To say I am astounded to receive the Pilgrim Award from the SFRA would be an understatement, as well as an acknowledgment of the Astounding heritage from science fiction and its people that makes me feel humbled and grateful. I look at the list of those who have received the Pilgrim Award before me, and I can’t believe I am in the company of my heroes of all available genders and genres. I do not deserve it, but I am mightily glad! I am sad not to be in Lublin with you, but family obligations made it impossible to come to Europe this July, and so I hope this projected audiovisual digital recording can convey some of the gratitude I feel to the Pilgrim committee and to the SF community.

First contact: in honor of Naomi Mitchison’s *Memoirs of a Spacewoman*, where no contact forged by a communication specialist goes either unrewarded or unpunished.

For fun, here is a picture of a first contact on my stovetop; this homely encounter tells of my first experiences with SF. Note the meeting of time-obsessed, broody technology with sour tentacular terran fruit. Which can be considered more a sign of SF: the plump plastic hen, courtesy of the history of industrial chemistry, DuPont’s Purity Hall, and the story of clocks, or the magic of my modern lemon tree, courtesy of the International Citrus Genome Consortium and multi-floral vagaries ripened in developmental time? SF writers and thinkers have shaped me since the middle of the 1970s, when, already an
adult, I read Joanna Russ's *Female Man*, quickly followed by Samuel R. Delany's already decade-old *Babel 17*. Ignorant of almost everything in this multi-form worlding practice, I came to SF late, guided by companions who already knew how to read and why it mattered. They tossed me into turbulent and generative rivers of SF, from which I have drawn continuously, if not always legibly. I have tried to add my own rills to the flows of SF. I think of my craft as multispecies story telling in the feminist mode. Equipped with a PhD in molecular, developmental, and evolutionary biology, I have earned a living as a humanities scholar in science studies and feminist studies, with a kind of green card to reside under strict surveillance in biological and cultural anthropology. Art in the biological, ecological, and cyborg modes has only added to the SF mélée that I call worlding. These knowledge-making and world-making fields inform a craft that for me is relentlessly replete with organic and inorganic critters and stories, in their thick material and narrative tissues. The tight coupling of writing and research—where both terms require the factual, fictional, and fabulated; where both terms are materialized in fiction and scholarship—seems to me to be built into SF’s techno-organic, polyglot, polymorphic wiring diagrams. My multispecies story telling is inflected through SF in all the fibers of the string figures that I try to pattern and to relay.

**Brittle stars**

Taught by a stovetop hen and a developmentally challenged lemon, I am in the SF grip of what a former student of mine, Eva Hayward, calls “fingery eyes”

[Cup Corals](https://commons.wikimedia.org/wiki/File:Cup_coral.jpg) by Nick Hobgood [https://commons.wikimedia.org/wiki/User:Nhobgood].
“Fingery eyes” and “tentacularity” are Eva’s terms for sensual trans-ing, and interstitial jointings. Appreciating Hayward’s fingery eyes, Katie King writes, “Working out in a multiverse of articulating disciplines, interdisciplines, and multidisciplinarities, such transdisciplinary inspection actually enjoys the many flavors of details, offerings, passions, languages, things, even while also demonstrating that its own forms of validity are not entailed only within those elegant but divergent parsimonies of explanation. Instead, one index for the evaluation of transdisciplinary work is in how well it learns and models how to be affected or moved, how well it opens up unexpected elements of one’s own embodiments in lively and re-sensitizing worlds” (*Networked Reenactments* 18). I think this criterion applies to SF in all its forms and modes. No surprise that Katie is one of those companions who taught me to read the voluptuous pleasures of SF in the first place.

**Cat’s cradle** [1]
that “It matters what ideas we use to think other ideas (with)” (Reproducing the Future 10). Marilyn embodies for me the practice of feminist speculative fabulation in the scholarly mode. It matters what matters we use to think other matters with; it matters what stories we tell to tell other stories with; it matters what knots knot knots, what thoughts think thoughts, what ties tie ties. It matters what stories make worlds, what worlds make stories. Marilyn wrote about accepting the risk of relentless contingency; she thinks about anthropology as the knowledge practice that studies relations with relations, that puts relations at risk with other relations, from unexpected other worlds. In 1933 Alfred North Whitehead, the American mathematician and process philosopher who infuses my sense of worlding, wrote The Adventures of Ideas. SF is precisely full of such adventures. Isabelle Stengers, a chemist, scholar of Whitehead, and a seriously quirky Belgian feminist philosopher, gives me “speculative thinking” in spades. Isabelle insists we cannot denounce the world in the name of an ideal world. In the spirit of feminist communitarian anarchism and the idiom of Whitehead’s philosophy, she maintains that decisions must take place somehow in the presence of those who will bear their consequences. In this same virtual sibling set, Marleen Barr morphed Heinlein’s speculative fiction into feminist fabulation for me. In relay and return, SF morphs in my writing and research into speculative fabulation and string figures. Relays, cat’s cradle, passing patterns back and forth, giving and receiving, patterning, holding the unasked-for pattern in one’s hands, response-ability, Octavia Butler’s Patternmaster series. My debts mount. Again and again, SF has given me the ideas, the stories, and the shapes with which I think ideas, shapes, and stories in feminist theory and science studies. There is no way I can name all of my debts to SF’s critters and worlds, human and not, and so I will record only a few and hope for a credit extension for years yet to come. I will enter these debts in a short ledger of my teaching and publishing. I start with Marge Piercy’s Woman on the Edge of Time, a typescript of my curriculum vitae that was part of a file for consideration for promotion in the History of Science Department at Johns Hopkins in 1979-80, and a bottle of chalky white out. I had written an essay review of Woman on the Edge of Time for the activist publication, Women, a Journal of Liberation and duly recorded this little publication on the CV. “The past is the contested zone”—the past that is our thick, not-yet-fixed, present, wherewhen what is yet-to-come is now at stake—is the meme that drew me into Piercy’s story, and I was proud of the review. A senior colleague in History of Science, a supporter of my promotion, came to me with a too-friendly smile and that betraying bottle of white-out, asking me to blot out this publication from the scholarly record, “for my own good.” He also wanted me to expunge “Signs of Dominance,” a long, research-dense essay about the semiotics and
To my shame to this day, I obeyed; to my relief to this day, no one was fooled. Piercy’s temporalities and my growing sense of the SF-structure of primate field work made me write two essays for the brave, new, hyper-footnoted, University of Chicago feminist theory publication, *Signs*, and to title the essays in recognition of Piercy’s priority and patterned relay to me. I could not forget—or disavow—Piercy’s research for *Woman on the Edge of Time*, which led her to psychiatrist José Delgado’s Rockland State Hospital experiments with remote-controlled telemetric implants, and my finding in my own archival research Delgado’s National Institutes of Mental Health-funded work applied to gibbon studies in the ape colony on Hall’s Island. The colonial and imperial roots & routes of SF are relentlessly real and inescapably fabulated. Later, living (non-optionally, in really real SF histories) with and as cyborgs, Piercy and I played cat’s cradle again, this time with my “Cyborg Manifesto” and then her *He, She, and It*. Cyborgs were never just about the interdigitations of humans and information machines; cyborgs were from the get-go the materialization of imploded (not hybridized) human beings-information machines-multispecies organisms. Cyborgs were always simultaneously relentlessly real and inescapably fabulated. Like all good SF, they redid what counts as—what is—real. The obligatory multispecies story-telling script was written in 1960 United States space research, when Manfred Clynes and Nathan Kline coined the word “cyborg” in an article about their implanted rats and the advantages of self-regulating human-machine systems in outer space.
Because no one was fooled by a palimpsestic CV painted with see-through white out, for precisely the same reasons and in the same month in 1980 I was fired at Johns Hopkins and hired in the first tenured faculty position in feminist theory in the U.S., in the History of Consciousness program at the University of California at Santa Cruz. If ever there was one in the Academy, HistCon is a SF site imbued with the spirit of Gregory Bateson (one of the early teachers in the program) and his kind of speculative adventures in thinking. In 1980 the program was usually pronounced HisCon. Thus provoked to give an inaugural lecture called HerScam, I shamelessly used Galileo's conic sections to model 1) the tragic parabolic detumescence of HisCon's fantasies of escape velocity from Terra through a disembodied, flighty thing called “theory” (or were those just my hyper-feminist paranoias?); 2) the brutal, perfectly circular, futile, targeting strategies of a late capitalist, faithfully Kantian cosmopolitics in a state of permanent global war; and 3) the hyperbolic, bodily saturated, limit-defined lusts of HerScam's practice of feminist theory, aka the conic section I remain in love with. In this model-cylinder of the university ivory tower, we were left with the modest, historically pregnant, phenomena-saving ellipse, a shape with two foci that suggested co-promise. Somehow, a “t” found its way into the pronunciation of His(t)Con, and a deal was struck, even though my imputed story of causality here is highly suspect. What followed for me was a community of colleagues and students to die for, within which it was possible to write “The Cyborg Manifesto,” “Situated Knowledges,” “Teddy Bear Patriarchy,” Primate Visions, Simians, Cyborgs, and Women, Modest_Witness@Second_Millennium. FemaleMan©_Meets_OncoMouse™.Feminism and Technoscience, The Companion Species Manifesto, When Species Meet, and now in progress, “Staying with the Trouble.” SF writers/thinkers/makers are among the stem cells of each of these efforts at scholarly multispecies story telling, sometimes obviously, sometimes cryptically. Remaking worlds within the matrix of abduction, forced generations and regenerations, and monstrous embodiment, Octavia Butler's Xenogenesis trilogy shaped my sense of field work in the history of scientific studies of free-ranging apes and monkeys. James Tiptree, Jr., was never very far away from my keyboards. Suzette Haden Elgin taught me and my students the power of Linguists. Feminist theory graduate seminars split vehemently in two between horse-crazy girls and psychoanalysts made of sterner theoretical stuff when we read Suzy McKee Charnas's Motherlines. Ursula Le Guin's now famous, then mimeographed and hand-circulated manuscript called “The Carrier Bag Theory of Fiction” gave me the courage
and the conceptual apparatus to cheer for woman the gatherer in her argument with man the hunter in credible accounts of hominid evolution. Delany's *Tales of Nevèrýon*, especially the “Tale of Old Venn,” and Fred Jameson’s way of doing the cultural logic of late capitalism re-taught me semiotics after the trauma of researching “Signs of Dominance.” That gave me more license to read and teach John Varley’s story, “Press Enter” and his rambunctious Gaean trilogy as key feminist theory texts in graduate seminars, an effort that, welded with Trinh T. Minh-ha’s inappropriate/d others in her *Woman, Native, Other: Writing Postcoloniality and Feminism*, resulted in an essay I titled “The Promises of Monsters: Reproductive Politics for Inappropriate/d Others.” I learned more than I can tell from pluripotent SF stem cells seeded in my already promiscuous cyborg/canine/rodent/primate marrow: Sarah Lefanu, Pamela Sargent, Shulamith Firestone, Judith Merril, Marleen Barr, Vivian Sobchack, Fran Bartkowsky, Eric Rabkin, Laura Chernaik, Marilyn Hacker, Veronica Hollinger, Sherryl Vint, Teresa De Lauretis, Margaret Atwood, Monique Wittig, Istvan Csicsery-Ronay, Vonda McIntyre, Gwyneth Jones, Julie Czerneda, Joshua LaBare, and many more, earlier, later and ongoing—and always and again those who showed me and so many others how to live and die in the adventure in worlding, the adventure of thinking, called SF: Samuel R. Delany, Ursula K. Le Guin, and Joanna Russ. Last year, I wrote an essay called “Sowing Worlds: a Seed Bag for Terraforming with Earth Others” for Helen Merrick and Margaret Grebowicz’s *Beyond the Cyborg*. Merrick had incited me with her extraordinary book, *The Secret Feminist Cabal: a Cultural History of Science Fiction Feminisms*. Le Guin and Butler came back to me, this time bringing therolinguists, ants, & acacia seeds and the U.S. teenage hyperempath Lauren Oya Olamina, named for the Yoruba Oya, mother of nine, the Orisha of the Niger River, with its nine tributaries. We will forever miss Butler’s last parable, the unfinished *Parable of the Trickster*. Hyperbolic, limit-defining death is more than HerScam.

