminism posits that women and nature are often positioned together at the bottom of oppressive hierarchies. This position accounts for a twinned oppression that is conceptual, material, and prototypical of other forms of domination.

Within feminist scholarship, ecofeminism has often been marginalized and charged with essentialism. It is sometimes seen to reaffirm a negative affiliation of women with nature that objectifies both and renders them inert and ultimately irrational. Feminism has long struggled against such an association by focusing on the discursive practices that shape social realities; however, strict adherence to discursive practices and social construction models rests heavily on a language/reality dichotomy that leads to a kind of disembodiment in which the significant entanglement of the human and nonhuman worlds is under-acknowledged, making it difficult to engage with the material aspect of lived experience in pragmatic ways (Alaimo and Hekman 2008). Indeed, feminist scholars such as Donna Haraway (2008), Karan Barad (2008), and Stacey Alaimo (2008) posit a more general form of material feminist theory that not only challenges the boundaries between the notions of human and nonhuman but invites an alternative conception of the material world that moves beyond simplistic binaries to highly interpenetrated modes of being. A coalition between ecofeminist and complexity theories can be seen as a supportive element in such scholarship and the cautionary points as equally applicable.

Arguably, complexity has been implicit in ecofeminist theory all along. Ecofeminists have explored the social dynamics in webs of domination and have drawn on adaptive experiential ways of knowing that embody the characteristics of being and becoming. In Erika Cudworth's *Developing Ecofeminist Theory: The Complexity of Difference* (2005), however, a

coalition is explicitly recommended. In this work, domination is conceptualized as a complex system of interrelated oppressions and it is argued that complexity theory therefore provides insight into how such systems develop, reproduce, and are sustained.

Complexity theory may provide a helpful conceptual toolbox for understanding interpenetrated social and material systems of oppression; however, there is a theoretical discrepancy. The problem concerns the ontological status of dominatory hierarchies: some ecofeminist theory is based on a conceptualization of dominatory hierarchies as restrictive and oppressive structures that serve to reinforce power distribution in harmful and unjust ways, and this differs markedly from the malleable and dynamic character such as is suggested in a complexivist framing. Are hierarchies rigid maladaptive structures or complex adaptive systems? As I address this problem, I posit that the answer(s) is(are) contingent on a particular way of seeing the world and I recommend a type of curdled logic, as articulated by Maria Lugones (2003), as a viable means of navigating this discrepancy.

Curdled logic is a pluralistic approach to vision that resists the hegemonic value of purity and highlights the violence of splitting and separating involved in its processes. Curdled logic resists the "privileged, simple, one-dimensional" vantage point of purity by bringing into focus the reality of ambiguity and liminal existence (Lugones 2003, 128). In other words, curdled logic is a logic of process, a logic of complexity, that does not settle on simple binaries but rather dynamically explores the context to accommodate seemingly disparate modes of knowing/being. Stacy Alaimo and Susan Hekman (2008) suggest that feminist scholarship has had little success incorporating materialist theory and they call for a novel and equitable approach to viewing the connections between discourse and matter. Perhaps curdled logic will make this task more accessible.

## Complexity Theory

Complexity theory is a theory of change. It is a broad area of scholarship that looks at emergent patterns of collective behaviour, and drawing on a base of insight from the physical sciences, it endorses a perspective of being and becoming that is centered on dynamic, adaptive, creative and relationship-based interactions. Purported to be the science of life (Capra 1996; 2005), complexity theory describes the wild and wacky workings of the natural world which encompasses a broad spectrum of domains from chemical reactions to social organizing practices. Complexity theory is concerned with the cyclical patterns of natural phenomena: how things come to be, how they are sustained, and how they are transformed (Capra 1996).

Ironically, complexity theory consists of a rather basic set of principles. Brent Davis describes complexity (science) as: "the study of adaptive, self-organizing systems - or more colloquially, the study of living systems - or, more educationally, the study of learning systems" (2004, 211). Complexity is a systems perspective that conceives of life as systems of relationships, which in turn consist of other systems, which consist of other systems, and so on *ad infinitum*. In other words, there are no fundamental building blocks, only systems or webs of relationships (Capra 1996).

