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RESTORYING ENVIRONMENTAL EDUCATION

Figurations, Fictions,
and Feral Subjectivities

Chessa Adsit-Morris



Curriculum Studies Worldwide

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Chessa Adsit-Morris

Restorying Environmental Education

Figurations, Fictions, and Feral Subjectivities

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*I refuse to be intimidated by
reality anymore...
I can take it in small doses, but as a lifestyle
I found it too confining.
It was just too needful;
it expected me to be there for it all the time, and with all
I have to do –
I had to let something go.*

– Wagner, The Search for Signs of Intelligent
Life in the Universe, 2012

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LIST OF ABBREVIATIONS

BPA	Bisphenol-A, an endocrine disrupting chemical.
EE	Environmental Education.
MSG	Monosodium glutamate (a form of the neurotoxin glutamate) used in the food industry as a flavor enhancer particularly in Chinese, Japanese, and Korean cuisine.
PAC	Parent Advisory Committee.
SF	SF is a material-semiotic sign used to describe a multitude of terms at once: Science Fiction, Speculative Fiction, Science Fantasy, Speculative Futures, Speculative Fabulation, String Figures, Science Fact, and So Far.
WCHP	White Capitalist Heterosexist Patriarchy narratives.

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How to Create Human Humus Instead of Human Hubris



Fig. 1.1 Space-Time Wanderings of a Bag-Lady. Copyright 2016 Lauriel J. Adsit

Abstract “How to Create Human Humus Instead of Human Hubris” serves as the introduction to this book and provides a brief overview of the books’ main topics, discourses, and themes, as well as a description of the research questions that drive and sustain these lines of inquiry. Introducing the varied theoretical approaches, foci, and philosophical commitments of the feminist social scientists engaged with throughout this book, this chapter sets the foundation for the methodological research practices developed in later chapters. This chapter also provides a brief overview of each chapter—an initial sketch or map—not with the goal of identifying a fixed location or fixed position, but to allow for the exploration of the multiple complex locations and overlapping territories of teaching, learning, and research.

Keywords Environmental education · New materialism · Praxis · Feminist social sciences

Wild domesticated woman waiting for the return of cyborg salmon and seeking feral sociality and citizenship. Looking for like-minded others.

Leesa Fawcett

I came to the University of British Columbia (UBC) lugging this heavy bag of stuff—a heavy bag of stories. Maybe I ventured to UBC to figure out what to do with them. Many of them were contradictory, all of them were personal. I spent the previous five years working as an environmental “sustainability” researcher for an architectural firm, having to research and tell stories of environmental degradation, pollution, habitat loss, and climate change due to human development and resource extraction, as well as spout sermons on humanity’s “responsibility” to protect and conserve the natural world for “our” own future survival. These narratives bump(ed) up and rub(bed) up against memories and experiences of exploring and growing-up with (becoming-with) a multispecies creative community. Stories/experiences in

Epigraph from Leesa Fawcett’s (2009) essay “Feral Sociality and (un)Natural Histories: On Nomadic Ethics and Embodied Learning” in Marcia McKenzie, Paul Hart, Heesoon Bai, and Bob Jickling (Eds.) *Fields of green: Restorying culture, environment, and education*. Reprinted with permission by Hampton Press.

which “nature” had an agency of its own that I responded to and created—with instead of controlled, dominated, subdued, or objectified. Experiences that created ethical multispecies stories of emergent artistic relations. But I am—we are—bombarded everyday with capitalistic, materialistic, anthropocentric stories of human superiority, human hubris, world-saving advanced technologies (via advanced capitalism). Which stories do I share, keep, discard, and/or alter? What type of world(s) do we want to “save” and “sustain” through these stories? They aren’t all my stories. Some were given to me—family stories, cultural stories, historical stories—some I found disregarded on the side of the progress(ive) highway, thrown overboard, and deemed to be un-useful. I pick(ed) up stories that some people refuse to take response-ability for; stories of environmental destruction, social injustice, animal cruelty, climate change, pollution . . . stories many sweep under the bed, stuff in closets, or leave on the doorsteps of NGOs. Maybe I came to UBC looking to find others able and willing to help share the load. Maybe I came looking for stories that would gather us together in creative, empathetic, and empowering ways. Stories move us, draw us together, separate us. They take us into the past and through to the future. They allow us to see from “Others” perspective(s). They allow us to imagine new/other worlds. The critical question remains: What stories, what world(s) do we want to share and sustain?

It seems to me as though I keep telling the same story over and over again, like a crazy bag-lady wandering around speaking to anyone who will listen (or not listen), discussing—sometimes shouting, in what some may describe as incoherent gibberish—what Donna Haraway (2004, 2) describes as, “one or another aspect of [the] inherited dualisms that run deep in Western cultures” (Haraway 2004, 2).¹ These dualisms are tricky and perverse. They have become embedded in complex networks of relations and realities. Yet, instead of breaking them down, unhinging them, reversing them, or resolving them into larger wholes, this work is an attempt to restory them, to think them otherwise, and hold them together *with-in* the complex, dynamic, messy world emerging/evolving out of our everyday *beings* and *doings*. It is an attempt to, as Haraway (2004, 1) construes, turn “lines into webs, trees into esplanades, and pedigrees into affinity groups.” We are in what Marcia McKenzie (2005, 401) calls the “post-post period,” typified by “multivoiced texts, researcher reflexivity, cultural criticism, and experimental works.” The “post-post period” calls into question the relationship(s) between the researcher and the researched, as well as issues of (mis)representation, legitimation, and power. McKenzie (2005, 403) explains that “research

in the post-post period views the researcher's 'precarious, contradictory and in progress subjectivity' as consciously and unconsciously framing the research process and outcomes."² Mary and Kenneth Gergen (2000, 1037) resolve that, as researchers we must acknowledge and embrace our polyvocality—an acknowledgment of the "multiplicity of competing and often contradictory values, political impulses, conception of the good, notions of desire, and senses of our 'selves' as persons"—as well as the partial nature of our voices.³ It requires what Rosi Braidotti (2006, 115) calls "epistemological humility," the "assumption that we cannot immediately comprehend everything." This means acknowledging that our "researcher identity" is not separate and/or isolated from our other personal/ecological/spiritual/professional identities and that we are situated within our research questions and subject matter using partial, located, and embodied knowledge. Yet, as Haraway (1988, 589) explains, it is not about locating oneself in a fixed location or fixed position, but viewing "from a body" that is "always a complex, contradictory, structuring, and structured" location. Thus I begin from the messy location I find myself situated—in the middle of things. Through this work I began to, as Carl Leggo (2008, 20) beautifully puts it,

Realize finally that I do not need to follow slavishly any roles. I can begin with who I am in the specific geographical, ideological, political, spiritual, physical, social, chronological, psychological, emotional, intellectual, psychoanalytical, economic locations where I dwell, and from these locations, I can seek to understand my relationship to others in their locations.

We are also living in a time that Braidotti (2006, 1) calls the "technologically driven historical phase of advanced capitalism," a period Haraway (2016) calls the Capitalocene, in which everything—from our genetic makeup to the environment we depend on—has become commodified and technologically mediated: social capital, natural capital, financial capital, human capital, spiritual capital. Other academics/scientists are calling the future epoch we are entering the Anthropocene, the geologic period in which humans will have (had) the most profound and measured impact on the planet—from global warming to the acidification of oceans, to the bleaching of the coral reefs resulting in mass extinction, and the loss of biodiversity.⁴ We have, as Haraway (2014, n.p.) expounds, created a "layer of profound change . . . written into the tissues of the planet." There has also been an exponential explosion in advanced technologies and new

sciences (ecology, genetics, quantum physics, developmental biology, microbiology, evolutionary theory, complexity theory, etc.) attempting to address complex immunological, anatomical, physiological, neurobiological, evolutionary concepts/ideas/problems, including such political/militarized/masculine euro infused research projects as the Human Genome Project and the “war on cancer.” With Haraway (2014, n.p.) I wonder: “What happens when human exceptionalism and methodological individualism as philosophical research commitments across disciplines in the euro infused knowledge projects . . . end their stories [and] become literally unthinkable in the best scientific practices of our day?” The academics and feminist social scientists that I *think-with* throughout this book/bag/sack propose new scientific narratives (fictive hypothesizes) that might just be truer and more livable, creating spaces for alternative modes of thought, intra-actions, and emergent new species to exist. This book explores the implications of such narratives for environmental education, hoping to restore environmental education in ways that allow us to *teach-with* and learn from the multiple complex locations we inhabit and beings we encounter.

Following Leesa Fawcett (2000) in her essay “Ethical Imagining,” I wonder, how do we learn and teach students to encounter the “Other” in all its complexity? In this semiautobiographical book, I hope to hold together the contradictions I have inherited and gathered—specifically in relation to the western educational system—and learn to encounter the “Other” (both real and imaginary), including the other that is my constantly shifting/growing “self” that is, as Haraway (1988, 586) describes, always “partial in all its guises, never finished, whole, simply there and original.” As she continues, partial beings are “always constructed and stitched together imperfectly, and therefore able to join with another, to see without claiming to be another” (*ibid.*). My hope is to join with and nurture what Fawcett (2009, 227) calls, “feral creatures of environmental knowledge, creatures of hope.” Creatures not ashamed to dig through the waste of human hubris and cobble together partially digested ideas. Creatures not afraid to, as Haraway (2014, n.p.) describes, “collect up the trash of the Anthropocene [and] the extermination of the Capitocene,” to create instead human humus, a rich compost pile teaming with life.

My research is an ongoing inquiry into possible alliances, possible narratives, possible worlds that may allow us to make sense of (what Haraway [2008b, 2014] describes as the promise of fragile and mortal coherence) our shared relentless co-vulnerability and learn to “get along with some grace”

(to live well with) in the face of that which is threatening to kill us. This requires grappling with the stories we have inherited, identifying/collecting generative stories of cohabitation, and crafting more livable stories to pass on. This is a task that, as Haraway (2004) explains—drawing on Derrida—always and relentlessly remains before us. This inquiry has led me outside the limits (and boundaries) of the Euro-American “western” metaphysics, in search of other ways of thinking and relating, doing and being. I found myself situated with a number of thinkers and doers who, instead of abandoning all the practices and knowledges/information created under the dominant ideologies of science and technology, choose to draw them kicking and screaming down from their ivory white tower (into the mud and compost) and replace them with other stories. For as Haraway (2004, 1) explains, “stories are always more generous, more capacious, than ideologies; in that fact is one of my strongest hopes.” The scholars/academics I think *with* in this book—in particular Haraway (1988, 2003, 2008b, 2013, 2016), Karen Barad (2007, 2008, 2012a), and Braidotti (2006, 2011, 2013, 2014), but also including Katherine Hayles (1995), Lynn Margulis (1998), Astrid Schrader (2010, 2012), and Natasha Myer (2012)—make up a diverse intra-active field, marked with cross-contamination, non-innocent partial translations, with—as Barad (2012b, 1) describes—“varied approaches, foci, and philosophical commitments. . . . It is a richly inventive endeavor committed to helping make a more just world.” They work without “any illusion of clean hands and unapologetically express their enthusiasm and amazement for the world and the possibilities of fostering just relationships among the world’s diverse ways of being/becoming” (*ibid.*).

The collaborative research project discussed in this book is twofold: An eco-art action research project with a local elementary school, which provided an opportunity to inquire into the types of environmental stories currently being told in the education system and the im/possibility for/of other stories (multiple other stories) to be told/shared/experienced; and a semiautobiographical narrative inquiry into the type of “shift in thinking” that is required to think ecologically (outside of the western metaphysics and representationalist paradigm), inquiring into the types of co-created stories that might gather us (sympoetic stories), figurations that might teach us (holobionts), and locations (historically embedded and embodied) that just might foster new relations (new assemblages).⁵ I chose to take up a new materialists’ methodology, a post-human performativity which, as Nikki Rotas (2015, 101) explains, calls for “an affirmative approach [to research] that undoes binary logic

by *thinking* and *doing* simultaneously.” For as Patti Lather (1991) argues, “theories are nurtured by actions and that theorizing is performative; it grows in and out of practical grounding”.⁶ Both *thinking* (theory) and *doing* (action) are material-discursive acts; all research activities/actions/inquiries/measurements have affects. Research is, as Barad (2012a) reminds us, an *ethico-onto-epistemological* matter. Therefore, I chose to embrace and strive for positive and collaborative affects through response-able actions. In this new materialist research praxis, thinking is doing and doing is thinking, and both are experimental world-making practices.

In this research journey I engage with various lines of inquiry around ecological thought, specifically pertaining to the type of shift in thinking required to think more ecologically—what Braidotti (2006) calls a “qualitative shift in perspective,” Haraway (2004) calls a “perverse shift,” Arne Næss (2005) calls a “gestalt shift,” and Gilbert Simondon (1995) calls an “ontogenetic shift.”⁷ I situate myself among new materialist theorists who attempt to, as Stacey Alaimo and Susan Hekman (2008, 9) describe, think “through the co-constitutive materiality of human corporeality and nonhuman natures . . . [opening up] possibilities for transforming environmentalism” and environmental education. Such thinking practices require an understanding that, as Hawarar (2014, n.p.) states, “it matters what thoughts think thoughts, it matters what knowledges know knowledges, it matters what relations relate relations, it matters what worlds world worlds, it matters what stories story stories.” Along with other stories, I have collected many questions throughout my research travels that deepen and complicate the stories created and encountered. Like any good bag-lady I pick them up, inspect them, ponder as to whether they will be useful, and search for a place for them in the vast sack that is my inquiring body/mind. I carry them to new territories, pull them out if I think that they might connect and thrive, not with the goal of answering them (not to end them), but to use them to open up space for wonder and amazement.

How do we think more ecologically within and outside of the limits of the western metaphysics?

What does an ecological “shift in thinking” entail and look like?

What types of stories, figurations, and/or relations are needed to sustain such an ecological shift in our thinking?

How do we create stories/opportunities for encounter that “don’t reduce the unknown subjectivity of an other being to the limited range of our own experiences?” (Fawcett 2000, 140)

How can we open up the formal school curriculum to encourage ecological thought and opportunities for students to encounter “other” beings in all of their complexity?

How can I do research that is collaborative and positively affects all co-participants, creating an environment and a space that fosters experimentation and creativity?

This research journey begins with a mapping praxis because, as Lather (1991, 154) reminds us, “the map precedes the territory.” “A Cartographic Mapping Practice” (Chapter 2) serves as a theoretical literature review, a tracing of the stories that make up and shape environmental education, their modes of storytelling, and an inquiry into which stories normalize all other stories (Haraway 2014). In attempting to move away from environmental education as a practice of teaching “about” nature, as well as away from simply tracing the history of environmental education, I began a mapping praxis—a cartography—as Braidotti (2011, 4) describes it, “a theoretically based and politically informed reading of the present,” in order to find “analytic and exegetical tools for critical thought and also creative theoretical alternatives.” In mapping out the territories of educational theory and practice (specifically focusing on environmental education), I found that the current, capitalistic, hyper-modern society has created complex modes of control and domination requiring new analytical tools to deconstruct, critique, and out-manuever their coercive powers. Thus, following environmental educators such as Noel Gough (1998, 2006, 2009, 2010), Fawcett (2000, 2009), and Patricia O’Riley (2003), I ventured through the post-structuralists (gathering up their discursive practices), and then turned towards the New Materialists hoping to “account for [my multiple] locations in terms both of space (the geopolitical, social, and ecophilisophical dimension) and time (the historical and genealogical dimension),” and find “alternative figurations or schemes of representation for these locations” (*ibid.*).

Situating myself outside of the western metaphysical territory, unmoored from its theoretical foundation of knowledge, with no solid ground, no fixed location, no home; I had to imagine new ways of *doing* and *thinking* research. Thus, I took up a nomadic bag-lady methodology of wandering and gathering. In “Bag-lady Storytelling” (Chapter 3), I describe this performative methodology as a creative (re)twist of Ursula Le Guin’s (1989) “Carrier Bag Theory of Fiction.” Using the figuration of Trudy, the chatty Times Square bag-lady character in the one-woman Broadway play, *The Search for Signs of Intelligent Life in the Universe* (Wagner 2012), I imagined a nomadic new materialist methodology. Bag-lady storytelling as a performative research

praxis is a practice of gathering stories and creating patterns as we wander habitually through our territories of research. As I illustrate, such a praxis requires a different logic, an attunement and attentiveness to what gets gathered up, used, shared. An attentiveness to which seeds/stories should be saved for future reseeded, for future reworlding (Haraway 2016).

The research journey expands and deepens as we venture out into the world and begin *doing* and *thinking* with the various human and nonhuman others we encounter. “Doing” (Chapter 4) is a (re)storying and recounting of a yearlong action research project undertaken with a Grade 4/5/6 class in order to inquire, learn, and teach environmental education by creating an eco-art installation around the Lost Streams of Vancouver. Using the figuration of the salmon, we attempted to imagine education as a process of metamorphosis in which diverse bodies and beings grow and adapt to new environments, a collective *becoming-with*. We found that the eco-art we encountered and created throughout the year provided openings for other stories and “otherworldly conversations” (Haraway 2008a), opening up the formal curricula to practices of experimentation, collaboration, patience, and to discovering the creative agential world outside the classroom. “Thinking” (Chapter 5) is a semiautobiographical inquiry into the types of figurations that might teach us to relate otherwise and the types of stories that might allow us to think otherwise. As Braidotti (2014, 15) explains, “thinking is the conceptual counterpart of the ability to enter modes of relation, to affect and be affected, sustaining qualitative shifts and creative tensions accordingly.” My hope was to push, drag, coax, trick, or pull ecological thought outside the boundaries of western metaphysics, outside the territories of systems theory, into the muddy and mucky world of everyday creatures, into the realm of a post-Newtonian, complex, embodied, creative, indeterminate, un/in/folding world. This semiautobiographical narrative inquiry also documents my metamorphosis in thinking and learning, exploring the experiences and practices of relating that I have inherited, and the new understandings that have emerged from my research practices.

The final chapter of this book/bag/sack is not a conclusion, it is not an *ending*. It is instead a sharing—a showing—of what I collected, created, and carried with me on my research journey. Carrier-bag assemblage/ing. It is an experimental act of crafting an assemblage, a process of arranging, organizing, and fitting/cobbling/stitching together stories of otherworldly conversations/encounters. Following Haraway, who is able to playfully unpack figurations through their multiplicity—their contradictory political, material, natural, cultural, and spiritual identities—you will

encounter the multiple beings/doings of the salmon, a lively figuration whose complexities and contradictions bring forth a deeper understanding of the entangled nature of the material and the discursive. Similar to Barad (2010, 244) I have “attempted to write . . . in a way that disrupts the conventions of historical narrative forms that underlie stories of scientific progress” by holding together “entanglements of here and there, now and then,” presenting stories “threaded through one another, knotted, spliced, fractured, each moment a hologram, but never whole.” And, like Braidotti (2006), it is my hope that by encountering and conversing with such “Others” we just might learn to wander nomadically and find that which just might be able to help hold together all of our heteronymous ideas, beliefs, and theories.

In the end, I am but one “captive-domesticated-feral-companion-wild” woman waiting for the return of alien cyborg salmon, seeking feral sociability and citizenship, gathering up like-minded others, in order to make more livable stories and worlds, and learn to live with the *mystery* of life (Fawcett 2009).

NOTES

1. In this book I take up a nomadic deleuzeguattarian interpretation of the term wander, or what Braidotti (2011) describes as *conscious nomadism*, atypical to its usual (negative) description of wandering aimlessly, without direction, *id est* being lost. A nomadic deleuzeguattarian interpretation of the term “wander” allows us to understand the practice of conscious wandering as a “move in a noncausal yet (inexplicably) clearer direction” (Berman 2000, 198). It is a practice of being open and attentive to the vital forces that shape our becoming-withs. A nomadic worldview calls for rhizomatic/ecological thinking, an element that Braidotti argues is vital to creating nomadic subjects and an ethics of sustainability. The term “nomad” derived from the Greek *nomas*, meaning wandering (roaming or roving) in search of pastures (OED); wandering is a spiritual movement, a practice of connecting with universal flows and forces. As Morris Berman (2000, 81) explains, according to Bruce Chatwin (1987) in his book *The Songlines*, the wandering movement is “central to the nomadic consciousness, to human fulfillment . . . it is an instinctive migratory urge, something we carry with us in a genetic or inherent sense.” The term wander also refers to the changes occurred during metamorphosis, a body wandering off from its usual course of development. Or simply (in a negative connotation) to an elderly persons’ brain/mind/thoughts wandering off due to illness or exhaustion, causing delirious, rambling talk.

2. McKenzie is quoting M. Orner's (1992) book chapter: "Interrupting the Calls for Student Voice in 'Liberatory' Education: A Feminist Post-Structuralist Perspective." In C. Luke & J. Gore (Eds) *Feminisms and Critical Pedagogy* (New York: Routledge), 74–89.
3. As quoted in Marcia McKenzie's (2005) essay "The 'Post-Post Period' and Environmental Education Research."
4. Haraway (2014, n.p.) proposes the term Capitalocene, because as she explains, "the Anthropocene is in fact premised on the exploitation of fossil fuels and that is the story of modern formations of systems of commerce, capital, financialization, production and extraction of vast amounts of wealth on the fund of carbon."
5. Figurations, a literary tool introduced/used by Haraway, are tropes or figurative metaphorical beings found within specific cultural traditions. They are, as Braidotti (2011, 101) explains, "a commonly shared foundation of collective figures of speech." Haraway (2004, 2008b) creates new powerful figurations (i.e., cyborg, dogs, OncoMouse™, and other companion species) to work/think/play with, in order to challenge existing taken-for-granted notions and habitual practices of thought. For Haraway (2008b, 4), figurations are where the imaginary meets the ordinary every day; figurations are not "didactic illustrations, but rather material-semiotic nodes or knots in which diverse bodies and meaning co-shape one another."
6. As quoted in Rotas (2015, 94).
7. I believe that the shifts in thinking required to create more nomadic subjects (and subjectivities), in order to think more ecologically, are multiple. There have already been a number of turns (i.e., the linguistic turn, corporeal turn, spatial turn, material turn, etc.) that begin to create such shifting movements (just need to keep the momentum going). Berman (2000, 56) argues that the shift from nomadic hunter gatherers to settled storage "potato growers" (Brody 2001) through the creation of "mortars, grinding stones, containers and durable dwellings," involved "an important mental shift: A distrust of nature, which is echoed (and . . . accompanied by) a distrust of human beings. For the nomadic way of life involves a fundamental trust in the ability of the natural world to provide, and along with this, an ethos of sharing with others."

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A Cartographic Mapping Practice: Environmental Education, the Material/ Discursive, and a New Materialist Praxis

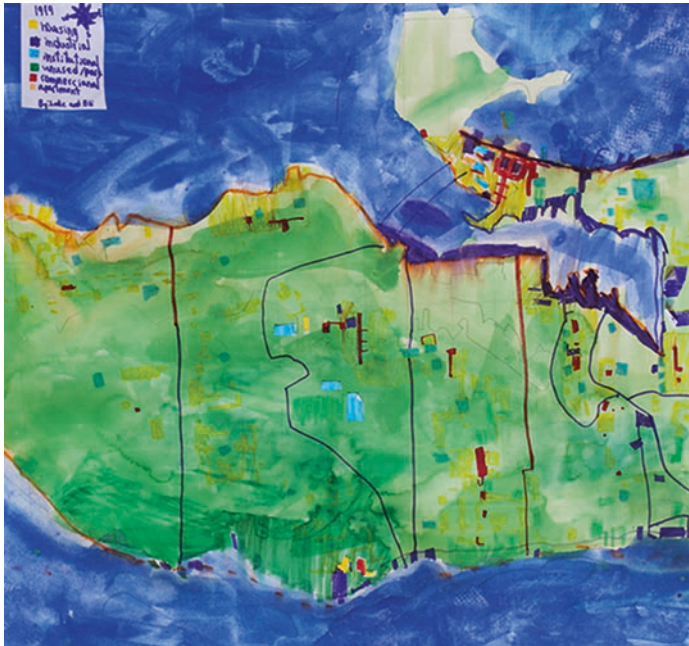


Fig. 2.1 Map of Vancouver Circa 1919 (Student Painting). Copyright 2015 Chessa A. Adsit-Morris

Abstract “A Cartographic Mapping Practice” serves as a theoretical literature review, a tracing of the stories that make up and shape environmental education (EE), their modes of storytelling, as well as an inquiry into narrative practices of normalization. The chapter illustrates a mapping praxis, a cartography, attempting to move away from EE as a practice of teaching “about” nature, by understanding how the current capitalistic, hyper-modern society has created complex modes of control, requiring new analytical tools to deconstruct, critique, and outmaneuver their coercive powers. Gathering up the discursive practices of the post-structuralists, the chapter explores New Materialist theories hoping to find alternative figurations and schemes of representation to account for the multiple complex locations and overlapping territories of teaching, learning, and research.

Keywords Cartography · New materialism · Post-structuralism · Environmental education · Story

To embody ecological learning from diverse ethical and epistemological standpoints, one has to remember or learn anew how to story it differently. Great stories and ethics require great imagination.

Leesa Fawcett

When I was a little girl I loved to create my own worlds, alone in the craft/play room I would spend hours cutting, sewing, gluing, painting, building structures for imaginary (and real) beings with their own tiny worlds. These worlds were fruitful places of material imaginings, ecotones; “mortal world-making entanglements that I call contact zones” (Haraway 2008b, 4). It was not until I was six when, while I was busy in my craft room making worlds, my aunt came to visit and challenged my understanding(s) of the creative playful process(es) of worlding and introduced me to instead, the story of capitalism. As I sat, exploring the ecology of materials (the mess or cat’s cradle [Haraway 1994, 2008b, 2011] of materials that were scattered

Epigraph from Leesa Fawcett’s (2009, 230) essay “Feral Sociality and (un)Natural Histories: On Nomadic Ethics and Embodied Learning” in Marcia McKenzie, Paul Hart, Heesoon Bai, and Bob Jickling (Eds.) *Fields of green: Restorying culture, environment, and education*. Reprinted with permission by Hampton Press.

about my world), my aunt asked me: “How would you make art if you didn’t have any money? If your mom hadn’t bought you all these things?” As a small girl I had never thought about where the materials came from, only what I could create with them. Seeing the puzzled look on my face, my aunt continued, “your mom purchased all these art materials from the store, how would you make art if you didn’t have glue or paintbrushes or paper or scissors?” A bit confused and flustered I tried to find a material that hadn’t been purchased, but to me these materials weren’t things/items/objects to be bought and/or sold, they were material extensions of my imagination, they had an agency and a life of their own that I related to (or “played with”). Every material/object/tool I chose was reduced to an economic (e)valuation. Finally, I explained that I would simply make my own paintbrushes using pine needles, twigs, and twine . . . use flowers to paint, and rocks to make sculptures. “But who owns the land?” My aunt countered. “Someone owns the land you get those materials from, even parks are owned by the government.” In this ten-minute conversation my world became reduced, my relations and understandings altered and fixed by financial interactions; the story of capitalism became real.

OLD STORIES: TRACING THE DUALISMS IN ENVIRONMENTAL EDUCATION

Our lives are filled with stories. Science fiction stories, political stories, love stories, heroic stories, tragic stories, news stories, mythical stories, autobiographical stories, and historical stories, told in all sorts of ways—orally (through storytelling, poetry, and song), written (in novels, scripture, academic research, non-fiction books, letters), visually (through photography and the visual arts), and through multimedia/technology (movies, TV shows, video games). This was the first “white capitalist heterosexist patriarchy” (WCHP) narrative (Haraway 2008a, 171) I was introduced to in a real way, in a way that shaped my *beings* and *doings*, my understandings of how the world worked and how I related to it. I have collected many of these stories over the years; society is bombarded with these narratives almost every minute of every day—stories of ecological, social, and cultural domination and objectification—stories related to/based upon, what Marcia McKenzie (2009, 212) identifies as, “anthropocentrism, globalization, colonialism, racism, classism, heteronormativity.” As Jenny Reardon (2014, n.p.) reminds us, these are the stories of our time, the stories of the

Anthropocene in which “the problem is out there, in grand systems that are collapsing” grounded in, what Jan Oakley (2011, 8) describes as “anthropocentric Western characterizations of humanity as separate from other species and the natural world—the belief that we are somehow of a different, and more important order, than all other animals.” This is not a new story. Many environmentalists/academics (Gregory Bateson 1972, 2000; William E. Doll 2013; Haraway 2008a) track the story back to Genesis 1:26–31 and 3:23–24 in which “God established the first national park in the Neolithic First World, now become the oil-rich Third World” (Haraway 2008a, 158); separating light from dark, land from water, humans from animals, and man from woman, creating a pristine garden filled with everything man could need. A story now retold under the title of “Sustainable Development” defined by the United Nations Educational Scientific and Cultural Organization (UNESCO) as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (UNESCO 2014; originally published in *The Brundtland Report* “Our Common Future” in 1987)—to “replenish the earth, and subdue it” (Genesis 1:24–31)—a definition that has influenced environmental policy, thought, and ethics over the last two decades (Bonnett 2009); a definition (a story) anthropocentric to its core, justifying the objectification, domination, commodification, and destruction of nature in the name of progress and human welfare (the story told by the “potato growers,” not the hunter-gathers).¹

Other academics including Heesoon Bai (2009), Sean Blenkinsop and Kieran Egan (2009), Vicki Kirby (2008), and Val Plumwood (1993) trace these narratives back to Plato and his *Allegory of the Cave* and then through to Descartes; the Cartesian “colonialist epistemological dualisms of relativism and realism” (Haraway 2004, 3) of nature/culture, mind/body, human/nonhuman, animate/inanimate, that lead the way to the hierarchical ordering, quantification, and the justification of human domination and control. The story—valuing the intelligible rational scientific mind (concept-based, discursive understandings based on hard, measurable, scientific facts) over sensual artistic/creative/imaginary forms of thought and embodied ways of knowing (Bai 2009)—has lead the way for western science and politics’ “escalating dominations of abstract individuation, [the creation of] an ultimate self untied at last from all dependency, a man in space” (Haraway 2004, 9) conquering the final frontier. As Haraway (2004, 2) explains, “all of these dualisms [that run deep in Western cultures] escape philosophical confinement or religious ritual to find themselves built into

weapons, states, economies, taxonomies, national parks, museum displays, intimate bodily practices, and much else.” Bai (2009, 141) explains that we are all “children of Plato and Descartes”:

Our consciousness is dominated by the spell of the discursive, and by the time we are out of childhood and through formal schooling, most of us have largely disposed of the animated sensuous perception of the world. Many of us may recall how in our childhood the world seemed like an enchanted place, not because anything extraordinary or spectacular happened, not because we felt we were very powerful and could make things happen at will, but because we could feel the pulse of life and mystery of being in every thing and being that surrounded us.