Sheri S. Tepper’s *The Companions* met my Klingon Warrior Princess agility dog companion Cayenne after I wrote *When Species Meet* (2008), but clearly Tepper’s hyper-competent enhanced canines time-traveled back to render even more capable than they already were, the mundane
critters I work & play with. *When Species Meet* is replete with all sorts of plant, microbial, animal, and technological critters engaged in terran work/play to learn to engage with response-ability, as companions, *cum panis*, with bread, at table together, when who is on the menu remains permanently at stake. Biologists are key players in *When Species Meet*, especially those who teach us about ecological developmental evolutionary biology, popularly known as EcoEvoDevo, i.e., co-making of species with and by each other in a turtles-all-the-way-down sort of relaying and co-constitutive intra-acting. We have come full circle back to Strathern's commitment to the relentless contingency of relations. Partners do not precede the relating; the world is a verb, or at least a gerund; worlding is the dynamics of intra-action (Karen Barad's word from *Meeting the Universe Halfway*) and intra-patience, the giving and receiving of patterning, all the way down, with consequences for who lives and who dies and how.

\[
\Omega
\]

\[
\text{Terra}[X]_n = \int\int\int\ldots\int \text{Terra}(X_1,X_2,X_3,X_4,...,X_n,t) \, dX_1 \, dX_2 \, dX_3 \, dX_4 \ldots dX_n \, dt = \text{Terrapolis}
\]

Companion species are engaged in the old art of terraforming; they are the players in a mathematical SF equation that describes Terrapolis. Finished once and for all with Kantian globalizing cosmopolitics and grumpy human-exceptionalist Heideggerian worlding, Terrapolis is a mongrel word composted in a mycorrhizium of Greek and Latin rootlets and their symbionts. Terrapolis exists in the SF web of always-too-much connection, where response-ability must be cobbled together, not in the existentialist and bond-less, lonely, Man-making gap theorized by Heidegger and his followers. Terrapolis is rich in world, inoculated against post-humanism but rich in com-post, inoculated against human exceptionalism but rich in humus, ripe for multispecies storytelling. This Terrapolis is not the home world for the human as *homo*, that ever parabolic, re- and detumescing self-image of the same, but for the human that is transmogrified in etymological IndoEuropean sleight of tongue into *guman*, that worker of and in the soil. My SF critters are beings of the mud, not the sky. My linguist and ancient civilizations scholar friends tell me that this guman is adama/adam, composted from all available genders and genres and competent to make a home world for
Battlestar Galactica, in struggle certainly but no longer in a state of permanent war. This Terrapolis has kin-making, cat’s-cradle, string-figure, SF relations with Isabelle Stengers’s kind of fleshy cosmopolitics and SF writers’ practices of worlding. This Terrapolis recognizes the tunneling Makers of Dune as planet-forming companion species.

**Microscopic symbionts**


An ordinary multiple integral equation fabulated for terran worlding, Terrapolis is a SF n-dimensional volume in earth’s naturecutures. This SF equation reminded me that I learned about n-dimensional niche space from my mathematician-theoretical ecologist PhD supervisor, G. Evelyn Hutchinson, in the late 1960s when I was a graduate student in Yale’s Biology Department, a refugee in Hutchison’s lab from a “genetic programming” sort of molecular biology lab that had no truck, or so I thought, with terran organisms in all their muddy, hyper-linked substances and indeterminate but quite definite processes. Hutchinson gave me the mathematics, the reading habits, and the courage for the lumpy, roiling, biogeochemical flows and hyper-volumes of Terra. How could I have forgotten? So, consider below a fictional multiple integral equation that is a flawed trope and a serious joke in an effort to picture what an intersectional—or intra-actional—theory might look like in Terrapolis. Think of this formalism as the mathematics of SF. SF is that potent material-semiotic sign for the riches of speculative fabulation, speculative feminism, science fiction, speculative fiction, science fact, science fantasy—and, I suggest, string figures. In looping threads and relays of
patterning, this SF practice is a model for worlding. Therefore, SF must also mean “so far,” opening up what is yet-to-come in protean entangled times’ pasts, presents, and futures. \[ \Omega \int \text{Terra}[X]_n = \int \int \int \int \int \int \text{Terra}(X_1, X_2, X_3, X_4, \ldots, X_n, t) \, dX_1 \, dX_2 \, dX_3 \, dX_4 \ldots dX_n \, dt \]

Terrapolis \( a \) \( X_1 = \) stuff/physics, \( X_2 = \) capacity, \( X_3 = \) sociality, \( X_4 = \) materiality, \( X_n = \)?? a (alpha) = not zoë, but EcoEvoDevo’s multispecies epigenesis \( \Omega \) (omega) = not bios, but recuperating terra’s pluriverse \( t = \) worlding time, not container time, entangled times of past/present/yet-to-come Terrapolis is a fictional integral equation, a speculative fabulation a “niche space” for multispecies becoming-with Terrapolis is open, worldly, indeterminate, and polytemporal chimera of materials, languages, histories companion species—not “post-human” but “com-post” an equation for guman, for humus, for soil. In this n-dimensional niche space, I am reminded that in her acceptance of the Pilgrim Award in 2008, Gwyneth Jones defined SF “as a volume, a set (overlapping with many others), in the vast, contained yet unlimited ocean of information—furnished with the icons of the genre… Within this volume, every significant writer opens up a new Imagination Space….Maybe the work of science fiction scholarship…[is] to forge links, build complexity, refine the details: and rescue the genuine novelty from each writer’s generic contribution” (11-12). I like this approach, but I want to characterize the work of SF scholarship, and SF as a whole, also as a game of cat’s cradle or string figures, of giving and receiving patterns, dropping threads and so mostly failing but sometimes finding something that works, something consequential and maybe even beautiful, that wasn’t there before, of relaying connections that matter, of telling stories in hand upon hand, digit upon digit, attachment site upon attachment site, to craft conditions for flourishing in terran worlding. Like me, Jones says that she received her baptism in science fiction’s sexual politics from The Female Man. I want to end with string figures as SF partly in homage to Joanna Russ’s Janet Evason, who landed on a desk in front of, to her Whileaway eyes, oddly dressed men, whom we, in Joanna’s world, know to be in military uniform, and proposes a game of cat’s cradle to calm them down. They did not understand; they did not pick up the threads and marvel at the patternmaking. Innocent that she is, Janet reasoned that cat’s cradle is a universal sign of peace. It is surely one of humanity’s oldest games, but like guman instead of homo, string figures are not everywhere the same game. Like all offspring of colonizing and imperial histories, I—we—have to relearn that all string figures are not exactly the same as English and U.S. American cat’s cradle. In the late 19th and early 20th centuries, United States and European ethnologists collected string figure games from all over the world; these discipline-making travelers were surprised that when they showed the string figure games that they had learned as children at home, their hosts already knew such games in greater variety. String figure games came late to Europe, probably from Asian
trade routes. All of the epistemological desires and fables of this period of the history of comparative anthropology were ignited by the similarities and differences, with their undecidably independent inventions or cultural diffusions, tied together by the threads of hand and brain, making and thinking, in the relays of patterning in the “Native” and “Western” string figure games.\(^7\)


This picture shows the hands of Rusten Hogness, Donna’s partner, learning Ma’ii Ats’áá’ Yilwoí, in English “Coyotes Running Opposite Ways.” Coyote is the trickster who constantly scatters the dust of disorder into the orderly star patterns made by the Fire God, setting up the non-innocent world-making performances of disorder and order that shape the lives of terran critters.

In the Navajo language, string figure games are called na’atl’o’. They are one form of “continuous weaving,” practices for telling the stories of the constellations, of the emergence of the People, of the Diné.\(^8\) These string figures are thinking as well as making practices, pedagogical practices and cosmological performances. Some Navajo thinkers describe string figures as one kind of patterning for restoring hózhó, a term imperfectly translated into English as harmony, beauty, and right relations of the world, including right relations of humans and nonhumans. Not in the world, but of the world; that is what leads me to include Navajo string figures, na’atl’o’, in the web of SF worlding. The worlds of SF are not containers; they are patternings, risky co-makings, speculative fabulations. It matters which ideas we think other ideas with; thinking or making cat’s cradle with string figures with na’atl’o’ is not an innocent universal gesture, but a risky proposition in relentless historical relational contingency. Janet
Evasion refused to hear Jael’s claim that the wonderful world of Whileaway got its start from an act of biological warfare—genocide—that killed off all the human males. Like Joanna, we cannot afford that kind of forgetting. Anyone who recognizes the repeated acts of genocide that undergird that nonetheless precious thing called democracy surely knows this basic fact. How to be response-able is the consequential question in SF worlding. String figure games are practices of scholarship, relaying, thinking with, becoming with in material-semiotic makings. Like SF, cat’s cradle is a game of relaying patterns, of one hand, or pair of hands, or mouths and feet, or other sorts of tentacular things, holding still to receive something from another, and then relaying by adding something new, by proposing another knot, another web. Or better, it is not the hands that give and receive exactly, but the patterns, the patterning. Cat’s cradle, string figures, na’atl’o’ can be played by many, on all sorts of limbs, as long as the rhythm of accepting and giving is sustained. Scholarship is like that too; it is passing on in twists and skeins that require passion and action, holding still and moving, anchoring and launching. So I end with renewed thanks to the SFRA and ongoing astonishment at receiving the Pilgrim Award. I hope that with others I can contribute to weaving this honor into the multicolored skeins and twists of SF worlding.

