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Indigenous Ecojustice Narratives in an Era of Climate Change and Pandemics

PETER COLE AND PAT O'RILEY

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Indigenous Ecojustice Narratives in an Era of Climate Change and Pandemics

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Abstract: The relentless progress narrative of global corporate capitalism has inundated, but not drowned out, millennia of land-based Indigenous knowings, relationalities, peoples, and practices. High-water marks of coloniality are exceeded ongoingly, but the resilience, interconnectedness, and creativity of the people of the land allow them to sidestep and out-manoeuvre the clichéd post-Enlightenment strategies of the settler state and their corporate bedfellows. Mainstream devaluing of organically-linked Indigenous knowings, including culturally appropriate agential responses to environmental stresses, is evidenced by accelerating climate change, global social inequities, loss of biodiversity, and emerging pandemics. This article is a call for rethinking and remapping the prevailing Eurocentric anthropocentric neoliberal narrative with respect to re-generating human/non-human/more-than-human interdependent, reciprocal, and symbiotic interrelationships toward a more just, compassionate, and ecologically sustainable world for all.

Keywords: Ecojustice, Global South, Localization, Non-Anthropocentric Worldviews, Post-Capitalism

Setting Out

World: "There is no way we can shut everything down in order to lower emissions, slow climate change and protect the environment."

Mother Nature: "Here's a virus. Practise." (Leser 2020)

Before the triumph of modernity – sealed in Western Europe of the seventeenth century by the advent of the scientific revolution – people lived in constant interaction with a host of beings, powers, spirits who tricked us, protected us, quarreled with us, guided us, taught us, punished us, and conversed with us. We were wealthy in our human and other-than-human communities. (Apffel-Marglin 2011)

At this historical juncture, humanity and all other lifeforms on our finite planet are facing the devastating consequences of the failures of global corporate capitalism, including rapidly escalating climate change and COVID-19. As human beings, academics, grandparents, and as scholars from the tribal peoples of the Americas and from Celtic lands and cultures, our hearts ache with sadness and trepidation for the future of our grandchildren and future generations of all beings on this planet. We invite you to join us in this writing-paddling-portaging-camping journey as we ponder and plan possibilities for a more equitable, socially just, and ecologically sustainable world.

Our narrative journey begins with a nine-day wilderness canoe trip last year with our seven-year old grandson and his parents at 950-metre elevation on the western slopes of the Cariboo Mountains of British Columbia, Canada: a 116-kilometre chain of lakes, rivers, and rapids, including eleven kilometers of very rugged connecting portages.

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Grandson: It is so quiet out here, Nana, I can hear my breath.

Nana: It's the sound of silence in nature, sweetie. If you dip your paddle very quietly into the water, you can hear more sounds.

Grandson: It's like an orchestra. The wind in the trees sounds like instruments!

Nana: The sun is setting. Time for us to pull up to shore.

Paddle, paddle. Swoosh!

Curving shapes from our canoe dance with the reflection of the snow-capped mountains on the stillness of the water. A loon welcomes us to the lake where it is guardian and guide. We set up our tents, re-organize our camping gear, help our grandson light the fire for dinner, set up the tarps and explore charts and maps of the geography of our journey. We listen carefully to the sounds (stories) of the birds, mammals, amphibians, insects, the water coursing and lapping, the wind in the trees, and our own breath as we locate our geo/somato/meta/positionings and realign the parameters and limitations of our individual and collective experiences and knowings in the lived world of shared being. We re-sort our tools, supplies, and maps and go over our survival strategies and emergency procedures, including re-mapping, re-planning, and re-imagining different narratives than the predominately Eurocentric, anthropocentric "progress narratives" that are based on classical and Cartesian-Newtonian scientific and philosophical paradigms and templates, and neoclassical economics.



Figure 1: Isaac Lake, Bowron Lakes Canoe Circuit, British Columbia, Canada. July 2019

Source: Pat O'Riley

Leaving the canoe circuit behind us, we soon find ourselves navigating and traversing Indigenous narrative terrains and geographies elsewhere in British Columbia and prepare for extended journeys into other lands, including the High Amazon and Sacred Valley regions of Peru. We pause to read and absorb the land that reaches deep inside us ... breathe out ... paddle ... glide ... *kukwstum'c* ...

Progress Narrative as Manifest Manners

Writing in the eye of the COVID-19 pandemic, the lockdown having suspended the busyness of daily life, we discover ourselves within novel temporo-spatial contexts from which we reflect on the myriad compassionate voices, intelligences, and agencies dismissed and silenced by five centuries of European colonization. Our minds and hearts are drawn to the Kichwa-Lamista and Andean peoples, who have been dragged into economic and cultural imperialism. They add COVID-19 to climate change, colonization, racism, slavery, biological warfare, state-sanctioned violence, food and water insecurity, and systemic ecological and social injustice. For 500 years, monarchy, government, and industry have tried to trample and extinguish Indigenous lives and rights to land, sovereignty, justice, and livelihood to benefit a colonial elite, whose spurious claim to ownership of the land is through predatory imperialism-nationalism and anachronistic religious edicts relating to Christian “discovery” of lands occupied by non-Christians, including Papal Bulls *Terra Nullius* (AD 1095) and *Romanus Pontifex* (AD 1493) (Reid 2010). Largely dismissed are Indigenous land-based ecological knowledges and cultural practices that are vital for responding to the global challenges facing all life and being. Meanwhile, mainstream settler knowledges offer limited piecemeal solutions founded on reason, logic and causality to deal with a world that does not fit itself into such a Western worldview.