As Blenkinsop and Egan (2009, 85) note, “modern western education as practiced tends to represent the underlying presuppositions of its culture, and that [current ‘hyper-modern’] culture tends to situate itself in competition with the non-human world . . . general educational theory and the current troubling environmental situation both arise from that same nexus of modern western ideas.”² As the authors/editors of *Fields of Green: Restorying Culture, Environment, and Education* (McKenzie et al. 2009, 2) note in the introduction to the book, there is indeed “a history of wrestling with education as a means of cultural reproduction or transformation.” Education (formal schooling) has been “reformed” (or “deformed” [Pinar 2012b, 2015]) over and over again by political parties/interests “starting in 1968 with Richard Nixon’s ‘Back to the Basics’ campaign” (Pinar 2012a, 3). Progressive education—that is, education focused on the development of subjectivity through experience and academic study (Pinar 2012a)—has been replaced by instrumentalist and deterministic education (“social engineering”) focused on assessment and outcomes, through practices of competition, standardization, “best practice” instructional guidelines, and testing; teachers being replaced by technology, experience for assessment, knowledge for information, study with memorization, and dialogue for textbooks (Pinar 2012b). As William Pinar (2015, 114) describes,

Today we understand education as a series of numerals, as test scores on standardized examinations, to be supplemented, if the Obama Administration succeeds, by rates of graduation. Not only philosophy, but subjectivity itself becomes bleached from schooling, itself reduced to test preparation. In the United States educational institutions have been

deformed; they are now cram schools. Dewey's coupling of democracy and education has been superseded by business and schooling.

Educational theory—including curriculum studies and the research that informs it—is grounded in and greatly influenced by the Euro-American “western” metaphysics, and as Lather (2006) warns, there has been a resurgence of “positivism and governmental incursion” within the fields. Thus, within the western educational system, environmental education (EE) is far from innocent in the types of stories it tells and teaches; stories inherited from a range of disciplines and philosophies, a situation that, as Robert Carter and Bora Simmons (2010, 4) explain, “often has given rise to confusion regarding EE’s identity and application.” Although legislation around, and recognition of, environmental issues began in the 1940s to 1960s—starting with the writings of Aldo Leopold (1949), John Kenneth Galbraith (1958), Rachel Carson (1962), and Steward Udall (1963), and including the passing of the Wilderness Act of 1964, the Solid Waste Disposal Act of 1965, the Species Conservation Act of 1966, and the National Environmental Policy Act of 1969, as well as the establishment of Earth Day (most notably in 1970 when even Nixon argued for a renewed understanding of “man’s” relation to “nature”)—the 1980s (and the Reagan administration) was not so kind to EE and the advances made (Carter and Simmons 2010). The success of EE and the broader environmental movement was/is inextricably tied to the political times (an increasingly conservative dominated Congress in the United States) and gas prices (as long as gas prices are low and the economy is “good” we can keep denying that there is a looming environmental crisis). Nevertheless, naturalists, environmentalists, conservationists, biologists, environmental scientists, ecologists, and outdoor educators all contributed to the steady growth of EE. However, even with such a broad base, EE was/is still stuck on the inferior pole of the human/animal, nature/culture binary; held down or *smothered*, as Nikki Rotas (2015, 92) would argue, by theories and practices that teach “about” the environment, unable to “address . . . the complexity of ecologies on a global, or even local scale . . . [and who] continue to think and write about the environment as if it is ‘One’ being that needs to be understood and/or repaired.” And I would add, predicted, controlled, and regulated. Educators teach “about” nature and the environment through outdoor education programs, nature studies, conservation education, and now in the emerging field of environmental science instead of EE being threaded through and integrated across disciplines, resulting in EE being

seen as an “add-on” to the existing formal curriculum. EE’s fragmented identity also leaves it open to being hijacked by political agencies with the goals of creating a new “green collar” working class, renaming, reappropriating, and reengineering EE into “Education for Sustainable Development” (see Metz et al. 2010), teaching “about” the natural world and the environment as a resource. Most recently this can be seen in the Province of British Columbia’s new WorkBC plan “B.C.’s Skills For Jobs Blueprint: Re-Engineering Education and Training,” a strategic partnership with Liquefied Natural Gas (LNG) Canada—a joint venture among Shell, KOGAS, Mitsubishi, and PetroChina—in order to create “new opportunities [for British Columbia and its residents], including expanding LNG development in Northern BC, increased trade with Asia, new mines and mining expansions, growing forestry exports as well as increased activity in resource sectors, transportation, industry and business” (Province of British Columbia 2014, 7) resulting in one million new jobs by 2022. Starting by reforming K-12 education in British Columbia so that “students in elementary, middle or high school will get a better, earlier head-start to hands-on learning so they’ll be ready for the workforce” by teaching applied skills and “making it faster and easier for qualified tradespeople to earn teaching certificates” (*ibid.*, 8–11). The plan also hopes to “reach out to Aboriginal youth in their communities and work with them to make sure they have the education, training and support they need to find their place in *our* economic future” (*ibid.*, 14, emphasis added!). Colonialism, capitalism, racism, globalization, classism, and heteronormativity run amuck.

DISCURSIVE STORIES: TURNING FROM MATTER TO LANGUAGE IN EE

There are many of us who are tired of these stories, who believe that they just might be unlivable and unthinkable, for as Jennifer Reardon (2014, n.p.) reminds us, “we have eradicated the world, not through driving our cars and flying, but through the very way we tell the story of our times . . . stories of big bad actors out there—global capitalism, human hubris, asteroids—[stories which] require heroes to save us . . . to save the earth.” She continues by explaining that “rather than these apocalyptic tales . . . [we need] interesting tales. That is, stories that are of *inter*-est or that which lie between us.”³ These stories gather us because they are interesting . . . stories that invite and require new partners” and other ways of thinking and being in the world. As

McKenzie (2009, 212) explains, there are many academics and educators doing the heavy task of unpacking/destabilizing “those discursive understandings and practices that are viewed as contributing to socioecological injustice” by “problematizing particular formulations of knowledge . . . [provoking] reflection on what they view to be harmful understandings and practices,” working from within “the culturally bound qualities of knowledge” instead of outside of or above it. For example, many environmental educators are aware that how we language “nature” is important. As Rotas (2015, 91) explains,

Generalizable terms, static definitions, and catchy slogans are . . . problematic as they affect the ways that ecology is approached within schools. . . . [W]hen ecology is transformed into a school subject, it creates the assumption that ecology is a natural system, that it is universal, and that it is outside, or separate, from human communities.

Static definitions rely on “scientific” understandings of the “real” natural world, those that exclude the social, cultural, and political. However, there have been a number of shifts or turns within the “hard sciences” and social sciences that have challenged and complicated the modernist interpretations that ground the western metaphysics. As Karen Barad (2008, 124) explains in her essay “Posthuman Performativity: Towards an Understanding of How Matter Comes to Matter,” within the hard sciences this shift was a shift in “focus from the nature and production of scientific knowledge to the study of the detailed dynamics of the actual practice of science,” most notably by Bruno Latour and Steve Woolgar in their book *Laboratory Life* (1979), in which they conducted an ethnographic study of endocrinologists at the Salk Institute. There were also significant shifts within the social sciences that resulted in, as Elizabeth Ellsworth (2005, 3) describes,

A search for ways to rethink the terms of these binaries that have been so strategic to social, political, and educational thought . . . to create concepts and languages that release and redirect the forces now locked up in such binaries by addressing them not as separate and in relations of opposition but rather as complex, moving webs of interrelationalities.

Stacey Alaimo and Susan Hekman, in their book *Material Feminisms* (2008, 1) explain that “the turn to the linguistic and discursive has been enormously productive . . . it has fostered complex analysis of the

interconnections between power, knowledge, subjectivity, and language.” The linguistic turn is, as they continue, a turning away from the “epistemology of modernism [which] is grounded in objective access to a real/natural world” (*ibid.*, 2) (i.e., scientific realism or logical empiricism [see St. Pierre 2016a], sometimes described as simply placing labels onto “real” concepts and objects that can be “sensed” and observed), and instead moving toward an understanding that language shapes our perception(s) of the material world and that language is not neutral or transparent but is socially constructed. The linguistic turn, the cultural turn, and the interpretive turn, have all been influential in deconstructing the discursive practices that shape and constitute social reality, challenging modernist interpretations. Many academics took up social constructionist models, which allowed “productive and wide-ranging analysis and deconstructions of the concepts” (Alaimo and Hekman 2008, 1) that form the foundation of the western metaphysics. However, as Barad (2008, 124) points out, “scientific realism and social constructivism...share representationalist assumptions” (i.e., that words mirror preexisting phenomena), or as Alfonso Montuori (2008, xxx) explains in his introduction to Edgar Morin’s book *On Complexity*, “anything we consider disorder or complexity [(i.e., the unknown) is] simply a function of our limited knowledge,” or our inability to describe (or put into language) phenomena. As Barad (2008, 122–123) continues, the world is still “composed of individuals...with inherent attributes, anterior to their representation... [there is an] ontological distinction between representations and that which they purport to represent.” Representationalism is a “Cartesian by-product—a particularly inconspicuous consequence of the Cartesian division between ‘internal’ and ‘external’ that breaks along the line of the knowing subject” (*ibid.*, 125). Many times described as a triad (the “holy trinity” of science): the representations (the knowledge, “facts,” or language/words), the represented (the known/knowable “object of study,” or the material, real world), and the observer (the “objective” knower). As Barad (2008, 125) explains, “Representationalism is so deeply entrenched within Western culture that it has taken on a common-sense appeal.” We cannot ignore that this dualism is sedimented into our western metaphysics and epistemology (trickling through into our theories and research practices). Or, as Alaimo and Hekman (2008, 2–3) explain, the postmoderns have failed to deconstruct the “language/reality” dichotomy; “in their zeal to reject the modernist grounding in the material, postmoderns have turned to the discursive pole as the exclusive source of the

constitution of nature, society, and reality . . . they have rejected one side and embraced the other.”

There are a number of scholars who have been able to bring together the material and the discursive, most notably for educational theory is Michel Foucault, whose analytics of power, as Barad (2008, 127) explains, “links discursive practices to the materiality of the body.” Foucault put forth in his *Discipline and Punish: The Birth of the Prison* (1977) ideas around the intimate connection(s) between knowledge and power, particularly around the spatial and social structure(s) of institutions (prisons, schools, etc.) and how these structures—through the panopticon—control and create individual bodies (instead of collective, democratic entities) through observation, or what Doreen Massey (2004) calls the “spatial turn.” Within the field of education these ideas were important for recognizing that spaces and places of learning are not neutral or passive “containers” of social interactions. They are “technologies of power,” as Foucault (1977) labels them, that help to “naturalize competition and collective identification” (Armstrong 1999, 82). They function by attempting to collapse the individual identities of students into simplistic categories and pit them against each other. The school culture, and the organizational policies and practices that maintain this culture, then create feelings of isolation, alienation, and polarization among students. This polarization and the strict binary discourses of self/other, mind/body, thinking/feeling, reason/emotion, natural/artificial, right/wrong, and inside/outside solidify and maintain these boundaries establishing the field for conflict. These binaries have been strategic in the creation of the social, political, and educational environment of schools (Ellsworth 2005). It is these binaries, the juxtaposition and control of materials/environments, and the creation of “immutable mobiles” (such as centrally imposed curricula) that facilitate the stabilization and reproduction of existing models of education (McGregor 2004). These ideas have been taken up by environmental educators (particularly garden-based educators, outdoor educators, and place-based educators) to highlight the need for diverse learning environments. They gained significant momentum after Richard Louv’s (2005) influential book *Last Child in the Woods* was published in which Louv draws connections between access to nature and the healthy physical and emotional development of children (including the creation of an environmental consciousness), arguing that the current lack of access to nature within western society has led to many of the disturbing

childhood trends, including obesity, depression, and attention disorders—what Louv calls “nature-deficit disorder.” A number of different social initiatives have emerged over the past decade as a result, including the “No Child Left Inside” campaign and a resurgence of garden-based education in schools across North America.

Additionally, Foucault (1977) also argued that discipline creates “docile bodies” through the controlling of space and time (in schools, such controls include blocks of teaching times, segmented into different disciplines, controlled by bells) imposing a linear “efficient” use of time turning “naturalized bodies” into “mechanized bodies” capable of working within the new industrialized economy (or the now new green collar workforce).⁴ These ideas, especially when paired with the work of Paulo Freire—most notably his *Pedagogy of the Oppressed* (1970), highlighting the political nature of education—have greatly influenced the development of critical pedagogies, postcolonial theories, and ecopedagogy. Ecopedagogy (which developed from critical pedagogy) emerged out of the second Earth Summit in 2002—further developed by and associated with the work of Freire and Moacir Gadotti (2005) as well as Richard Kahn (2010) in the United States. Ecopedagogy is a movement that works toward what Gadotti (2005) calls, “education for a planetary citizenship,” requiring an expanded notion of who and what is (or should be) considered a “citizen.” With Kahn (2010, 18) ecopedagogy developed a “future-oriented ecological politics that militantly opposes the globalization of neoliberalism and imperialism . . . and attempts to foment collective ecoliteracy,” by critically examining EE and Education for Sustainable Development’s close ties to political agencies and corporate-sponsored agendas—particularly in the curricula of science/technology and social studies. However, as Noel Gough and Leigh Price (2004, 5) remind us,

Since the Earth Summit in Rio in 1991, the language of “sustainable development” has become a language of power, global capitalism and government, and nature’s “laws” are often invoked as a basis for social and economic policy. Our generation of environmental educators tend to take a relatively benign view of ecopolitics and associate it with left leaning, socially critical thought and action. But during the century that preceded the rise of contemporary (Western) environmentalism in the 1970s, much ecological activism was distinctly right-wing, with many fascist groups and organizations exhorting the merits of nature conservation, small scale living, energy efficiency, regulation of industry, and so on.

For, as Matthew Carlin and Jason Wallin (2014, xxii) explain, “modes of social control have undergone a marked transformation in the past half century . . . we live in an era in which bio-political power functions in collusion with the decoding of social codes under capitalism,” or as Rosi Braidotti (2011, 8) explains, “one of the features of our present historical condition is the shifting grounds on which periphery and center confront each other, with a new level of complexity that defies dualistic or oppositional thinking.” Social control and the dichotomies created and sustained are, as Haraway (2004, 20) in her *A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century* describes, “simultaneously material and ideological . . . the comfortable old hierarchical dominations” have transitioned/transformed into “scary new networks,” what Haraway calls the “informatics of domination.” Carlin and Wallin (2014, 22) continue by explaining that “the forms of control documented by such radical pedagogues as the Marxian-inspired Paulo Freire have become outmoded,” the project of capitalism thrives on crisis, contradiction, and complexity; what Gilles Deleuze and Félix Guattari (1987) refer to as *Oedipal*, “the regulation of social flows or differences under strict regimes of *statistical* and *identitarian* organization” (Carlin and Wallin 2014, xxi). Apparent homogeneity hides/masks underlying heterogeneity (or multiplicity), leaving only singularity—the “one true story” of modern western science (Harding 1993, 193)—or pluralism—the reproduction of the same elsewhere, the decentered structures of power proliferating sameness on a planetary scale in a fragmented manner (Braidotti 2014) creating what John Law (2004, 45) describes as “the horrors of relativism.” As Law continues,

We are being pressed, all the time, to make a choice between singularity and pluralism. Either there is one, one reality, one ethics, one politics, or there are many. There is nothing in between. This pressure to dualist choice is why I take it that we are being pushed up against the enacted limits of Euro-American metaphysics—and, to be sure, being asked to re-enact it.

This new complex landscape is difficult to traverse using the tattered old maps of pre/postmodern thinkers. It is not just about traversing (submitting or conquering) the “Mountains of Dualisms,” there are other territories and topographies to traverse (and re/deterritorialize) including what Plumwood (1993, 3) calls the “Ocean of Continuity,” the “Desert

of Difference,” the bottomless “Abyss of Relativism,” and “the Cavern of Reversal, where travelers fall into an upside down world which strangely resembles the one they seek to escape.” As Plumwood expounds, the postmoderns mainly “linger by the Well of Discourse near the cavern, gazing in dismay into the fearful and bottomless Abyss of Relativism beyond it.” The challenge is that we must address both past and present forms of oppression, which “have left their traces in western culture as a [complex] network of dualisms . . . [that] forms a major basis for the connection between forms of oppression” (*ibid.*). As Bateson and his colleagues (1956, 14) explain, these tracings can be found prevalent in many forms of narratives including “humor, ritual, poetry, and fiction” and play a coercive role in issues related to feminism, racism, classism, and capitalism by creating the “simultaneous existence of multiple levels of messages in the fictional presentation of ‘reality’.” These narratives result in internally fractured (“schizophrenic”) understandings of the current historical social/cultural/environmental situation; creating a “double bind” in which an individual (or group of people) is caught in a paradox between two conflicting demands in which the nature of the contradiction is concealed, hiding the repressive forces; or as Joel Cullin (2006, 138) explains, “it is a metaphor for explaining the manifestation of paradox in human communication.” The double bind results in a negative pattern of relating in which the inherent contradiction or dilemma cannot be solved (a “no-win” situation), resulting in a more inexpressible internal conflict, causing schizophrenic thought, allowing an opening/vulnerability to coercive powers. According to Deleuze and Guattari (1977) the “schizoid political economy” is a character of advanced capitalism, “a complex political economy of fear and consumer comfort” (Braidotti 2014, 177), sustained by a centerless but constant surveillance system (a technologically dispersed panopticon, an “informatics of domination”), a contrast/paradox between “an ideology of free mobility and the reality of disposable others” (Braidotti 2014, 178) which leaves individuals open to consumerism and the creation of a “paranoid or rapacious model of a dominant, dialectically driven consciousness” (*ibid.*, 172). As Helena Pedersen (2010, 239) explains, advanced capitalism operates “on the double logics of repression and protection” similar to “animal welfare organizations working for ‘humane’ treatment and improved conditions for animals who in the end are destined for use and slaughter,” what Haraway (2014) calls “making killable.” The paradoxes of advanced capitalism include, as Braidotti (2014, 177–178) notes,

The dense materiality of bodies caught in the very concrete conditions of advanced global societies [which] flatly contradicts advanced capitalism's claims to being "immaterial," "flowing" or virtual . . . these differences are not qualitative, but rather quantitative and as such they do not alter the reactive power of the majority as the phallo-Euro-centric master-code.

Or, as Bateson (1987) explains, "quantification will always be a device for avoiding the perception of a pattern"; we need, as Braidotti (2006, 105) explains, "a qualitative shift of perspective," or as Haraway (2004) calls it, a "slightly perverse shift of perspective"; because "given the fluid, internally contradictory and ferocious nature of advanced capitalism, the social and cultural critic needs to innovate on the very tools of analysis" (Braidotti 2014, 178). Thus academics such as Braidotti (2006, 2012, 2014) and Gough (2006, 2009, 2010) as well as many other environmental educators (O'Riley 2003; Fawcett 2009; Le Grange 2011; Clarke and McPhie 2014) bring in influences/tools from post-structuralists (Jacques Derrida, Judith Butler, Gayatri Spivak, Roland Barthes, Deleuze and Guattari) that provide alternative ways of understanding and deconstructing these narratives and the binary oppositions that reify them, uncovering the underlying contradictions, "looking for what is concealed" (Jackson and Mazzei 2012, 38), destabilizing (decentering) the practices and processes of meaning making, and embracing multiplicity; focusing not on what signs/concepts/metaphors "mean" but what they *do* and how "realities and narratives are mutually constituting themselves" (Gough and Price 2004, 4). As Braidotti (2014, 165) explains, post-structuralists have attempted to outmaneuver the coercive power(s) of language, in particular,

The writer tricks (Deleuze's style), decodes (Foucault-like), unveils (Derrida) or seduces (Barthes) language into directions it was not programmed to follow. Writing so as to make the master signifier falter (Foucault), stutter (Deleuze), expose its drive to mastery (Derrida) [and] reveal its affective core (Barthes).

As Alecia Jackson and Lisa Mazzei (2012) illustrate, Derrida and Spivak shifted the post-structuralist focus to the discursive through deconstruction, understanding that, as Gough and Price (2004, 6) explain: "As we word and reword our worlds, deconstruction is indispensable to our project, not only in helping us think about the words of others, but also

in helping us self-reflexively assess our own words.” In deconstructing the double-bind of marginality, Spivak illustrates that there are no “pure” non-innocent (universal) spaces to locate oneself. Foucault and Butler (1990, 1993) facilitated the shift from discursive to material, through their concepts of discourse (discursive fields), relations of power/knowledge (*puissance/connaissance*) and performativity, exploring the physical and performative spaces “where language, social institutions, subjectivity, and power exist, intersect, and produce competing ways of giving meaning to and constructing subjectivity” (Jackson and Mazzei 2012, 50). Deleuze and Guattari begin the turn back to material reality, creating a new language that is “concurrently conceptual and literal” (Jackson and Mazzei 2012, 85); realities and narratives are “‘mutually’ constituted, distinguishable but not strongly dichotomized” (Gough and Price 2004, 5). As Gough (2009, 70) explains, this new critical language enables academics to analyze “thinking as flows or movements across space” through the development of “concepts such as *assemblage*, *detrterritorialization*, *lines of flight*, *nomadology*, and *rhizome/rhizomatics*.” As Gough continues, Deleuze and Guattari have enlarged “the field of concepts and categories we can deploy to account for difference, which in turn multiplies the possibilities for analyses, critiques, and interventions” (*ibid.*, 74).

MATERIAL-SEMIOTIC STORIES: A (RE)MAPPING OF EE WITH/ THROUGH A NEW MATERIALIST METHODOLOGY

Deterritorialisation: A term put forth by Deleuze and Guattari (1987) in their book *A Thousand Plateaus: Capitalism and Schizophrenia*, to describe, as Kaustuv Roy (2003, 21) notes, “a movement by which we *leave the territory*, or move away from spaces regulated by dominant systems of signification that keep us confined to old patterns, in order to make new connections.”⁵

Braidotti (2014, 164) explains that scholars—particularly the new materialists (also referred to as “*neo-materialism*” [coined by Braidotti], “material feminisms,” “new feminist materialisms,” “post-constructionists,” “post-anti-humanists,” or “feminist social scientists,” etc.)⁶ including scholars such as Haraway, Braidotti, Elizabeth Grosz, Hekman, Claire Colebrook, and Barad to name a few—are attempting to *enact* the theoretical abstractions of the post-structuralists’ social and political philosophy.

Particularly, in the field of EE, academics have taken up Deleuze and Guattari's (1987) rhizomatic view of knowledge, which allows for an understanding of knowledge as onto-epistemological, a complex heterogeneous non-hierarchical network of interconnections, as opposed to the binary logic of the root-tree. As Patricia O'Riley (2003, 27) explains, "Deleuze and Guattari offer the concept of 'rhizome' as a cartographic gesture of deterritorialization in contradiction to what they refer to as western 'arborescent thought,' which is organized systematically and hierarchically as branches of knowledge grounded in firm foundations." For, as Deleuze and Guattari (1987, 15) explain, "we're tired of trees. We should stop believing in trees, roots, and radicles. They've made us suffer too much. All of arborescent culture is found on them, from biology to linguistics." The tree model can be seen in the "grammatical tree" put forth by Noam Chomsky (sometimes referred to as the "father of modern linguistics") as well as the "tree of knowledge" put forth by Francis Bacon (dubbed the "father of the scientific method") a formulation in which knowledge is separated/partitioned dichotomously into taxonomic classes/types/categories with an increasing hierarchy of power. Instead, the rhizome is a subterranean system of bulbs and tubers (potatoes and crabgrass, sustenance and weeds) with no beginning or end simply multiple entryways, exits, connections, and *becomings*. Rhizomes are acentered, "dynamic, heterogeneous, and nondichotomous; they implicate rather than replicate; they propagate, displace, join, circle back, fold" (O'Riley 2003, 27). As Deleuze and Guattari (1987, 12–13) explain,

The rhizome is altogether different, a *map and not a tracing*. Make a map, not a tracing... What distinguishes the map from the tracing is that it is entirely oriented toward an experimentation in contact with the real... The map is open and connectable in all of its dimensions; it is detachable, reversible, susceptible to constant modification. It can be torn, reversed, adapted to any kind of mounting [or fit into any carrier bag], reworked by an individual, group, or social formation. It can be drawn on a wall, conceived of as a work of art, constructed as a political action or as a meditation... The map has to do with performance, whereas the tracing always involves an alleged "competence."

Braidotti (2006, 69) and other academics (referenced above and scattered throughout this book) are working toward creating new maps for the complex locations we find ourselves situated (embedded and

embodied) with/in because “the point is not just mere deconstruction, but the relocation of identities on new grounds that account for multiple belongings” and becomings. It requires a cartographic mapping of the present that includes the past but is not determined by it, as Rotas (2015, 101) so poignantly reminds us, “inquiring into new landscapes does not, however, mean that oppressive pasts, presents, and futures can be erased or prevented,” but rather requires a redrawing of the boundaries of subjectivity and objectivity, one that moves from the individual to the collective, from static objects to material-semiotic generative nodes. For as Haraway (1988, 595) explains, “boundaries are drawn by mapping practices; ‘objects’ do not preexist as such. Objects are boundary projects. But boundaries shift from within; boundaries are very tricky. What boundaries provisionally contain remains generative, productive of meanings and bodies.” Such boundaries are material-discursive, as Lynda Birke (1999, 144) illustrates: “It is not only discourses . . . that construct my boundaries, but also the various cells that are busily making and remaking my tissues.” Along with Rotas (2015, 93) my hope is to join those who have taken up and engaged with a “deleuzeguattarian philosophy” and reconfigure/remap “environmental education through new materialist ontologies.” This requires moving from representation-alism to performativity (Barad 2008), embracing a material-discursive relational praxis that relocates “difference outside the dialectical scheme” (Braidotti 2014, 170) as a generative intra-active “event” (Barad 2008). As Rotas (2015, 93) explains,

Ecology as *performed* becomes a relational praxis, a disruptive action . . . Attending to ecology as performed fosters a becoming praxis of knowledge creation that is not bounded by the school and does not materialize as the memorization of knowledge. This shift in thinking and doing disrupts the repetition of reason and rather asks philosophical, ontological, and empirical questions, as well as attends to the ethical, political, social, and cultural questions, and questions of agency that produce different ecologies.

The “material turn” or “post-human turn” (as it is currently being labeled) calls for a critical reengagement with materiality by challenging the biological essentialist (or scientific realists) and social constructionist binary; the new materialists argue for an ontological reorientation away from the privileging of the discursive over the material. New materialists begin from/within an

understanding that we are always already entangled within a material world, focusing on what Jackson and Mazzei (2012, 112) describe as the “inseparable nature of the resiliency of matter and its productivity in concert with the human.” Such an understanding requires, as Diana Coole and Samantha Frost (2010, 3) explain, raising fundamental questions about

The nature of matter and the place of embodied humans within a material world; it means taking heed of developments in the natural science as well as tending to transformations in the ways we currently produce, reproduce, and consume our material environment. It entails sensitivity to contemporary shifts in the bio- and eco-sphere, as well as to changes in global economies in structures and technologies.