References

21-36.


—CITATION—


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Footnotes (returns to text)

1. Kurt Vonnegut’s 1963 *Cat’s Cradle* is probably the first writing SF people think of when they hear the term, but in all my ignorance, my
umbilicus for SF string games traces to The Female Man. In this year of Joanna Russ’s dying, I need to record this matrix.

2. Isabelle Stengers on relay, via Guatarri, from “Relaying a War Machine”: “To try and take the relay, to try and become part of “an ambulant people of relayers, rather than a model city” [Guattari] produces a rather particular affect. ...More precisely, com-menting, if it means thinking-with, that is becoming-with, is in itself a way of relaying... But knowing that what you take has been held out entails a particular thinking “between “. It does not demand fidelity, still less fealty, rather a particular kind of loyalty, the answer to the trust of the held out hand. Even if this trust is not in “you” but in “creative uncertainty”, even if the consequences and meaning of what has been done, thought or written, do not belong to you anymore than they belonged to the one you take the relay from, one way or another the relay is now in your hands, together with the demand that you do not proceed with “mechanical confidence” (134) ... “Haraway’s own word for the kind of help she needs and loves unsurprisingly belongs to the register of the homely and the ordinary – cat’s cradling, a child’s game, apparently, but also a game versions of which exist in cultures all over the world. Two pairs of hands are needed [me in relay: or at least many tentacles, however attached to individuals or not], and in each successive step, one is “passive”, offering the result of its previous operation, a string entanglement, for the other to operate, only to become active again at the next step, when the other presents the new entanglement. But it can also be said that each time the “passive” pair is the one that holds, and is held by the entanglement, only to “let it go” when the other one takes the relay. A complex dance indeed...”(145).


6. The point was to read and teach these SF texts as theory, not as material to do theory on.


8. Naabeehó Bináhásdzo (the Navajo Nation, the legal geographically defined territory for the semi-autonomous nation), or Diné Bikéyha (the People’s name for Navajoland), is located in the Four Corners area of the Southwestern United States, surrounded by Colorado, Arizona, Utah, and New Mexico. For Navajo scholarship on their history, written in the web of Diné creation stories and the discipline of academic history, see Jennifer Nez Dinétailde, *Reclaiming Diné History* (University of Arizona Press, 2007). There are several sources for Navajo string games and string figures (http://dine.sanjuan.k12.ut.us/string_games/games/opening_a/coyotes_opposite.html), with varied stories and names (see the large Library of Navajo String Games (http://dine.sanjuan.k12.ut.us/string_games/games/index.html), © 2003 San Juan School District, Tucson, AZ. For an extraordinary video of an elder Navajo woman playing String Games, Margaret Ray Bochinclonny (called Grandma Margaret in this short clip), see http://www.youtube.com/watch?v=5qdcG7Ztn3c. Margaret Ray’s grandson, Terry Teller, explains Navajo string figure star constellations at http://www.angelfire.com/rock3/countryboy79/navajo_astronomy.html. Navajo string games are played mainly in winter, Spider Woman’s story-telling season.

**Donna J. Haraway** (https://adanewmedia.org/author/donnaharaway1)

Donna Haraway is Distinguished Professor Emerita in the History of Consciousness Department at the University of California at Santa Cruz. Her work explores the string figures composed by speculative feminism, speculative fabulation, science and technology studies, and multispecies studies. She earned her PhD in Biology at Yale in 1972, and she taught biology at the University of Hawaii and the history of science at The Johns Hopkins University. Her books include *When Species Meet* (2008), *The Companion Species*

6 THOUGHTS ON “SF: SCIENCE FICTION, SPECULATIVE FABULATION, STRING FIGURES, SO FAR”

Pingback: feminist science fiction « queer geek theory

Gloria McMillan

NOVEMBER 1, 2014 AT 6:00 AM

First, congratulations on that award, Donna!

I wonder what sites there are that connect feminist SF to peacemaking. I ask because after many years, I am finally connecting my fanac with peace activism.

Thanks,
Gloria

Pingback: SF and Cyborgs — more from Donna Haraway | Biomedical Futures Since 1945

Pingback: Week 8 – The Post-Human Metamorphosis – cava332readinglogphilipreuter

Pingback: Week 8 – The Post Human Metamorphis | Keely McCarthy

Pingback: Instantiating Imaginactivism: Le Guin's The Dispossessed as Inspiration | Ada New Media
Toward a pedagogy of speculative fabulation

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(Submitted: 1 April 2020; Accepted: 19 August 2020)

Abstract
In resistance to capitalist logics of speculation, this article argues for audacious pedagogies of speculative fabulation. The kinds of pedagogical endeavours that times of uncertainty call for are by no means straightforward, calling as I argue along with Elizabeth de Freitas (2020) writing in this issue, for more venturesome approaches informed by speculative posthuman inquiries and exploratory new materialisms. The Anthropocene or Capitalocene are terms that capture equivocal nature of the crisis-riven present. Laden with contradiction and destruction, these descriptors also embody strange afterlives. Beyond problematic present/futures produced by humans only for themselves lie intimate and uncanny sympoiesis, world-buildings and meaning-makings with non-human others and more than human processes. In accounting for these as well as for the already entangled material conditions of our time, pedagogy needs to pay attention to the slippery nature of cognition itself; a task to which the genre of science-fiction or speculative fabulation (SF) is primed.

Keywords: Anthropocene, bewilderment, cognitive biology, New materialism, posthumanism, science-fiction/speculative fabulation, sympoiesis, trickster, unthought

Introduction: speculative fabulation, new materialism and education
Pedagogies that aim to be meaningful in these times of crises need to account for the equivocal nature of materiality as well as to the slippery nature of our attempts to know and teach it. Speculative fabulation, or science fiction (SF), holds indisputable value for higher education (HE) pedagogies that are interested in such endeavours precisely because it embraces uncomfortable yet productive tensions, while being able to diffract contradictory orders of meaning-making. Combining insights from diverse fields (spanning the hard and soft sciences, as well as the arts) with the fantastic, surreal and uncanny, SF present cartographies of catastrophe and renewal premised on tactics of defamiliarization and cognitive estrangement that enables slippages into genuinely novel territories for thinking, feeling and doing differently. While, as de Freitas (2020) observes in this issue, SF ‘appeals to relational ontologies and methodologies that remix the physical and social sciences,’ it also gives rise to ‘uncomfortable affinities’ with the more-than-
human world with which humans are inseparably co-constituted. Such mappings of a posthuman/more-than-human unknown are not flights of creative whimsy. As socio-economic crises, environmental catastrophes and neoliberal economising increasingly produce and reproduce conditions of increasing precarity, HE needs to break free from the shackles of ‘capitalist realism’ and human exceptionalism that have come to exert such a poisoned stranglehold over all forms of social reproduction (including education). SF, as I argue here, presents HE with invaluable perspectives on navigating not only the ambiguous nature of materiality and cognition, but also the enormous material problems that are currently imperilling the future of life itself.

SF presents figurations or narratives of ‘intra-active’ subjectivity that, in Donna Haraway’s words, act as ‘material-semiotic nodes or knots in which diverse bodies and meanings co-shape one another’ (2007: 4). These kinds of figurative sympoesis, or ‘makings-with,’ are favoured by venturesome new materialist philosophies that, as de Freitas (2020) writes in this issue, ‘pursue metamorphic couplings across conventional divides of matter-meaning.’ We are urged, in the process, to move toward more open systems of knowledge production in education; systems that will help us ‘[re]think the meaning of the disavowed relations in which we are already entangled … relations that involve humans, animals, machines and things’ (Snaza, et al., 2014: 52). Taken in the posthuman/new materialist sense, SF asks that we ‘re-orient ourselves elsewhere’ and ‘mobilise the possibilities of this elsewhere’ toward the production of new meanings that ‘displace and dispose of humanness as the presumed ground’ around which meanings are typically assembled (2014: 51). If meaning can be understood as ‘the interactions among patterns of information creation and the randomness of unperceived patterns’ (2014: 51) this raises the speculative question of how exactly meaning emerges in the first place as an embodied response to materiality and its affective conditions.

Contemporary SF, along with the new materialisms, thus call on us to pay attention to recent developments in the life sciences – particularly, as this paper argues, to the more-than-human meaning-making figurations revealed by recent developments in cognitive biology. While scientific endeavours find themselves entangled with their problematic inheritances, which continue to replicate ‘the foundational and epistemic violence of European colonialism’ (Davis and Todd, 2017: 769), SF and new materialist philosophies ask that we pay attention to promising new developments in the sciences that are ushering new forms of noticing. Elizabeth Wilson, in Gut Feminism (2015: 5), writes that new insights in cognitive biology have, of late, begun to move away from the ‘convention that the neurobiology that counts is all above the neck [and started] to think about minded states as enacted not just by the brain but also by the distributed network of nerves that innervates the [bodily] periphery’. New studies of cognition have begun to subvert mind/body, self/other and nature/culture dualisms by revealing that human meaning-making emerges from more-than-human affects. Consciousness and pattern-recognition in the human brain are woven as William Connolly (2002: 10) observes, from ‘dissonant relays and feedback loops’ as well as ‘complex, layered’ interactions between ‘different bodily sites’. Meaning is triggered by pre-individual nonconscious sensations, moods, and flavours, assembled from...
affective chemical knots, tied, and untied across multiple bodily sites at differential speeds and, crucially, across complex nutrient-absorption processes at work in our multispecies guts. Researchers and educators, like Wilson, de Freitas, Snaza, Probyn, Haraway, and Barad (to name but a few) have mobilised on such developments, taking onboard scientific accounts of materiality and cognition, while troubling ‘standard historical and scientific materialisms that are invested in the ideology of progress and the fantasy of the human subject’s autonomous self-containment’ (Carstens, 2019: 139).