Webs (individual systems or individual agents) cohere into larger systems: they self-organize into complex adaptive systems sometimes conceptualized as intimately connected networks (Barabasi 2003). Self-organization is basically a grassroots-type of organization in which communication between individuals in close proximity facilitates a set of shared values and ideas upon which actions are based. These communication processes, in complexity theory, are described as feedback loops - positive loops amplify and negative loops restrict the development of a system. Both may be necessary at times. When complex adaptive systems self-organize, positive feedback loops drive the system's development to a critical point at which novelty - a movement, an organism, a pattern

- appears. This is called "emergence" (Johnson 2002; Waldrop 1992, 152).

Emergence happens under a set of specific conditions which are key elements of complexity theory. Emergence is said to be most abundant at "the edge of chaos" (Waldrop 1992, 11), which is to say that there needs to be a mixture of randomness and order. Order is provided by the physical or material configuration (and consequential limitations) of the system and chaos is provided by an abundance of possibilities available to said system. As individuals interact, new things happen in unplanned and undirected ways. There is no central command and control: emergence, or patterns of becoming, are characteristics of partnership relationships rather than dictator-type relationships. Agential causations are multidirectional such that an entity shapes and is shaped by the environment simultaneously.

Self-organization leading to emergent phenomenon occurs in states that are far from equilibrium (Capra 1996; Gleick 1987; Prigogine and Stengers 1984). In other words, they are not static, but are instead maintained by a steady flow of energy through the system. As such, complex systems are open, which means they continuously interact with, act upon, and react to their surroundings. For example, the cyclical processes of living entities (biological complex systems) are such that they need to take in sustenance and oxygen and expend energy and waste in turn. These properties form a layered structure. For example, cells interact to form an organ, which constitutes an emergent property of a network of cells; organs interact to form a body which is an emergent property of a network of organs; people interact to form communities, which is an emergent property of a network of people, and so on. Emergent properties are properties of the whole; they are products of relationships and therefore are not visible in the individual entities of the system. This is not to say that entities are not individuals, but rather, it is to say that entities are not isolated, reducible, or abstract. Entities are highly entangled in webs of being.

Adaptation is the process of a system's change in response to the

environment while it simultaneously changes the environment (Capra 2005; Johnson 2002). The dynamic quality of complex systems calls for non-linear descriptions, which confounds the process of prediction and control and entails a holistic approach. Complexity theory is a more-than-the-sum-of-its-parts theory that requires its practitioners to step outside of reductive knowledge seeking norms and embrace alternate ways of looking and thinking that Brent Davis and Dennis Sumara (2006, 3) refer to as "transdisciplinary." It is a theory that requires its practitioners to relinquish monistic perspectives of the world and embrace multiplicity as a constructive concept of reality.

### **Ecofeminist Theory**

There are many themes and variations of ecofeminism which makes it difficult to pin to a single definition, but the common thread is that ecofeminist theory argues that women and nature are often positioned together at the bottom of oppressive hierarchies. This position accounts for a twinned oppression that is conceptual, material, and prototypical of other forms of domination. Ecofeminism is by no means a predominantly theoretical perspective and indeed a major element of ecofeminist work is evident in grassroots activism that highlights empirical realities of the connection between environmental issues and the lived experiences of women and other Others (Warren 1997). Although the aim of this paper is not to exclude the multifarious positions that exist under the banner of ecofeminism, the theoretical work of Karen Warren provides the philosophical base from which I proceed.

Warren constructs a philosophical foundation upon which explanation for the host of "isms of domination" (Warren 2000, 67) can be situated. Value dualisms, as Warren (1996; 1997; 2000) describes them, are sets of idea pairs in which each member of the pair is constructed as an opposite, separate, and distinct entity. Value hierarchies, according to Warren, are the conceptual placement of ideas into an up-down arrangement with the value

dispersed such that the upper portion is seen as the more beneficial and desirable position while the bottom is discredited.

The logic of domination is the culmination of value dualisms and value hierarchies in an oppressive conceptual framework. An oppressive conceptual framework consists of values, beliefs, attitudes and assumptions, that contribute, sustain or reproduce ideas so as to support social inequities (Warren 2000). "The problem is not simply that value-hierarchical thinking and value-dualisms are used, but the way in which each has been used in oppressive conceptual frameworks to establish inferiority and to justify subordination" (Warren 1996, 21). Ecofeminist theory holds that the proliferation of this logic is evident in normative social-organizing practices and their resulting social institutions. The objective is to seek out and uproot such structures via processes that are both discursive and material. In other words, ecofeminist theory seeks to recast the cognitive, linguistic, or logical in such a way as to expose the interconnectedness to the material, empirical, or intuitive.