Isabelle Stengers (2015) refers to the cumulative impact of climate change, pollution, depletion of natural resources, and global social inequalities as an “epochal change” that is challenging humans to “think, feel, imagine, and act. But such an attempt is formidable in that the same observation can serve as an argument to prevent us from thinking, to anesthetize us” (Stengers 2015, 28). This epochal change began to pick up steam with the Scientific Revolution and the ushering in of Eurocentric Enlightenment philosophy, underscoring an insentient clockwork-mechanical worldview that rejected non-human and more-than-human worlds as being alive and relevant beyond human utilitarianism and religions self-proclaiming intercessionary sovereignty over all beings. The Scientific Revolution spurred the way for the Industrial Revolution (mid eighteenth to nineteenth centuries) with the growth of scientific and technological innovations and trust in endless economic growth and expendable human capital, moving relentlessly toward the pinnacle of civilization. Frédérique Apffel-Marglin (2011) writes that the canonical mechanistic nature/culture dualism and the *Terra Nullius* doctrine decree plants and animals as “wild” and “undomesticated/uncivilized” peoples as “wild,” thereby legitimating their exploitation by the dominant colonial economic paradigm.

With the truncating of what counts as the “beginning of history” to the emergence in Asia and Africa of Sumerian cuneiform script and Egyptian hieroglyphs, and inscriptions in what is now southern Mexico, any civilizations that existed prior to this are declared by Western and westernized powers to be prehistoric, preliterate, and uncivilized. Many theories have arisen about dating knowledge writing systems, including proto-history writing dating back to 3200 BC (Scoville 2015), though some scholars date them as far back as 8000 BC (Schmandt-Besserat 1992). Olmec writing artifacts have been dated as far back as 1200 BC (Magni 2012). If history is presumed to have begun with writing/recording systems and archaeologists learning to read bones and artifacts, how can the written word be a reliable witness of history as a failed universalized abstraction, a personification etched on the page, all else being oral, including silence? In 1970, when friend and Métis scholar Olive Dickason applied to the University of Ottawa to write her MA in History on Aboriginal Peoples in Canada, she was told that Aboriginal Peoples, being oral, had no history (Posner 2011). Writing on stone did not count at the time, as it was pictorial, not alphabetical. Art versus (l)iterature.

The reductionist, materialist de-sacralization of nature that rejects land-based Indigenous knowledges, has become an onto-epistemological virus claiming cultural superiority. Chippewa scholar Gerald Vizenor (1993) refers to these imperial imaginings as “manifest manners” that are aligned with Manifest Destiny’s universalizing ubiquitous ideological code and linguistics

of expansionism and domination, the ultimate narrative of legitimacy against which all other knowledge is measured, evaluated, and coded. In the documentary *Schooling the World: The White Man's Last Burden* (Marlens, Hurst, and Grossan 2010), the devastating impacts of imposing Western education on a sustainable Indigenous community in Ladakh, India, are brought to light. Speaking in the film, anthropologist Wade Davis (2009) argues that with the loss of Indigenous knowledges worldwide, there is the loss of ten thousand different voices, a diversity of ecological wisdom for dealing with the challenges facing life on Earth. In *A Short History of Progress*, Ronald Wright (2004) stresses that *now* is the time to get our future right if civilization is to survive. That was sixteen years ago.

The COVID-19 pandemic has awakened the majoritarian settler society in Canada to the egregious social inequities that had always been in plain sight for those who cared to notice, and it has awakened a spirit of compassion for those at the bottom of the socioeconomic/health-and-wellness ladder. Richard Horton (2020), editor-in-chief of *The Lancet*, foresees a post-pandemic world in which disease will no longer be viewed as simply a pathology of the body, but also a pathology of society in which all lives matter, not just those of elite species who are part of a global capitalist supply-and-consumption chain. The Black Lives Matter and Indigenous Lives Matter movements have exposed and reconfirmed the racist underbelly of Western nations—including Canada—most of which continue to colonize Indigenous Peoples and deny their rights to land, sovereignty, and self-determination, despite many religious groups repudiating the Doctrine of Discovery's morality and authority. The Doctrine's mindset is deeply held in Canada, not just in the fields of law, politics, history, and economics, but by the general settler public which has benefited from it for 500 years. Horton writes that human health and animal health are linked and argues for a global universal healthcare system, One Health, that recognizes the health of one person depends on the health of every other person, as well as the health of animals. Most contagious human diseases arise from human-animal interactions. In *Creatures of Empire*, Virginia Anderson (2006) shows how the settlers' domestic animals and their diseases were of critical importance in colonizing the Americas. We add that human health and animal health are also linked to the health of the planet. Indigenous Peoples have always understood the human-animal-environment interface as being a oneness of being and becoming: joined, shared destinies.