Mobilising uncanny and bewidering pedagogies of resistance

The multimodal semiotic/chemical/neuro-affective more-than-human nature of cognition challenges us to generate a pedagogical praxis of speculative fabulation and bewilderment. In *A Thousand Plateaus: Capitalism and Schizophrenia* (1988), Gilles Deleuze and Félix Guattari outline the groundwork for such an approach by giving an example of how such a venturesome pedagogy might work in practice. Through the voice of a fictional pedagogue, Professor Challenger, they deliver a delirious lecture on a pedagogy of more-than-human material-semiotic meaning-making that weaves together a diversity of signals and affective regimes originating from the sciences (physics, chemistry, biology, economics and sociology) and the arts (minor literature, experimental painting, music, radical Spinozist ethics and innovative philosophy). The result is a distinctive kind of posthuman pedagogy that Joshua Ramey (2013) terms learning the uncanny. Filled with ‘double articulations’ that present inert ‘forms and substances’ alongside mercurial ‘lines of flight,’ operating at differential speeds, Challenger’s spooky lecture so thoroughly bewilderds his fictional students, that it generates an affective ‘gate-opening’ between the scientific/technological and the mystical, the heterogenous and the singular, the human and the non-human, the fixed and the fluid (Deleuze and Guattari, 1988: 72-73). Nathan Snaza (2019) draws our attention to an analogous bewidering pedagogical scene that occurs in Bram Stoker’s *Dracula* when Dr Von Helsing delivers a disorienting lecture to Dr Steward; a lecture that so crowds and confuses Dr Steward’s mind with geological, biological, historical, psychological and affective detail that it fires-up his imagination into conceiving a solution to a problem that his mind had not yet fully grasped. ‘Before there is cognition,’ as Snaza explains (2019: 77), ‘there is an exposure to a set of relations that disorientates, and in disorientating sets part of self into motion’. What goads imagination ‘is the affective experience of bewiderment, which becomes event precisely in the relation between a disciplined attentive apparatus’ – that of the schooled and encultured mind – and ‘a messy, unknowable set of [more-than-human] relations that are always swirling around’ us, affecting us, even though we don’t consciously register them (2019: 78).

As Wilson (2015) and Connolly’s (2002) insights, as well as the examples of Professor Challenger and Dr Von Helsing aptly illustrate, thinking and teaching about matter and materiality – and, indeed, about what it means to be human in a more-than-human world – means considering how other-than-human processes impact the ways we think, parse, or make sense of the world. Thinking and teaching, considered from such perspectives, is transformed into a
spectral, bewildering, and affective speculative engagement that grapples with the uncanny nature of cognition itself. As Snaza (2019: 100) observes, before we even ‘know we are sensing a thing, we are moving toward or away from it corporeally, and we are being moved by it,’ affectively and emotionally toward ‘a kind of knowledge’ (in the sense of conscious cognition) that is ‘belated, arriving on the scene [only] in a certain mood that primes the body to think it’. Sigmund Freud’s neologism Nachträglichkeit or ‘deferred action’ captures the uncanny ‘afterwardsness’ of thinking/feeling, describing the ‘retroactive temporality’ whereby the conscious self fictionalises itself in belated relation to the materiality of events, sensing only after-effects and after-images (Bistoen, et al., 2014: 672-73). Ghostly effects of delay and deferral like déjà vu epitomise the Freudian sense of the uncanny by scrambling our perceptions of present and presence; it is only in the otherness of their radical spectrality or ghostliness that material objects, things, bodies or events allow us to approach them and know them. Pedagogy occurs in this equivocal space between sensing, thinking, and knowing. The spectral afterwardsness of cognition does not, however, imply that reality is unknowable or unteachable; what it should alert us to, however, is that no single epistemological stratagem (such as reductive science, for example) will completely suffice for knowing (or teaching about) materiality. The spiralling multitemporal nature of matter, existing at all scales and variations – as recent developments in physics and the life sciences have demonstrated and indigenous cosmologies have long held sacrosanct – announces the radical protean multiplexity of materiality and the impossibility of single-vision in our attempts to parse meaning, create knowledge or teach (about) it. The persistence of the uncanny in our cognitive and pedagogical attempts to approach matter and materiality signals that there are always other ways of knowing and doing. We are directed thus toward a more venturesome pedagogy of speculative fabulation that is more fully able to account for the slippery nature of materiality and our incomplete attempts to parse it.

Throughout A thousand plateaus, Deleuze and Guattari utilise SF as a pedagogical tool-kit to, as Joshua Ramey writes, create ‘dramatic encounters’ as well as to generate moments of lively confrontation, that ‘provoke the mind to interpret and to create’ (2013: 177). More than the mind, however, is being provoked by the affect-laden Deleuze-Guattarian pedagogical encounter, which urges us toward a pedagogy that is able to account for aesthetics, affects, ambiances (or haecceities) and an array of multiple interacting more-than-human systems in which humans and their meaning-making systems are inextricably embedded (such as pre-individual affects, bacterial, plant and animal assemblages, meteorological cycles, chemical gradients, geological processes, etc., all of which operate at differential speeds, intensities, and scales).

In order to respond to this entangled, spiralling and equivocal world-making assemblage that completely exceeds the belatedness of human consciousness or reason, pedagogy needs, more than ever, to employ the uncanny (the ambiguous, the spectral, and the difficult to determine). Today, in the age of the Anthropocene/Capitalocene, when the biosphere of the planet itself is being undone (along with all its rich multimodal/multispecies world-making) there is a desperate need for more exploratory pedagogies that move against the grain of traditionally conceived, tightly disciplined and narrowly focused human-centred/humanist education systems.
Towards a pedagogy of speculative fiction

Against the neoliberal injunction that no pedagogical resistance to the ‘grey curtain’ of ‘capitalist realism’ is possible, even ‘the tiniest [pedagogical] event can tear a hole. ... From a situation in which nothing can happen, suddenly anything is possible’ (Fisher, 2009: 81). As Wilson (2015) writes, we are called upon to challenge long-standing reductionist paradigms that see learning and thought as something that involves individual human brains and discreet human bodies. Aside from involving innumerable sensory signals hitting the bodily peripheries (atmospheres, flavours, sounds, smells, movements, postures, colours, etc.), learning is intimately tied to the affective and chemical ‘substrata’ of our multispecies guts as well as to a multitude of more-than-human materials, affects, processes and living substances carousing through or impacting on the body at any given moment (2015: 63). Meaning-making figurations, whether involving individual human attempts at cognition or the stratagems of educational systems are already, intrinsically, more-than-human.

According to Haraway (2007: 4), there is much that pedagogy can take from the ‘meaning-making figures’ of SF, which ‘gather up those who respond to them into unpredictable kinds of ‘we,’ presenting a potentially transformative posthuman/new materialist relational ethico-onto-epistemology. This involves incorporating an aesthetic sensibility in which knowledge and feeling are presented as situated, conditional, accountable, affective, fluid and dynamic, as well as continually altered by more-than-human interactions that traverse multiple orders of knowledge-making and being. SF, and SF-inspired pedagogies, are at ease with the uncertainty evoked by such a sensibility which takes up the challenge of learning the uncanny. The sense of wonder – so integral to learning – that might in some examples of SF be conveyed through marvel, scientific or otherwise, might just as readily be conveyed in others through radical uncertainty, as de Freitas’s example of SF in this issue readily demonstrate. Her case, Liu Cixin’s The Three Body Problem (2008), presents an instance of SF that moves against the world of reasoned humanist knowing and certitude toward a terrifying more-than-human universe that extends infinitely beyond us. This example of SF does what all venturesome pedagogies should, namely, cultivating an openness to that which exceeds current knowledge paradigms via experimental imaginative and affective confrontations with the uncanny. Pedagogies of bewilderment carry us through ‘thresholds and doors, where becoming itself becomes’ (Deleuze and Guattari, 1988: 249), challenging us to engage in speculative more-than-human meaning makings that are open to the possibility of radical transformation.

Reaching into the death-places of the Anthropocene

There is a manifest urgency in attempting to open pedagogy to the bewildering and uncanny effects and affects of the contemporary Anthropocene crisis. ‘Will expanding death effects diminish us further as the life sustaining capacities of the Earth are [increasingly] degraded and extinguished?’ (Rose, 2011: 146). In the midst of an escalating double-death – as both species and their relational networks are made to vanish from the Earth’s biosphere, along with a diversity of human meaning-making languages and cultures – pedagogy needs to take stock of its objectives. If education seeks to ‘reach out to make a difference’ it will need to generate uncanny
pedagogical encounters with the ‘death places’ of the Anthropocene/Capitalocene, engaging with the strange afterlives ‘emerging from extinctions’ and challenging ‘everything we thought we knew about who we are and how to live within the imperilled family of life on Earth’ (2011: 146).

In channelling such apocalyptic effects and flavours, a pedagogy of speculative fabulation needs to teach about the dark side of human meaning-making figurations, especially those of rational/reductive science and the economic, educational, and political fancies they have inspired. Pedagogies that venture into the death-places of the Anthropocene will need to explore how, for the last 300 years, science has been conjuring a powerful world-shaping sorcery: The Enlightenment fabulation of progress. In this regard, science’s sheer speculative inventiveness has been extraordinary. Pedagogy, along with the entirety of social reproduction, has been swept up in its forward march, unleashing a pandora’s box of ‘progress traps’ (technologies as well as technologically-enabled means of production, social and otherwise, with unintended, often disastrous, consequences) on the world. The ideology of progress has contaminated socio-economic systems, governments, and education itself, making nonsense of the multiple ways that humans and other lifeforms are embedded in the world, littering the world with trash, inappropriate technologies and dislocating lifestyles and destroying entire worlds of alternative meaning-making configuration in the process. Having once fuelled the comfortings of progress narratives that promised bright and confident futures for some, science now finds itself facing an intractable enemy: that of accelerated superstitions and conspiracy theories (which are meaning-making figurations with their own dark sides) in a post-truth world that was paradoxically born from its bright light of reason. Assailed by front-page accounts of weaponised violence, invasive surveillance tech, chemical pollution, pandemics, and industrially produced global warming (with its hurricanes, floods, droughts, fires, and coral bleaching) the story of progressive, reductionist science is currently being subverted by spectres of its own making. This is something that pedagogy needs to critically account for.

It is from these troubled apocalyptic spectres that SF weaves its fabulations. While one side of SF faces the screen of human exceptionalism and certitude that progressive science erected, its other side faces radical indeterminacy. A pedagogy appropriate to Anthropocene/Capitalocene realities needs to pay close attention to such moves. Truth – to take up de Freitas’s example of The Three Body Problem – is agitated by the limits and limitations of scientific knowledge and meaning-making practices. As it turns away from anthropocentrism and certitude, SF engages with culturally diverse modes of alternative meaning-making that run counter to the ideology of progress. Monkey King, Kitsune, Hermes, Eshun, Puck, Cagn, Loki, Raven, Coyote, and innumerable other tricksters have found new other-than-human guises in contemporary SF. That trickster lore, which is universal to all human cultures, has found a home in SF is hardly surprising. SF continues a long tradition of pedagogical resistance that, like the tutelary trickster stories of diverse folkloric traditions, speaks to the uncanniness that underscores attempts to know and master the world. Science and its progress stories are not immune to the ambiguities and cognitive Nachträglichkeit embodied by the trickster tradition. Like the progress-
stories to which many contemporary instances of SF speak, trickster fabulations expose that far from being epistemologically secure or privileged, all knowledge-making practices – especially those that insist on mastery and control – are riddled with indeterminacies.