Ecofeminist theory has been harshly criticized for a perceived affirmation of the essentializing woman/nature affiliation, but such a caricature is facing contemporary challenge. Stacy Alaimo and Susan Hekman (2008), for example, suggest that in a bid to hedge themselves from essentialist associations, feminist scholars of the postmodern genre have focused on the discursive as a means of uprooting entrenched oppressive dichotomies such as feminine/masculine which pit one against the other in an oppositional and adversarial manner. Though important and insightful, this linguistic turn constitutes reality as a product of language, a social construction, thus obstructing the possibility of meaningful access to a material realm (Alaimo and Hekman 2008). Yet, as ecofeminist theory holds, it is the material realm, the realm of matter and its entailments, or more specifically, material bodies, that hosts the tangible effects of oppression and injustice. It is the body that fuses the biological and social realms into a blurrily bounded spiral of forms

and realities, and it is on this site of interaction where ecofeminism specifically and material feminisms in general are focused. Material feminist theories posit ways of seeing the world as composed of multifarious agential bodies, thus inviting new ways of conceptualizing the relationship between the human and nonhuman world. The space outside the boundaries of essentialism created by this theorizing opens the door to meaningful engagement with a broad spectrum of phenomena that constitutes realities. With careful consideration and articulation, ecofeminism should fit nicely into the material feminist genre.

### **The Common Ground**

At the core of ecofeminist theory, as with complexity theory, lays a critique of an entire epistemic paradigm inherited from an era of mechanistic ideology. The metaphor of the world as a machine has been a dominant mindset since the Scientific Revolution (Merchant 1980). This metaphor embraces an ideology of separate, isolatable, discrete, and conquerable parts that fit together in a "correct" way. Karan Barad (2008) traces the birth of atomistic metaphysics back to the pre-Socratic philosophy of Democritus in which it was purported that knowledge of the conglomerate was attainable through knowledge of the smallest fundamental indivisible unit. The atomistic concept of separation accentuates the notion of individuality and independence that negates a prominent assertion of ancient wisdom which is a keystone of ecofeminist theory - the unity and interdependence of all (Spretnak 1999).

Complexity theory, as with ecofeminism, inquires into the space between individual entities; it highlights the relationships or the patterns produced in multiplicity. Reductionism is rejected by both theories, thus alternative epistemic practices are necessary. Non-reductionism poses challenges to the traditional scientific method in such areas as measurability, predictability and repeatability (Suteanu 2005). The irreducible nature of complex systems makes the task of measuring in a traditional sense problematic because the measurement changes depending on the scale being used:

the smaller the scale the greater the detail and the larger the measurement (Suteanu 2005). Without a measurement toolbox, the project of predictability also becomes problematic. Without measurement and predictability, repeatability is not really a viable objective.

Ecofeminist discourse also problematizes many traditional scientific approaches, and in this way it might be argued that complexity theory has been inherent in ecofeminist theory all along. Carolyn Merchant (1980; 1992), for example, discusses the ways in which mechanistic ideology facilitated the death of nature metaphor, thus allowing nature to be immune from ethical considerations and free for unfettered exploitation. The location of expertise in an enterprise based on exerting uniformity via perceptual practices that convert whole entities into basic discrete parts is labelled by Vandana Shiva (Mies and Shiva 1993, 24) as "a source of violence against nature and women" because it dismisses the relational aspect of systems and discredits ways of knowing that for centuries belonged to the domain of women. Contrary to the death view, ecofeminist theory focuses on embodied epistemic approaches as integral to the flourishing of life and necessary for responsible epistemic practices.

Complexity theory constructs the relationship between the observer and the observed as one of deep entanglement thus purporting an embodied epistemology (Cudworth 2005; Davis 2004). Complex systems are nested structures that require some degree of perceptual agility. Nested structures, such as in the organ-body-community example, are not necessarily hard and fast structures with distinct boundaries. Rather, they can be loosely bounded structures that largely depend on an observer's perceptual focus moving further and further into abstraction relative to an original focal point. At what point, for example, is a group of people living in close proximity labelled as a community as opposed to just a group of people living close to one another? This is a difficult question and the answer would likely differ among respondents. There are, no doubt, "real"

defining characteristics of complex systems, but these characteristics are highly entrenched in the observer's perceptual practices.