Yet, as Hekman (2008, 102) describes, they have done so in a way “that takes matter seriously without forgetting the lessons of the social constructivists,” by creating new concepts and figurations (new “thinking technologies” as Haraway [2004] describes) that allow us to reconceptualize our situated relations (our ecologies) and begin to think differently. Or as Haraway (2012, n.p.) states, “It matters what matters we use to think other matters with.” New materialism requires a profound reconceptualization of nature (and material) as agentic, an approach able to “account for the agency, semiotic force, and dynamics of bodies and natures” (Alaimo and Hekman 2008, 6); an understanding of nature “that is, expressly, *not* the mirror image of culture” (*ibid.*, 12). This requires an acknowledgment that, as Haraway (2009) states, “history is not an exclusively human affair.” Nor is language.⁷ As Alaimo and Hekman (2008, 7) explain, new materialism provides an “approach to ethics that displaces the impasse of cultural relativism” and instead entails an ethical approach that compares “the very real material consequences of ethical positions and draw conclusions from those . . . [showing that] the material consequences of one ethics is more conductive to human and nonhuman flourishing than another . . . [allowing] us to shift the focus from ethical principles to ethical practices”; what Barad (2007) calls *ethico-onto-epistemological*. This performative, relational ethic is one that acknowledges the enactment of boundaries, for as Barad (2008, 122) explains, the enactment of boundaries “always entails constitutive exclusions and therefore requisite questions of accountability.” For Barad (2013, 17), “physical matters, matters of fact, matters of concern, matters of care, matters of justice, are not separable.”

There are three new materialists that I have taken up (collected/gathered together) in order to think with and through in this work, so that I might better understand the shift in thinking required to think ecologically; to better understand the complex locations (relations) I am/we are situated within. Haraway—as Alaimo and Hekman (2008, 5) describe in their introductory chapter to *Material Feminisms*—brings a deep and complex understanding of how “scientific concepts constitute the reality they study,” able to show how the “nature” of science “is entangled with the nature of philosophy, politics, literature, and popular culture” and has never been “neutral when it comes to race, gender, or sexuality” (*ibid.*, 12). Haraway (2004, 338) brings forth the concept of “material-semiotic nodes,” through various figurations—*exempli gratia* the “chip, gene, cyborg, seed, fetus, brain, bomb, ecosystem, race”—and collectivities, “balls of yarn . . . gravity wells . . . [ecotones . . .] points of intense implosion” that “can be exploded, and they can lead to whole worlds, to universes without stopping points, without ends . . . you can in fact untangle the entire planet on which the subjects and objects are sedimented.” Haraway unpacks figurations through their multiplicity, their contradictory political, material, natural, cultural, and spiritual identities. Barad (2008, 126) provides the crucial/critical concepts of “agential realism” and “intra-action,” an understanding of the “entangled” nature of the material and the discursive, leading to a “posthuman performativity” one that “incorporates important material and discursive, social and scientific, human and nonhuman, and natural and cultural factors . . . [and] calls into question the givenness of the differential categories” or “differential boundaries” drawn within western society. Barad argues that relations are not things (what she calls *thingification*), instead they are “things-in-phenomena” or, more specifically, she describes materiality (things) as enacted. Braidotti (2006, 9) brings a vitalistic, non-unitary, nomadic subjectivity to the forefront and asks for a “radical scrambling of the codes . . . [an] alternative [mode] of postulating the self-other interaction . . . [following] the figuration of the parasite; the cloned animal; the leaping gene; hybrid complexity, diasporic displacements and cosmological resonance.” Braidotti (2013a, 11) understands that “the negative bonding of shared vulnerability is not enough to create alternative values” or effect political action; there needs to be, in essence, something greater holding us together; holding together all of our heteronymous ideas, beliefs, and theories. All three understand that thinking ecologically is not about identifying natural patterns that exist in nature and replicating them (nature as mirror for culture); instead, as Timothy Morton (2008, n.p.) notes, there “is another way of thinking ecologically, which isn’t thinking about things fitting

together into this organic whole, it's about everything being completely contingent and not fitting together." It is about the power relations within patterns; it is about flawed translations (partial digestions); it is about "giving and receiving patterns," it is about doing and undoing patterns (i.e., composition as well as decomposition), and "relaying connections that matter" (Haraway 2012, n.p.).

Rotas (2015, 94) puts forth the idea that "new materialist methodologies invite new ways of doing ecology in schools that provoke researchers and educators to methodologically re/consider qualitative research and curricular practice as emergent praxis." She continues by explaining that "new materialist research calls for an affirmative approach that undoes binary logic by *thinking* and *doing* simultaneously (i.e., performing ecology)" (*ibid.*, 101). Such a praxis requires, as McKenzie (2009, 211) explains, "exploring possibilities for education that enable us to consider our relationships with human and non-human others, in ways that do not suggest to have transcultural, [transethical] or transhistorical answers to questions about how we or others should live." It is an exploration into the words and worlds that make up EE within the classroom, and a performative experiment in thinking/making/creating/doing other words and worlds by partaking in "otherworldly conversations" (Haraway 2008b); because as Haraway (2004, 126) reminds us: "No longer able to sustain the fictions of being either subjects or objects, all the partners in the potent conversations that constitute nature must find a new ground for making meanings together." This requires co-creating stories that gather us, figurations that teach us, and locations (historically embedded and embodied) that foster new relations (new assemblages) for, as Rotas (2015, 101) reminds us: "Ecology is a comprehensive process, a process of comprehension, a material reality that critically examines corporeality, yet does not dismiss the intangible."

NOTES

1. See Hugh Brody (2001) *The Other Side of Eden: Hunter-Gathers, Farmers and the Shaping of the World*.
2. The term "hyper-modern" is used by a number of academics I draw on, including Braidotti in her book *The Posthuman* (2013b) and Haraway (2004) to describe the increasing faith in science and technology, particularly in regards to cloning, artificial intelligence, and genetics, resulting in the increasing positive valuation of new technologies without critical and/or

ethical reflection. The hyper-modern results in the convergence of technology and biology, ideas Haraway unpacks with the figuration of the cyborg (most notably) and OncoMouse™.

3. “Inter-” (prefix) meaning between, among, in the midst of, within, mutually, and/or reciprocally; in combination with verbs to “*intercēdere* to go between; *intercipere* to seize on the way, intercept; *interdicere* to interpose in speech, interdict; *interjacere* to throw between, interject; *interpōnere* to put between, interpose; *intervenire* to come between, intervene; *interdigitalis* lying between the fingers; *interfluus* flowing between; *intermūrālis* between walls; *interamnium* a place between rivers” (OED).
4. The shift to educational “efficiency” and the “dominance of measurement” can be traced back to the industrial revolution and “Frederick Winslow Taylor’s ‘time and motion’ studies with pig-iron carriers as the Bethlehem Steel Company, in the 1890s” what William E. Doll, Jr. (2012, 24) calls the “Taylor Plan.” See Doll (2012) “Chapter 3: Looking Back to the Future.” Noel Gough also describes this development (forthcoming) noting that: “The doctrine of closely aligning learning activities and assessment tasks with intended learning outcomes...[was] inspired by Frederick Winslow Taylor’s (1911) principles of ‘scientific management’ and exemplified by Franklin Bobbitt (1924) [*sic*] and Ralph Tyler (1949).” See Gough (2013) “Towards Deconstructive Nonalignment: A Complexivist View of Curriculum, Teaching and Learning” for a more detailed discussion.
5. Similar to Haraway (2004, 333): “I like layered meanings, and I like to write a sentence in such a way that, by the time you get to the end of it, it has at some level questioned itself.” Definitions of terms are palimpsestic, multimodal, multidisciplinary, historically situated, and often (mis)translated. My hope in this book is to search for polysemes, and hold together the multiple definitions of terms to create a deeper, richer, and more complex understanding(s). My goal is to create thick meanings, messy meanings, that drawing on multiple fields/planes/modes of thought; to create generative (re)interpretations and translations. The definitions scattered throughout the book are not intended to be conclusive static definitions; they are simply the current gathering of descriptions that shape my understanding.
6. As Elizabeth St. Pierre, Alecia Y. Jackson and Lisa A. Mazzei (2016, 106) note, academics (including myself) who identify with what is now being called “new materialism” would “no doubt...refuse those labels because there is no essence to center such structures.”
7. In a presentation given to the Institute of English Studies at the University of London, titled “Cosmopolitical Critters: Companion Species, SF, and Staying with the Trouble,” Haraway, Donna (2012) argues that, quite possibly, the semiotics of bacteria may be the only truly universal language.

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Bag-lady Storytelling: The Carrier-bag Theory of Fiction as Research Praxis



Fig. 3.1 Carrier-bag. Copyright 2016 Lauriel J. Adsit

Abstract “Bag-lady Storytelling” is a performative methodology, a creative (re)twist of Ursula Le Guin’s “Carrier Bag Theory of Fiction” into a new materialist methodology. Using the figuration of Trudy, the chatty Times Square bag-lady character in the one-woman Broadway play, *The Search for Signs of Intelligent Life in the Universe*, the author conducts a feminist critique of traditional research methodologies and draws together theories of research that inform, instead, the practice of research as Bag-lady storytelling, a performative research praxis of gathering stories/ideas/theories and creating habitual nomadic research patterns. Such a praxis requires a different logic, an attunement and attentiveness to what gets gathered up, used, shared; an attentiveness to which seeds should be saved for future reseeding, for future reworlding.

Keywords Methodology · New materialism · Praxis · Bag-lady storytelling · Research

How else might we tell the story, and how might those stories gather us?

Jenny Reardon

Bag-lady: A homeless woman (a vagrant, a nomad), often elderly, who carries all of her possessions in plastic shopping bags and transports them around in a shopping cart (usually, always with one janky wheel), collecting things that might just be of use as she travels.¹

I refuse to be intimidated by reality anymore. After all, what is reality anyway? Nothin’ but a collective hunch. My space chums think reality was once a primitive method of crowd control that got out of hand. In my view, it’s absurdity dressed up in a three-piece suit (Wagner 2012, 18).²

In her short story, *The Carrier Bag Theory of Fiction*, Ursula Le Guin (1989) proposes (as the title states) a carrier-bag theory of fiction, a feminist critique,

Quote from Jenny Reardon’s (2014) presentation titled “Inhabiting Multispecies Bodies: Panel Discussion with Donna Haraway, Margaret McFall-Ngai, and Jenny Reardon” at the conference *Anthropocene: Arts of Living on a Damaged Planet*. Reprinted with permission by author, Jenny Reardon.

that argues against the masculinist heroic narrative with its root metaphors of patriarchy that participate in what Chet Bowers (2015) calls “linguistic colonization”; narratives of “bashing, thrusting, raping, killing” (Le Guin 1989, 152) all in the name of progress (white capitalist heterosexist patriarchy [WCHP] narratives).³ The story—novel as spear or arrow—in which, as Le Guin (1989, 150–151) writes,

The Ape Man first bashed somebody with [that wonderful, big, long, hard thing, a bone, I believe] in the movie and then, grunting with ecstasy at having achieved the first proper murder, flung up into the sky, and whirling there it became a space ship thrusting its way into the cosmos to fertilize it and produce at the end of the movie a lovely fetus, a boy of course, drifting around the Milky Way without (oddly enough) any womb, any matrix at all.

Instead, borrowing from Elizabeth Fisher’s “Carrier Bag Theory of Human Evolution,” in her book *Woman’s Creation: Sexual Evolution and the Shaping of Society* (1979) in which she argues that historically (and currently) the more useful life-sustaining tool for the human species is the container—“a leaf a gourd a shell a net a bag a sling a bottle a pot a box a container . . . holder . . . recipient” (Le Guin 1989, 166)—able to collect, gather, hold, and sustain more diverse and rich possibilities for continued flourishing. Le Guin (1989, 167) notes that “before the tool that forces energy outward, we made the tool that brings energy home” and shows that thinking of the story/narrative/novel as a carrier “bag/belly/box/house/medicine bundle” (*ibid.*, 152–153) just might be a more useful metaphor for creating more livable stories. Viewing narratives in a more ecological way, as a collection of stories of life, of everyday *beings* and *doings*. Gathering requires a different logic, an attunement and attentiveness to processes and practices of ongoingness (not simply endings), a shift in focus from the hero to all the “Others” in the story (women, nature, etc.) fashioned as “props, ground, plot space, or prey,” as Haraway (2016, 39) lists. It is a list of those who don’t “matter” in the story of western science or the “prick tale,” “their job is to be in the way, to be overcome, to be the road, the conduit, but not the traveller, not the begetter” (*ibid.*). Carrier-bag stories are about being attentive to what gets gathered up, used, shared—which seeds should be saved for future reseeded—for as Haraway (2016, 40) explains, “with a shell and a net, becoming human, becoming humus, becoming terran, has another

shape—that is, the side-winding, snaky shape of becoming-with.” Haraway (2008a, 160) takes up Le Guin’s carrier-bag theory of fiction and proposes a “bag-lady practice of storytelling” a practice that hopes to “remind us that the lurking dilemma in all of these tales is comprehensive homelessness, the lack of a common place, and the devastation of public culture.” The bag-lady practice of storytelling requires, as Haraway continues, “putting unexpected partners and irreducible details into a frayed, porous carrier bag” creating “messy tales to use for retelling or reseeded, possibilities for getting on now” (Haraway 2013, 139). As Le Guin (1989, 153) describes,

I came lugging this great heavy sack of stuff, my carrier bag full of wimps and klutzes, and tiny grains of things smaller than a mustard seed, and intricately woven nets which when laboriously unknotted are seen to contain one blue pebble, an imperturbably functioning chronometer telling the time on another world, and a mouse’s skull; full of beginnings without ends, of initiations, of losses, of transformation and translations, and far more tricks than conflicts, far fewer triumphs than snares and delusions; full of space ships that get stuck, missions that fail, and people who don’t understand.

There are many who believe that the heroic, “true,” “prick” story of research and science, the one based on facts, is approaching its end; it is proving to be too heavy to carry. As Le Guin (1989, 168) narrates, those “of us out here in the wild oats, amid the alien corn, think we’d better start telling another one.” But, as Le Guin (*ibid.*, 152) reminds us, “people have been telling the life story for ages, in all sorts of words and ways. Myths of creation and transformation, trickster stories, folktales, jokes, novels . . .” so it is not just about creating new stories (or metaphors or figurations) but collecting, protecting, fostering, (re)storying our thick past.⁴ Because, as Haraway (2016, 125) explains, “good stories reach into rich pasts to sustain thick presents to keep the story going for those who come after.”

I have taken up Haraway’s bag-lady practice of storytelling, transmuting it into a new materialist research methodology. Instead of researcher as “detective,” what Noel Gough (1998, 111–112)—drawing on Brain McHale (1992, 254)—describes as the “archetype of the modernist subject—a quest(ion)ing ‘cognitive hero’, an ‘agent of *recognition* . . . reduced synecdochically to the organ of visual perception, the (private) eye’, seeking to understand the *universe*, a unified and objective

world,” or what Haraway (2008b, 160) describes as researcher as “hero,” “pursuing luminous objects across and through the plot matrix of the world”; I propose researcher as bag-lady, in which we collect stories, theories, and ideas, put them in our carrying bags and take them with us where ever we go, pushing them around in a wobbly shopping cart or an old stroller. They get bumped around, jostle to and fro, cross-pollinate, cross-contaminate, break, shatter, decompose; some fall through the cracks, others must be left behind. Unmoored from the western metaphysical theoretical foundation of knowledge, with no solid ground, no fixed location, no home; we must become bag-ladies, wanderers, travelers—and no adventurer leaves home without a sack (Haraway 2016). Outside of the western metaphysical territory, the value, currency, and legitimacy of “research” stories change, they don’t hold the same weight or worth. Most environmental educators interested in ecological thought agree that we need new metaphors—new stories—to create new ethics for new worlds; we need, as Fawcett (2009, 230) so poignantly states, to “remember, or learn anew, how to story differently.” As Gough (1998, 100) explains, “if we think of all stories of educational inquiry as being fictions, we may be less likely to privilege without question those that pretend not to be, and more likely to judge each story on its particular merits in serving worthwhile purposes in education.” Fiction can, as Gough continues, “help us to generate stories which move educational inquiry beyond reflection and reflexivity towards making a difference in the world” (*ibid.*, 94). New research in neuroscience shows that stories—detailed descriptions, evocative metaphors, and/or emotional exchanges between characters—change how we act in life, activating and stimulating the regions of the brain associated with physical experiences and movements. As Annie Murphy Paul (2012, para. 6) explains, “the brain, it seems, does not make much of a distinction between reading about an experience and encountering it in real life.” As she continues, “fiction—with its redolent details, imaginative metaphors and attentive descriptions of people and their actions—offers an especially rich replica” (*ibid.*).

Le Guin (1989, 169) explains: A “book holds words. Words hold things. They bear meanings. A novel is a medicine bundle, holding things in particular, powerful relations to one another and to us.” We have, as Haraway (2008b) describes, “metaphor-work” to do. Yet these metaphors (or figurations) “are not representations or didactic illustrations, but rather material-semiotic nodes or knots in which diverse bodies and meanings coshape one another”; such metaphors (and figurations) are where the

“biological and the literary or artistic come together with all of the force of lived reality” (*ibid.*, 4). This type of metaphor-work requires a biosemiotics—or eco-semiotics as Chet Bowers (2015) prefers—understanding of our relations or intra-actions because “reality is more complex than any [single] account that can be given of it” (Reid 1981, 182; as cited in; Gough 1998). Thus, we need to create ecologies of stories—or ecotones—in which emergent new species and worlds appear. This type of work requires what Rosi Braidotti (2006, 7) calls a “nomadic subjectivity,” the ability to “weave a web connecting philosophy to social realities; theoretical speculations to concrete plans; concepts to imaginative figurations.” It also requires what Barad (2008) calls a “posthuman performativity” because as Gough (2010, 45) explains,

Performing educational inquiry as “actors in a story-telling practice” means, in part, seeing fact and fiction as mutually constitutive—recognizing that facts are not only important elements of the stories we fashion from them but also that they are given meaning by the storytelling practices which produce them.

For a nomadic new materialist bag-lady, research is, as Braidotti (2014, 171) describes, “a process of expression, composition, selection, and incorporation of forces aimed at positive transformation of the subject.” The sites of research are multiple and include “inhabiting language as a site of multiple others within what we call, out of habit and intellectual laziness, ‘the self.’” Stories are as Braidotti (*ibid.*, 164) continues, “an ontological site of constitution of our shared humanity.” This requires what Hillevi Taguchi (2012, 265) describes as, “a reconceptualization of the very act of thinking as a transcorporeal process of engagement, going beyond the idea of reflexivity and interpretation as inner mental activities taking place in the mind of the researcher understood as separated from the data.” For a new materialist researcher, thinking is doing and doing is thinking, and both are experimental world-making practices. In searching for a quantum (Barad), nomadic (Braidotti), and SF (Haraway) bag-lady figuration to teach me a thing or two about performing educational inquiry, I stumbled upon Trudy, the chatty Times Square bag-lady character in the one-woman Broadway play, *The Search for Signs of Intelligent Life in the Universe*, written by Jane Wagner in 1986. Trudy is one of the multiple eccentric characters/personalities that populate the story—including a runaway teenager, a lonely rich lady, a fitness junkie, several hookers, and two

queer feminists. But it is Trudy—a bag-lady situated at “Walk, Don’t Walk,” who is a “creative consultant” for a group of alien fact finders (her “space chums”) doing research on earth and who undergoes time-space continuum shifts—that gathers them all together in a “madly coherent whole” (Canby 1991, para. 4) through their partial overlapping connections. As Vincent Canby (*ibid.*, para. 2) describes, the play mostly records “how these characters have interfaced (as some of them might say) with the last 20 years of women’s liberation, sexual revolution, dome houses, political commitment, having-it-all, Cuisinarts and two-timing husbands.” The drama covers, as Lawrence Bommer (1992, para. 3) notes, a “host of contemporary dislocations and dilemmas, in effect reproducing our world in a dozen voices.” Trudy (as bag-lady researcher) spends much of her time writing research findings down on post-it notes and trying to explain the difference between an actual can of Cambell’s soup and Andy Warhol’s paintings. The play is a “political fiction” (Braidotti 2014) bringing together the characters and the audience in a “shared joke, an epiphany of the solidarity of just being alive” (Bommer 1992, para. 9). For as Trudy states, “Because at the point you can comprehend how incomprehensible it all is, you’re about as smart as you need to be” (Wagner 2012, 205). Just the sort of new vitalist message, we knew materialists can get behind. The play concludes with Trudy recounting how the aliens saw their first theatrical play and got goose bumps, not from the play, but from the audience’s shared collective encounter. As Trudy explains, “Yeah, to see a group of strangers sitting together in the dark, laughing and crying about the same things . . . that just knocked ‘em out” (Wagner 2012, 212).

It makes sense to me. . . . This theory not only explains large areas of theoretical obscurity and avoids large areas of theoretical nonsense (inhabited largely by tigers, foxes, and other highly territorial mammals); it also grounds me, personally, in human culture in a way I never felt grounded before. (Le Guin 1989, 167)

The storytelling research practice—doing and thinking, gathering and sharing, composing and decomposing, experimenting and crafting—is a mapping praxis, a drawing, redrawing and undrawing of boundaries and territories within the multiple locations one finds oneself. It is the everyday practices of ordinary beings “making a living” in this collective pouch (Haraway 2014). We create patterns and leave traces as we wander throughout space-time, gathering up others (im/material others that *matter*) and

scribbling half thought ideas on post-its.⁵ What follows in this book/bag/sack is a retelling and recrafting of the experiences and beings (enacted relations) gathered *doing* and *thinking* a performative environmental educational inquiry. In the spirit of Laurel Richardson's (2001) "writing-stories"—creating "narratives that [situate one's] . . . work in academic, disciplinary, community, and familial contexts"—Gough's (2010) "narrative experiments" (writing as a method of discovery), and John Law's (2004) "method-in-practice," this performative educational inquiry is the act of crafting an assemblage. The practice of cobbling together stories of other-worldly conversations/encounters, a practice that may be closer to creating medicine bundles than to the traditional practices of creating "research stories." Busily opening bags, searching, taking things out, weighing them, comparing them, repacking, sorting, stacking, reorganizing, making open space, fitting things together, forgetting where I left things, remembering things I have lost, mumbling to myself as I journey on . . . my research will be presented as two performative events, a *doing* and a *thinking*. Although both practices occurred at the same time, co-constructively cross-pollinating/contaminating each other and infecting/influencing enacted relations and im/possibilities for future movements. Or, to put it another way as Law (2004, 69) describes, they "relate to one another . . . are included in one another . . . but cannot and should not be reduced to one another." The *doing* involved a yearlong eco-art action research project with a Grade 4/5/6 class, inquiring into the types of environmental stories currently being told in the education system and the im/possibility of other stories—multiple other stories—to be told/shared/experienced. The *thinking* is a nomadic narrative inquiry into the types of stories and figurations needed to shift our thinking—what Braidotti (2006) calls a "qualitative shift in perspective," Haraway (2004) calls a "perverse shift," Arne Næss (2005) calls a "gestalt shift," and Gilbert Simondon (1995) calls an "ontogenetic shift"—in order to create ways of being, ways of knowing, and ways of living (getting on) together, that keep the story going. Such stories are sympoietic because, as Haraway (2013, 125) explains, "sympoiesis 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." This is, as Haraway (2014) (drawing on Derrida) remind us, a task that (always and relentlessly) remains before us. As Le Guin (1989, 170) reminds us, "The story isn't over . . . Still there are seeds to be gathered, and room in the bag of stars."

NOTES

1. Similar to Haraway (2004, 333): “I like layered meanings, and I like to write a sentence in such a way that, by the time you get to the end of it, it has at some level questioned itself.” Definitions of terms are palimpsestic, multi-modal, multidisciplinary, historically situated, and often (mis)translated. My hope in this book is to search for polysemes, and hold together the multiple definitions of terms to create a deeper, richer, and more complex understanding(s). My goal is to create thick meanings, messy meanings, that drawing on multiple fields/planes/modes of thought; to create generative (re)interpretations and translations. The definitions scattered throughout the book are not intended to be conclusive static definitions; they are simply the current gathering of descriptions that shape my understanding.
2. Throughout this book, the character of Trudy generatively interrupts the text, posing questions, providing insights, and sharing research stories. Trudy’s interruptions were originally posed in Jane Wager’s (1986) play *The Search for Signs of Intelligent Life in the Universe*, that was turned into a film in 1991 directed by John Bailey (although the film title was intentionally misspelled, *The Search for Signs of Intelligent Life in the Universe*). The play was also published as a book in 2012.
3. WCHP is an acronym that describes, what Haraway (2008a) calls, “white capitalist heterosexist patriarchy.”
4. Throughout this book I utilize the term “thick” drawing on Donna Haraway’s interpretation, infliction, and influence in wanting to highlight (by using this term) that the in-between spaces, separations, dead zones, or seemingly “empty” spaces really are not empty at all. They are filled with ideas/beings/concepts, material and immaterial, that simply cannot be seen/touched/comprehend/identified within our current frame or sensual abilities. Or they are occupied by beings/ideas/concepts that are not accepted or acknowledged by the dominant normalizing/colonizing social entities/states and thus these unvalued dead zones are erased, ignored, and given no value. They are ghostly. But all ghosts have a presence, an affect, a mattering. Haraway (1997) also uses the word “thick” to draw the “material” back through into the discursive; she describes words “as thick, living, physical objects that do unexpected things.”
5. In this book I take up a nomadic deleuzeguattarian interpretation of the term wander, or what Braidotti (2011) describes as *conscious nomadism*, atypical to its usual (negative) description of wandering aimlessly, without direction, *id est* being lost. A nomadic deleuzeguattarian interpretation of the term “wander” allows us to understand the practice of conscious wandering as a “move in a noncausal yet (inexplicably) clearer direction” (Berman 2000, 198). It is a practice of being open and attentive to the vital forces that shape our

becoming-withs. A nomadic worldview calls for rhizomatic/ecological thinking, an element that Braidotti argues is vital to creating nomadic subjects and an ethics of sustainability. The term “nomad” derived from the Greek *nomas*, meaning wandering (roaming or roving) in search of pastures (OED); wandering is a spiritual movement, a practice of connecting with universal flows and forces. As Morris Berman (2000, 81) explains, according to Bruce Chatwin (1987) in his book *The Songlines*, the wandering movement is “central to the nomadic consciousness, to human fulfillment . . . it is an instinctive migratory urge, something we carry with us in a genetic or inherent sense.” The term wander also refers to the changes occurred during metamorphosis, a body wandering off from its usual course of development. Or simply (in a negative connotation) to an elderly persons’ brain/mind/thoughts wandering off due to illness or exhaustion, causing delirious, rambling talk.

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Doing: Exploring the Lost Streams of Vancouver Through Eco-Art

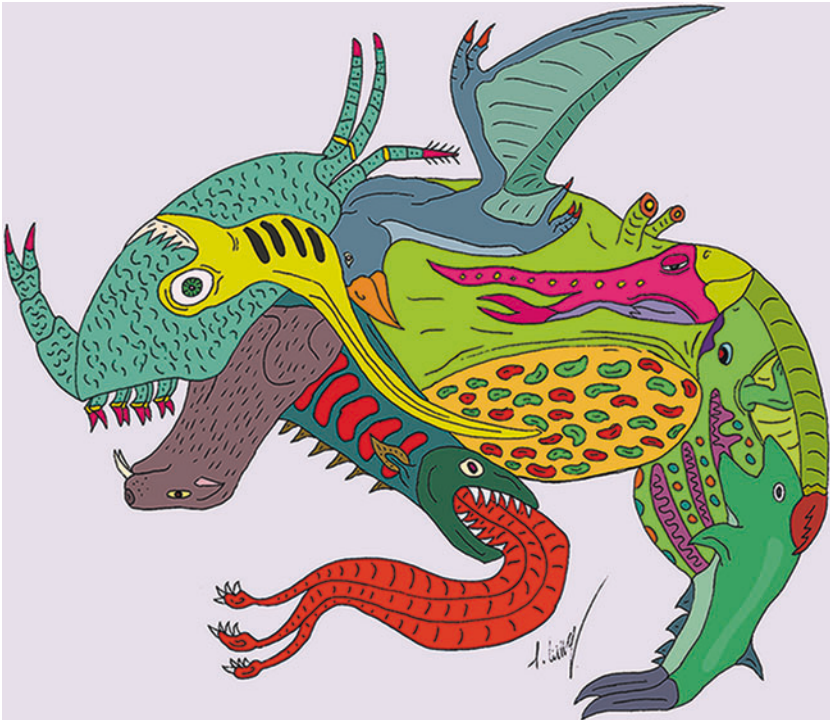


Fig. 4.1 Holobiont or Entangled Bank. Copyright 2010–2016 Tommy Leung

Abstract “Doing” is a (re)storying and recounting of a yearlong action research project undertaken with a Grade 4/5/6 class in order to inquire, learn, and teach Environmental Education (EE) through the creation of an eco-art installation around the Lost Streams of Vancouver. Using the figuration of the salmon, the author attempted to (re)imagine education as a process of metamorphosis in which diverse bodies and beings grow and adapt to new environments, a collective becoming with. Exploring and creating various eco-art projects throughout the year provided openings for other stories and otherworldly conversations, opening up the formal curricula to practices of experimentation, collaboration, patience, and to discovering the creative agential world outside the classroom.