In its conjurations of confrontations between different modes of thought and being, certainties and uncertainties, SF plays up its central theme of cognitive estrangement or ostranenie (literally, making strange). Having begun with ‘encounters [with] strange animals’ and/or aliens, and then reached toward ‘the ultimate regions of a continuum inhabited by unnameable waves and particles,’ SF continually grapples with forces that drag humanity backward toward extinction, whilst simultaneously supplying impetus for movements forward into new modes of existence (Deleuze & Guattari, 1988: 248). This is perhaps the most significant quality of SF; its engagement, often contradictory and always uncanny and affective, with the limits of what we can both know and be. As educators and researchers struggle to reinvent more inclusive, ethical and speculative materialisms, the lesson to take from SF, as de Freitas (2020) notes in this issue, is to not to throw the science baby out with the reductionist/androcentric/anthropocentric/extractive-imperialist bathwater. Instead, we are called toward more venturesome, inclusive, and accountable sciences; materialisms that pursue sympathetic, sympoietic, affective, terrestrial, and metamorphic couplings. SF presents us with innumerable protocols for experimental pedagogies constructed along such lines. By generating thought experiments that reach beyond the death-worlds of the Anthropocene, SF presents pedagogy with an archive of the imagination where different subjectivities and categories of knowing/being – ontological, epistemological, ethical, political, scientific, mystical, etc. – can converge and cross-pollinate. SF calls us to confront, in our pedagogies, our boundaries and boundedness as humans; to find in the radically other and alien the equally radical possibility of other worlds of being, knowing, and becoming. Informed by the virtual worlds and fecund possibility spaces of SF, pedagogy might generate imaginative encounters with strange others under the sign of the unseen, grasp for the formerly imperceptible and open itself up to experiments with the limits of the known.

Grappling with the possibility of an outside of science
A renewed interest in SF and relational ontologies have occurred, as de Freitas remarks elsewhere, ‘alongside a growing interest in philosophies of immanence and a widespread turn to the study of non-human agency’ (2016: 224). This turn has drawn heavily on technical advances in information/computing technology; developments that have propelled molecular biology’s growing understanding of DNA’s informational chemistry, as well as cosmology’s grasp of the quantum informational substrate of the universe (or, rather, the pluriverse or spookiverse). That everything in nature and the cosmos computes is an ancient cosmological insight that is gaining new cultural tracts in an age of unprecedented crisis and material transformation that abounds with irony. The ‘intellectual, cultural, and technical convergence’ that Donna Haraway refers to the ‘new new synthesis’ (2017: M29) in biology coincides with a sixth mass extinction of biological life brought on in no small part by the advances in software analytics and computing power that made the ‘new new synthesis’ possible. Advances in computing have, after all, extended the
tentacles of biopolitical capitalism into the very bedrock of planet Earth (Cooper, 2008). As de Freitas writes elsewhere, ‘we witness here how the concept of ecology has become increasingly denaturalised in our current diffuse technosphere where power is environmentalised by media technologies allowing for new forms of governmentality and control’ (2018: 88).

The life-sciences, along with computer sciences, find themselves messily entangled with the algorithmic control regimes and bio/necropolitical expulsion scenarios of ‘disaster capitalism’ whereby life is rendered as surplus to the economy and the gap between ‘grievable’ and ‘ungrievable lives’ is continually widened (Butler, 2020: n.p.). Here, educators and researches in the biosciences, political sciences, history and sociology would do well to take heed of Melinda Cooper (2008) and Saskia Sassen’s (2014) hard-hitting multidisciplinary investigations of the confluence of these fields with the brutal algorithmic economising of disaster capitalism. There are, of course, other sides to these unsavoury entanglements and assemblages. While living and non-living bodies and things are being converted into (data)minable informational materials, strange afterlives and posthuman promise continue to flourish in the wake of advances in informatics.

In the worlds of SF, Artificial intelligence (AI), quantum computing and cognitive biology call on us to account for a more-than-human world of agential capacities and relational networks that subvert attempts at control and mastery. SF invites us to discover that technology and science are, in fact, tricksters with whom we must learn to converse and form wary pacts. Alongside the example of the Three Body Problem, I can point here to multiple other examples. Award-winners like Adrien Tchaikovsky’s Children of Time (2018) and Children of Ruin (2019) novels, Peter Watts incendiary Blindsight (2006), or Tade Thompson’s Afrofuturist Rosewater (2017), for instance, are nuanced and invaluable explorations of the equivocal and trickster sides of science and technology. These, and many other examples of SF, test the boundaries and boundedness of trust in post-apocalyptic worlds where survival depends on the forging of intimate alliances with slippery non-human agencies that are material and extra-material, cognitive and non-conscious, biological and artificial. Not only do texts such as these grapple with the possibility of an outside of science as it is traditionally conceived, but they invite us to imagine the material/biological body, the planet and the cosmos itself as alive with trickster motive.

It was while conducting research for NASA that geochemist James Lovelock formulated the concept of Gaia – a supreme evolutionary force of nature; a vast, mysterious and distributed network of information which includes but infinitely extends beyond humans, and to which our species is utterly subservient, if not insignificant. In contemporary SF, informational networks – both biological and artificial – are extended into the abysms of cosmic space where dark materials and enigmatic forces hold sway. The more-than-human cosmos that information-age science is beginning to uncover includes a multitude of nonhuman forces, objects and beings, including the microbial aliens at work within our individual human bodies as well as the multitudes of non-humans sharing and sustaining our biosphere. It includes geological and industrially produced objects that exude strange, and even malevolent powers, machine networks, and even non-
terrestrial alien objects (meteorites, moon-dust and Martian soil samples, etc.). The landscapes that humans increasingly inhabit – the dynamically burgeoning networked communications landscape, the compromised ecosystems we’re intrinsically entangled with and destroying – as well as the shifting alliances within our multispecies microbiomes, are alive with dark and vibrant matters and active nonhuman agents that are beginning to make pivotal contact with us. In an age of escalating and overlapping crises, humans are gaining unprecedented new insights into the dynamics of world-building and world-destroying. The very sciences and technologies that have enabled Anthropocene humans to intercede in geologic time have enabled us to perceive nonhuman agencies in surprising new ways. These agencies call us toward an uncanny pedagogy of speculative fabulation that, as de Freitas (2020) observes, is based on a tentative kind of trust, shadowed by apocalyptic forebodings.

In the Anthropocene, as in any other geological epoch, ecological succession is the replacement of one species by another; a process that should give us humans pause in the context of a currently unfolding anthropogenic sixth mass extinction of biological life whereby the planet’s former biodiversity is being replaced with a tiny handful of organisms (humans, their factory-farmed/monocultured domesticates and opportunistic parasites) and fatally disrupted by capitalism’s planet-altering extractive processes. While progress has generated mountains of poisonous waste that will show up in the future geological record, stratigraphic studies of this record reveal that Gaia has weathered multiple extinction and succession events. Insights gleaned from the ‘new new synthesis’ in biology reveal that life has survived innumerable crises by weaving strange experimental string-figures (via symbiotic partnerships and lateral gene transfers) that utterly defy systematic biological classification schemes (Haraway, 2017). As the human destruction of biological diversity intensifies, could strange unforeseen scenarios of ecological succession – new order-defying symbiogenetic becomings – beckon to us to from assemblages of silicon and stem cells, networks of waste, infectious diseases, and microbial gumbo? The unforeseen alliances with nonhuman others that populate SF as well as the co-evolution survival stories of the new biology conjure a politics of the impure that rubs shoulders with a grey sublime. Increasingly we humans populate a continuum between the human and the inhuman, occupying a borderland where the organic, the artificial, the engineered and the evolved are spectrally yet materially entangled. In an age of burgeoning extinctions, it is to these shifting borderlands and more-than-human assemblages that a pedagogy of speculative fabulation needs to turn its urgent attentions.

As de Freitas (2020) observes, the kinds of relational ontologies we encounter in speculative fiction remix the physical and social, hard and soft sciences, exploring our affinities with various kinds of problematic assumptions, naturalistic, realistic, casuistic, abstracted, reductive and so forth. Some of the most important SF to emerge in the past few decades have, like the new materialisms of feminist scholars like Haraway and Elizabeth Grosz, been mapping exciting and challenging developments in the life sciences and cognitive biology. The mutational ‘metamorphic zones’ opened by developments in this field have, as de Freitas (2020) notes, moved us away from purely epistemological questions regarding the warranting of scientific truth.
claims, towards ethical questions about the possibility of trusting more-than-human relations. In this new biological schema, all of life is in *sympoieisis*, or making-with as literally nothing in biology makes itself (Haraway, 2017). Assemblages dominate; symbionts, parasites, commensalists and pathogens are only some of the actants in life’s complex trickster networks; actants that bring advantages, disadvantages, limitations, precarities and even dangers to a tangled mix that extends all the way up and down bodies, populations, food-chains and ecosystems. Balances are easily and catastrophically tipped one way or another, as Anthropocene humanity is starting to discover. There are, as de Freitas (2020) remarks, limits and incommensurables to all this making-with that are not easily accounted for by existing new materialisms or even science, for that matter: Trust becomes extremely tested in a global environment where new promiscuous and unfamiliar non-human agencies (from emerging algorithmic data-mining networks to pandemic-causing viruses) populate the earth. While the fruitful nature of terms like relationality and trust belie the ways in which they are lived in radically divergent ways, a more pressing question is how all these entangled biological and artificial networks compute or, rather cognate, as we enter into relationships of conditional trust or distrust with them. Cognition is perhaps the least studied and most troubling of all phenomena. Can an algorithmic network, virus, bacterium, plant, animal, or ecosystem think? That science is beginning to ask such questions indicates the persistence of a radical unthought far beyond any lingering humanist desires for relational correlationism. This is why I would warrant, along with Katherine Hayles in *Unthought* (2017), that it is the newly emergent field of cognitive biology, a facet of the new synthesis in biology, that HE pedagogies, in both the Sciences and Arts, will need to pay most careful attention to.