For ecofeminism, the world, the universe, the cosmos, and humanity are all made up of material entities - bodies. Stacey Alaimo (2008) suggests the term "trans-corporeality" to signify the common materiality of various bodies, thereby highlighting the coherence between entity and environment. This theoretical space is significant because it exposes some of the causal complexities between the mental and the extra-mental world. "The material level is where dominations assume physical form, often embodied in specific institutions and their associated practice" (Cudworth 2005, 3). The mechanistic ordering of the intellectual world translates into institutions, practices and technologies that structure the material world in specific ways. These structures impact social and ecological environments and "are often experienced most directly and pertinently as effects on human bodies" (Cudworth 2005, 3). The body is simultaneously biological and social.

Both complexity theory and material feminist theories suggest that an atomistic perspective is not sustainable, and within the context of what Alaimo and Heckman label as "the material turn in feminist theory" (2008, 7), Karan Barad develops the theory of "posthumanist performativity" (2008, 120) which resembles complexity theory in significant ways. Not only do they both claim a foundation in the physical sciences, but they both offer a concept of reality that portrays the material world as dynamic, agential, interpenetrated forces from which novel phenomena emerge. Moving away from an ontological assumption of the world as consisting of discrete units connected via straightforward unidirectional static forces, Barad (2008, 126) describes a world as "one that incorporates important material and discursive, social and scientific, human and nonhuman, and natural and cultural factors" in processes of inter-action or performativity, thus blurring the boundaries between the concept of "human" and "nonhuman." Such a concept demands a significant alternate

perspective.

Karan Barad (2008) proposes a performative metaphysic that takes into account one's situatedness within the world without objectifying it. Such a metaphysic requires one to acknowledge the co-participation of actors, be they human or otherwise, in the being and becoming of the material world. For Barad, the epistemological unit is a phenomena which is inherently multiple as it emerges out of "agential intra-action" (2008, 132). It is at this point that complexity theory and materialist theories seem to converge: for both perspectives, understanding, knowing and seeing is an act of performativity (Barad 2008) that takes place trans-corporeally (Alaimo 2008) or between material bodies via multifarious acts of intercourse or "conversation" (Haraway 2008, 164).

Although complexity theory and ecofeminism share a number of elements, their specific academic domains differ; however, Erika Cudworth (2005) argues explicitly for the uptake of complexity theory by ecofeminists. She develops a multiple systems approach that she calls "anthroparchy" to describe the domination of the non-human environment by humans as a species. "This systematic conception involves structures, sets of relations of power and domination which operate to different degrees and have different forms, and are resultant from normative practice" (2005, 8). Cudworth's approach highlights the nested structure familiar to complex systems. She describes three levels of domination. Discourse, which is the embedding of concepts and ideas into day-to-day social, economic, and political practices, is implicated in various forms of oppressive power relations. Discourses cohere into systems such as patriarchy, for example, which involve patterns of normative institutions and practices that constrain women. Furthermore, various structures including patriarchy, capitalism, and post-colonialism develop and cohere into a complex system of oppression (anthroparchy) that operates differentially at various sites. From this framework, complexity theory can elucidate the properties of domination, and

the objective is to more thoroughly understand how complex systems work in order to make pro-social changes that take into account the embeddedness of human society in the natural or more-than-human world.

### **Discrepancy**

Some ecofeminists have described domination as practices in hierarchical structures that are rigid, maladaptive, and imposing systems, and this differs dramatically from Cudworth's conceptualization. For example, Karen Warren (1996; 1997; 2000) discusses oppressive hierarchies as fundamental structuring elements of oppressive conceptual frameworks that restrict and hamper life processes. Carolyn Merchant (1992) positions hierarchy as a ubiquitous pillar of warfare, economic oppression, and a fundamental facilitator of a rigid imbalance that positions males over females in that profoundly anti-ecological configuration. Janis Birkeland (1993, 17) describes hierarchies as locations of command and control that "are simply maladaptive in an age of toxic waste and nuclear weapons" and Riane Eisler (1988), in recasting the ancient history of cultural origins, describes the development of domination hierarchies as a model of social organization that is inflexible and unsustainable. By contrast, a systems perspective suggests that such structures are fluid and dynamic.

To understand this issue it is necessary to turn to the epistemic implications of complexity theory. Complexity theory has at times been heralded as a major paradigm shift in scientific thought (Capra 1996 & 2005; Prigogine 1996). The shift involves a move away from the linear approach of classic Newtonian physics to embrace non-linearity as a major constituting universal force. Within the Newtonian worldview the elements of certainty, control, evenness, uniformity, and constancy are the valued visual markers (Prigogine 1996). Consequently they inspire and inform a particular type of questioning.