Keywords Eco-art · Salmon · Currere · Lost streams · Environmental education

Symbiogenesis: Symbiogenesis is a theory of evolution (originally coined by Boris Kozo-Polyansky and made popular [rediscovered] by Lynn Margulis [1998]) that posits that the neo-Darwinist “explanations” for evolution (based on competition and natural selection at an “individual” level) should be replaced by stories of coevolution or symbiogenesis: *sym* meaning bringing together, *bio* meaning life, and *genesis* meaning to produce or create. The most common theory of symbiogenesis put forth by Margulis (1998) is the *Endosymbiotic Theory*, which posits that the origin of eukaryotic cells was (originally) through the combination, partial digestion, and incorporation of various prokaryotes (Haraway 2014).¹

With my carrier bag full of stories, dreams, intentions, theories, figurations, experiences, doubts, and questions, I began a yearlong collaborative eco-art place-based action research project at a local Montessori elementary school—Tyee Elementary School—working one day each a week with a Grade 4/5/6 class.² Tyee (or thye) means chief, king, or champion in “Chinook jargon” (a trade language originating in the Pacific Northwest, a hybrid language used between Europeans and First Nations people) from the Nuu-chah-nulth language; currently/presently the term is most commonly used to describe a Chinook or Spring salmon weighing over 30 pounds (an impressive catch), the “King of Salmon.” The school, despite its name, is a small school with only two hundred K-7 students, located in the Kensington-Cedar Cottage Neighbourhood. It is adjacent to two of

the Old Streams of Vancouver (Davey Creek and Gibson Creek) which historically—before they were covered, buried, or diverted via culverts and sewer pipes—provided the water supply for a dairy farm owned by Moses Gibson (or “Old Man Gibby” as he was called by locals because he was a “grumpy old man” who refused to let the neighborhood children eat apples from his orchard) and the original “Cedar Cottage” which consisted of a few Chinese Market Gardens, a bakery and a brewery (Fass 2010).³ Being a Montessori school there was a strong focus on the integration of subject areas (arts, sciences, geography, history, math, and language), the importance of the learning environment, and a focus on creating a “community of learners” in which students co-create the agendas and time schedules for the day. With no bells dictating or structuring the learning process, Tyee was/is surely swimming upstream against the current practices and policies of “standard” public schools. After working with the eight teachers at Tyee the previous year on a “Teacher Collaborative Inquiry” research project through a Social Science and Humanities Research Council (SSHRC) Community-University Research Alliance (CURA) Grant called the Think&EatGreen@School project, funded to research food system experiential education initiatives and barriers within the Vancouver School Board, I was able to create a collaborative, trusting research relationship with the teachers through our shared passions and concerns around creating healthy and diverse teaching and learning environments that support students’ social and emotional growth, as well as fostering connections to the natural world, local community, and multiple cultural (hi)stories of the neighborhood and region.⁴

I made a particularly strong connection with one of the teachers who seemed to share a similar environmental ethic, teaching philosophy, and love of trail running (we would regularly get caught chatting about new trails to explore in the North Vancouver mountains and runs we had ventured on while the students completed activities in their journals). Thus, together we decided to engage her class in experiencing, encountering, and creating eco-art in order to gather together diverse subject matters, stories, and ways of knowing; threading through the curriculum a collaborative and creative project that would end up engaging and affecting the whole school. The teacher and I decided that because one of the school’s main goals for the year included increasing students’ writing fluency and expression using a variety of genres, as well as our observations that the students’ writing was much more descriptive and creative when they wrote about experiential learning activities and

projects, we decided to have all the students keep journals throughout the year to collect and create stories. Thus emerged our first eco-art activity, creating journals by reconstituting cereal boxes and discarded paper. This research project was in all aspects emergent, it could not have been preplanned, structured, or formalized. Every activity we did, and connection we made, (re)constituted future possibilities and impossibilities within our ever changing and growing community of learners. Being flexible and porous we were able to accommodate new ideas brought forth by the students, other teachers, and community members, allowing synchronization with other activities and initiatives, altering/expanding/sharing planned activities and experiences, as well as allowing the ability for the class to revisit ideas that were previously impossible within a new context. Not having a predetermined structure allowed us to let the students drive the inquiry and make their own personal connections to the topics and ideas we explored. During our first activity, the class discussed issues around food packaging and marketing, waste and recycling (up-cycling and down-cycling) while using the cereal boxes to make covers for their journals. One of the students remembered how, during the previous year, their class collected and stored all plastic waste for a month, tracking and calculating the weight, mass, and extrapolating/estimating the amount of plastic the class would collect over the entire year. Another student discussed learning about the large plastic gyre in the North Pacific Ocean, a conglomeration of plastic bags, chemical sludge, and other plastic debris. A different student shared a story from their summer vacation in Hawaii, during which he explained with concern that he saw a lot of trash washed up on the beaches; and then another student chimed in with a story of finding a dead bird on the beach with plastic around its neck while walking along Spanish Banks, in Vancouver, BC. The teacher then facilitated a discussion about what we, as a class and as individuals, can do to address these issues. The students suggested recycling, not using plastic bags at the grocery store, reducing the amount of packaging in their lunches, cleaning up trash at local beaches, and possibly using an army of military airplanes and ships to scoop up all of the plastic in the ocean with large nets. In the end, the class decided to schedule a school grounds and neighborhood clean-up day, as well as host a waste-free lunch week, during which the students would “teach-out” to other classes about the importance of reducing waste, including strategies for eliminating waste from lunches, and would track and monitor the amount of waste the school produced during that week.

What emerged through our projects was the figuration of the salmon with all of its multiple identities, allowing us to open up the curriculum to the political, spiritual, artistic, embodied, and embedded stories. The figuration of the salmon also provided a useful figuration to (re)think education curricula with—not as a standard set of activities or a linear program of study structured around predetermined Prescribed Learning Outcomes (PLOs), but curriculum as a journey, as *currere* (Pinar 2015). We journeyed out of the classroom into the community, following traces of the old streams, through the rivers to the estuaries, the intertidal zones at Spanish Banks, to the hatcheries where salmon fry are trucked around manmade damns, out into the Pacific Ocean and back again. We discovered that we were following the lifecycle of the salmon—curriculum as “the course of one’s life” (OED)—engaging with salmon’s multiple beings and doings, its de/re/territorialization of spaces and places throughout the Pacific Northwest. Following the salmon also included tracing the multiple physical/biological/emotional processes of metamorphosis—curriculum as the course of metamorphosis (Rolleston 1870)—bodies growing and adapting to new learning environments and processes, a collective becoming-with. The term metamorphosis, meaning to transform, was first used in plural form as the title of a poem by Ovid—*Metamorphōsēs*—a gathering of stories about the transformation of gods and humans into the shapes/forms of nonhuman others—animals, plants, and inanimate objects. An epic poem that is not centered around a human hero, but holds together playfully mythic multi-genre stories of becoming-animal. Stories in which transformation emerges from pain, loss, and love within specific situations, through collective in/un/foldings.⁵ *Currere* as, not just a “complicated conversation” (Pinar 2015) but an “otherworldly conversation” (Haraway 2008a) in which, as Stacy Alaimo and Susan Hekman (2008, 13) describe, “various nonhuman entities participate as subjects rather than objects.” We were interested in the ongoing stories of a messy understanding/reinterpretation of what Aaron Sloman (2012) describes as metamorphogenesis, the complex becoming-with within a creative universe. It is an understanding that just as we learn new ways of learning (metacognition) there is also the development of new forms of development; an evolution of new types of evolution (Sloman 2012). But, following Stuart Kauffman’s (1995, 73) famous statement that “the story of . . . ecosystems at all scales is the story not merely of evolution, but of coevolution,” Scott Gilbert et al. (2010, 673) argue that, “the situation may actually be more intimate. Almost all development may be codevelopment.” To engage with the creativity of the

world and create a community of learners, a collective entity, that develops patterns of relating and learning that just might be closer to the growth patterns of bacterial colonies and slime molds than to any predetermined linear generalized developmental program written-up in educational textbooks. These stories of collective becoming, of collective living and dying—love and loss—are sympoetic stories, stories of symbiogenesis, “the codevelopment of the holobiont” (Gilbert et al. 2010, 672), for as Donna Haraway (2013, 145) explains, “symbiogenesis is not a synonym for the good, but for becoming with each other in response-ability.”

EARTH ART NATURECULTURE STORIES AT VANDUSEN BOTANICAL GARDEN

That in one piece the viewer may see
both human form
and form of tree.

(Micheal Dennis 2012, n.p.)

For our second activity we ventured out of the classroom to the VanDusen Botanical Garden to encounter the work of some of the world’s top earth artists: Nils-Udo, Urs-P. Twellmann, Chris Booth, Nicole Dextras, Michael Dennis, Paul Burke, and Anna Gustafson.⁶ Earth Artists work, as Haraway (2003, 23–24) describes, with “scales and flows of time through the flesh of plants, earth, sea, ice, and stone” and provide an alternative “mode of attention” with which to encounter the natural world, one in which “relation is the smallest unit of analysis, and the relation is about significant otherness at every scale.” These artists each fabricated different “natureculture” stories (Haraway 2003), allowing us to teach environmental ethics as a “mode of attention” or a way of relating in which we learn to encounter and respond to the “Other” in ways that foster creative becoming-withs. Upon first entering the gardens we were greeted by two towering figures—forest ancestors—carved from two cedar trees, logging debris left behind by the logging industry on Vancouver Island, a place with a landscape scarred by a long history of destructive logging practices. Carved/created/transformed by Michael Dennis, a sculptor originally from California where he worked as a neurophysiological researcher and professor at the University of California Berkley, his sculptures are created through an intuitive process of communication with



Fig. 4.2 *Visitors* by Micheal Dennis. Copyright 2015 Chessa A. Adsit-Morris

the wood, by searching for elemental connections, invoking the spaces “*where primal images dwell, [and] speak an elemental visual tongue of our elemental form*” (Dennis 2015, para. 2), what he calls sculpting the shadows of ancestors. His sculptures, tall figures leaning slightly toward each other with a gravity of their own, whispering tales that seem to draw them ever closer together, reminded me of the writings of Linda Hogan (1995, 47) when she wrote about female scientists who work by listening and respecting the language and intelligence of the nonhuman world, describing “such a keen listener that even the trees leaned toward her, as if they were speaking their innermost secrets into her ears . . . a hearing full and open enough that the world told her its stories.” To illustrate this, Hogan (1995, 48) described the work of biologist Barbara McClintock,

who received a Nobel Prize for discovering genetic transposition in corn plants by “listening to what the corn had to say.” As Hogan described, McClintock’s respect for “life allowed for a vision expanded enough, and sharp enough, to see more deeply into the mysteries of matter than did other geneticists who were at work on the same problems” (*ibid.*). These are intuitive practices that go beyond our previous assumptions of what knowledge is (or is not) and looks to connect with the wisdom of the world. In an interview with Dan Rowe (2003), Dennis stated that he began carving because one day he realized that he did not have any elders to pass onto him the wisdom of the world, so he went to find it, to create it. An attempt to, as Hogan (1995, 50) describes it, return “to the origins of things and their meanings, to the secret places where original law fosters all evolution, to the organic center of all movement in time and space, which is the mind or heart of creation.” What could these great ancestors teach us? What types of stories would they tell and create if we could listen and understand them? Maybe, as Ursula Le Guin (1982, 13–14) imagines in, “The Author of the Acacia Seeds,” there will be a world in which we are able to understand the world through transcribing and deciphering the texts and languages of the nonhuman world; messages from ants written in touch-glad exudation on acacia seeds, or the kinetic sea literature of penguin. A world in which: “The phytolinguist will say to the aesthetic critic, ‘that they couldn’t even read Eggplant?’ And they will smile at our ignorance, as they pick up their rucksacks and hike on up to read the newly deciphered lyrics of the lichen on the north face of Pike’s Peak.”

Winding through the gardens searching for the other earth art pieces that had been scattered across the landscape, we entered a quiet wooded area. The path changed from rock and gravel to cedar chips, soft and responsive to our tread. The group became quiet and still as we approached a gathering of large rocks and wood, a Stonehenge-like sacred site, that seemed to invite us to huddle around it like a warm campfire on a cool night. We were gathered around *na̓θə̓tə̓p* (Transformation Plant) created by Chris Booth in consultation with local Aboriginal elders and key members of the Musqueam Indian Band, who bestowed its name. *na̓θə̓tə̓p* is what Booth (2015) describes as a “living earth art work”; a long-term (30 +/- years) kinetic piece that will grow and develop as the large stone petals erected around the center open like a flower. The piece consists of a ring of stones—large granite slabs—that are surrounded and held together by stacked wood pieces, all situated around a small juvenile cedar tree that



Fig. 4.3 naḥṭəṭəṭp (Transformation Plant) by Chris Booth. Copyright 2015 Chessa A. Adsit-Morris

has been planted in the center. As Booth (2015, para. 5) explains: “As the fungi breaks down the stacked wood, recycling it into humus, the cedar will flourish into a beautiful tree while the stone slabs . . . slowly open up like a flower.” The piece is meant to draw attention to the importance and strength of even the smallest beings—fungi—what Booth (*ibid.*, para. 7) describes as “the supreme terrestrial recycler, the most extensive of all living organisms . . . one of our most ancient sources of food and medicine,” including penicillin (the wonder drug that has saved millions of human lives). The students discussed how the fungi in this sculpture (specifically the mycorrhizae) is also vital to the health and life of the young cedar tree, participating in a symbiotic relationship, helping the cedar tree absorb water and nutrients through its roots while the tree allows the fungi a steady supply of carbohydrates. This living earth art is an attempt to shift our “mode of attention” to the unseen and unheard beings, celebrating them, yet also bringing up questions around the effects of human-induced climate change on such vital organisms—love and loss—stories of collective living and dying in order to keep the story going.



Fig. 4.4 *Zipper* by Urs-P. Twellmann. Copyright 2015 Chessa A. Adsit-Morris

Leaving the sheltered forest, we ventured toward the open meadow where another earth art piece was located, a large wooden zipper seeming to unzip the green grassy vegetation from the soil and earth below. As the meadow opened up in front of us, begging us to run with open arms, the students' calm and reflective mode exploded into shrieks and giggles, energy radiating out of them as they waited like race horses in the stables to be let loose on the open fields. Once the "go" word was said, releasing them from their obligation to listen and follow, the students took off in a sprint toward the giant zipper, eager to interact and play with the piece. They began jumping and hopping up and down, into the open earth and back up onto the grass above the zipper, but slowly their motions paused and stuttered as if they began to see and understand that this earth art piece was not simply made for their amusement (it was not playground equipment designed for specific movements or interactions), but was cut apart, created with a chainsaw, with ragged edges and splinters of wood still visibly scattered within and around it. As Twellman (2013, n.p.) explains,

My main focus lies on transforming. In this process—where destruction and creation become as one—materials are collected and analyzed; they get bent, broken, split and cut to become new forms or are arranged in a different context. The individual process can be long or short, free flowing or troublesome, can be hard physical work and lead through phases of chaos, disorientation and uncertainty - but it has to be a new challenge every time, resulting in expanding experiences and journeys of discovery.

Playful and serious at the same time, it brings forth (for me) memories of the ever-expanding suburbs that have destroyed most of the desert landscapes in Southern California, particularly within the outskirts of San Diego where I grew up. Mountaintops chopped/topped and stripped for cookie cutter developments, green lawns rolled out and into place like installing carpets, swimming pools scooped out like ice cream and piled high in unseen locations—the American Dream. The botanical garden itself, filled with plants that aren't native to the area, pruned, primped, and which require significant amounts of upkeep, can also be viewed as a “living garment.” We dress and undress the earth, transform it, with little regard for the specifics of place (climate, culture, history), interrupt and displace processes, practices, and lives of nonhuman others we decide do not belong, lives that are not valued. “Do you think anything will grow in here?” Asked one of the students, referring to the area of earth opened up by the zipper. “I don't know, what do you think?” I replied. “Yea, eventually . . . I think eventually nature will take everything back. I've seen it, like in old barns and empty lots.”

Adjacent to the giant zipper, in a nook surrounded by a tall hedgerow at the end of the meadow, were 21 dresses lined up in rows like little toy soldiers plated in armor. The artist, Nicole Dextras, hand crafted 21 “little green dresses” for 21 different women using natural plant materials collected from their personal gardens, everything from radishes to roses to crab apples. The dresses were placed in the installation one by one, as they were individually completed over the three months it took to create them, with the oldest dresses at the back and the newest dresses added to the front resulting in a gradient of degrees of decomposition. The oldest dresses, with dried leaves and muted colors, stood in sharp contrast to the newly finished dresses with bright green leaves and colorful radiant flowers. But even the decomposing dresses were beautiful; as the flowers dried and curled, the plant material became almost translucent bringing out the delicate patterns of veins in the leaves. Each dress was tagged with the name of the woman it



Fig. 4.5 *Little Green Dress Projekt* by Nicole Dextras. Copyright 2015 Chessa A. Adsit-Morris

was created for and the date it was finished. The base design for the dresses was the classic shift dress introduced by Coco Channel in the 1960s, the traditional “little black dress” that every woman should have. Instead, Nicole Dextras is pushing for everyone to have a “little green dress,” garments made from local natural compostable materials instead of the synthetic materials and toxic dyes that currently fill our closets, dressers, and hampers. Her goal was to shed light on the enormous environmental, social, and economic impact(s) of the clothing industry, from the unsustainable materials, to the unethical labor practices, to the wasteful disposal practices. “Do you know what material(s) your jacket is made out of?” We questioned the students. “I don’t know. Cotton?” One student replied. The students began checking the tags on their clothing: polyester, cotton, spandex, and nylon. “Where do you think these materials were grown, manufactured, processed or created?” The students shrugged. It was a story they didn’t know, that no one tells (or at least it is a story that no one likes to tell). The story of the clothing industry has been fragmented, scattered across the globe, and manipulated by the market. Nicole Dextras’s

installation tells a different story, one that began before the garments were purchased and worn, and one that doesn't end when they are taken off and "discarded." It is a story about the art and craft of the fashion industry, our historical and present (partial) connections to the processes and practices that shape it today, as well as its potential to be more response-able, ethical, and sustainable. Inspired by the work of socially engaged artists such as Joseph Beuys, Nicole Dextras describes her work as a socially engaged art practice that draws together ecology, culture, and eco-feminism, exploring the connections between bodies and the natural world. Garments as extensions of our bodies and as connections to the natural world (Brown 2014). It is a story about the beauty of the natural world, its resiliency and hope. Even after the dresses had been left in the garden to decompose, after the first rainstorm swept through the garden battering the dresses, seeming to speed up the process of decay, the dresses began to sprout—new growth, new life, from decay and destruction.

The earth art pieces we encountered at VanDusen Botanical Garden were natureculture stories of response-ability, of transformation. Stories that attempt to shift our attention to other scales, times, and processes. They attempt, through their work, to shed light on our current environmental condition as well as imagine different futures by holding together stories, materials, experiences that just might be more livable and more true; that might begin to teach us how recuperation might be possible. For Haraway (2013, 137–138) reminds us that "recuperation is still possible, but only in multispecies alliance, across the killing divisions of nature, culture, and technology and of organism, language, and machine," this requires "opening up the story of companion species to more of its relentless diversity and urgent trouble" as well as to its resilient struggle for life, its hope.

AN ECO-ART JOURNEY: WRITING AS METHOD OF DISCOVERING THE LOST STREAMS OF VANCOUVER

Although the students kept journals throughout the year, what was actually written in them was not important. Most of the time they wrote what they thought "we" (as teachers, researchers, and adults) wanted them to write. What was important was the process; the action of writing and grappling with experiences that mattered. I wasn't looking for student comprehension of environmental issues, or understandings of new terms



Fig. 4.6 Student Earth Art Piece. Copyright 2015 Chessa A. Adsit-Morris

(such as invasive species, ecology, ecosystem, etc.). I was simply trying to open up the curriculum to experiences that would cause a pause, a shift, in their thinking about the world that they live and learn in. Most of the activities we did throughout the year were considered “fun” not (formal) schooling; in fact, at the end of the year when the students were asked to make a poster for the school fair outlining of all the activities they did with me they titled it “Fun with Chessa.” Yet, I could tell that the students knew that what we were *doing* and *learning* was something important, particularly when they went to write in their journals. Not because of what they wrote but how they wrote it, beginning in quiet contemplation, thinking about the importance of these experiences and ending in excited anticipation for our next activity—most of their writing ended in unfinished sentences because they would start asking questions and suggesting ideas for future activities before they finished.

The entire project was processual. It was important that the students were part of every aspect of the project from decision-making to implementation—nothing was prepared in advance, all of my work was done in

class even if the students were working on other tasks—the students were allowed to observe, ask questions, and help (if their other work was completed). Most of the time we were *figuring it out* as we went along, drawing on the expertise of the larger community (parents, other teachers, community members) and bumbling our way through trial and error. It was indeed one huge collective experiment. After our journey to VanDusen Botanical Garden, the class was inspired to create eco-art in the school yard, so we decided to watch *Rivers and Tides* (Riedelsheimer 2002) a documentary film on the work of Andy Goldsworthy one of the world's most famous environmental artists. The film allowed the students to see how eco-art pieces are constructed—particularly showing the artists' attention to the fluxes and flows of the natural world. My favorite scene in the movie (the scene that got a huge gasping reaction from the students) was the scene in which one of Goldsworthy's pieces—a beautiful pattern of twigs suspended in the air like a spiders' web, created by carefully, slowly, and meticulously connecting together tiny sticks—crashed to the ground while he was still working on it. We discussed the nature of ephemeral art, how the earth art the students create might change or be destroyed by wind, rain, or other beings (including other students at the school). Each week we would choose a new eco-artist to learn about/from, as well as experiment/play/create an outdoor or arts-based activity to explore the concepts and learn about the local community (human and nonhuman). We learned about hunger and the global food system through Agnes Denes's 1982 installation *Wheatfield—A Confrontation* in which she planted a two-acre field of wheat in Manhattan. We learned about food waste through Klaus Pichler's *One Third* project composed of beautiful still life photographs of rotting food. We learned about invasive species through Sharon Kallis's weavings in which she uses invasive plant materials (including blackberry, English ivy, scotch broom, and yellow flag iris) to create site-specific installations that become ecological interventions.

Most of the activities we decided to do—from pottery to papermaking to printmaking with natural materials—I had never before tried to facilitate on my own, nor with 30 excited elementary students. I was no expert, and the students could tell; but they learned that we are all really just making up stories as we go, trying to create possible fictions that come alive. It was creative play in all seriousness, imagining solutions to tangible problems and goals. They watched as we couldn't get the hand hole punches to break through the cardboard cereal boxes; they watched as I spent one whole day attempting to make wooden screens for

papermaking, running in and out of the classroom with hammers, nails, drills, staple guns, and glue; they watched as we burnt out three blenders pureeing paper bits (smells of burning plastic filled the room)—trial and error, chaos and order, love and loss. As the year progressed the students became more and more engaged in imaginative problem-solving, throwing ideas on the wall like spaghetti to see what stuck. We cast out seeds of ideas and waited to see what would germinate and begin to grow within the community classroom climate, and then we tended to them ever so gently until they were strong enough to harvest from. Inspired by the work of Jane Ingram Allen, an artist who creates decomposable indoor and outdoor mixed media installations with handmade paper (or paper pulp) and native plant/flower seeds, the class decided to end the year by creating a large eco-art installation at Gibby's Field, an undeveloped site adjacent to the school that is the last remaining piece of an old stream system (the China Creek System) which ran from South East False Creek past Tyee Elementary School toward 41st street. The China Creek System was the second largest in the Lower Mainland providing habitat for salmon, trout, lamprey, eels, and stickbacks (although it was never commercially fished) (Fass 2009). Named after Old Man Gibby, the site has remained undeveloped due to drainage issues, while the rest of the creek system was slowly developed starting in the early 1900s with the creation and extension of the China Creek sewage line—you can still hear the water rushing through the access covers to the combined sewer system. In 2000, a group of concerned community members came together with the mission of protecting the physical site from development so that it might one day be preserved as a community greenspace. The committee began collecting stories, through historical archives, historical photographs, survey data, books, and interviews with elders in the community (and their family). In 2013 Gibby's Field was identified as one of Vancouver's 125 "Places That Matter," a project initiated by the Vancouver Heritage Foundation in honor of the City's 125th anniversary, during which 125 historic sites across Vancouver were chosen by a committee of local artists, historians, writers, educators, and heritage consultants to receive a permanent educational plaque. This provided a wonderful opening for Tyee Elementary School to begin to foster a relationship with the site and its associated caretakers. It was decided that the eco-art installation would coincide with the official "Places That Matter" plaque ceremony on May 3rd, 2013.

As the project unfolded around Gibby's Field it grew rhizomatically, with multiple independent projects sprouting up in various places, all with



Fig. 4.7 Gibby's Field Eco-Art Installation. Copyright 2015 Chessa A. Adsit-Morris

subterranean connections. We started by taking a historical walking tour of the Kensington-Cedar Cottage neighborhood with the Gibby's Field Subcommittee, comparing the existing landscapes to historical photographs, exploring the still existing contours of the streambed ravine (the traces visible in the slopes of the streets and locations of trees), locating buildings and houses built in the early 1900s still standing, and following the subterranean flow of water. We had groups of students researching the history of Vancouver during different time periods (tracing the expansion of human development) drawing maps and writing stories, while other students completed research on native plants and invasive species. As a class we visited Lynn Canyon (a municipal park in North Vancouver) to learn about stream ecology by experiencing what a "natural" (undeveloped) stream environment looks like, learning about the types of plant and animal inhabitants present, their codependence and importance—*exploring-with* even the smallest mayflies and stoneflies we viewed under a microscope with their intricate shelters made of tiny rocks, twigs, and shells. We visited the Museum of Anthropology at the University of British Columbia (UBC) to learn about

the Musqueam (the Northwest Coast First Peoples) their connection to and respect for the nonhuman world, particularly focusing on their complex social and cultural practices as well as their artistic traditions (cedar weavings, totem poles, and traditional ceremonial garments). We followed Musqueam Creek (a restored salmon spawning stream in Vancouver's Pacific Spirit Park, located on Musqueam land) through the estuary out to Spanish Banks (the intertidal zone on the tip of Vancouver), working with a local ecologist to learn about and encounter various species that occupy the coastal waters. We also had two of the sixth Graders create questions and interview two of the community elders who grew up in the Kensington-Cedar Cottage neighborhood, Olive Cairns (97 years old) and Florence Anderson (99 years old). Olive Cairns told stories of Vancouver before there were paved roads, when their weekly groceries were delivered on Thursdays by horse and carriage, how her younger brother would catch garter snakes along the creek and taunt her with them, and how she worked in the tea factory downtown to support her family through World War II. Florence Anderson told stories of family picnics along the creeks, and how the school children would cut through Gibby's Field on their way home from school each day, stopping to play and explore when weather permitted.

The Gibby's Field eco-art installation required much experimentation and preparation, collaboration and patience. It took four months to make all of the paper needed for the installation, hand dying individual batches of recycled shredded paper (salvaged from a local law firm) with natural dyes: Indigo (which left the room smelling of rotten eggs), red cabbage (which contrary to its name creates a blue color), yellow onion skins (for salmon colored paper), and blackberries. Each piece of paper was seeded with native blue flowers after it was screened, then laid out to dry on the classroom floor overnight (the classroom became a giant game of hops-cotch). As word spread around the school about the project, more and more students and teachers were interested in getting involved. Thus, our students made posters describing the history of Gibby's Field and went to "teach out" about the project to the other classes at the school. They also taught small groups of students from other classes how to make paper, so that by the end of the project every student at the school was involved in the Gibby's Field project. By the end, over two-thirds of the school had contributed to making paper for the installation. I worked with a few of the other classes to creatively contribute to the project by doing art projects or poetry: The kindergarten class decided to paint colorful fish

with unused or unfinished scraps of the paper, one of the Grade 1/2/3 classes wrote eco-poetry on the finished paper, and another class decorated paper cutouts of butterflies and flowers with ideas and hopes for what Gibby's field might look like in the future. With Earth Day falling smack dab in the middle of the week before the Gibby's Field plaque ceremony was scheduled, the entire school was attentive to environmental issues, participating in various "environmentally friendly" activities such as a waste-free-lunch week, school grounds and beach clean ups, recycling activities, gardening activities, and the school hosted a small garden "pocket" market in which they sold local seasonal produce as well as organic food products the students prepared (including dried soup mixes, dried apples, ginger ale, popcorn, cookies, etc.) in order to raise money for their school garden program.