**Spectral tricksters, SF, and new modes of learning**

In the realm of contemporary cognitive biology, the ‘critical role played by materiality in creating the structures and organisations from which cognition emerge’ is coming under investigation (Hayles, 2017: 66). Our attention is drawn toward what Murray Shanahan (2016) terms conscious exotica, namely, uncanny non-human intelligences and memory-systems that exceed the bounded and embodied criteria of human experience. Conscious exotica, such as hunting spiders, cephalopods and perhaps, soon, AI networks, add an expansive, tactile, and fluid materiality to our ways of looking at, feeling, and making sense of the world. Computing bacterial networks and the uncanny evolutionary adaptive stratagems of non-life such as viruses are even more spectral in their exoticism. Spectral exotica, whether conscious or ‘unthinking,’ critically trouble normative constructions of history, temporality, genealogy, and identity. Such exotica are tricksters or, as Deleuze (1994) terms them, demons with immense pedagogical potential. While cognitive biologists as well as software programmers are beginning to parse their ecological and cyberspatial presences, mercurial beings such as these have long inhabited indigenous lore in the form of tricksters (Pelton, 1980).

Tutelary tricksters, it seems, have always been amongst us; curious amalgamations of technology and magic, human and other-than-human meaning-making assemblages that
embody ‘the peculiar unity and persistence of the liminal’ (Pelton, 1980: 105). From a Deleuze-Guattarian or new materialist perspective, conscious as well as unconscious exotica are spectral tricksters; pedagogical demons that assist in the conjoining of mind and body, nature and culture, life, and non-life. Tricksters literally help us to change our minds, drawing our attention to the fact that, as Viveiros de Castro points out with the aid of trickster-laden Amerindian cosmology, there can be no ‘spiritual’ or ‘mental change which is not also a bodily transformation, a of bodily affects and capacities’ (2015: 255). As Deleuze writes, it is a peculiarity of demons and tricksters to ‘operate in the intervals ... to leap over the barriers or the enclosures, thereby confounding the boundaries between properties’ (1994: 37). ‘What we encounter’ when we encounter spectral exotica are demons as ‘sign-bearers: powers of the leap, the interval, the intensive and the instant’ (1994: 37). As Chantelle Gray explains, what Deleuze’s demons and tricksters do is to counter ‘the Cartesian method of premeditated thinking’ by ‘deterritorialising dogmatic images of thought or habitual ways of thinking’ (2020: 131), and provoking a kind of learning that takes ‘consciousness’ into ‘experimentation’ and ‘field[s] of continuous intensities’ (2020: 132).

Tricksters and demons are potent pedagogical avatars that can deliver what Deleuze calls ‘paideïa’ – shock-therapy or ‘violent learning’ that counters programmatic/habituated thought (1994: 168). Cephalopods are particularly potent in this regard; as teaching aids they are transformative avatars of a new mode of learning – one in which thinking and acting are made co-extensive to one another. Cephalopods, like squid and octopuses, are conscious exotica. These spectral tricksters speak with their bodies, signalling their intent via an affective language involving chromatic signalling, skin texture variation, postures, and locomotion (Godfrey-Smith, 2016). Such multi-brained multi-limbed and many-hearted beings are like the tricksters of indigenous African lore that ‘poke play with and shatter assumptions of origin and boundary,’ nature and culture, mind, and body (Pelton, 1980: 105). In the peculiar fluid nature of their cognitive expressiveness cephalopods, like all tricksters, convey ‘the peculiar unity’ of the liminal; ‘that which is neither this nor that, but both’ (1980: 105). Cephalopods are the experimental subjects of new branches of AI and gene manipulation. They have an especially spectral agency in context of emerging cognitive algorithmic data networks and genetic engineering, urging us to pay attention to the neglected affected, embodied, and poetic experience of our industrially produced new materiality.

A speculative cephalopod pedagogy asks us to explore the sensual aspect of the multi-layered somatechnical experience in which contemporary humans are embedded, to give ourselves over, as Anthony Dunne writes, to ‘intentional ambiguity,’ to ‘attune’ ourselves to the ‘strange and unfamiliar’ trickster-like aspects of technological immersion (2005: 36–37). What if artificial algorithmic intelligence was cephalopod-like, learning human language via questing electromagnetic and algorithmic tentacles? What if algorithmic AI was sensually exploring us via multiple sensory devices (like the information-gathering questing tentacles of an octopus); CCTV cameras, screens, sensors, and smart appliances embedded in everyday domestic and workspaces? How could spectral tentacular trickster AIs touch us, exactly? Could they penetrate beneath our skin and infiltrate our internal organs? Could they reach into our being-human? As
they reach for and enfold us with their speculative algorithmic tentacles, could we learn them back, parse their touch, think their unthoughts and learn to speak their spectral language? These are questions that Adrien Tchaikovsky skilfully explores in his seminal *Children of Ruin* (2019), which plays on emerging AI studies in mapping cephalopod consciousness and bacterial computing onto machine networks.

Conscious exotica – animals with radically different body-brain plans to the human template yet possessing eerily analogous complex conscious processes – are not the only exotica we need be paying attention to. All forms of life, and increasingly digital forms of un-life, it turns out, possesses cognitive capacity – mostly of the non-conscious variety. The biosphere and the technosphere are positively riddled with ‘intelligent’ non-conscious cognitive networks. Even where consciousness, with its slow uptake and limited information processing ability, is present in a few isolated groups of organisms, survival – even human survival – depends almost entirely on non-conscious cognition. Everything we assume to be conscious processes, ‘including the detection and extrapolation of patterns, the integration of somatic markers into coherent body representations and the fusion of diverse temporal and spatial events’ is dependent on nonconscious cognition (Hayles, 2017: 87). Bacteria, cephalopods, and humans, in turns out, exist on a continuum of unthought. Adding the non-conscious to the consciousness/unconscious agential binary, cognitive biology aligns with the new materialist project of decentring the human and, I would warrant, takes it further. Yet, as Hayles continues, much work remains to be done – including in education – in recognizing and mapping the ‘particularly consequential forms of material agency’ (2017: 87) possessed by cognition – particularly of the non-conscious variety – as well as the radically divergent and contingent agential capacities that mark the cognitive spectrum.

By failing to take onboard the non-conscious, writes Hayles, we are operating under ‘a very partial and incomplete picture’ of materiality (2017: 86). Here too SF takes up much of the flack. Peter Watts’ *Blindsight* (2006), for example, extrapolates on the kinds of intelligent behaviour evinced by non-conscious networks, suggesting that what counts as normal cannot be sufficiently anchored by consciousness alone, or indeed by human cognition. Like Tchaikovsky in *Children of Time* (2016) and *Children of Ruin* (2019), Watts maps different kinds of cognitive material agencies, conscious, unconscious, and non-conscious as well as their differential agential capacities. Unlike Tchaikovsky, whose non-human agents represent an affirmative pluralistic relational posthuman ecology, despite their cognitive differences, Watts (2006) confronts the pressing problematic of unthought, imagining a radical outside to cognitive relationality – something utterly alien and incommensurable to human thought and science. In this project, Watts (2006) draws on cognitive biology, neuro-atypical neuroscience, and theory, making different theories of mind and evolution protagonists in his writing in a manner typical of SF.

Cognitive biology reveals a biosphere dominated by non-conscious unthought. Consciousness appears to be an exception rather than an outcome in evolution; one that carries heavy evolutionary penalties – as Anthropocene humanity is beginning to discover. As one of Watts’ characters ruminates, the idea of ‘normalcy’ alters when the heavy cost of consciousness
Towards a pedagogy of speculative fiction

is considered: consciousness ‘wastes energy and processing power and self-obsesses to the point of psychoses’ (Watts, 2006: 302). In *Blindsight*, consciousness is revealed to be a complete outlier, and not only on Earth. Humanity fatally encounters a trickster alien race that can travel between the stars ‘unhampered by self-awareness’ (2006: 302). Humans are indeed alone; but not in the way they once imagined. In Watts’ figuration, consciousness and its correlate of language are represented as inept evolutionary stratagems, rapidly weeded out in a universe dominated by unthought. This kind of speculative SF brings us into confrontation with anthropocentric assumptions about the primacy of consciousness and so-called reason. Confronted by a trickster Gaia, cognitive but like Watson’s aliens unhampered by self-awareness, Anthropocene humans find themselves at an analogously perilous juncture, faced with an extinction-level event precipitated by our energy wasting, self-obsessed conscious doings. In such a hazardous milieu, ‘whether consciousness is a crown or a burden, or both together,’ must be re-evaluated by the new materialisms in the ‘larger context of planetary [non-conscious] cognitive ecologies,’ emerging non-conscious AI networks and perhaps, one day, newly discovered non-conscious exo-planetary ecologies as well (Hayles, 2017: 111).

Our bodies, endowed with colour perception, stereoscopic vision, and consciousness are not the only kinds of bodies that can think. We are reminded by Connelly that we humans are not as conscious as we’d like to assume; our brains, like those of cephalopods, are extended nervous systems that are given to ‘side perceptions’ that involve an array of infraconscious embodied perceptions that are not directly available to conscious processes (2010: 10). As Snaza explains: ‘before any consciousness knows the body is perceiving something let alone interpreting it, it is already responding at a neurological level, which leads to shifts in both the affective system (in the sense of affects as something like feelings) and the body’s motor capacities’ (2019: 110). Hayles (1999) reminds us that consciousness is a relative latecomer to the game of cognition on planet Earth. There were thinking organisms like cephalopods on this planet long before humans or even mammals arrived on the scene, and undoubtedly non-human cognisers will still be around long after we humans have become fossilised sediments. Like cephalopods, we are constantly moving towards what we think. Even ‘before we know we are sensing a thing, we are [already] moving toward or away from it corporeally, and we are being moved by it in the sense that our emotional or affective state is being modulated’ (Snaza, 2019: 100). The dynamics of cognitive biology allow us to realise that affects, emotions and feelings are already a kind of knowledge. As Snaza (2019: 100) writes, ‘it also seems to be the case that all knowledge in the sense of conscious cognition is belated, arriving on the scene in a certain mood that primes the body to think it’. By taking on board the non-conscious and conscious spectral tricksters of SF as speculative pedagogical aids we can begin to move toward a more open-ended pedagogy that takes on board the more-than-human world; in other words, a pedagogy that is alive to the uncanny and equivocal nature of this world that we share with a multitude of other thinking beings.
Conclusion: Turning the tide of ruination, extinction, and death