To ask whether domination hierarchies are either dynamic or rigid is to

demand a monistic response to a pluralistic reality. On one hand, it seems that the description of domination hierarchies as solid, rigid, and maladaptive is reflective of and inspired by the very ideology that ecofeminists critique. On the other hand, that Cudworth neglects to include a concept of robustness in her version results in the harnessing of complexity to a monistic perceptual practice, is an under-engagement of complexity, and is also reflective of mechanistic thinking. Complex systems are both open and closed systems. For example, although the human body must be open to environmental interactions, it is structurally closed, and for an undetermined amount of time it maintains a rather robust structure. In other words, human bodies more or less remain human bodies throughout the duration of a lifespan. Likewise, the robustness of domination hierarchies is highly contingent on the perpetual flux of social participation. Thus, no singular vision is sufficient.

At issue here is an understanding of plurality. The hierarchy question is an either/or question but conversion to a both/and type of question would necessarily entail the inclusion of space for either/or questions as well. Epistemic practices that require a shift to multiple vision must realize that the multiple necessarily includes the singular. This is truly trickster terrain. As Donna Haraway (2008, 163) points out, "machine, organism, and human embodiment all were articulated - brought into a *particular* co-constitutive relationship" [emphasis in original] which, I might add, involves a social history of atomistic and mechanistic thinking. Where ecofeminist theory has often fallen short is in trying to rewrite this history without fully appreciating the extent to which their discursive tools are creative embodiments of the mechanistic ideology they reject. It seems to me that material feminist theory, including ecofeminism, must embrace a fully engaged complexity, which is to say that it must develop a type of bi-focal vision that accommodates plurality as simultaneously single and plural, and this will require a curdled logic.

There are some cautionary points to be made in regards to the uptake of

complexity theory in ecofeminism. Problems arise when the purpose of fusing complexity theory to ecofeminism is to create specific social changes. Complexity theory, purportedly, eschews predictive practices; therefore, if it can be used to dissect, create, or manipulate social patterns in particular ways, social systems of domination become conceptually denigrated to simply complicated (meaning predictable given known variables (Davis and Sumara 2006)), and not complex (meaning unpredictable given the exponential or more-than-the-sum-of-its-parts nature (Davis and Sumara 2006)). Furthermore, it is unclear what connection(s) if any there are or can be between complexity theory and notions of ethics or morality.

Complex systems develop through the local interaction of individual agents; however, they are typically not egalitarian. Often discussed in terms of network theory, agents of complex systems are referred to as nodes, and the development of a network generally involves the super connectedness of only a few nodes within the network (Barbarasi 2003). These highly connected individuals - called "hubs" in network theory (2003, 55) - are responsible both directly and indirectly for the growth and development of the system. So, if complexity theory is used as a model for social change, there is a high probability of the development of such powerful individuals. This might not be problematic if the individuals are morally conscious, but this scenario, on the surface at least, seems to differ little from that of a potentially benevolent dictator. Furthermore, although complex systems demonstrate a high degree of stability, they are susceptible to a fairly simple demise: it takes only one blow to a highly connected individual to destroy the whole system. These issues have yet to be sorted out and so it seems to me that there is some serious work to be done in the context of this theoretical union.

Complexity is an effective tool for creating and inspiring robust creative structures, but there is a risk inherent in the unpredictable nature of complex systems. Highly adaptable structures can facilitate the maintenance and reproduction of oppressive systems as they respond effectively to

changing and varied contexts. Indeed, complexity theory has been taken up in a number of capacities by institutions notoriously associated with domitory hierarchies: the state (Moffatt 2003), the church (Wollert 2004), and corporations (Senge 2006). Thus, as the issues of social structures and the problems of domination continue to garnish theoretical attention, ecofeminists, as Erika Cudworth (2005) suggests, could benefit from the broad range of conceptual tools that complexity theory has to offer. Complexivists too may benefit from epistemic values and ethical commitments that are at the core of ecofeminist theory. These are values of being and becoming that would set the boundaries of its application. There is no guarantee that what becomes will be better than what is; however, bi-focal vision allows for a perception of multiple realities, of blurred boundaries, ambiguities, liminal spaces, places where one can interact with what is and with what could be.