On the day of the Gibby's Field Plaque ceremony the class buzzed with excited energy; the students eager to help with whatever activities needed completing. However, like most weeks, the students were also busy with other assignments including preparing for the school learning fair. The Parent Advisory Committee (PAC) had decided to host their yearly plant sale and activity fair on the same day in order to capitalize on the energy and enthusiasm of the community built up around the plaque ceremony, as well as provide a space for an informal "reception" to take place afterwards. The students set up an informational booth at the activity fair with all the materials that they had made about Gibby's Field (posters, maps, journals, sample pieces of handmade paper, and drawings) and spent time rehearsing what they would say to interested community members. The installation took all morning to install; with classes of students visiting to help put out the paper and add whatever artistic component/contribution their class had decided to create. It was a sunny spring day, cherry blossoms filled the trees, but the winds made it difficult to keep the paper in place. With buckets of water the students began "watering down" the paper river, laughing at the irony of it as they darted back and forth between the tubs of water and the installation. The water made the paint and colors run into each other like ripples and waves adding to the texture of the piece, as well as beginning the germination process of the seeds. Our intervention was an active encounter with the spacetime-mattering that is Gibby's Field, an opening for others to imagine possible futures, an attempt to reseed our imaginations. What will germinate and grow is still yet to be seen. Did we solve all of the "environmental problems" we came across on our journey? No, the giant plastic gyre

is still forming, the invasive species are still outcompeting native species, edible food is still being wasted by the tons in North America, and the diversity of nonhuman others is still in dramatic decline. But what we did do, and what we *can* do, as Leesa Fawcett (2000, 145) outlines, is to

Tell each other stories, question, write, “listen” to one another, hold the contradictions a while. We can encourage stories from childhood through adulthood, all the while reminding ourselves that stories are neither innocent nor neutral. We can turn them over and over, look for ethics of care and justice in who tells which stories, and notice whose stories get to count? We can focus on “situated knowledges” and we can highlight interdependence, imagination, mystery, and the co-authorship possible in our relations to other beings.

As Haraway (2013, 118–119) reminds us, “to study the kind of situated, mortal, germinal wisdom we need . . . [we must turn to] stories of becoming-with, of reciprocal induction, of companion species whose job in living and dying is not to end the storying, the worlding,” but open up possibilities for practices of recuperation and the co-creation of places of refuge.

NOTES

1. Similar to Haraway (2004, 333): “I like layered meanings, and I like to write a sentence in such a way that, by the time you get to the end of it, it has at some level questioned itself.” Definitions of terms are palimpsestic, multi-modal, multidisciplinary, historically situated, and often (mis)translated. My hope in this book is to search for polysemes, and hold together the multiple definitions of terms to create a deeper, richer, and more complex understanding(s). My goal is to create thick meanings, messy meanings, that drawing on multiple fields/planes/modes of thought; to create generative (re)interpretations and translations. The definitions scattered throughout the book are not intended to be conclusive static definitions; they are simply the current gathering of descriptions that shape my understanding.
2. Figurations, a literary tool introduced/used by Donna Haraway, are tropes or figurative metaphorical beings found within specific cultural traditions; they are, as Rosi Braidotti (2011, 101) describes, “a commonly shared foundation of collective figures of speech.” Haraway (2004, 2008b) creates new powerful figurations (i.e., cyborg, dogs, OncoMouse™, and other companion species) to work/think/play with, in order to challenge existing taken-for-granted notions and habitual practices of thought. For

Haraway figurations are where the imaginary meets the ordinary every day; figurations are not “didactic illustrations, but rather material-semiotic nodes or knots in which diverse bodies and meaning co-shape one another” (Haraway 2008b, 4).

3. The Old Streams of Vancouver are a series of creeks and streams that existed prior to the extensive development of Vancouver and the surrounding area. The streams have since vanished, having been covered by houses, roads, or diverted via culverts and sewage pipes with only a few sections existing today. Over the past decade there has been a resurgence of interest in the creek system with a number of restoration and daylighting initiatives beginning in the area.
4. The Think&EatGreen@School project (<http://thinkeatgreen.ca>) was a Community-University Research Alliance (CURA) Grant project that investigated issues around food security in elementary and secondary school across Mainland Vancouver, BC. This community-based action research project investigated food security and sustainability issues with students, parents, staff, and administrators within the Vancouver School Board, specifically through the creation of curricula focused on student learning and the creation of critical environmentally conscious “food citizens.”
5. In her book *Metamorphoses: Towards a Materialist Theory of Becoming*, Braidotti (2002, 125) draws attention to the processes of transforming animals into metaphors (another powerful form of metamorphosis); she reminds us “animals are also living metaphors, highly iconic emblems within our language and culture. We normally and fluently metaphorize them into referents for values and meanings.”
6. There are a number of terms used to describe various forms of earth art including environmental art, nature art, art in nature, crop art, site-specific performance, land art, earth art, earthworks, eco-art, ecological art, bio-art, and/or ecoventions. Throughout this book I will use the terms eco-art and earth art. Many use these two terms to differentiate contemporary artistic approaches from earlier earth art practices. The term “earth art” involves, as Bower (2010, n.p.) explains, the use of the “earth itself as stage, material and canvas for conceptual art ideas.” As he continues, the term eco-art is a “contemporary art movement which addresses environmental issues and often involves collaboration, restoration and frequently has a more ‘eco-friendly’ approach and methodology” (*ibid.*). I have chosen to use the term “earth art” to describe the works of art present at VanDusen Botanical Gardens because they are created in a more traditional fashion, by manipulating organic materials found onsite. However, a number of the pieces addressed contemporary environmental issues similar to other eco-art pieces we studied later in the year.

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Thinking: A Narrative Inquiry into Possible Figurations and Multiple Modes of Ecological Thought



Fig. 5.1 *Jim's Dog*. Photograph by Jim Clifford, copyright 2005. With permission of Donna Haraway

Abstract “Thinking” is a semiautobiographical narrative inquiry into doing research on ecological thought in “dragon times”; an inquiry into the types of figurations that might teach us to relate otherwise and the types of stories that might allow us to think otherwise. The author attempts, through this chapter, to push, drag, coax, trick, or pull ecological thought outside the boundaries of western metaphysics, outside the territories of systems theory, into the muddy and mucky world of everyday creatures, into the realm of a post-Newtonian, complex, embodied, creative, indeterminate, un/in/folding world. Exploring the various shifts in thinking that ecological thought requires outside the limits of the western metaphysics. This chapter is also a semiautobiographical narrative inquiry that documents the author’s own metamorphosis in thinking and learning, exploring how past personal experiences inform new understandings of teaching, learning, and research.

Keywords Ecological thought · Gestalt · Symbiosis · Holobiont · Ecotone · Becoming-with

We are at stake to each other, I think, in more powerful and more humble ways.

Donna Haraway

Relation: The term relation has a multiplicity of overlapping meanings—it is an enacted agential practice—it is the expression of connections or correlations, the practice of relating or narrating, the practice of organization, the “connection of people by circumstance” (OED), the connection of people by blood line, heritage or the expanded notion of kinship (including multispecies kinship; a notion taken up by many feminist scholars). Physical, social and emotional inter- and intra-actions (Barad 2007). In quantum physics relation refers to the state of a system being observer-dependent (Barad 2014), the practice of

Direct quote from a presentation Haraway gave on March 24, 2014 at the University of Alberta titled, “SF: String Figures, Multispecies Muddles, Staying with the Trouble.” Reprinted with permission by author, Donna Haraway.

making cuts or being part of larger material arrangements that agentially enact cuts (see Barad 2007).¹

This past Christmas my dad and I went on a cycling trip along the California coast. Four days of salty air, burning climbs, sea lions, and some of the luckiest cows I've ever met. The coast of California, particularly near Big Sur, is one of the most beautiful ecotonal zones in the world (or at least I think so). Big Sur is on the Central Coast of California where the Santa Lucia Mountains meet the Pacific Ocean. Where the desert meets the forest and they both crash into the sea. A place where tensions—verging on contradictions—thrive, creating a region of rich biodiversity. Arid, dry, dusty hills covered in chaparral intermix with lush, green redwood coniferous forests. In between the cliffs and climbs we cruised through rolling ranch lands with green pastures stretching and then dropping straight to the ocean. I could die happy living here. The beauty and dramatic tensions—the freezing cold nights and hot days, the vertical cliffs and rolling hills, the dry crisp air that smells lush with pine—it makes you feel alive. It makes you want to hurt more, push yourself farther and harder in order to feel the sweet relief and euphoric sensations of recovering from your exertions. It is these dramatic tensions that shock you out of your mundane life, resetting and recalibrating your senses and expectations.

As a 30-year-old woman, my “biological clock” is telling me to settle down; sending me dreams and thoughts of children. As I rode my bicycle past the beautiful houses perched on the cliffs of Carmel and Big Sur, I wanted to imagine what it would be like to settle down in such a beautiful place. But I've never been able to imagine settling down, buying a house, and raising a family. My husband and I have been planning and preparing for an apocalypse (or more accurately, rising seas, the end of oil, economic collapse, pollution, the loss of biodiversity, and—possibly the worst of all—no more coffee) instead of planning a family. We talk about it half-jokingly with our friends, scared that they will think we are crazy; but I suspect they are more scared of us because we make them think about these issues everyone seems to work so hard at ignoring (at least in their everyday lives). However, besides the rising seas and intense storms brought on by climate change, living on the California coast might not be a bad plan. Big Sur's got enough sunlight to grow things year round, and there really aren't that many people living in the area (i.e., less pollution and less people vying for limited resources). We'd be able to grow what we need to survive. Plus, the Central Coast of California grows most of the

strawberries sold in the US and it is pretty damn good wine country. I could live on strawberries and wine; die drunk and happy.

BREAKING THE BINARIES AND BECOMING SITUATED HYBRIDS

Patti Lather (2006), in her essay “Paradigm Proliferation as a Good Thing to Think with: Teaching Research in Education as a Wild Profusion” notes that in the last decade there has been a proliferation of paradigms and research methods in the field of education, all vying for legitimacy. Many of these trends attempt to shake or erode the foundations of traditional positivist research philosophies. Binary either/or positions (or oppositions) are being replaced by a Deleuzian both/and philosophy. Many of these academics have attempted to “break down” the either/or binaries by occupying the “in-between” space(s) between the two poles of the binary opposition. Although this provides a critical alternative vantage point, and it is instrumental in the process of restoring and reinhabiting these “dead zones,” it still utilizes the “lens of dualism” as Christian Diehm (2003) describes, and if used improperly may in fact reify the binaries instead of disrupt/rupture them or break them down. “Breaking down” binary dualisms is no simple task. As Val Plumwood (1993, 47) explains, dualisms are “more than a relation of dichotomy, difference, or non-identity, and more than a simple hierarchical relationship”; dualisms are affected by what Plumwood identifies as backgrounding, radical exclusion, incorporation, instrumentalization, and homogenization. These features of dualism function by (a) denying the “relation and continuity between disjuncts,” through backgrounding, radical exclusion, and incorporation, and (b) by denying the “independence of that which stands at the inferiorized pole of the dualism” through homogenization and instrumentalization (Diehm 2003, 33). Or, as Rosi Braidotti (2006, 58) describes, “it is a case of quantitative pluralism, as opposed to qualitative multiplicity” where the later is simply a case of “a multiple of One—multiplied across an extended space . . . a system that generates differences for the purpose of commodifying them” (*ibid.*, 94) in an attempt to hide the processes of discursive formation of these dualisms. Gilles Deleuze and Félix Guatarri (1987, 20–21) call this “the magic formula we all seek—PLURALISM = MONISM—via all the dualisms that are the enemy, an entirely necessary enemy, the furniture we are forever rearranging.” These social and cultural processes are complex and interrelated, and they mask and simplify the interdependent and co-constitutive nature of the two poles. Utilizing the “liminal” space—or spaces of transition that are passed

through—as well as the center-periphery relation (Braidotti 2006) denies the complex interdependence between the two poles and the systems of relations that they are nested within.

Deleuze (1988, 1993) through his notion of the *fold* and Elizabeth Ellsworth (2005) through her notion of the *hinge* (or *pivot place*), begin to get us thinking of the in-between space as dynamic, in motion, and provide embodied ways of thinking that move us out of our cognitive aporias. The fold's function, as explained by Alain Badiou (1994, 178), is to “avoid distinction, opposition, [and] fatal binarity.”² However, when the fold is viewed as a static metaphor it reifies the binaries it initially attempted to bring into relation. Or, as Braidotti (2006, 58) warns,

Once this dialectical bond is unhinged, advanced capitalism looks like a system that promotes feminism without women, racism without races, natural laws without nature, reproduction without sex, sexuality without genders, multiculturalism without ending racism, economic growth without development, and cash flow without money . . . Welcome to capitalism as schizophrenia!

Unhinging these binaries produces waves of racialized, naturalized, gendered “Others,” multiples of the same masked as diversity, but are simply pluralities of the same affected by the same logic of domination (Plumwood 1993) and incorporation/homogenization/reifying processes. As Deleuze (1988, 1993) explains, “what always matters is folding, unfolding, refolding.”³ We must shift our attention, as Kaustuv Roy (2003, 3) notes, to the “emergent relations of force rather than [the] fixed categories”; and we must focus on what Arne Næss (2005) describes as the *intrinsic relationality* within each “situation” or “place” as understood as, what Rita Irwin and Stephanie Springgay (2008, xxi) describe as a performative “relational constitution of social, economic, cultural, [ecological] and political processes.” We must expand our notion of relationality from simply an understanding/conceptualization of “connective tissue” (or networks of connections) because “relationality is more than just the contexts that are brought to bear on particular ‘sites’ but the potentialities and the ‘other thans’ that continuously evolve and provoke meaning” (*ibid.*).

How do we conceptualize the unique set of characteristics that emerge from specific “situations”? Or, as Diehm (2006, 26) poses, how do we conceptualize the “aspects of reality that emerge in specific networks of

relations”? In order to better understand and address the many issues discussed above, I have chosen to develop/utilize/*play-with* three figurative concepts—the hyphen, the ecotone, and the holobiont—in order to craft a material-semiotic understanding of our situated relationality. The concept of the hyphen runs parallel to and intersects with a number of other concepts frequently used in the academic field, including Jean-Luc Nancy’s (2000) notion of *being-singular-plural* and the concept of *hybridity* used by Donna Haraway (2003, 2008), Sarah Whatmore (1997, 2002), and Bruno Latour (1999, 2003), among others (who utilize the concept in similar but productively heterogeneous ways). The hybrid has been used to challenge *a priori* Cartesian binaries and the dualistic narratives that solidify and strengthen these binaries. Haraway uses the figuration of the cyborg to challenge the human/machine, nature/culture, virtual/real binaries, along with her creative concepts, naturecultures and companion species. Haraway (2004, 300) asks us to be “alert to the emergent historical hybridities actually populating the world at all its contingent scales.” For, as she illustrates through her politically charged stories, we are all hybrids; we are all cyborg, mixed mutt, monsters (and most recently in her new book *Staying with the Trouble*, we are all “mutter, matter, mother” [Haraway 2016]). Haraway’s hybrid figurations are political and personal; they successfully restory and restructure the complex processes that have upheld the Cartesian dualisms and reductive materialist ontologies. However, as Whatmore (2002, 2) notes, hybridity is already “freighted in various ways” including that many conceive “every hybrid as a mixture of two pure forms,” what she calls “one-plus-one” logic. Whatmore also questions how these hybrids are created, whether “these hybrid subjects stitch their own parts together, in which case they become more cohesive than Haraway wants to admit, or whether this ‘stitching together’ is better understood as an operation taking place from without” (*ibid.*, 47). For me, the notion of “hybrid beings” brings forth images of people in white lab coats genetically modifying and combining specific characteristics of different species; creating Frankenstein monsters (which is indeed one form of hybridity). However, Whatmore points out that hybrids are “not just the inter-connectedness of pre-given entities but the condition of immanent potentiality that harbors the very possibility of their coming into being” (*ibid.*, 161).

Although I also struggle with the notion of the hybrid as a “prefigured” entity (Whatmore 2002, 187, note 16) I do not believe that Haraway’s notion of the hybrid can be that easily dismantled or dismissed because her figuration of the cyborg (which Whatmore uses to understand Haraway’s

notion of hybridity) cannot be fully understood without an understanding of her other hybrid figurations (i.e., naturecultures and companion species including Cayenne, OncoMouse™, Dolly and fungi). We are all hybrid beings and thus our ideas are also always hybrid, intertextually (Rogoff 2000) formed. Understood intertextually, Haraway's (2008, 4) notion of hybridity is one of *becoming-with* because as she states: "To be one is always to *become with* many." The notion of becoming-with is also the premise of Nancy's (2000, 34) notion of being-singular-plural which is "*the proper essence of one whose Being is nothing other than with-one-another.*" Nancy (2000, 35) explains that

This "with" is at once both more and less than "relation" or "bond," especially if such relation or bond presupposes the preexistence of the terms upon which it relies; the "with" is the exact contemporary of its terms; it is, in fact, their contemporaneity. "With" is the sharing of time-space; it is the at-the-same-time-in-the-same-place as itself, in itself, shattered.

Haraway (2008) uses Scott Gilbert's notion of "interspecies epigenesis" to describe this notion of becoming-with. Epigenesis is the development of an organism from an egg (or spore) through a series of interactions by which, as Scott Gilbert (2002, 203) explains, "the inherited potentials of the egg become realized in the phenotype of the adult" through a process of differentiation. However, Gilbert's notion of interspecies epigenesis explains that, "in addition to the epigenetic interactions occurring within the developing embryo, there are also critical epigenetic interactions occurring between the embryo and its environment." Gilbert was able to prove that these epigenetic interactions with the environment can affect "the sex of the embryo, increase its fitness, or even be involved in the formation of particular organs" (*ibid.*, 202). This is not an insubstantial relationship. Or, to describe the significance in another way, he proclaims "we were 'never' individuals" (*ibid.*, 212). As Braidotti (2006, 122–123) positions it, "Becoming is a zoological, biological and geological event, which feeds on multiple territories."

FROM HYBRID TO HYPHENATED

Haraway (2003, 4) describes these interactions as "a subject- and object-shaping dance of encounters." We are hybrid beings interacting with, relating to, and becoming-with other hybrid beings within specific situations; or

what I call being *hyphenated beings*. I chose to use the hyphen as a figuration for understanding our becoming-with in order to illustrate that agency and meaning are located within relations (Latour 2003). Agency, in this view, emerges through situated interactions/encounters/relations. Nancy uses and elaborates on the concept of the hyphen to describe the dynamics of being-singular-plural. Nancy (2000, 37) explains that

Because none of these three terms precedes or grounds the other, each designates the coessence of the others. This coessence puts essence itself in the hyphenation—"being-singular-plural"—which is a mark of union and also a mark of division, a mark of sharing that effaces itself, leaving each term to its isolation *and* its being-with-the-others.

The hyphen creates tension between the terms, simultaneously pulling them together and pushing them apart. It functions as a continuum or transition zone, or what Brian Massumi (2002) calls a *smudge*. The hyphen allows for the relations to change, definitions and understandings to blur. I have always understood myself as a hyphenated being. I believe that there are two significant reasons for this personal identification as a hyphenated being; namely two significant becoming-withs that have shaped my development. The first becoming-with occurred in the womb because not only did I codevelop with my embryotic environment, I literally codeveloped with my twin brother. I have, as a result, never been an individual; always a coupling of identities—Chessa&Devin—shared experiences, shared spaces, shared lives. Although at times it may have seemed that we were at binary oppositions to each other (I am a girl, he's a boy; I like vanilla ice cream, he likes chocolate; I like getting dirty, he likes staying clean; I like cats, he likes dogs) we were/are always only ever reacting to and responding to our continuously in-the-making expanding relationship. But if my "tomboy" cross-dressing, asymmetrical haircut, and plethora of broken bones (most caused by trying to keep up with my brother) signified anything, it was that everything about our relational identities were/are in contention and in-the-making.

My second significant becoming-with was because of my hyphenated last name, Adsit-Morris. I am part of what some call the "hyphenated generation" of the 1980s and 1990s when feminists such as my mother chose to keep their maiden names and give their children a hyphenated last name (Smith 2012). This may seem like an inconsequential decision but having a hyphenated last name creates tension, challenges social norms, and makes it

extremely difficult to fill in bureaucratic forms for standardized tests. The hyphen challenges patriarchal notions of lineage, power, and dominance. Hyphenated last names provide openings for new combinations and creations. On the National Public Radio (NPR) show called “When Hyphen Boy Meets Hyphen Girl, Names Pile Up,” Tovia Smith (2012) interviews a married couple who both have different hyphenated last names and struggled to decide on a last name for their newborn child. The couple eventually decided upon giving their child two middle names and a hybrid hyphenated last name. This signals, as Whatmore (2002, 161) explains, “not just the inter-connectedness of pre-given entities but the condition of immanent potentiality that harbors the very possibility of their coming into being.” The hyphen allowed me to view myself as “other-than” and “more-than.” It opened my identity to other possibilities and creations, unmooring it from the patriarchal processes that shape our culture.

Having a twin brother and a hyphenated last name does not make me more of a hyphenated being (we are all equally hyphenated); it has simply made me more attentive to (or attuned to) our hyphenated nature, or our becoming-with(s). My hybrid household was host to more than simply hyphenated twins; it was full to the brim of naturecultures and companion species. We had what Whatmore (1997, 46) describes as “a hybrid concept of community which disrupts the purification of culture and nature into distinct ontological zones, onto which the binary of ‘human’–‘nonhuman’ is then mapped.” Our hybrid family community or *assemblage* (Deleuze and Guattari 1987) included a mixed litter of dogs, horses, turtles, birds, fish, spiders, rats, mice, and cats; including a cat that taught *himself* how to pee in the toilet like a human (although he never figured out how to flush or put the seat down). In a cowritten and co-presented paper on researching with the more-than-human world, I reflected upon my hyphenated relationships with my companion species, in this case my relationship with my two whippets:

I sit with my two whippets, Bison and Bear (i.e., the skinnies), curled on either side of me with their noses nuzzled under the blanket. I find it ironic that they are called sighthounds when I (like anyone with a whippet companion) knows they are really “touchhounds.” These skinny racers are never content unless they are touching another being. The way they lay on top, under, through, between, and with each other and myself, I feel as though we are knotted together, stuck in a way in which you can’t tell who is holding whom, who is entangled in whom, or who is twisted around whom. Yes, whippets were bred to hunt by sight and speed (hence the name sighthound

or gazehound) but I would argue that they have consequently also been bred to need the warmth of others due to their almost complete lack of body fat. But I believe that this biological need for warmth has been morphed into affection, co-habitation, and co-dependence, due to what Haraway (2008, 5) calls “doing-in-relation” through which we have become “ordinary knotted beings” who “gather up those who respond [in] unpredictable kinds of ‘we’.” “I” becomes “we” as our emotions, consciousness, unconsciousness, and biological/emotional needs become knotted together.

Becoming “we” through our partial connections leads to an embodied awareness of each other. Haraway (2003, 50) explains that, “all ethical relating, within or between species, is knit from the silk-strong thread of ongoing alertness to the otherness-in-relation.” Being knotted/knit together we create a sort of friction or energy as we move through our everyday lives, through our otherness-in-relation. I have become alert and aware of this friction, the embodied energy that flows between us and how it affects my conscious and unconscious. I can sense their presence, and not just when they stretch their gangly legs into my back or stomach, pushing me off the edges of the bed as we sleep. When they are present, the energy in the room changes. The way I move through space changes, the way I carry myself changes. Haraway (2003, 42) describes this as the “corporeal posture of cross-species respect,” indicating that ethics and “significant otherness” is an embodied act.⁴

Reflecting/refracting/diffracting our hybrid community leads me to question what happens in this hyphenated space. A space that as Michelle Fine (1998, 131) explains, “both separates and merges personal identities with our inventions of Others.” Fine asks us to “work the hyphen” or “probe [into] how we are in relation” (*ibid.*, 134). Nancy (2000, 5) writes that, the hyphen

Has neither a consistency nor continuity of its own. It does not lead from one to the other, it constitutes no connective tissue, no cement, no bridge. Perhaps it is not even fair to speak of a “connection” to its subject; it is neither connected nor unconnected; it falls short of both; even better, it is that which is at the heart of a connection, the *interlacing* [l’*entrecroisement*] of strands whose extremities remain separate even at the very center of the knot. . . . All of being is in touch with all of being, but the law of touching is separation; moreover, it is the heterogeneity of surfaces that touch each other.

The hyphen is more complex than a hinge or a fold and more inhabited than the in-between, the “dead zones.” Haraway (2008, 41) explains that “more often, the configurations of critters have other patterns more reminiscent of a

cat's cradle game of the sort taken for granted by good ecologists, military strategists, political economists, and ethnographers." We are within, as Whatmore (2006, 603) describes, "a sticky web of connections or an ecology of matter."

ECOTONES AND THE EMERGENT GESTALT

Ecotone: From the combination of "eco" Greek οἶκος meaning house or dwelling and "tone" or τόνος meaning tension. Ecotones are transition zones, areas between two or more communities that contain the characteristic species of each community, plus species unique to their particular contact zone. Thus resulting in a place of danger or opportunity; an experimental testing ground.

Braidotti (2006, 60) argues that the challenge is to find "a creative alternative space of becoming that would fall not between mobile/immobile, the resident/the foreigner, but within these categories. The point is neither to dismiss nor to glorify the status of marginal, alien others, but to find a more accurate, complex location for a transformation of the terms of this political interaction." I prefer to use Haraway's notion of a *contact zone* to describe and understand the creative alternative space of the hyphen. This contact zone is the overlapping territories of affecting and becoming (Deleuze and Guattari 1987). Mary Pratt (1992, 8) explains that the "contact" perspective "emphasizes how subjects are constituted in and by their relations to each other. It treats the relations . . . in terms of co-presence, interaction, interlocking understandings and practices, and often within radically asymmetrical relations of power." Contact zones are, as James Clifford (1997, 7) explains, "systems already constituted relationally, entering new relations through historical processes of displacement."⁵ The contact zone I choose to foster and utilize is called an *ecotone*. Ecotones are regions of co-occupation (Grosz 2008) and co-habitation; they are both/and spaces—both a transition zone and a boundary (or fringe, or margin). Koen Hufkens et al. (2009, 977) define an ecotone as "a multi-dimensional environmentally stochastic interaction zone between ecological systems with characteristics defined in space and time, and by the strength of the interaction." The width and shape of the ecotone is location-specific due to the interplay of various processes and properties. Haraway (2008, 217) describes ecotones as "interdigitating edges . . . the richest places to look for ecological, evolutionary, and historical diversity."

Ecotones have a unique species assemblage, as Peter Lesica and Fred Allendorf (1995) illustrate, they contain species from both adjacent ecosystems as well as some genetically unique populations. Thus ecotones have high intra- and inter-species genetic diversity (Safriel et al. 1994). Ecotones are more-than the blending of characteristics from two different ecosystems, just as I am more-than simply a blending of my parents' genetic characteristics. However, ecotones are not limited to the biological. Braidotti (2006, 59) recognizes and argues for "a transnational cultural space of transitions and flows, which express the overlapping and non-linear contact zones between natures and cultures; border, travel, creolization, transculturation, hybridity and diaspora."

Ecotones, however, are not the only type of possible interaction/contact zone between ecological systems or communities; there are also dead zones. Dead zones are ecosystems that, due to particular human activities (or human altered processes), are currently uninhabitable except to specific toxic microbes or what Astrid Schrader (2008, 2010) calls harmful algal species.⁶ Dead zones usually refer to marine ecosystems that due to processes of eutrophication are hypoxic or lack enough oxygen to sustain aquatic life. I prefer to use the term more broadly because I believe that the number of terrestrial dead zones is growing rapidly due to pollution, desertification, and the resulting increase of salinity in soils. Robert Diaz and Rutger Rosenberg (2008) estimate that there are 400 marine dead zones (most around the Eastern and South Eastern coast of North America and the European Union) the largest being where the Mississippi River meets the Gulf of Mexico. Schrader (2010) likens the toxic microbes that inhabit and (co)create these dead zones to the anthropocentric concerns of "our" political economies that have created social and academic dead zones (i.e., the "in-between" spaces of the either/or binaries, and the watery moats surrounding the academic ivory towers). I would agree that there are an abundant number of social and academic dead zones which, similar to marine dead zones, are a symptom of the homogenization of landscapes and educational institutions. However, these "dead zones" are far from "dead" as Jeremy Jackson (2008) reminds us, they are full of microbes and jellyfish; they are simply ecosystems which lack all the species "we" (progressive individualistic "untethered" humans) want, and instead sustain and nourish all the nonhuman others we don't want. These dead zones provide a useful tool for shifting our understanding(s), our ways of thinking, and altering the concepts we use to *think-with*, allowing us to (hopefully) better, as Haraway (2008, 4) states, "grapple inside the flesh of mortal world-making entanglements that I call contact zones."