No matter where we look, we are confronted by uncanny spectres. Embroiled in a game of survival that is sure to become increasingly desperate, we are called upon to face, as de Freitas (2020) notes alongside Bruno Latour, the multiple trickster faces of that non-conscious network of planetary intelligence named Gaia. ‘As progress falters,’ the task of educators is to diffract together new scientific discoveries, speculative fabulation and ‘the immanent onto-ethical and epistemological systems of Deleuzoguattarian and feminist new materialists [that] might enable us to recognize and implement new narratives that were previously masked by anthropocentric conceits and haughty Enlightenment-based notions of supposedly all-encompassing progress and linear progression’ (Geerts and Carstens, 2019: 923). Searching for new modes of being and becoming, we will need to climb from one strange attractor to another in search of a better destiny – and not only for humanity. In the process, we will need the assistance of a variable trickster ontology that is able to merge the planetary with the specific, the geological with the biological, the conscious and the non-conscious, etc. While this article, in keeping with the open-ended spirit of fabulation, has focused only on identifying important speculative lines of flight for venturesome pedagogues, there are many resources for educators who are interested in more practical and focused pedagogical specifics. Snaza’s *Animate Literacies* (2019), for instance, is a compelling study for HE pedagogues interested in generating an affects-based more-than-human pedagogy of bewilderment. Elsewhere, I extrapolate, with practical pedagogical examples taken from my own experiences in teaching, on ‘key principles, by which we might come to a critical understanding of new materialist perspectives and their value for HE’ (Carstens, 2019: 138). Here, however, my intention has been to come to a broader understanding of the some of the strange meaning-making figures and figurations mobilised in SF and SF-inspired theory that highlight the equivocal nature of our time of crisis. My argument has been to underscore the central premise of SF – namely, that we exist in an uncanny cosmos in which truths are flexible, equivocal and often radically contingent. This insight requires that we, as educators, take on more than one point of view simultaneously, while trying to find a productive and immanently ethical middle ground on which to found a meaningful and accountable Anthropocene-appropriate pedagogy (Geerts and Carstens, 2019).

The time for maintaining faithfulness to particular paradigms of meaning-making is, in any event, long past. In the game of reductive single-vision, evidence is often disastrously ignored because it does not fit predetermined models of thought. Consequently, data is invariably fudged, and opportunities and potentially productive new alliances missed. Deleuze and Guattari write that all assemblages – even a pedagogical ones – faces two sides: one side faces the strata, the ‘organism or signifying totality,’ while the other faces the ‘body without organs’ and its ‘asignifying particles and pure intensities’ (1988: 4). While our first impulse might be to reject outright the stratified, institutionalised face of meaning-making assemblages, leaning too heavily on the intense event-side, as new materialist theory often tends to do, ignores ‘the necessary other side of the story, the forces of cohesion, encapsulation and level-specific dynamics characteristic of living beings’ (Hayles, 2017: 71). A venturesome pedagogy, informed by
speculative fabulation will therefore need to pay close attention to forces of both cohesion and intensity, embracing lessons gleaned from evolutionary and cognitive biology as well as from indigenous meaning-making practices (see, for example, Carstens, 2017).

Contrary to what might be supposed, cohesion, encapsulation and level-specific dynamics are, in fact, the games of unthought (Hayles, 2017). Non-conscious life and even non-life, like pandemic-causing viruses and algorithmic data-mining networks, exploit them in complex networked ways that we as cognitive cognisers have only tentatively been able to grasp. Yet, as I have hopefully demonstrated, conscious reason – an evolutionary laggard in the game of cognition – is not the signifying totality that progress stories have led us to believe. Instead, it is belated, uncanny, and intensive. In its making-strange, SF merges both sides of the assemblage of meaning-making, taking in the conscious and the non-conscious, the intense, empathic and radically relational, along with the stratified and rational, while attempting to find a productive middle ground. This balancing act, then, is the task of a venturesome pedagogy; a task it will accomplish by bringing in, as I have argued, the meaning-making figurations of SF. To become adequate to a trickster reality of climate change and extinction, education will need to trouble the disastrous narratives of neoliberal progress in which it finds itself embedded. The motivation for undertaking a venturesome pedagogy of speculative fabulation could not be more relevant or urgent. As the tide of ruination, extinction and death begins to lap at our feet, pedagogues will need to cultivate new forms of noticing that are able to account for the multiple overlapping more-than-human histories and meaning-making configurations through which things, bodies, minds and ecologies are continually being made and unmade.

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Author Biography
Delphi Carstens is lecturer at the University of the Western Cape with an interest in applying new materialist cartographical methods to pedagogy. He holds a PhD in apocalypse culture, Deleuze-Guattarian theory, and uncanny science fictions from Stellenbosch University and has published widely, most recently in Philosophy Today 63(4), Somatechnics 10(1), and Parallax 24(3).

References


Donna Haraway (born September 6, 1944) is an American Professor Emerita in the History of Consciousness Department and Feminist Studies Department at the University of California, Santa Cruz, United States. She is a prominent scholar in the field of science and technology studies, described in the early 1990s as a "feminist and postmodernist". Haraway is the author of numerous foundational books and essays that bring together questions of science and feminism, such as "A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century" (1985) and "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective" (1988). Additionally, for her contributions to the intersection of information technology and feminist theory, Haraway is widely cited in works related to Human Computer Interaction (HCI). Her Situated Knowledges and Cyborg Manifesto publications in particular, have sparked discussion within the HCI community regarding framing the positionality from which research and systems are designed. She is also a leading scholar in contemporary ecofeminism, associated with post-humanism and new materialism movements. Her work criticizes anthropocentrism, emphasizes the self-organizing powers of nonhuman processes, and explores dissonant relations between those processes and cultural practices, rethinking sources of ethics. Haraway criticizes the Anthropocene because it generalizes us as a species. However, she also recognizes the importance of it recognizing humans as key agents. Haraway prefers the term Capitalocene which defines capitalism's relentless imperatives to expand itself and grow, but she does not like the theme of irreversible destruction in both the Anthropocene and Capitalocene.

Haraway has taught Women's Studies and the History of Science at the University of Hawaii (1971-1974) and Johns Hopkins University (1974-1980). She began working as a professor at the University of Santa Cruz in 1980 where she became the first tenured professor in feminist theory in the United States. Haraway's works have contributed to the study of both human–machine and human–animal relations. Her works have sparked debate in primatology, philosophy, and developmental biology. Haraway participated in a collaborative exchange with the feminist theorist Lynn Randolph from 1990 to 1996. Their engagement with specific ideas relating to feminism, technoscience, political consciousness, and other social issues, formed the images and narrative of Haraway's book Modest Witness for which she received the Society for Social Studies of Science's (4S) Ludwik Fleck Prize in 1999. In 2000, Haraway was awarded the J. D. Bernal Award, Ludwik Fleck Prize.
Donna Jeanne Haraway was born in 1944 in Denver, Colorado. Haraway's father was a sportswriter for *The Denver Post* and her mother, who came from a heavily Irish Catholic background, died from a heart attack when Haraway was 16 years old.[19] Although she is no longer religious, Catholicism had a strong influence on her as she was taught by nuns in her early life. The impression of the Eucharist influenced her linkage of the figurative and the material.[20] Haraway attended high school at St. Mary’s Academy in Cherry Hills Village, Colorado. Growing up around her father's adoration for sports writing is a major part in her own love for writing. The two of them would have dinner conversations about words and their fascination with them.[21] Another impact on Haraway's writing came from the wars she experienced throughout her life, considering she was born at the end of World War II and grew up during the Cold War.[22]

Later work

Haraway was the recipient of a number of scholarships. Alluding to the Cold War and post-war American hegemony, she said of these, "...people like me became national resources in the national science efforts. So, there was money available for educating even Irish Catholic girls' brains."[27] In 1999, Haraway received the Society for Social Studies of Science's (4S) Ludwik Fleck Prize. In September 2000, Haraway was awarded the Society for Social Studies of Science's highest honor, the J. D. Bernal Award, for her "distinguished contributions" to the field.[28] Haraway's most famous essay was published in 1985: "A Manifesto for Cyborgs: Science, Technology, and Socialist Feminism in the 1980s"[29] and was characterized as "an effort to build an ironic political myth faithful to feminism, socialism, and materialism".

In Haraway's theses, "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective" (1988), she means to expose the myth of scientific objectivity. Haraway defined the term "situated knowledges" as a means of understanding that all knowledge comes from positional perspectives.[30] Our positionality inherently determines what it is possible to know about an object of interest.[30] Comprehending situated knowledge "allows us to become answerable for what we learn how to see". Without this accountability, the implicit biases and societal stigmas of the researcher's community are twisted into ground truth from which to build assumptions and hypothesis.[30] Haraway's ideas in "Situated Knowledges" were heavily influenced by conversations with Nancy Hartsock and other feminist philosophers and activists.[31]

Primate Visions: Gender, Race, and Nature in the World of Modern Science, published in 1989 (Routledge), focuses on primate research and primatology: "My hope has been that the always oblique and sometimes perverse focusing would facilitate revisionings of fundamental, persistent western narratives about difference, especially racial and sexual difference; about reproduction, especially in terms of the multiplicities of generators and offspring; and about survival, especially about survival imagined in the boundary conditions of both the origins and ends of history, as told within western traditions of that complex genre".[32] Currently, Donna Haraway is an American Professor Emerita in the History of Consciousness Department and Feminist Studies Department at the University of California, Santa Cruz, United States.[33] She lives North of San Francisco with her partner Rusten Hogness.[34] In an interview with Sarah Franklin in 2017, Haraway addresses her intent to incorporate collective thinking and all perspectives: "It isn't that systematic, but there is a little list. I notice if I have cited nothing but white people, if I have erased indigenous people, if I forget non-human beings, etc. I notice on purpose. I notice if I haven't paid the slightest bit of attention ... You know, I run through some old-fashioned, klutzy categories. Race, sex, class, region, sexuality, gender, species. I pay attention. I know how fraught all those categories are, but I think those categories still do important work. I have developed, kind of, an alert system, an internalized alert system."[8]

Major themes

"A Cyborg Manifesto"
In 1985, Haraway published the essay "Manifesto for Cyborgs: Science, Technology, and Socialist-Feminism in the 1980s" in Socialist Review. Although most of Haraway's earlier work was focused on emphasizing the masculine bias in scientific culture, she has also contributed greatly to feminist narratives of the twentieth century. For Haraway, the Manifesto offered a response to the rising conservatism during the 1980s in the United States at a critical juncture at which feminists, in order to have any real-world significance, had to acknowledge their situatedness within what she terms the "informatics of domination."[3][35] Women were no longer on the outside along a hierarchy of privileged binaries but rather deeply imbued, exploited by and complicit within networked hegemony, and had to form their politics as such.