Successful coalition of complexity theory and ecofeminism rests on the development of a bi-focal vision, a continued openness to novelty and uncertainty, and a foundation of responsible epistemic values. Complexivists that only see one dimension of a complex system have the same monistic epistemic values as those associated with a mechanistic mindset. Yet, ecofeminists who do not see a monistic mindset as a constitutive element of plurality employ a similar reductive strategy by reducing upward, or in other words, constricting the space of plurality.

This sounds like remarkably dangerous territory for an academic paper, but it is an idea that is ancient: If we change the way we look at things, the things we look at change. Of course this is metaphoric, and I am not suggesting that I can wield some kind of Superman laser eye and convert solid objects to dust. But clearly we can engage a variety of perspectives on a single issue that allows for a degree of uncertainty and unpredictability, which would in turn grant a degree of freedom to whatever it is that is subject to our gaze. I turn now to explore curdled logic as a way of thinking about bi-focal vision, or in other words, how to think



about thinking in multiple.

### Logics

Purity, for Maria Lugones (2003), is a concept that describes a pervasive epistemic norm. "According to the logic of purity, the social world is unified and fragmented, homogenous, hierarchically ordered" (Lugones 2003, 127). This logic demands purity and certainty, which subsumes diversity and maybes. Such a perspective denies the living history of the world in which beings become, develop and change by positing the clear isolated abstract as the ideal reality. Purity as an objective goal negates the dynamic adaptation and creative existence of beings and entities that are irreducibly complex.

Yet, I would not advocate that purity in all forms be done away with entirely; epistemic norms are important and necessary. Certainly I am not ready to part with the technological furnishings that have been developed under its practice. There is no turning back. The world is our history, and the ways in which it has been known contribute to how it is and who we are. Clarity is still an important element of communication, growth and development. When I take my children to the hospital, I would prefer that the attendants are clear, sure and absolute about what they need to do and how they need to do it. I want my mechanics to be clear, sure, and absolute about what my car needs to run safely. It is not yet time to relinquish such epistemic norms entirely.

At the same time, I am not sure if anything is ever really pure. There is very little certainty. The attendants at the hospital make an informed guess as to the appropriate actions to take, but there is no guarantee. So it seems to me that to the extent that epistemic norms exclude multiplicity and uncertainty as important elements of purity, "domination, in which power and ideology are at all times changing into each other" (Lugones 2009, 127) remains a reality. To challenge and resist requires a curdled logic. What is needed is a way to have one's cake and eat it too - so to speak.

Curdled logic implies an open view of

the world that spans an expansive epistemic territory. "According to the logic of curdling, the social world is complex and heterogeneous and each person is multiple, nonfragmented, embodied" (Lugones 2003, 127). Like a kaleidoscope of colours, ambiguity renders dichotomies powerless and calls focus to the worlds of dreams and imaginations. It validates contradiction and paradoxes as critical constructors of interest and complexities. In this logic lies the possibility for reasoning in a classical sense with all its dichotomies, hierarchies and searches for absolutes and concretes; but it limits them to specific situations and conditions. Lugones (2003, 125) describes the logic of curdling as a "hybrid" imagination, and this description challenges the unity of worldviews that claim broad closed territories. It allows mechanistic reasoning to work well for machines and technology without stretching that conceptual canvas to cover entire cosmologies and smother the living world.

Responsible epistemic practices and bi-focal perception is engagement with a real material world. This engagement is not to yield nice clean theories of appropriation and objectification; rather, it is to dance with the bodies around us, to "be" together and to "know" one another through conversation and other meaning-making activities. Donna Haraway (2008) sees these activities, these conversations, as themselves a form of life such that knowledge emerges from connection. Navigating such a densely populated terrain requires adept perceptual agility. It requires what Barad (2008, 147) calls an "onto-epistem-ology - the study of practices of knowing in being."

It is a curdled logic for what I have called a bi-focal vision that will facilitate a successful coalition of complexity and ecofeminism because it accommodates a multi-dimensional way of being that navigates among what is and what is possible. From this perspective, entities are seen as consisting of multiple parts - identities, cultures, practices, experiences - that often work in contradiction to one another and feed on the tensions of ambiguity. Both complexity theory and ecofeminism speak as much to

the observer as to the observed, and so while one may not be able to change the world in specific ways, one can perhaps, as Maria Lugones might say, step into the limen, an open a space where there is hope for something new, something hopefully better.

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