Schrader (2010), in her article “Responding to *Pfiesteria piscicida* (the Fish Killer): Phantomatic Ontologies, Indeterminacy, and Responsibility in Toxic Microbiology,” uses the harmful algal species (*Pfiesteria piscicida* in particular) which inhabit these dead zones to challenge the existing temporally linear understandings of the relationship between cause/effect, decentering the human, bringing into question current anthropocentric concerns and (scientific) practices. The *Pfiesteria piscicida* also functions to challenge existing dualisms (including nature/culture, human/nonhuman, and simplicity/complexity). Schrader (2010, 281) explains that “rather than an ‘organism-niche system’ that is moving through time (Oyama 1985, 23) *Pfiesteria* might better be described in Rheinberger’s (1997) terms, as ‘an ecohistorical nexus in an environment of potential traces’ (227)” in which the *Pfiesteria* cannot preexist their relations. Although considered a simple “primitive organism,” Schrader notes that “unlike most species that are considered to be ‘harmful algae,’ *Pfiesteria* is not an alga according to the classical definition (primitive plant-like organisms) . . . *Pfiesteria* are neither plant nor animal, but can act as both.” The *Pfiesteria* have a very complex lifecycle with at least 24 distinct life stages, three different life forms (one which is toxic, another which is a dormant benign cyst), that do not occur in a linear fashion, “nor a static web or network, nor anything that could be easily translated into a program”; rather, the *Pfiesteria* metamorphize and transform into different life forms, with different modes of reproduction, in relation to their environmental conditions/connections (*ibid.*). The *Pfiesteria* in essence are constantly becoming-with and co-constructing their environment(s) at the same time. Schrader (2010) uses Karen Barad’s (2007, 170) notion of *intra-activity* and Gilbert’s interspecies epigenesis to explain that, “bodies do not simply take their place in the world. They are not simply situated in, or located in, particular environments. Rather ‘environments’ and ‘bodies’ are intra-actively co-constituted.” As Schrader (2010, 283) continues, due to *Pfiesteria*’s “phantom-like” multiple identities (or multiple “beings and doings”) the scientific community has not been able to successfully establish *Pfiesteria* as the “causative agent” in fish kill incidents, nor separate out (or “cut” out as Barad would describe) its “fish killer” toxic identity from its other identities (or life forms/stages). The *beings and doings* of the *Pfiesteria* provide a useful tool to move “ecological thought” and “systems theory” toward a more complex multilayered, messy, post-human understanding of our own beings and doings in relation, so that we can, as Haraway (2008, 15) states, have a “chance for getting on together with some grace.” Borrowing from Marilyn Strathern, Haraway (2013, 138) explains

that “it matters which concepts we use to think other concepts with.” The question around “who *Pfiesteria* are” (Schrader 2010, 282) becomes an understanding of the *Pfiesteria* identity as performative; returning to Irwin and Springgay (2008, xxi), we might think of the *Pfiesteria* identity as a “relational constitution of social, economic, cultural, [ecological] and political processes.” Schrader uses *Pfiesteria* as a concept to shift our focus, to blur or smudge (Massumi 2002) the boundaries between existing static categorical (scientific) concepts of species, time, cause/effect, and identity. As Braidotti (2006, 122) explains,

The line of demarcation [should] not [be] between species or categorical divides, but rather at the molecular level of the forces, passions, intensities or affectivity that get invested in them. In other words, it is the typology of affects, or the ethology of forces, that makes all the difference.

Many academics have begun the task of re-inhabiting these dead zones by occupying the in-between space or “interstitial space” (Bhabha 1994) of the hinge or fold, restoring the habitat and beginning to foster and rebuild vital relations through the reintroduction of native species, removal of invasive species, and various erosion control measures. However, along with the daunting task of repairing existing dead zones (which like most pollution sites, no one will take responsibility for) we must conserve and foster the ecotones that exist. Inhabiting the ecotonal zones of interaction/contact requires a different mode of thinking, what Braidotti (2006, 105) calls a “qualitative shift of perspective.” It requires relational complex material-semiotic thinking and what Næss (1989, 2005) and Maurice Merleau-Ponty (1963) call a *gestalt ontology*; as Braidotti (2006, 102) states, “it is rather the case that it requires a shift of the ontological grounds of embodiment”; to live and think thickly, as Haraway (2014) would describe.⁷ We must move away from a reductionist materialist ontology that requires things to be taken apart, segmented, fractured, and reduced in order for them to be understood (Capra 1996). Fritjof Capra (1996, 2) explains that “living organisms do not perceive things in terms of isolated elements but in terms of integrated perceptual patterns—meaningful organized wholes that exhibit qualities that are absent in their parts.” Ecotonal spaces require not only an understanding of how the “parts” are interconnected/related but also an understanding of the emergent patterns; or what is called the *gestalt*.

Gestalt, as Capra (1996, 2–3) explains, is a German word meaning “organic form,” it describes the “essential properties of a living system—an

organism or a community—... properties of the whole, which none of the parts have. They arise from the interactions and relationships between the parts.” As Ted Toadvine (2009, 21) elaborates, Merleau-Ponty describes the natural world as a “self-organizing systems of ‘gestalts’—embodied and meaningful relational configurations or structures.” Gestalts are the *more-than* I referred to earlier; it is the *Aha!* moment of educational experience when all the pieces come together and you can see the emergent whole. But, as Capra (1996, 3) explains, “the parallel between ecosystems and human communities is not just a metaphor. It is a real connection, because both are living systems. The principles of ecology are, if you wish, the patterns of life.” As Næss (2004, 13) explains in an interview with Christian Diehm, “we are basically gestalt entities experiencing gestalts”; or in other words “it’s all just as much out there as it is in you!” However, as Næss explains, “gestalt thinking calls for ... not simply a return to our spontaneous gestalt experiences [(the *Aha!* moments)], but the development of alternative frameworks for understanding and encountering the natural world” (Diehm 2006, 23). We need, as Capra (1996, 4) explains, to be able to “perceive patterns of connectedness” that we are a part of because, as Haraway (2012, n.p.) states, keeping the story going requires “giving and receiving patterns,” doing and undoing patterns (i.e., composition as well as decomposition), and “relaying connections that matter.” This qualitative shift in perspective is crucial to identifying the patterns we choose to pass on. This requires, as Braidotti (2006, 47) so clearly reminds us, an acknowledgment that “nature is more than the sum of its marketable appropriations: it is also an agent that remains beyond the reach of domestication and commodification.”

In 1987 the state of California introduced a new methodology for learning language called *whole-language learning*. Beginning my formal elementary schooling in San Diego in the Fall of 1989, I was part of the second batch of whole-language learner test subjects. As Carol Gilles (2006, 2) describes, “whole language represents a paradigm shift from a skill, drill and direct instruction model of reading and learning to a holistic and dynamic philosophy that is student centered and meaning focused.” In whole-language learning students learn all aspects of language at once: graphophonic, syntactic, semantic, and pragmatic. Language is viewed as a meaning-making system, the parts of which are relational and complex. Gilles (2006, 21) also acknowledges that language as a system is constantly changing, she writes that “language at whatever system or subsystem of the language is impermanent. It’s changing ... with all of these changes critical ideas and practices can

emerge. Growth and richness of thought can't emerge in a permanent literacy situation." Ellsworth (2005, 1) explains that

Knowledge, once it is defined, taught and used as a "thing made," is dead. It has been forced to give up that which "really exists": its nature when it is a thing in the making, continuously evolving through our understanding of the world and our own bodies' experience of and participation in that world. When taught and used as a thing made, knowledge, the trafficked commodity of educators and producers of educational media, becomes nothing more than the decomposed by-product of something that has already happened to us.

Once enough of a critical mass of knowledge as a "thing made" has formed and begins to decompose, using up the oxygen needed for knowledge as a thing *in the making*, as a *lived experience*, as *thinking-feeling* (Ellsworth 2005), a dead zone is created. For me, the specific definition of a word emerges from its specific context and historicity, based on relationships with the words situated around it and my previous relations to it. I don't see fixed dictionary definitions; I see potentials for new meanings, understandings, and hybrid species. Such meanings are temporary, always shifting, changing, and metamorphosing into new entities. I search for the gestalt; I focus on the relations between the words, the multiple cross/inter/disciplinary definitions/meanings, and how my understanding(s) of the words change and evolve over time. I believe this is why I've always been drawn to poetry, a form of prose that plays with tensions, forcing readers to find the "embodied and meaningful relational configurations" (Toadvine 2009, 21) within the lines of text. The gestalt is, as Nanci Bell (1991, 3–4) explains,

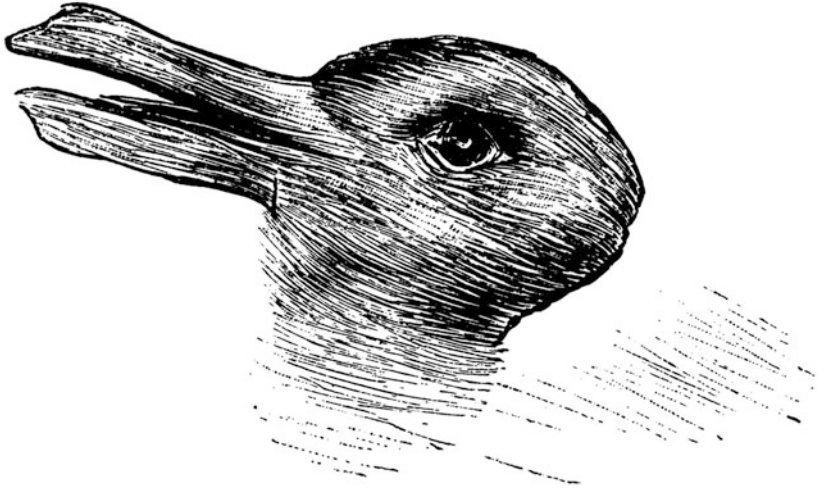
The entity from which the interpretive skills of identifying the main idea, inferring, concluding, predicting, extending, and evaluation can be processed. It enables the reader or listener to bring meaning—deep structure—to what is read or heard. . . . Gestalt imagery connects us to incoming language and links us to and from prior knowledge, accesses background experiences, establishes vocabulary, and creates and stores information in both long term and short term memory.

As David Lewkowich (2012, 209) in his essay "Poaching in the Chords of Reading: Dwelling in the Murky Spaces of Literary Landwash" reminds us, "the act of reading [is] one of clandestine labor, where the meaning that

emerges—and which in its dynamic relations remains emergent—is accomplished through a hidden struggle of uneasing inventiveness and translations.” However, whole-language struggled, particularly because in our current cultural mindset, it was pitted against traditional (phonics) practices in a dichotomous relationship, simplifying and homogenizing the complexities of the two practices (Gilles 2006). This dichotomy created a false understanding of whole-language learning practices because, like any good gestalt, it is a holistic system that integrates/incorporates all the systems below it, including graphophonics (or the phonics system). Whole-language practitioners also acknowledged that language is only a subsystem of a broader learning system; as Jerome Harste (1989, 244) explains, “an interest in reading and writing is an interest in all learning.” Næss argues that we need a “gestalt shift” toward more complex gestalts that inform a relational holistic ontology resulting in an “expansion of the possibilities for experiences,” because the world is “so *full* of them that they cannot be experienced all at once, thus requiring multiple methods of approach or relation to encounter them” (Diehm 2006, 26–30).

Gestalt theory has its academic origins in gestalt psychology which, as Thomas Leahey (2003, 649) explains, “arose [in the early 1900s] from the philosophy of Brentano” (who also greatly influenced the development of phenomenology by Husserl) and was highly influenced by Carl Stumpf (who allegedly trained all of the founders of gestalt psychology including Max Wertheimer, Wolfgang Kohler, and Kurt Koffka). Gestalt psychology was, as Leahey continues, reacting to psychology’s “analytic spirit of post-Newtonian natural science,” which functioned within the representationalist framework brought forth by Descartes, utilizing an atomistic-representational dualistic framework (*ibid.*). The gestalt theorists believed that “psychologists took it for granted that the objects of consciousness were complex combinations of sensory elements just as material objects were complex combinations of atomic elements.” These gestalt psychologists were interested in exploring “how meaningful, organized, objects of perception are created out of meaningless sensory atoms” (*ibid.*, 650–651).⁸ Due to socio-political difficulties brought on by World War II and criticism by various other schools of thought (including the Leipzig school and the Frankfurt school who turned to psychoanalysis), the influence of the gestalt psychologists diminished (Leahey 2003). However, some of their demonstrations and principles are still used in psychology textbooks today, including what has been termed the “gestalt switch.” One of the most famous examples of the gestalt switch is Wittgenstein’s “Duck-Rabbit” drawing.⁹

Welche Thiere gleichen ein- ander am meisten?



Kaninchen und Ente.

Fig. 5.2 Rabbit and Duck, *Fliegende Blätter* (1892)¹⁰

The Duck-Rabbit drawing is referenced and referred to as a “visual phenomena” or “puzzle” in many of these textbooks; a “trick of the eye” or optical illusion.¹¹ It was Thomas Kuhn in his book *The Structure of Scientific Revolutions* (1962) who utilized the Duck-Rabbit drawing to illustrate how scientific development is not cumulative, it happens in leaps and jumps; scientific development happens through revolutions.¹² These scientific revolutions result in a paradigm shift or “gestalt switch”; as Kuhn (1962, 111–112) explains, “what were ducks in the scientist’s world before the revolution are rabbits afterward.” Kuhn argued that the pre- and post-revolutionary paradigms are incommensurable, lacking the ability to be translated into a neutral observational “common” language.¹³ As Eric Oberheim and Paul Hoyningen-Huene (2013, “Introduction” section, para. 1) explain, Kuhn

believed paradigms were incommensurable because, as he argued: “These competing paradigms lack a common measure because they use different concepts and methods to address different problems, limiting communication across the revolutionary divide.” However, it is not about leaping over what Latour (1999) and Haraway (2008) call the “Great Divides” of dualisms (in this case the parts/whole or atomistic-representational dualism), or “switching” between paradigms in a schizophrenic—internally disjointed (Braidotti 2006)—either/or leap between separate and competing identities. Malcolm Forster (1998, section 6, para. 3) warns that there “is a danger that we might take Kuhn’s duck-rabbit analogy too seriously, and view theory change as literally involving a change in *perception*, and therefore a change in the data themselves, rather than a change in the relations amongst the data.” Leahey (2003, 655) explains that Kohler—who was the primary theorist and researcher of gestalt psychology—believed/argued that “gestalts were physically real, natural self-organizations in nature, in the brain and in experience, all of them isomorphic to one another”; gestalt theorists were “seeking physiological explanations of consciousness.” As Leahey continues, “Kohler’s view of the brain as a self-organizing system is returning, unacknowledged, in connectionist psychology and neuroscience,” most importantly through the work of Francisco Varela who, in collaboration with Humberto Maturana, introduced the concept of *autopoiesis* (from the Greek *auto-* meaning “self” and *poiesis* meaning “creation” or “production”); self-making, self-organization, and self-regulation. For Maturana and Varela (1980, 13) “living systems are cognitive systems, and living as a process is a process of cognition.” Maturana and Varela were interested in identifying or differentiating between living and non-living systems. They argued that living autopoietic systems are *operationally closed* systems in which the components and processes of the system are reproduced/maintained within the system.

Gestalt psychology and the concept of autopoiesis both emerged from an inability to explain perceptual phenomena through reductionist methodologies. This can be seen in Maturana et al.’s germinal article “What the Frog’s Eye Tells the Frog’s Brain” (Lettvin et al. 1959) in which the authors describe an internal cognitive system (operative constructivism) that is self-organizing, non-representational, and separate from the environment (through its own circular, self-reflexive dynamic). Katherine Hayles (1995, 73), drawing on the article, explains:

A frog’s visual system operates very differently from that of a human. . . . Small objects in fast, erratic motion elicit maximum response, whereas large,

slow-moving objects evoke little or no response. It is easy to see how such perceptual equipment could be adaptive from a frog's point of view, because it allows him to perceive flies while ignoring other phenomena irrelevant to his interests. The results imply that the frog's perceptual system does not so much register reality as construct it . . . "the frog's eye speaks to the brain in a language already highly organized and interpreted instead of transmitting some more or less accurate copy of the distribution of light upon the receptors" (Lettvin et al. 1959) [*sic*].

Thus, as they describe, the environment simply acts as a "trigger" for an autopoietic system to act based on its predetermined organization; or as Hayles (1995, 89) critically explains "the system never reacts to changes in the environment, only to changes within itself triggered by its structural coupling with the environment." The frog's perceptual system is organized in such a way as to only respond to certain (fast moving) environmental triggers. This structural coupling creates a trigger-causality relationship instead of a performance-causality relationship because "no information is exchanged between a system and its environment. Events that happen in the environment do not *cause* anything to occur in the living organism. Rather, they are the historical occasions for triggering actions determined by a system's organization" (*ibid.*, 76). Hayles (1995, 89) illustrates that Maturana makes a decisive cut between the autopoietic system and the observer, "intended to act as a prophylactic against anthropomorphism. Our commonsense intuitions about the world are relegated to the 'domain of the observer,' leaving the space of autopoiesis free from contamination by time, causality, motivation, intentionality, and desire." The identification of every system begins with a cut; a cut between the autopoietic system and the observer as well as a cut between the system and its environment. As Hayles (1995, 71) continues,

The cut helps to tame the noise of the world by introducing a distinction, which can be understood in its elemental sense as a form, a boundary between inside and outside . . . What is inside is further divided and organized as other distinctions flow from this first distinction, exfoliating and expanding, distinction on distinction, until a full-fledged system is in place. What is outside is left behind, an undifferentiated unity.

In order to understand the system, we must cut it away from the "environment," and we must cut ourselves as "observers"—or what Haraway (1997b) calls "modest witnesses"—from the object of study.

Cut, divide, homogenize, pasteurize (by removing those microorganisms *we* don't want), simplify, reify, and then commodify. As Edgar Morin (2008, 17) explains, "the theory of self-organization was made to understand the living, but it remained too abstract, too formal to deal with physic-chemical data and processes that make up the originality of living organization." Autopoiesis is clean and tidy, there are organizational laws that go all the way down; there is no cross-species communication (or contamination), no signal transduction(s), no symbiogenesis, no multiple *Pfiesteria* identities, no intra-action, no messy undifferentiated noisy multifariousness.

FROM HYPHENS TO HOLOBIONTS

The theory of gestalt that I am bringing forward is a more complex gestalt that has a material, fleshy thickness; a practice/perspective/way of being that requires sympoietic thinking (Haraway 2016). It is not an attempt to see/capture a unified whole, but an understanding that the emergent form(s)/beings/doings we "see" are always only ever partial and temporary; they are alive and enact the practices of living and dying, flourishing and not, killing and making live. As Haraway (2014) explains, such forms are radically, relentlessly, unequally, un-optionally, situated—contextually, historically, and politically. Sympoietic thinking requires what Gilbert Simondon (1995) calls an *ontogenetic shift*, a shift in focus to the "unity of becoming" (the practices and processes of becoming) rather than just the unity of "complete" and "identifiable" substances/forms/identities. It requires a move toward *schizogenesis*, what Braidotti (2011) describes as "reproduction by fission," the emergence or genesis of two distinct positions and their dis/continuity, creating non-unitary subjects and subject positions—what Haraway (2004) playfully calls "Fission Impossible"—required in order to get out of the double bind of advanced capitalism. Differentiation as a generative internal practice of assemblage (Braidotti 2006). This gestalt ontology is, to return back to Haraway (2008), the material-semiotic practice of gathering up those "others" (biotic and abiotic) who respond/relate in unpredictable kinds of "we"—the creation of assemblages and alliances that are sympoietic/symbiotic however temporary and however strong or resilient. This gathering is both a *being* and a *doing*, a collective living and dying for the possibility of flourishing (Haraway 2014). In order to more fully understand what and how this means/matters, I'd like to think through

the figuration of the *holobiont*: the assemblage of multi-species participants (called bionts) into a sympoietic system, what Beth Dempster (2007) refers to as, “mutual reliance for continued poiesis.” Jeffrey Gordon et al. (2013, 152) explain that

Throughout the biosphere, different species associate, transiently or permanently, to do things of ecological and evolutionary import. The labels initially applied to these relationships were rooted in economics and reflected the perceived benefit or harm, thus terms such as commensalism, mutualism, and parasitism. The actualities define a spectrum; the complex and sometimes subtle give-and-take defies such simple categorization. To better reflect this reality, Lynn Margulis proposed that any physical association between individuals of different species for significant portions of their life history constitutes a “symbiosis,” that all participants are bionts, that the resulting assemblage is a holobiont.

Holobionts are not simple, they are complex transversal assemblages (Braidotti 2006); they are embodied and embedded, accountable to their collective: A multi-layered yet singular entity/identity/formulation.¹⁴ Holobionts participate in the practice(s) of autopoiesis *and* sympoiesis. As Adrian Mackenzie (2002, 17–18) explains a holobiont “gives information to itself and, in doing so, individuates itself on the basis of a reserve of pre-individual singularities, or a field of intensities not yet organized in specific forms and functions.” It is the practices and processes of collective ontogenesis (Simondon 1995) and epistogenesis. Haraway (2014, n.p.) explains that immunological, anatomical, physiological, neurobiological, evolutionary concepts/ideas/“problems” cannot be thought through in terms of organisms and environments, they must be thought of in terms of something closer to a holobiont: A “kind of sympoietic provisional entity with porous and layered and palimpsestic and intertwined kinds of boundaries maintained in various ways some enduring, some transitory.” These boundary maintaining ways and workings are unequal and inequitable practices; apoptosis, symbiosis, trophobiosis, infection, reproduction, transference, communication, exclusion.¹⁵ There are many types of symbioses that make up the complex interactions/relations within the holobiont, some doing harm others providing evolutionary advantages through conjugation, transduction,¹⁶ and transformation (in biological ways through DNA alterations/[re]interpretation via cell-to-cell contact, virus infections, amplification, and horizontal gene transfer between species; as well as socially/culturally

through the [re]interpretations/translations of stories/metaphors between and through individuals/communities/cultures across multiple modes/languages/species) (Zilber-Rosenberg and Rosenberg 2008).¹⁷ Holobionts are not created in sterilized laboratories; they are biologically/socially inherited, consumed, contaminated in/through continual interactions with complex environments and entities. As Gordon et al. (2013, 152) explain,

A holobiont occupies an ecological niche, adapts, and may be the organizational level at which natural selection acts. When challenged by environmental perturbations, a holobiont can employ strategies unavailable to any one species alone. Adaptation can occur rapidly by swapping microbial constituents or by reshuffling the relative proportions of current bionts.

The holobiont demonstrates how the gestalt shift requires a qualitative shift in perspective to alternative spatial and temporal scales, as well as a shift toward a more ontogenetic understanding of the entities/figurations that we are engaging-with, entangled-with, and be(com)ing-with. It is not about locating oneself in a fixed location or fixed position—we are not modest witnesses we are un-optionally entangled/situated participants—it requires, as Haraway (1988, 589) describes, viewing from a body that is “always a complex, contradictory, structuring, and structured” location, a location that is always shifting in dynamic and divergent ways. As Gerald Weinberg (1975, 52) states, “a system is a way of looking at the world,” it is the practice of making cuts, of situating oneself in relation to others. The gestalt shift requires an opening up and uncovering; it requires poking holes, smudging, expanding, thickening, decentering.¹⁸ Braidotti (2014)—and other feminists scholars, including Haraway and Hayles—suggests that we must shift the scale of politics and ethics to the body; focusing on the politics of everyday life down in the mud and then expanding outward to create a new understanding of politics that is embodied and embedded, affective and relational, as well as aesthetic.¹⁹ Dempster (2007, 107), in her essay “Boundarylessness: Introducing a Systems Heuristic for Conceptualizing Complexity” which is an inquiry into boundaries with/in sympoietic systems, asks whether or not—when identifying genetically modified organisms—we should

Include the genetic technician, farmer, or horticulturist? What about organisms that have been fertilized or treated with pesticides or biological controls? A sympoietic interpretation of long and straight cucumbers and large bananas would [therefore also] include social preferences as part of the system.

These expanded, dynamic, complex systems require multiple modes, multiple methods, multiple practices and processes of encounter, including multiple practices of thinking: diffractive thinking (Barad 2007, 2012b), transductive thinking (Mackenzie 2002), and sympoietic thinking (Haraway 2016), to name a few. A sympoietic interpretation requires, as Barad (2012a, 52–53) describes, “being attentive to what gets excluded as well as what comes to matter,” a practice that requires diffractively thinking through things for their various entanglements.²⁰ Barad (2003, 52), using/transmogrifying Haraway’s *diffraction* metaphor—the relational nature of difference, a metaphor used to rethink the optics and geometry of relationality—explains that

Diffraction, understood using quantum physics, is not just a matter of interference, but of entanglement, an ethico-onto-epistemological matter. This difference is very important. It underlines the fact that knowing is a direct material engagement, a cutting together-apart, where cuts do violence but also open up and rework the agential conditions of possibility. There is not this knowing from a distance. Instead of there being a separation of subject and object, there is an entanglement of subject and object, which is called the “phenomenon.” Objectivity, instead of being about offering an undistorted mirror image of the world, is about accountability to marks on bodies, and responsibility to the entanglements of which we are a part. That is the kind of shift that we get, if we move diffraction into the realm of quantum physics.

Diffraction, as Haraway (1997b, 16) explains, is a metaphor for “the effort to make a difference in the world,” it is about heterogeneous histories and/or qualitative multiplicities instead of “reflections” or the practice of displacing the same elsewhere (quantitative pluralism); repetition without difference is the binary unhinged producing waves of racialized, naturalized, genderized others, a process “mediated by the luminous technologies of compulsory heterosexuality and masculinist self-birthing” (Haraway 2004, 69). Diffraction, as Haraway continues, is “a mapping of interference, not of replication, reflection, or reproduction. A diffraction pattern does not map where differences appear, but rather maps where the *effects* of difference appear” (*ibid.*, 70). Diffraction is meant to disrupt linear and fixed causalities—double binds—and to work toward “more promising [and generative] interference patterns” and practices (Haraway 1997b, 16). It is a practice of reading concepts/texts through one another, and then rewriting (re/worlding) them. This practice of re/writing/worlding

disrupts the Euro-American metaphysic narrative of temporality; it trans-verses boundaries such as “disciplines” and “subjects”; it shifts our focus/location from one of representationalism—reflecting on the world from outside—to one in which we understand, as Barad (2007, 88) explains, “the world from within and as part of it.” It is a shift from “knowing” to a situated relational understanding. As Haraway (1997b, 273) states, “diffraction is a narrative, graphic, psychological, spiritual, and political technology for making consequential meanings.”

The term/concept of transduction is also useful in that it requires an understanding that the processes and practices of (re)interpretation, translation and transformation, are situated (historically, socially, culturally and politically) and embodied. Transductive systems, as Mackenzie (2002, 127) explains, have a certain openness and incompleteness to them because they “always exist in a relational context or milieu which enfolds certain specific degrees of indetermination along with determination.” Or, as Barad (2007, 234) explains, these types of systems (through exclusions and inclusions, interpretations and erasures)

Foreclose the possibility of determinism, providing the condition of an open future. But neither are anything and everything possible at any given moment. Indeed, intra-actions iteratively reconfigure what is possible and what is impossible . . . possibilities are reconfigured and reconfiguring.

The patterns and practices of transduction (the translation and passing on of information/material/energy/matterings) leave wiggle room for incomplete, inaccurate, incomprehensive translations. For as Haraway (2004, 4) notes, “We have nothing but non-innocent translations, all the way down.” Both of these thought practices aid in what Haraway (2011, n.p.) calls inheriting “the past thickly in the present so as to age the future.” As Mackenzie (2002, 18) explains, such practices aid in

The tracking processes that come into being at the intersection of diverse realities. These diverse realities include corporeal, geographical, economic, conceptual, biopolitical, geopolitical and affective dimensions. They entail a knotting together of commodities, signs, diagrams, stories, practices, concepts, human and non-human bodies, images and places. They entail new capacities, relations and practices whose advent is not always easy to recognize.

The figuration of the holobiont is not just biological, it is a material-semiotic entanglement in which, as Haraway (2008, 4) describes, the “biological and the literary or artistic come together with all of the force of lived reality”; figures “root peoples in stories and link them to histories” (Haraway 2004, 1). Beginning with a body (be it a more-than-human body) Haraway uses the figuration of “Jim’s Dog” (Fig. 5.1)—a photograph of a redwood stump that (from the specific spatial and temporal perspective the human/camera/viewer is “located”) looks like a seated dog. Haraway utilizes Jim’s dog to explore the thick, important ecological and political histories, struggles, and practices in which the “clean lines between traditional and modern, organic and technological, human and nonhuman give way to the infoldings of the flesh that powerful figures such as the cyborgs and dogs . . . signify and enact” (Haraway 2008, 8). As Haraway (2008, 5) describes,

This attentive, sitting dog endured for only one season. The next winter the shapes and light in the canyon did not vouchsafe a canine soul to animate the burned-out redwood stump covered with redwood needles, mosses, ferns, lichens—and even a little California bay laurel seedling for a docked tail—that a friend’s eye had found for me the year before. So many species, so many kinds, meet in Jim’s dog, who suggests an answer to my question, Whom and what do we touch when we touch this dog? How does this touch make us more worldly, in alliance with all the beings who work and play for an alter-globalization that can endure more than one season?