According to Haraway's "Manifesto," "there is nothing about being female that naturally binds women together into a unified category. There is not even such a state as 'being' female, itself a highly complex category constructed in contested sexual scientific discourses and other social practices."[3] A cyborg does not require a stable, essentialist identity, argues Haraway, and feminists should consider creating coalitions based on "affinity" instead of identity. To ground her argument, Haraway analyzes the phrase "women of color", suggesting it as one possible example of affinity politics. Using a term coined by theorist Chela Sandoval, Haraway writes that "oppositional consciousness" is comparable with a cyborg politics, because rather than identity it stresses how affinity comes as a result of "otherness, difference, and specificity".[3]

Haraway's cyborg is a set of ideals of a genderless, race-less, more collective and peaceful civilization with the caveat of being utterly connected to the machine. Her new versions of beings reject Western humanist conceptions of personhood and promote a disembodied world of information and the withering of subjectivity. The collective consciousness of the beings and their limitless access to information provide the tools with which to create a world of immense socio-political change through altruism and affinity, not biological unity. In her essay, Haraway challenges the liberal human subject and its lack of concern for collective desires which leaves the possibility for wide corruption and inequality in the world. Furthermore, the cyborg's importance lays in its coalition of consciousness not in the physical body that carries the information/consciousness. A world of beings with a type of shared knowledge could create a powerful political force towards positive change. Cyborgs can see "from both perspectives at once."[3] In addition, Haraway writes that the cyborg has an imbued nature towards the collective good.

Haraway explains that her "Manifesto" is "an effort to build an ironic political myth faithful to feminism, socialism, and materialism."[3] She adds that "Cyborg imagery can suggest a way out of the maze of dualisms in which we have explained our bodies and our tools to ourselves."[3] Haraway is serious about finding future ways towards equality and ending dominating behavior; however, the cyborg itself is not as serious of an endeavor for her as the idea of it is. Haraway creates an analogy using current technologies and information to imagine a world with a collective coalition that had the capabilities to create grand socio-political change. Haraway's "Manifesto" is a thought experiment, defining what people think is most important about being and what the future holds for increased artificial intelligence.

Gender, Work, & Organization's author Agnes Prasad's piece Cyborg Writing as a Political Act: Reading Donna Haraway in Organization Studies elaborates on how Haraway's writing contributes to the greater feminist community. "This essay, almost immediately, became a watershed text for feminist theory and for, what was at the time, the inchoate field of feminist science studies. Interweaving ideas that were playful and imaginative with an incisive critique of the totalizing essentialism that was the ironic hallmark of the myriad strands of the second-wave feminist movement — encompassing, but not limited to, Marxist, psychoanalytic and radical feminist approaches — Haraway conscientiously articulates the politics of a monstrous creature of the post-gender world: the cyborg."[36]
In her updated essay "A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century", in her book *Simians, Cyborgs and Women: The Reinvention of Nature* (1991), Haraway uses the cyborg metaphor to explain how fundamental contradictions in feminist theory and identity should be conjoined, rather than resolved, similar to the fusion of machine and organism in cyborgs. The manifesto is also an important feminist critique of capitalism by revealing how men have exploited women's reproduction labor, providing a barrier for women to reach full equality in the labor market.

"Situated Knowledges"

"Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective" sheds light on Haraway's vision for a feminist science. The essay originated as a commentary on Sandra Harding's *The Science Question in Feminism* (1986) and is a reply to Harding's "successor science". Haraway offers a critique of the feminist intervention into masculinized traditions of scientific rhetoric and the concept of objectivity. The essay identifies the metaphor that gives shape to the traditional feminist critique as a polarization. At one end lies those who would assert that science is a rhetorical practice and, as such, all "science is a contestable text and a power field". At the other are those interested in a feminist version of objectivity, a position Haraway describes as a "feminist empiricism". Haraway argues for an epistemology based in "situated knowledges," which synthesizes aspects of these two traditions. Haraway posits that by acknowledging and understanding the contingency of their own position in the world, and hence the contestable nature of their claims to knowledge, subjects can produce knowledge with greater objectivity than if they claimed to be neutral observers.

*Primate Visions*

Haraway also writes about the history of science and biology. In *Primate Visions: Gender, Race, and Nature in the World of Modern Science* (1990), she focused on the metaphors and narratives that direct the science of primatology. She asserted that there is a tendency to masculinize the stories about "reproductive competition and sex between aggressive males and receptive females [that] facilitate some and preclude other types of conclusions". She contended that female primatologists focus on different observations that require more communication and basic survival activities, offering very different perspectives of the origins of nature and culture than the currently accepted ones. Drawing on examples of Western narratives and ideologies of gender, race and class, Haraway questioned the most fundamental constructions of scientific human nature stories based on primates. In *Primate Visions*, she wrote:

"My hope has been that the always oblique and sometimes perverse focusing would facilitate revisionings of fundamental, persistent western narratives about difference, especially racial and sexual difference; about reproduction, especially in terms of the multiplicities of generators and offspring; and about survival, especially about survival imagined in the boundary conditions of both the origins and ends of history, as told within western traditions of that complex genre".

Haraway's aim for science is "to reveal the limits and impossibility of its 'objectivity' and to consider some recent revisions offered by feminist primatologists". Haraway presents an alternative perspective to the accepted ideologies that continue to shape the way scientific human nature stories are created. Haraway urges feminists to be more involved in the world of technoscience and to be credited for that involvement. In a 1997 publication, she remarked:
I want feminists to be enrolled more tightly in the meaning-making processes of technoscientific world-building. I also want feminist—activists, cultural producers, scientists, engineers, and scholars (all overlapping categories) — to be recognized for the articulations and enrollment we have been making all along within technoscience, in spite of the ignorance of most "mainstream" scholars in their characterization (or lack of characterizations) of feminism in relation to both technoscientific practice and technoscience studies.\[47\]

**Make Kin not Population: Reconceiving Generations**

Haraway created a panel called 'Make Kin not Babies' in 2015 with five other feminist thinkers named: Alondra Nelson, Kim TallBear, Chia-Ling Wu, Michelle Murphy, and Adele Clarke. The panel’s emphasis is on moving human numbers down while paying attention to factors, such as the environment, race, and class. A key phrase of hers is "Making babies is different than giving babies a good childhood."\[8\] This led to the inspiration for the publication of *Making Kin not Population: Reconceiving Generations*, by Donna Haraway and Adele Clarke, two of the panelist members. The book addresses the growing concern of the increase in human population and its consequences on our environment. The book consists of essays from the two authors, incorporating both environmental and reproductive justice along with addressing the functions of family and kinship relationships.\[48\]

**Speculative fabulation**

Speculative fabulation is a concept which is included in many of Haraway's works. It includes all of the wild facts that won't hold still, and it indicates mode of creativity and the story of the Anthropocene. Haraway stresses how this doesn't mean it isn’t a fact. In *Staying with the Trouble*, she defines speculative fabulation as "a mode of attention, theory of history, and a practice of worlding," and she finds it an integral part of scholarly writing and everyday life.\[49\] In Haraway's work she addresses a feminist speculative fabulation and its focusing on making kin instead of babies to ensure the good childhood of all children while controlling the population.\[8\] *Making Kin not Population: Reconceiving Generations* highlights practices and proposals to implement this theory in society.\[48\]

**Reviews**

Haraway's work has been criticized for being "methodologically vague"\[50\] and using noticeably opaque language that is "sometimes concealing in an apparently deliberate way".\[51\] Several reviewers have argued that her understanding of the scientific method is questionable, and that her explorations of epistemology at times leave her texts virtually meaning-free.\[51\][52]

A 1991 review of Haraway's *Primate Visions*, published in the *International Journal of Primatology*, provides examples of some of the most common critiques of her view of science.\[52\]

This is a book that contradicts itself a hundred times; but that is not a criticism of it, because its author thinks contradictions are a sign of intellectual ferment and vitality. This is a book that systematically distorts and selects historical evidence; but that is not a criticism, because its author thinks that all interpretations are biased, and she regards it as her duty to pick and choose her facts to favor her own brand of politics. This is a book full of vaporous, French-intellectual prose that makes Teilhard de Chardin sound like Ernest Hemingway by comparison; but that is not a criticism, because the author likes that sort of prose and has taken lessons in how to write it, and she thinks that plain, homely speech is part of a conspiracy to
oppress the poor. This is a book that clatters around in a dark closet of irrelevancies for 450 pages before it bumps accidentally into its index and stops; but that is not a criticism, either, because its author finds it gratifying and refreshing to bang unrelated facts together as a rebuke to stuffy minds. This book infuriated me; but that is not a defect in it, because it is supposed to infuriate people like me, and the author would have been happier still if I had blown out an artery. In short, this book is flawless, because all its deficiencies are deliberate products of art. Given its assumptions, there is nothing here to criticize. The only course open to a reviewer who dislikes this book as much as I do is to question its author's fundamental assumptions—which are big-ticket items involving the nature and relationships of language, knowledge, and science.

Another review of the same book, appearing in a 1990 issue of the *American Journal of Primatology*, offers a similar criticism of Haraway's literary style and scholarly methods.\[51\]

There are many places where an editorial hand appears absent altogether. Neologisms are continually coined, and sentences are paragraph-long and convoluted. Biography, history, propaganda, science, science fiction, and cinema are intertwined in the most confusing way. Perhaps the idea is to induce a slightly dissociated state, so that readers can be lulled into belief. If one did not already possess some background, this book would give no lucid history of anthropology or primatology.

However, a review in the *Journal of the History of Biology* disagrees.\[53\]

*Primate Visions* is one of the most important books to come along in the last twenty years. Historians of science have begun to write more externalist histories, acknowledging the possibilities of a science profoundly integrated with ongoing social agenda. Haraway's history of primatology in the twentieth century sets new standards for this approach, standards that will not be surpassed for some time to come. The book is important to students of science, feminists, historians, and anyone else interested in how the complex systems of race, gender, and science intertwine to produce supposedly objective versions of the "truth." This analysis of primatology is at once a complex, interdisciplinary, and deeply scholarly history and an imaginative, provocative analysis of the working of science in late twentieth-century Euro-America.

**Publications**


See also

- A Cyborg Manifesto
- Cyborg anthropology
- Ecofeminism
- Postgenderism
- Posthumanism
- Postmodernism
- Sandy Stone
- Techno-progressivism
- Feminist technoscience
- Judith Butler
Sources

Citations


Donna Haraway: Storytelling for Earthly Survival (http://earthlysurvival.org/), a film by Fabrizio Terranova

External links

- Donna Haraway (http://people.ucsc.edu/~haraway/) Faculty Webpage at UC Santa Cruz, History of Consciousness Program
- Donna Haraway: Storytelling for Earthly Survival (http://earthlysurvival.org/), a film by Fabrizio Terranova