As Haraway (2008, 7) describes, the figuration of Jim’s dog “could never be replicated but must be encountered”; it is a “place of meeting” (a contact zone) as understood—returning to Irwin and Springgay (2008, xxi)—as a performative “relational constitution of social, economic, cultural, [ecological] and political processes.” Exploring and unpacking Jim Dog’s thick pasts/presents, Haraway (2008, 5) begins by discussing the digital/biological historical techno-space in which the digital apparatuses (camera, computers, servers, and email programs) of “metal, plastic, and electronic flesh” meet/merge with the biological primate visual system (the interpretative processes of the central nervous system) of tissues, nerves, and fibers we have inherited, to allow for us to encounter the situated and embodied figuration of Jim’s dog. Within this space are the “histories of IT engineering, electronic product assembly-line labor, mining and IT waste disposal, plastics research and manufacturing, transnational markets, communication systems,

and technocultural consumer habits” as well as the history and heritage of intersecting “race-, sex-, age-, class-, and region-differentiated systems of labor” (*ibid.*). This includes the labor practices of loggers and firefighters that have shaped the central California coast’s forests through harvesting and controlled burns; practices informed by academic research as well as environmental philosophies and ethics (historically divided, wildlife conservation vs. resource management). Looking even farther back Haraway (2008, 6) notes the geological histories, the “water-eroded and earthquake-sculpted ruggedness of the canyons,” the climate, the converging regional ecosystems and the biodiversity that has emerged/evolved—from the cougars to the “invisible viruses and bacteria,” to the “crown of ferns on top of this pooch’s head.” She explains that we are indebted to the histories of both environmentalism and the leisure class whose predilection toward access to “nature” created “the greenbelt policies of California cities resisting the fate of Silicon Valley [which] ensured that Jim’s dog was not bulldozed for housing at the western edge of real-estate hungry Santa Cruz” (*ibid.*). As a holobiont, Jim’s dog is seen with “fingery eyes” as an entity (however whole or temporary) that has an affective capacity, with various storied and layered histories and practices, as well as a future however brief, open, or incomplete. Haraway (2014, n.p.) states that “I want to work within figures that I think of as engaged in the practices of partial and finite and mortal flourishing that somehow give us the figures and stories and sciences that are not simply a counter to that which is threatening to kill us.”

The question, as Haraway (2008, 5) asks, of “whom and what do we touch when we touch this dog,” is a question about taking responsibility—being accountable to and for—the cuts we make, the connections we do or don’t attempt to foster. What Barad (2014, n.p.) calls the “agencies of observation.” The affective capacity of Jim’s dog, the effects of difference we trace (or story) during/after our encounter, require epistemological humility and an ontogenetic shift in our “location” so that we may “enact ways of being or connecting that have not yet arrived or never will”—practices of re-membering the future and re(con)figuring the past. It is what Barad calls the “irreducible entanglements of responsibility” (*ibid.*). It requires being attentive to *who* we gather up, live-*with*, think-*with*, become-*with*; it requires being response-able to the beings/figures/narratives we use to narrate and live our collective lives *with*. It is an ongoing inquiry into possible alliances, possible narratives, possible worlds that may allow us to make-sense of (the promise of fragile and mortal coherence) our shared relentless co-vulnerability and learn to “get

along with some grace” (to live well with) in the face of that which is threatening to kill us—a task that (always and relentlessly) remains before us (Haraway 2014).

NOTES

1. Similar to Haraway (2004, 333): “I like layered meanings, and I like to write a sentence in such a way that, by the time you get to the end of it, it has at some level questioned itself.” Definitions of terms are palimpsestic, multimodal, multidisciplinary, historically situated, and often (mis)translated. My hope in this book is to search for polysemies, and hold together the multiple definitions of terms to create a deeper, richer, and more complex understanding(s). My goal is to create thick meanings, messy meanings, that drawing on multiple fields/planes/modes of thought; to create generative (re)interpretations and translations. The definitions scattered throughout the book are not intended to be conclusive static definitions; they are simply the current gathering of descriptions that shape my understanding.
2. As quoted in Elizabeth St. Pierre’s (1997) essay “Methodology in the Fold and the Irruption of Transgressive Data.”
3. *Ibid.*
4. This paper was presented with Julia Ostertag at the 2012 American Educational Research Association (AERA) Conference held in Vancouver, BC on the traditional, ancestral, unceded territories of the Musqueam Peoples.
5. As quoted in Haraway’s (2008) *When Species Meet*.
6. According to Schrader (2010) because of the *Pfiesteria*’s complex life cycle no causal relationship has been scientifically identified between human-induced environmental change (due to an increase of agricultural run-off) and harmful algal blooms.
7. Throughout this book I utilize the term “thick” drawing on Haraway’s interpretation, infliction, and influence in wanting to highlight (by using this term) that the in-between spaces, separations, dead zones, or seemingly “empty” spaces really are not empty at all. They are filled with ideas/beings/concepts, material and immaterial, that simply cannot be seen/touched/comprehend/identified within our current frame or sensual abilities. Or they are occupied by beings/ideas/concepts that are not accepted or acknowledged by the dominant normalizing/colonizing social entities/states and thus these unvalued dead zones are erased, ignored, and given no value. They are ghostly. But all ghosts have a presence, an affect, a mattering. Haraway (1997a) also uses the word “thick” to draw the “material”

back through into the discursive; she describes words “as thick, living, physical objects that do unexpected things.”

8. The conflict between atomistic and holistic theories can also be seen in a number of other fields including animal behavior (Leahey 2003) and developmental biology (or embryology), a theory known as *organicism* (Haraway 1976). Organicism, or materialistic holism (Gilbert and Sarkar 2000, 1), is very similar to the theory of gestalt in that it holds that “complex wholes are inherently greater than the sum of their parts in the sense that the properties of each part are dependent upon the context of the part within the whole in which they operate.” However, organicism still focused on the identification of forms by focusing on/identifying “levels, hierarchies, and holist oppositions to fragmentation” (Haraway 1976, xix).
9. In his book *Wandering God*, Morris Berman (2000, 200) describes Wittgenstein as a nomad, a wanderer, “a spokesman for a variable, nomadic truth,” pointing to Wittgenstein as creating some of the key philosophical ground work for the “emergence of nomadic consciousness” (*ibid.*, 191), describing this shift (from vertical to horizontal and rhizomatic) in Wittgenstein’s work in which he “attacks the (vertical) search for essence as an example of a misguided scientific ‘craving for generality’” (*ibid.*, 197). But he explains that many scholars misunderstood and misinterpreted Wittgenstein’s works, others “argued that Wittgenstein’s work was not philosophy but rather ‘schizophrenese,’ a kind of insane German poetry” (*ibid.*, 200). Wittgenstein himself struggled between the striated and smooth spaces of philosophy, declaring that the “depths are on the surface” (*ibid.*, 199). Berman (2000, 211) continued by stating that it “takes a certain shift of perception to recognize how extraordinary this [work] really is.” Berman also identifies a number of other twentieth-century thinkers who resonate with and utilize a nomadic consciousness including Virginia Woolf, an author that Braidotti (2002) draws heavily on.
10. According to McManus et al. (2010, 167) the original drawing appeared in the “humorous German magazine *Fliegende Blätter* on October 23, 1892” without attribution. This image is a scan from the original document which is no longer under copyright law because it was originally published over 50 years ago.
11. The duck-rabbit figure is included in Jonathan Miller’s introductory text *Darwin for Beginners* (1982) as well as in many everyday common items such as on playing cards, cereal packets, and Christmas crackers (McManus et al. 2010).
12. Kuhn’s theory of scientific revolutions was greatly influenced by Darwin’s theory of evolution (Kuhn himself described his work as developing an evolutionary view of science), including a rejection of a teleological explanation—or as Kuhn (1962, 172–173) explains, scientific knowledge “may have occurred, as we now suppose biological evolution did, without the benefit of a set goal, a permanent fixed scientific truth”—as well as the focus

on the individual as the level at which evolution functions (which also influenced the concept of autopoiesis, thought through the sciences of the modern evolutionary synthesis). However, many feminist science studies scholars are attempting to (re)read Darwin in transverse, oblique, and/or sideways approaches. As Carla Hustak and Natasha Myers (2012, 77) explain, such researchers work “against the grain of neo-Darwinism” rejecting the deterministic readings of evolutionary theory based around competition, selfish genes, efficiency, and maximizing reproductive fitness. Instead they are focusing on co-evolution and “the creative, improvisational, and fleeting practices through which [species] involve themselves in one another’s lives” (*ibid.*).

13. In 1962 (the same year Kuhn published his book *The Structure of Scientific Revolutions*) Paul Feyerabend also used the notion of incommensurability (initially used by the Greeks in mathematic studies to describe irrational numbers) to describe the relationship between two competing scientific theories (Oberheim and Paul Hoyningen-Huene 2013).
14. The term “transversal assemblages” refers to, as Braidotti (2012, 136) describes, how the “nonsemiotic codes (the DNA or all genetic material) intersect with complex assemblages of affects, embodied practices, and other performances that include but are not confined to the linguistic realm.” Originally coined by Deleuze and Guattari (1987), Braidotti uses the term to highlight the creative form(s) of evolution; differentiation as an internal practice of assemblage. Haraway (2014) explains this through Carla Hustak and Natasha Myers’s (2012) notion of *involution* (or involutionary momentum), exploring an *affective ecology* or the practices that bring beings/species together in “an affectively charged, multisensory partnership” in/through which becoming-withs “take shape in the thickness of the space between bodies, where affects and sensations are *transduced* through *excitable tissues*” (Hustak and Myers 2012, 78, emphasis in original).
15. Apoptosis is programmed cell death, the tightly collectively regulated practice of cell suicide which regulates cell numbers and is the process of digitation, or the formation of fingers through the apoptosis of tissue cells between the digits (generative cuts as Barad [2007] would describe). Apoptosis is death for the sake of ongoing flourishing.
16. Transduction is a multimodal/multidisciplined term used to describe the transformations that occur when things (DNA, energy, ideas, data, meanings) are passed/exchanged/transferred between different entities/modes/languages. The word stems from the Latin word *trādūcere*, which is to lead across, transport, or transfer (OED). In the biological realm transduction refers to how cells convert/interpret signals or stimulus in order to respond; in physics transduction refers to the conveyance of energy resulting in a change in class/form/quality of the energy (such as in photosynthesis); in genetics transduction is the transfer of

genetic material from one bacteria to another by a virus. Gunther Kress (1997) in his book *Before Writing: Rethinking the Paths to Literacy* uses the term to explore the social semiotic aspects of multimodality (how meaning changes between modes of expression), and Adrian Mackenzie (2002) in his book *Transductions: Bodies and Machines at Speed* uses the term in a post-human interpretation in order to break down the organic/technical divide.

17. I am attempting to engage with the multiple meanings/matterings/interpretations of the term “conjunction” in my specific reference. In a grammatical interpretation, conjunction is a discourse connective—a grammatical particle—that is used to connect words, phrases, sentences or ideas, coordinate shared meanings, and correlate understandings. In an astronomical sense conjunction is a visual phenomenon in which two bodies/objects/planets, although possibly light-years apart, appear to be close or on the same plane/field. Conjunction, from the Latin *coniunctiō* or “to join,” was used in reference to the act of sexual intercourse, the joining of two bodies (OED). In the field of chemistry, conjunction refers to a system of connections or overlaps, multiple bonds allowing decentralization, resulting in a conjugate. Thus conjunction is both the joining practices (and perspectives) as well as the effects of such practices.
18. As Celia Deane-Drummond (2014, 44) in her book *The Wisdom of the Liminal: Evolution and Other Animals in Human Becoming* explains, Haraway discusses four decenterings (or wounds) to human exceptionalism: first is the “decentering of the earth following the Copernican revolution,” second is the “Darwinian revolution that placed humanity in the midst of other creatures,” third is the “additional primacy to the unconscious in human psychology given by Freud,” and the fourth is the notion of the hybrid which “mixes up human and material reality.”
19. As Haraway (2008) states we are creatures of the mud not creatures of the sky.
20. Barad (2014, n.p.) describes matter as “not a thing but a doing, a congealing of agency; it is morphologically active, responsive, generative, articulate and alive.”

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How to Keep the Story Going for Those Who Come After

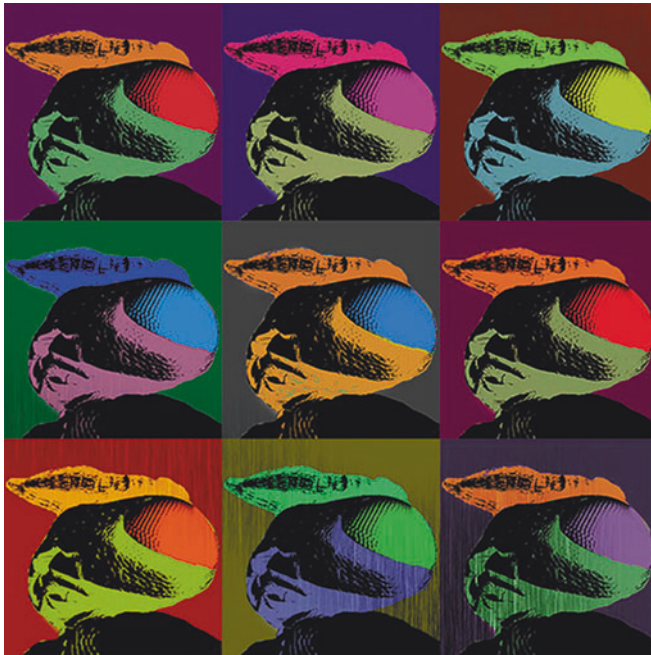


Fig. 6.1 Nasonia. Copyright 2013 Robert M. Brucker¹

Abstract “How to Keep the Story going for Those Who Come After,” is an experimental act of crafting an assemblage, cobbling together stories of otherworldly conversations/encounters, envisioning the production of knowledge as a process of arranging, organizing, and temporarily fitting together ideas and theories. Playfully unpacking the figuration of the salmon through its complex multiple contradictory identities, the author brings forth a deeper understanding of the entangled nature of the material and the discursive. The chapter is written diffractively in order to disrupt conventional historical forms of research narratives, instead holding together dispirit findings and presenting stories threaded through one another. Questioning the practices and processes of who, what and, why we teach, the author imagines the development of feral nomadic subjects able to hold together heteronymous ideas, beliefs, and theories in a generative society.

Keywords Diffraction · Salmon · Feral · Citizenship · Data · DNA · Behavioral epigenetics

We inherit the future not just the past

Karen Barad

Nomadic ethics does not prescribe a path to follow but it does insist on wandering with others and forming nourishing alliances.

Leesa Fawcett

Quote from a presentation given by Karen Barad (2014) “Re-Membering the Future, Re(con)figuring the Past: Temporality, Materiality, and Justice-to-Come,” presented on May 19, 2014. Reprinted with permission of author, Karen Barad.

Epigraph from Leesa Fawcett’s (2009) essay “Feral Sociality and (un)Natural Histories: On Nomadic Ethics and Embodied Learning” in Marcia McKenzie, Paut Hart, Heesoon Bai and Bob Jickling (Eds.) *Fields of green: Restorying culture, environment, and education*. Reprinted with permission by Hampton Press.

WANDERING WITH THE FIGURATION OF THE SALMON

The final chapter of this book/bag/sac of stories is an experimental act of crafting an assemblage—cobbling together stories of otherworldly conversations/encounters—a practice that may be closer to creating a medicine bundle than to the traditional practices of creating a “research story.” Following Alecia Jackson and Lisa Mazzei (2012, 1–2), I envision the production of knowledge “emerging as [an] assemblage, creation from chaos,” because “an assemblage isn’t a thing—it is the *process* of making and unmaking the thing. It is the process of arranging, organizing, fitting together. So to see it at work, we have to ask not only how things are connected, but also what territory is claimed in that connection.” Thus, the practice of creating an assemblage is also a mapping praxis, as Rosi Braidotti (2014, 171) describes, “a process of expression, composition, selection, and incorporation of forces aimed at positive transformation of the subject.” Such a mapping praxis requires being attentive to the stories and figures gathered throughout this research project, paying particular attention to the stories that have also gathered me and allowed me to (re)claim territories and (re)draw boundaries. Following Donna Haraway (2008a, 2013, 2016) who is able to playfully unpack figurations through their multiplicity—their contradictory political, material, natural, cultural, and spiritual identities—my hope is to unpack the figuration of the salmon, a lively entity whose complexities and contradictions bring forth (or allow) deeper understanding(s) of the entangled natures of the material and the discursive. Engaging with the figuration of the salmon leads to, what Karen Barad (2008, 126) describes as, a “posthuman performativity” which “incorporates important material and discursive, social and scientific, human and nonhuman, and natural and cultural factors . . . [and] calls into question the givenness of the differential categories” or “differential boundaries” drawn within western society. Unpacking the figuration of the salmon, inquiring into/about/around “who salmon is,” allows us to see salmon as what Rita Irwin and Stephanie Springgay (2008, xxi) describe as a performative, “relational constitution of social, economic, cultural, [ecological], and political processes.” Similar to Barad (2010, 243–244), I have

Attempted to write . . . in a way that disrupts the conventions of historical narrative forms that underlie stories of scientific progress . . . sagas of progress from an earlier time period to a later one punctuated with discoveries that lead the way out of the swamp of ignorance and uncertainty to the bedrock of solid certain knowledge.

Instead I hope to disrupt such narratives, and wander, holding together “entanglements of here and there, now and then” by presenting stories “threaded through one another, knotted, spliced, fractured, each moment a hologram, but never whole” (*ibid.*). So, similar to Trudy,² I wait patiently here at the ecotonal intersection of “Walk/Don’t Walk” for my space chums—my alien salmon—in order to maybe learn a thing or two about the meaning of it all. It is my hope that by encountering and conversing with such “Others” we just might learn to wander nomadically and find that which just might be able to help hold together all of our heteronymous ideas, beliefs, and theories.

SALMON AS ALIEN OR OUTLAW

Space Chums: Alien fact finders, researchers looking for signs of intelligent life in the Universe (Wagner 2012). Alien salmon, salmon who have travelled past their “natural range” or habitat and established themselves in new territories, sometimes called “invasive,” “non-native,” or “non-indigenous.”³

Trudy: “My space chums are concerned about our evolvment because they say we’re all connected. ‘Everything is part of everything.’ They started talking about a little something they call ‘interstellar interspecies symbiosis’ . . . the Quantum Inseparability Principle. ‘Every particle affects every other particle everywhere’ . . . Seems like there’s some kind of cosmic Krazy Glue connecting everything to everything.” (Wagner 2012, 115–117)⁴

A very young boy ran into the house yelling incoherently that there were submarines coming up the river. He was in his fascination-with-all-things-military stage—tanks, stealth and bomber planes (clearly a parenting blip for a pacifist mother). Doubtful, I followed him to the shore. Before the first submarine appeared, I could hear the fierce splashing around all the bends in the river, and the smell of stirred up mud, algae, and dying fish infused the autumn air. Lunging and surging up the Nottawaasaga River were huge fish . . . their skin and scales were torn loose and raw from the rocky journey. (Fawcett 2009, 230)

The narrator, Leesa Fawcett (2009) in her article “Feral Sociality and (Un) Natural Histories: On Nomadic Ethics and Embodied Learning,” describes discovering (after numerous phone calls) that Pacific salmon, farmed in the Great Lakes, had escaped their human engineered pens (prisons/schools/farms) and ventured into territories they “didn’t belong” bringing about a

myriad of “nature-culture-technology” debates. This is the beginning of a story, told by Fawcett, about hope, environmental education, and “feral cyborg” salmon. It is a gendered story, a political story, a personal story, an ethical story—a story about, as Haraway (2008b, 160) describes, “comprehensive homelessness, the lack of a common place, and the devastation of public culture.” These salmon were “refugees” having escaped the “white capitalist heterosexist patriarchy” (WCHP) narrative they were born into, a story of profit, product, commodity, sterilization, and genetic engineering.⁵ As Fawcett (2009, 231) explains, “what we witnessed were feral acts of fish survival, breaking out of the official ecological stories.”

The salmon tell many stories, and we tell many stories about the salmon. Salmon as “nature,” is a tragic story, made ever more despairing by the human species (destroying habitat, building dams, creating pollution, over fishing, etc.). Yet, it is only tragic because it is told as a tragedy, the only outcome and conclusion—the only ending—being a situation that leads to death; mournful, sorrowful, fated. No one ever writes salmon as superhero. Salmon may be a superfood, but is never cast as the leading role in an action movie or a romantic comedy. Currently, in the Pacific Northwest, the “who, what, why, and how” of salmon is hotly debated because they are tied to so many political, economic, environmental, and spiritually disparate narratives and thus, to numerous ways of being in this world. They live in the tension(s) between the sacred and the commodified, with no safe place, no journey unhindered by political conflict, pollution, overfishing, dams, or human com/modification. Salmon have become the narrative of health. They have not only become an *indicator* of health (for people, streams, ecosystems, and regions) but a commodity of health. Salmon as “food,” the current WCHP narrative (Haraway 2008b), has storied salmon into a commodified product—an object—genetically engineered to grow twice as big in half the time, stripped of its reproductive capacities, “sterilized,” labelled as an “animal drug” rather than “human food” in order to bypass the FDA bureaucracy—the story of “frankenfish.” But we know, as Haraway (2013, 184) tells us, that “it matters what stories we tell to tell other stories with; it matters what concepts we think to think other concepts with.” The “who, what, why, and how” of the salmon that I know/experience/relate to tell a different story. One in which they break out of the traditional ecological stories; one in which, as Humberto Maturana (2001) proclaims, “our genome does not determine us”; and one in which, as Braidotti (2006, 47) explains, “nature is more than the sum of its marketable appropriations . . . it is an agent that remains beyond the reach of domestication and

commodification.” Salmon are what Haraway (2004, 242) calls, “genetically strange, inflected, proprietary beings,” akin to OncoMouse™ and FemaleMan©. Salmon stories are stories of agency in which salmon survive by beating the odds, escaping their prison, changing their “predetermined” genetic gender, finding a new home, and reproducing. Maybe, just maybe, they can teach us a thing or two about desire and what Nick Garside (2013) describes as being political “actors-spectators-storytellers.”

Salmon: The common name for several species of fish in the Salmonide family, the most common being *Salmo salar* (OED). The name is a derivative of the root *salire* “to leap” (similar to sauté—the practice of making food leap out of the frying pan). Almost every dictionary definition for salmon (from the OED to Wikipedia) explicitly identifies salmon as a human food. In Chinook Jargon (a trade language originating in the Pacific Northwest, a hybrid language used between Europeans and First Nations people) the term “sa-men” is used to describe all fish species (Blanchet 1869). Other names include: char, chum, alevins, grilse, smelt, turbot, fry, parr, smolts, kype, kelt, quinnat, wild salmon, wild-wild salmon, indigenous salmon, cultivated salmon, hybrid salmon, Frankenfish, and dinner.

“I love the trite mythos of the outlaw . . . The outlaw boat sails against the flow . . . There are outlaw maps that lead to outlaw treasures . . . Unwilling to wait for mankind to improve, the outlaw lives as if that day were here, and I love that most of all” (Robbins 1980, 65).

Once upon a time, a salmon had made her way up river. She was exhausted after travelling for months and hungry too. And just as she had buried her eggs in the gravel and felt that familiar urge to let herself go with the flow, back towards the Atlantic Ocean where food is abundant, she had an idea . . . she thought, what if we didn’t have to do this? What if food was right here near the shore? What if we could train some other species to get it for us? So that we could stay put right here and just eat, eat, and eat. Wouldn’t that be wonderful? “Careful what you wish for,” said her salmon friend. “You never know, sometimes your wishes come true.” (Lien 2014)

Marianne Lien (2014), in her presentation “Escapee, Homeless and Those That ‘Wander Off’: Salmon as Rubble in Norwegian Rivers,” at the conference *Anthropocene: Arts of Living on a Damaged Planet*, explains that “co-species histories are notoriously difficult to tell,” particularly when

identities become blurred and the lines between domesticated/wild become particularly messy. Lien discusses the “who, what, why, and how” of salmon in Norway—the top global provider of Atlantic salmon—where there is a long history of co-species becoming-with that is currently being challenged by environmental degradation, governmental policy and regulation, as well as corporate fish farms. She explains that there is an estimated 360,000 “escaped” farmed salmon that travel up local rivers each year, threatening “wild” or “indigenous” stalks of salmon (via genetic contamination). In comparison, there are only about 500,000 wild salmon that return each year to spawn. This number has been dwindling drastically over the past few decades and has caused governmental agencies to “take action” by creating “rescue projects” which includes the cultivation and release of genetically distinct roe, fry, or smolt and the “implementation of measures to reduce threats to native salmon,” which includes habitat restoration and regulation of local fishing (*ibid.*). However, due to such a messy co-species history it is difficult to determine what type of salmon are returning each year to spawn. Are they indigenous/native salmon? Are they cultivated salmon? Are they escaped farm salmon? Or are they hybrids (offspring of escaped farmed salmon)? Researchers and governmental officials have been trying to track, trace, and identify “who’s who” in these torrid waters. Cultivated salmon, hatched from the gene bank are either released as smolts (and have their fins clipped as an identifier) or as roe or fry (in which case they would have a colored ring apparent in their brains after dissection, an effect of chemicals added to the water at the hatchery). Those with no markers have their scales scrapped and sent for genetic analysis. Identification has become yet another anthropogenic obstacle for the salmon attempting to go on making a living in such turbulent capitalist driven times. As Lien (2014, n.p.) continues, of those caught by researchers “some are allowed back into the river to continue their journey to spawn, others need to die because the information they carry can only be revealed from their dead bodies or because they are farmed escapees of no value to the river which is *being made*” (emphasis added). Lien explains that: “As salmon yield data they help cultivate an entire river watershed, in this way salmon are eclipsed by an ever expansive vocabulary and of scaling devices which highlight particular sets of connections but also silence others . . . what is emerging here [or attempting to be made] is . . . a single story, a meticulous fleshing out of what John Law often refers to as a ‘one-world world’” (*ibid.*).

The story is similar in British Columbia (BC), governmental agencies provide support and funding to stock rivers through hatchery projects,

meticulously tracking and attempting to control the genetic diversity of the rivers. The BC government, through Fisheries and Oceans Canada, created (in the early 1980s) an educational program called *Salmonids in the Classroom*, through which children hatch salmon roe in aquariums in their classrooms, raising them and feeding them until they are able to be released into one of the two remaining salmon spawning streams left in Vancouver. Students have the opportunity to visit local hatcheries and learn about the life cycle of the salmon and their journey out into the sea and back again. However, sometimes “salmon do not return to their tributary river of origin, but wander off” as Lien (2014) describes, and as we have seen, usually end up “in places where [they] cause controversy [because] who knows what genes are moving with them”? How would the story change if salmon were considered simply wanderers instead of escapees? Through her ethnographic work with salmon in Norway, Lien explores this line of inquiry by positing, what if “farmed escape salmon never actually escaped at all?” She notes that “salmon make few if any attempts to break out [of their man made pens], they just swim round and round and round. Accidental escapes happen when their home at sea, the netting that surrounds them, is broken open.” They then, in attempting to go on with their task of making a living, wander off in search of food, shelter, or protection. Lien suggests that “rather than escapees they [may be] better referred to as hungry, or lost, or homeless . . . refugees or maybe survivors.” However, as she notes, they will find no protection from us, they have already been made killable, “they are impure and unfit to take part in the future imagined by those defining what a restored salmon habitat should look like” (*ibid.*). Maybe they should be better thought of as outlaws, protected by no one, outside of the protection of the law, a rebel, a nonconformist, with a bounty out for their heads, “wanted dead or alive.” They are out of place, homeless survivors, outlaws destined to die, “they intervene in the imagined trajectory of the future of the rivers and watershed” (*ibid.*).

Outlaw: The term can be traced back to the Old Norse word *útlagr*, from the combination of *út*, “out,” and *lög*, “law.” Outlaws are any individuals who commit a serious crime, act outside of the law and are thus deprived of its protection; or a prostitute working without the protection of a pimp (OED). Outlaws are considered felons and/or criminals on the run from the law (a fugitive), or an individual banished and in exile; an outlaw may also be considered a bandit (or brigand); or a wild, untamed, or hunted animal (particularly used to describe a wild untamed horse). History is filled

with outlaws, from Robin Hood to Princess Leigh-Cheri and Bernard M. Wrangle (Robbins 1980), often admired and viewed as avengers, fighters for justice, that disrupt the conventional narratives and the laws of the normative oppressors.

“I’m an outlaw, not a hero. I never intended to rescue you. We’re our own dragons as well as our own heroes, and we have to rescue ourselves from ourselves” (Robbins 1980, 99).

I don’t mind that I took my goldfish
and I put it in water
from the faucet
and it died;
our drinking water
caused it.

I tried my mouth-to-mouth
resuscitation skills.
My dad said, ‘*You* are the
daughter of a scientist;
it should have been
mouth-to-gills.’
But I don’t mind.

(Wagner 2012, 96)

I’m now a fry and turning into a smolt. I am swimming down a strong stream, and I feel like I’m getting stronger. I have now officially turned into a smolt. My vertical lines have disappeared. Down the stream I see something has made the water cloudy. I feel like it was something bad so I hold my breath and swim through the fog. When I’m in the fog I see all the fish struggling through like me. Then all of a sudden, many of my friends and family are dying! Then I felt as if something had spotted me. It wasn’t a bird or a bear, it was a human! The human’s name was Tyler and while he was working in the construction that had caused the water to become cloudy, he notices that many of the salmon are dying and that the water is full of dirt and sand. He ran to the manager of the construction project. The manager loved nature. “Manager, the construction project is causing sand and dirt to slide into the water. That’s killing the fish because there isn’t enough oxygen in the water!” When the manager heard, he jumped to his feet and said, “The project is over.

This is not an area where we should build. Leave them be!” So eventually the water cleared and the salmon were left in peace, where they continued their journey to the ocean. (Student, Grade 5)

SALMON AS GHOST: REPLACING SALVATION STORIES WITH GHOST STORIES

Trudy: “Crick and Watson, it said that, one of them was walking down a spiral staircase, when he thought of the model for the DNA code, which is shaped somewhat like a spiral staircase . . . I could have a similar eureka experience . . . One day, when I am putting on my pantyhose, as I roll them down to the ankles, just the way I like them, no telling what law of physics I might unravel!” (Wagner 1986, n.p.).

Diffractively threading several narratives through each other, I hope to (re)story some of the “present” research stories that have been created from “past” traces of data to, instead, create “ghost stories” which are radically open and indeterminate; stories that challenge the deterministic heroic stories (in which “human exceptionalism and methodological individualism” save the world) and the scientific stories they are based on (in which the “data” is interpreted through a linear narrative of fixed cause and effect relations and universal laws) (Haraway 2014). Instead, following Julian Wolfreys (2002, 3) in his book *Victorian Hauntings: Spectrality, Gothic, the Uncanny and Literature*, I intend to co-create stories that invoke ghosts, stories which “open a space through which something other returns”; stories that trace intra-actions—the hauntological inheritances, the traces of “non-identity within identity.” We will begin not at the beginning (as if there is such an identifiable place/time/thing/location), but in the midst of it, the thick of it, *with-in* the entanglements of intra-active spacetime-matterings (Barad 2010)—in the time of ghosts, a heterodidactic SpaceTime between living and dead, within the space of im/possibilities and in/stability. A SpaceTime between, as Jacques Derrida (1994, 21) describes, a “past that has never been present” and “a future to come [that] will never be a production or reproduction in the form of presence.” We will begin, as Haraway (2008a, 160) describes, with ghost stories made up of “unexpected partners and irreducible details” that encourage “halting conversations,” these ghostly encounters transmute and reconstitute “all the partners and all the details. [These] stories do not have beginnings or ends; they have continuations, interruptions, and reformulations—just the kind of survivable

stories we could use these days”; for there is nothing less at stake than “learning to live” (Derrida 1994) with ghosts. These ghost stories contain indeterminacies that can never be completely interpreted away, never be solved, resolved or “put to rest,” but must be lived with, and haunted by. As Wolfreys (2002, 1) explains, these stories “exceed any single narrative modality, genre or textual manifestation,” for all forms of representation are ghostly. Ghost stories bring into the foreground what Barad (2010, 261) describes as the “patterns of sedimented enfoldings of iterative intra-activity” inviting, invoking/evoking an understanding that “the living present is scarcely as self-sufficient as it claims to be; that we would do well not to count on its density and solidity, which might under exceptional circumstances betray us” (Jameson 1999, 39).

My research began with *Ghost Salmon*, an eco-art installation by Paul Burke and Anna Gustafson, an invitation, invocation/evocation to remember the historical/future presence of salmon in the Pacific Northwest. As Gustafson (2014, para. 1) explains,

In 2010 the west coast of Canada received a message from the past, the largest run of sockeye salmon in one hundred years. We felt so rich. The emotion created by viscerally experiencing the abundant generosity of our planet, generated this project, *Ghost Salmon*.

The *Ghost Salmon* installation was a part of the “Touch Wood” exhibition at the VanDusen Botanical Gardens tapping into a rich multi-species co-dependent history (the entanglements) of salmon, wood, and humans (in economic, ecological, spiritual, biological, and political spacetime-matterings). An exhibition that attempted to bring to the foreground questions surrounding our open, indeterminate, entangled futures—our “hauntological im/possibilities”—shifting the focus from uncertainties in human understanding(s) to “matters of indeterminacy in the nature of being/becoming” (Barad 2010, 264). Raising questions around the nature of these entanglements, the nature of these specters. In an editorial review of *Ghost Salmon*, Don Richardson (2014, para. 1) asks “Are they ghosts of past salmon, confused and wandering through our cities” gesturing toward a still unformed future? Barad (2010, 265) explains that these “entanglements are relations of obligation—being bound to the other—enfolded traces of othering.” The question(s) of hauntological entanglements, of presence and absence, is in many ways a question of justice, “*of what might yet be, of what was, and what comes to be*” (*ibid.*).

For the salmon (and many other nonhuman species), current conservation, preservation and restoration projects (particularly through the Endangered Species Protection Act) are based on historical narratives of presence and absence. These narratives of presence/absence are constructed through the (mis)interpretation of traces—archaeological data (fish bones and tools), historical documents (newspapers, state laws, court records, etc.), and scientific data (genetic analysis, chemical signatures, etc.). The past/future abundance of salmon rests on our ability to interpret the presence or absence of hauntological traces. Stephen Jane et al. (2014) describe how many researchers/politicians/corporations are utilizing these stories to remove or reduce the funding (and legal protection) of salmon restoration projects across North America (particularly in New England and the Fraser River in British Columbia). But, as Derrida (1994, 138) explains,

If the ghost is disseminated everywhere, the question becomes a distressing one; where does one begin to count progeniture? It is again a question of the head. Who is put at the head of all those whom one gets in one's head? At the head of the procession comes capital, the capital representation, the oldest Son: Man. The arch-specter, the one who is at the beginning and at the controls.

Who determines what traces (data) are valid, legitimate, justified? And what types of stories are being created, by whom, for whom, and with whom? The current stories being told and traded pit the biological vs. anthropological (either/or sides of the nature/culture divide), separating the entangled co-species histories of salmon and humans. As Lien (2014, n.p.) explains, salmon are portrayed as either “pristine nature,” a victim of human capitalist development (wild salmon), or as a “villain of capitalist food production” (farmed and genetically engineered salmon) outcompeting and tainting natural wild stocks of salmon. One worthy of protection, the other a commodity, a threat, made killable (Haraway 2011). These stories, traced through the presence or absence of “human intervention” via practices of domestication—an anthropocentric approach which, as Lien and Law (2011, 74) explain, “emphasizes particular qualities of the human-animal phenomena on the basis of relations of asymmetry marked by animal subordination”—human cuts on salmon bodies (literally and figuratively). But what if we traced our (quantum) entanglements? Or at least attempted to begin to?

Ghost Salmon was greatly influenced by the work of Canadian biologist Tom Reimchen (2001) who discovered a way to trace the “historical” abundance of salmon through trees (and other vegetation), using a mass spectrometer to measure the amount of N-15 (a stable isotope of Nitrogen—a ghostly relation—used mostly in agricultural and medical research) found in vegetation surrounding salmon spawning streams. N-15 is used because it is rare, stable, mainly present/abundant in marine algae (as compared to N-14 which is the most common form/isotope of Nitrogen) and is further enriched/concentrated as is transduced through the tropic levels (transductions are generative). Reimchen began to trace a story of ecological entanglements; he began to trace the entanglements of salmon and trees through hauntological traces of Nitrogen, through the size of yearly tree growth rings, through the practices of (current) predators and scavengers, tracing these entanglements from the coastal waters of British Columbia to the glacial mountain ranges of the Rockies. He began to trace a complex co-dependent history showing that, not only were salmon historically “abundant” in the Pacific Northwest, but that they were/are/will be vital actors within forest ecosystems providing 40–80% of the Nitrogen for these ecosystems. Attempting to shift the focus from the salmon as an entity (that is either present or absent, victim or villain), Reimchen, using N-15 as the main character whose presence and absence was tracked and traced, attempted to focus on the effects and intra-active affects of salmon’s multiple *beings* and *doings* (Schrader 2010) on the larger ecosystem(s) they are a part of—viewing salmon in Hans-Jörg Rheinberger’s (1997, 227) terms, as “an ecohistorical nexus in an environment of potential traces.” But the doings and beings of N-15 are multiple and are entangled with the hi/stories of more than just salmon.

Fact: Did you know, the RNA/DNA molecule can be found throughout space in many galaxies . . . only everybody spells it differently?” (Wagner 2012, 75)

The last really deep conversation I had with my dad was between our T-shirts. His said “Science Is Truth Found Out.”

Mine said “The Truth Can Be Made Up If You Know How.”

(Wagner 2012, 88)

In 1958, N-15 was part of what has been called “the most beautiful experiment in biology” (Hanawalt 2004, xx)—Matthew Meselson and Franklin Stahl’s experiment(s) on the replication of DNA—illustrating the process by which DNA is passed/copied/replicated from generation to generation. Nothing less than the nature of DNA replication, the basis of evolution, was/is at stake—“nothing less than the nature of reality” (Barad 2010, 255). Straight off the heels of James Watson and Francis Crick’s (1953) famous paper proposing the double-helix structure of DNA, during the heart of the modern synthesis of Darwinian evolution through natural selection, Meselson and Stahl’s experiment—through what Tinsley Davis (2004) describes as their “clever use of nitrogen isotopes and density gradient centrifugation”—illustrated how the two intertwined strands of DNA separate. As Frederic Lawrence Holmes (2001, 406) describes, Meselson and Stahl’s experiment illustrated that DNA strands separate “semiconservatively in an orderly fashion” in which, as Philip Hanawalt (2004, 1789) describes, each separated strand serves as templates for the “synthesis of the respective complementary strands” with “each [resulting] daughter DNA molecule [consisting] of one ‘old’ strand and one ‘new’ one.” These findings paved the way for the modern synthesis and the “great competition equations” (Haraway 2004). Evolution became determinable, progressive, and knowable; resulting in the publishing of such works as Richard Dawkins’s (1976) *The Selfish Gene*, a genocentric view of evolution that positions DNA as the key, the “holy grail” as Haraway (2004, 243–244) describes, that is needed to decode the “book of life.” Haraway explains that “the ‘human genome’ in current biotechnical narratives regularly functions as a figure in a salvation drama that promises the fulfillment and restoration of human nature” (*ibid.*). This can be seen in Barack Obama’s announcement (during his State of the Union address) that the US government will be creating a DNA Biobank and spending \$215 million dollars on a “precision medicine” project, DNA-driven research focused on linking genomics to national health records (Regalado 2015). This initiative will, as Obama declared, lead to cures for cancer and diabetes making the US the leader in a “new era of medicine”; our past and future determined and fixed in our DNA. Or as Haraway (2004, 242) describes, “the narrative frames of the Scientific Revolution [are] a kind of time machine that [situates] subjects and objects into dramatic pasts, presents, and futures.” The ability to sequence genomes has allowed scientists to track descent, create genealogical trees, in the search for our “universal ancestor” (our origin) and further define what

makes humans different (separate from) other species. Not only that, DNA sequencing has a long history of being used for capitalistic goals (enter Monsanto), and with the introduction of AquAdvantage salmon—the first genetically engineered animal permitted for human consumption by the FDA—the tried and true process of first separating “subject” from “object” (salmon as food and/or drug), making the object into a commodity, and then selling it to the highest bidder is continually enacted. And it is not just the “flesh” of the salmon that is being sold. The genetic code (the “instruction manual”) is a highly marketable commodity, so profitable that, as Randy Shore (2014, para. 3) reports,

An international consortium of scientists and funding bodies—including Genome BC—based in Norway, Canada and Chile spent four-and-a-half years and \$10 million to map the entire DNA sequence of about 3 billion characters, essentially the genetic instruction set required to grow and operate an Atlantic salmon.

Mapping the genome of the salmon promises the salvation of the salmon farming industry, eliminating disease and increasing feed efficiency. However, as Shore (2014, para. 13) continues, the scientists reported that they faced “significant hurdles in their effort to decode the salmon genome” particularly because unlike humans whose cells “contain two copies of the genetic sequence, salmon cells contain four copies” and the salmon genetic code contains “very long strings of repeating code, which has no apparent meaning” (*ibid.*, para. 14–15). In order to decode and map the salmon genome, scientists had to chop it up into pieces, translate it into short strings of characters and then reassemble it back in the correct order, a task that required the creation of new mathematical algorithms and computer programs. They reported that the salmon genome is full of what scientists call “junk DNA” or DNA passed on that doesn’t code for proteins. Up until recent years’ scientists have only focused on protein coding DNA (the causal agents for development). As Evelyn Fox Keller (2013, n.p.) explains in a presentation titled “Paradigm Shifts and Revolutions in Contemporary Biology,” molecular evolutionists “based their entire study of the evolution of differences between species on divergences in protein sequence,” which left scientists puzzled for decades because of the “lack of correspondence between an organisms complexity and the amount of DNA it carries.” Particularly the fact that the human genome contains the same number of genes as

the mouse and only 5% more than the “lowly worm.” As Keller points out, only 1.2% of the human genome is coding DNA. New studies are helping to “make sense of these enigmas.” Yet, as Keller continues, what they are finding is that “what primarily increases with complexity is not the number of genes, but the proportion of non-coding DNA, much of which seems to be devoted to regulation.” If most of what the human genome does is regulate our relations to and reactions to the environment (specifying the time and location of gene expression) we must, as Keller expounds, “abandon the twin dichotomies, on the one hand between genetics and environment, on the other between nature and nurture” (*ibid.*).

Trudy: “If evolution was worth its salt, by now it should’ve evolved something better than survival of the fittest... Seems like evolution just kinda plateaued out, left mankind with a middle management problem” (Wagner 2012, 113).

Fact: “‘Did you know, throughout the cosmos they found intelligent life forms that play to play. We are the only ones that play to win.’ Explains why we have more than our share of losers” (Wagner 2012, 75).

Delicate strands of kelp swaying sensuously, touching, dancing, playing with our bodies, reaching deep inside to that sacred place of being where love winds itself around desire and touch rekindles the fire of passion. This passion wraps itself around our memory from first fish to now. We remember every struggle to return home. We return to the same home, generation after generation. Memory after memory of every trip, the markers, the stones, the eddies, the falls are all known to us from birth. We are not disconnected from our bodies, our lineage memory, our spirits, all work together to instruct us, compel us to return home. (Lee Maracle 1998, *Where Love Winds Itself Around Desire*, 170)

There are specters abound, leaving ghostly signs and interrupting present narratives, causing us to question whether the past is dead and gone or if it is more than just a mere memory. Enter behavioral epigenetics, a new “scientific” field (a new territory) that looks at how epigenetics shapes behavior (as well as personality, cognition, and mental health) throwing the “nature vs. nurture” binary into the fray of contested dualisms. As Dan Hurley (2013, para. 14) explains in his article “Grandma’s Experiences Leave a Mark on Your Genes,” new research in behavioral epigenetics show that “our experiences, and those of our forebears, are never gone, even if they have been

forgotten. They become a part of us, a molecular residue holding fast to our genetic scaffolding.” First discovered by Moshe Szyf (a molecular biologist) and Michael Meaney (a neurobiologist), published in 2004 in a paper titled “Epigenetic Programming by Maternal Behavior,” the field of behavioral epigenetics since then has grown significantly, mainly focusing on how environmental changes, including “hormonal, social, nutritional, and toxicological exposures” (or encounters)—as Frances Champagne and Emilie Rissman (2011, 277) point out—can dramatically alter the expression of genes, in adults as well as developing children. The most prevalent example in popular culture is the endocrine disrupting chemical bisphenol-A (BPA), exposure of which can cause consequences for “anxiety-like responses, learning, and reproductive behaviors with particular effects on sexual dimorphism” (*ibid.*). Findings that have resulted in a ban of BPA in all children’s toys and bottles. Research in the field of behavioral epigenetics mainly focused on, as Champagne and Rissman (2011, 277) explain, “DNA methylation, post-translational histone modifications, and . . . the recruitment of proteins which bind to methylated DNA.” In laymen’s terms, epigenetic changes can be passed down (inherited) through methyl groups (sometimes called tags) which attach to specific DNA affecting the expression of the DNA based on complex environmental encounters. Methylation (the addition of a methyl group) can also affect histones, proteins that package, compress, and order DNA; the posttranslational modifications of histones can affect the replication, transcription, recombination, and repair of DNA (an aspect that has huge implications for research on cancer and other diseases). Thus, as Champagne and Rissman (2011, 277) unfold, there is a “transgenerational impact of parental exposure to drugs and toxins, particularly when exposure occurs prenatally.” This can be seen in current studies around epigenetic factors/exposures leading to schizophrenia, most particularly exposure to the neurotoxin glutamate (or monosodium glutamate [MSG] used in the food industry as a flavor enhancer particularly in Chinese, Japanese, and Korean cuisine) (Mostafavi-Abdolmaleky et al. 2011). Yet, the environmental factors that affect inheritable tags also include traumatic experiences, as Hurley (2013, para. 13) explains, “Jews whose great-grandparents were chased from their Russian shtetls; Chinese whose grandparents lived through the ravages of the Cultural Revolution; young immigrants from Africa whose parents survived massacres” and “adults of every ethnicity who grew up with alcoholic or abusive parents—all carry with them more than just memories.” Behavioral epigenetics brings to the forefront the complexity of interactions between

“environmental factors” and the unknown meaning/function of the +98% of our DNA focused on regulation; relations that positively and negatively affect our everyday *beings* and *doings*. There are traces everywhere, unseen entities that interrupt the narrative, provide opportunities for other possible worlds through their indeterminate relations and reactions to our everyday *beings* and *doings*. We must learn to be response-able to these past and future traces. As Barad (2010) reminds us,

To address the past (and future), to speak with ghosts, is not to entertain or reconstruct some narrative of the way it was, but to respond, to be responsible, to take responsibility for that which we inherit (from the past and the future), for the entangled relationalities of inheritance that “we” *are*, to acknowledge and be responsive to the noncontemporaneity of the present, to put oneself at risk, to risk oneself (which is never one or self), to open oneself up to indeterminacy in moving towards what is to come.

These inheritances are, indeed, important and vital to the ongoingness of the story, and it is our collective ongoing task, as Derrida (1994, xviii) resolves, “to learn to live *with* ghosts, in the upkeep, the conversation, the company, or the companionship, in the commerce without commerce of ghosts. To live otherwise, and better. No, not better, but more justly.” Being attentive to our own ghosts might, just might, allow us to be attentive to all of the “Other” ghosts that make up the complex world that we are a part of. For, as Jim Lichatowich (2000, para. 9) reminds us,

Salmon ghosts are found in unlikely places—in the dry streambeds below irrigation diversions, in rivers blocked by impassable dams, under tons of silt and mud below logged hillsides, under the quiet, warm waters of reservoirs or in the hot water of streams stripped of their riparian vegetation. They may be under the pavement of the local shopping center. City dwellers are often unaware that many old salmon streams are imprisoned in culverts and buried under the asphalt and concrete they drive on every day. Salmon ghosts are found in places with names like the John Day, Umatilla, Klamath, Yakima, Tillamook, Weiser, Owhyee, Dungeness, Pysht, Alsea, and Jimmy-Come-Lately.

Trudy: “My space chums . . . they said to me, ‘Trudy, beyond any bio-force we have ever encountered, Human Nature is the most thought-stirring, neuro-numbing, heart-boggling of all.’ They say just as the whole chemistry of the ocean can be found in each drop of sea water, all the profound emotional

polarities of Human Nature are crammed into each bio-container—or, to use our term, human body. It could be just too much for any one bio-container to grapple with” (Wagner 2012, 134).

Once I met a girl. The story went something like this . . . My name is Anne. I am a smolt. I'm almost ready to go to the ocean. A year later . . . I was swimming in the ocean happily and I saw something. Part of me wanted to turn around and part of me wanted to find out what it was. I swam up to it and bit down. Once I bit down, I found myself being pulled from the ocean. I found myself face to face with a young girl. I flipped and flopped. The girl looked at me. Then she put me in a bowl filled with water. She studied me closely. "Aha! " "You're a spawner! I bet you were going to swim home soon," the girl said. "I'm Anya." I stared at her. How did she know I was going to swim back home? "Don't bother swimming back. There's a huge dam. Don't worry. I have an idea," said Anya. "Anya! Time for dinner!" I turned to see who had called Anya. It was Anya's mother. Anya picked up the bowl I was in and carried me back to her house. She left me in the bedroom and after she had finished what she was doing, she came back, said good night to me and we both went to sleep. In the morning I found Anya talking to her mom. "Can you please drive me to that small stream? Pretty please," pleaded Anya. "Fine, I don't see why not," replied her mom. She went downstairs. Anya picked me up and walked outside. She climbed into the car. Ten minutes later the car stopped. She climbed out and lowered to her knees. "Goodbye," she whispered. She put me into the stream and I swam away. I looked at her one last time. I dug a redd and then met another Chinook salmon. His scales touched mine and he smiled. I laid my eggs and he put the milt on my eggs. I tried to guard my eggs, but soon I died. (Student, Grade 5)

DRAWING THE PAST THROUGH TO THE FUTURE

Trudy: “All this searching. All these trances, all this data, and all we really know is how little we know about what it all means. Plus, there's the added question of what it means to know something. Scientists say for every deep truth discovered, the opposite is also true” (Wagner 2012, 201).

Recuperation: Recuperation is the recovery or regaining of something (im/material); the act of recovering from injury, illness, damage, or exertion; to regain or rehabilitate to a former state or condition; to reawaken, reinvigorate, resurge, revive, or rally (OED). Haraway (2014) argues for “terrain recuperation” instead of habitat restoration. Recuperation

requires an understanding of ongoing processes and relations, of healing processes and practices; it requires the establishment of new patterns or the reconnecting/expansion of existing patterns. Restoration, on the other hand, implies a return to a previous state, including the restoration of a person, a species, or a habitat to its “original form” (as if there were an identifiable place or time); this includes restoring a monarch to the throne, restoring a habitat to its pre-human intervention state, and/or a reinstatement of innocence by the church (OED).

The question at the bottom of this book/bag/sack is not “what do we know now?” But rather “what have we learned? From whom? With whom? And for whom?” This research project was an attempt at learning to *live-with* “Others,” be they our multiple “selves” or the multispecies beings we co-produce and co-construct. It was a story-telling research practice—doing and thinking, gathering and sharing, composing and decomposing, experimenting and crafting—and a mapping praxis, a drawing, re-drawing, and un-drawing of boundaries and territories within the multiple locations one finds oneself. What fills this book-bag is the everyday practices of ordinary beings “making a living” in this collective pouch (Haraway 2013), learning to get along however they (we) can. My hope through this work, was to be attentive to the patterns created and the traces left by those who wander throughout spacetime, by those who gather, and those who scribble half thought ideas on post-its. I wandered in search of stories that might gather us (sympoetic stories, ghost stories, outlaw stories), figurations that might teach us (bacteria, holobionts, bag-ladies, salmon), and locations (historically embedded and embodied) that just might foster new relations or create new assemblages. If I have learned anything it is that, as Nel Noddings (2003, 35) explains, “a thoroughly relational view puts less emphasis on moral heroism and more on moral interdependence,” on be(come)ing-with. The figures that I have collected, the friendships created “across various work terrains” keep us, as Leesa Fawcett (2009, 234) resolves, “enlivened and honest with each other, [and] to [our] shared histories and disparate efforts.” As Braidotti (2014, 163) reminds us, “at such a time more conceptual creativity is necessary, and more theoretical courage is needed in order to bring about the leap across inertia, nostalgia, *aporia* and other forms of critical stasis induced by our historical condition.” We need to, as she continues, “learn to think differently about the kinds of subjects we have already become and the processes of deep-seated transformation we are undergoing”

(*ibid.*). For this, I have turned to the salmon—the master leaper, the wanderer, the outlaw—hoping to learn a thing or two about desire and being political “actors-spectators-storytellers” (Garside 2013). Fawcett (2009) takes up Nick Garside’s (2013, 63) conception of feral citizenship in which “wandering feral citizens create political moments and consider themselves capable of being multiply political (spectator, storyteller, and actor),” and imagines feral sociality: Hybrid communities of “living beings sometimes learning from each other, sometimes socially feral, but always interdependent.” For feral citizens, as Garside explains, wandering is “not a way of getting anywhere, but a way of being somewhere . . . Feral citizens are content with visiting, disrupting, listening, and interrogating.” Feral citizens strive for recuperation instead of restoration. The goal is not a returning to a previous state (or fixed identity) but a collective revival of agency—of becoming-with—because, as Braidotti (2006, 39) states, it is the “generative powers” and the “endless vitality of life as continuous becoming” that gathers us and gives us hope and desire for a shared future. Practices of recuperation call for response-able practices and allow for the creation of places of refuge for a people yet to come. I am but one “captive-domesticated-feral-companion-wild” woman waiting for the return of alien cyborg salmon, seeking feral sociality and citizenship, gathering up like-minded others, in order to make more livable stories and worlds, and learn to live with the *mystery* of life (Fawcett 2009).

We stopped to look at the stars.
And as usual,
I felt in awe . . .

Suddenly I burst into song:
‘*Awe,*
sweet mystery of life,
at last I’ve found thee.’

And I felt so good inside
and my heart felt so full . . .

Because at the moment you are in most awe of all there is
about life that you don’t understand,
you are closer to understanding it all
than at any other time.

(Wagner 2012, 205–206)

NOTES

1. Robert Brucker, a Rowland Junior Fellow at Harvard University who co-authored an article entitled *The Hologenomic Basis of Speciation: Gut Bacteria Cause Hybrid Lethality in the Genus Nasonia* (2013), created a pop-art image of the holobiont in order to push/challenge the boundaries of science into the everyday, just as the pop artist attempted to challenge the notion of “fine” art by including aspects of pop culture and everyday objects (such as the soup can) into their artwork. The hologenome theory is pushing the boundaries of what is considered a “species” and at which level evolution functions at (the “individual” or the collective). As Brucker (2013, para.5) writes, “Bacteria are often considered part of the environment, and any influence they have on a species is no different than any other organism-organism interaction, like say a predator and prey. But because it is impossible to have a naturally occurring organism without any microbiome, bacteria are essential to the existence of that species. Pop art parallels this, ordinary objects and pop culture references where not considered high art because they were part of everyday society, but yet art is a reflection of our society—neither exists without each other. Our microbes are as much part of our identity as a species as Marilyn Monroe. The art and beauty of living surrounds us, though in mass produced quantities it represents what we are and where we are going.” The image is ironically similar to the image on a T-Shirt Donna Haraway wears on a short video called “Donna Haraway Reads the National Geographic on Primates” (1987) in which she explores the intersections of naturecultures illustrated on various covers of National Geographic issues. The T-Shirt, also drawing on Andy Warhol’s screen prints of Marilyn Monroe, illustrates instead a series of colorful portraits of a gorilla, shifting the cultural gaze toward more complex natureculture relations.
2. Trudy is the chatty Times Square bag-lady character in the one-woman Broadway play, *The Search for Signs of Intelligent Life in the Universe*, written by Jane Wagner in 1986. Trudy is a bag-lady situated at “Walk, Don’t Walk,” who is a “creative consultant” for a group of alien fact finders (her space chums) doing research on earth and who undergoes time-space continuum shifts.
3. Similar to Haraway (2004, 333): “I like layered meanings, and I like to write a sentence in such a way that, by the time you get to the end of it, it has at some level questioned itself.” Definitions of terms are palimpsestic, multi-modal, multidisciplinary, historically situated, and often (mis)translated. My hope in this book is to search for polysemes, and hold together the multiple definitions of terms to create a deeper, richer, and more complex understanding(s). My goal is to create thick meanings, messy meanings, that drawing on multiple fields/planes/modes of thought; to create generative

- (re)interpretations and translations. The definitions scattered throughout the book are not intended to be conclusive static definitions; they are simply the current gathering of descriptions that shape my understanding.
4. Throughout this book the character of Trudy generatively interrupts the text, posing questions, providing insights, and sharing research stories. Trudy's interruptions were originally posed in Jane Wager's (1986) play *The Search for Signs of Intelligent Life in the Universe*, that was turned into a film in 1991 directed by John Bailey (although the film title was intentionally misspelled, *The Search for Signs of Intelligent Life in the Universe*). The play was also published as a book in 2012.
 5. The acronym WCHP was created by Haraway (2008b) and used to describe "white capitalist heterosexist patriarchy" narratives and practices.

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