The World Wildlife Fund, alarmed about the rise of zoonotic diseases (viral, bacterial, fungal and parasitic pathogens originating in animals and transferred to humans), calls for "urgent action...to address the planetary emergency and to reduce the risk of future pandemics through systemic changes that create a more sustainable relationship with nature" (WWF 2020, 33) rather than simply treating nature as a natural resource to exploit. This, however, does not address the majority of zoonotic diseases that arise from domestic animals. A United Nations (2020) brief suggests that a key response to the current pandemic must be accelerated investment to rebalance and transform our food systems to be more inclusive, sustainable, and resilient, rather than over-reliance on foreign sources for food staples. As well, many are moving away from the industry-friendly *Canada Food Guide*, which has relied heavily on the cattle, dairy, and grain industries for policy guidelines since 1942. UN Global Compact official Lise Kingo states: "The human community is completely interconnected and interdependent.... Without solidarity, especially with those most vulnerable among us, we all lose. We are paying the price for turning a blind eye to obvious injustices in the world" (cited in Harvey 2020), not just within the human family.

We return to our grandson's delight at hearing different dimensions of silence, the whetherness of weather that is difficult to experience amid the supersaturation of noise and pervasive stimuli in his urban living environment. For cosmologist Brian Swimme, "by depriving ourselves and our children of direct contact with the numinous powers that fill the universe, we are choosing a diminished existence" (Swimme 1999, 46). We ask ourselves if it is possible to escape from the endless din of dominant discourses, to be receptive to and

appreciative of other sound(and silence)scapes, to affirm life at this political-historical interval. We think about musician-philosopher John Cage's notion of silence not being the absence of sound, but rather a different relationship to hearing/listening, by being attentive to the words and worlds around and within us, other/ed voices, to be awakened "to the very life that we're living" (Cage 1961, 12). Cage's "poethics" is a relationship between poetry and ethics; ethical stances we live in and through: art, languages, and worldviews (Bruns 1994). Poethics is about freeing the listener from prescribed narratives by letting silences and sounds become joined harmonies, scattering reasoned knowing and dissembling words, making room for re-composition and new resonances. French philosophers Gilles Deleuze and Félix Guattari offer the cartographic gesturing of "rhizomatic mapping" that is not a tracing of the same, rather it is "entirely oriented with the real ... It can be drawn on a wall, conceived of as a work of art, constructed as a political action or a meditation" (Deleuze and Guattari 1987, 12–13). Gerald Vizenor's (1999) "trickster discourse" provides inventive, ludic, labyrinthine language, directed toward different knowings, refigurations of what is possible in the impossible, learning to disimbricate from taken-for-granted dominant narratives so that we might learn to converse, cry, play and laugh with other resonances, other utterances, other agencies and practices, other wor(l)ds that deny completion for reintegration into the same.

A Call for New Narratives

There has been a growing call from academics (Apffel-Marglin 2020; Mavelli 2019; Monbiot 2017; McKibben 2019; O'Riley 2003; Shiva 2015); organizations, citizens, and nations around the world (IPCC 2007; Klein 2014; UNESCO 2019); and Indigenous Peoples (Cole 2016; Cole and O'Riley 2017; Simpson 2014) for compelling new narratives to reshape the "progress narrative" that privileges mind over body, heart, and spirit; human over non-human and more-than-human; and overlooks or tokenizes Indigenous knowledges and ways of being. Progress, as defined by global corporate capitalism, has transformed democratic function into unregulated profit-at-any-cost consumerism that maintains the ecologically unsustainable lifestyles of the ultra-rich. This notion of progress has accelerated and normalized climate change and global injustice. Kirk and Ladha (2020), writing about the "poverty of progress" for most of humanity, refer to the latest neoliberal permutations as the "New Optimist narrative" that they describe as "partial, incomplete, and remarkably selective. To maintain optimism at such a pitch, must deny reality itself." Indeed, to destroy the livelihood, health, and wellness and sustainability of the majority of human beings and the environment of earth, water and air, in the name of such a notion of "progress," and calling this optimism, beggars explanation and belief.

COVID-19 has brought the vulnerabilities and deeply-embedded hierarchies of [post]modernity's "fetish of the frontier" (Stanley 2019) out of the shadows of stark relief with its belief in high-tech as the liberator of the crises facing us earthlings. Made visible are the overlooked, low-valued, and expendable—but crucial—"foundational economies" disproportionately comprised of female, migrant and non-white immigrants. The SARS-CoV-2 virus and its human interface, COVID-19, have together uncovered the incalculable global public impoverishment in societies of private affluence. Stanley (2019) maintains that sociopolitical and financial valuing of foundational economy workers would enhance not only their humanity, but also the humanity of those who benefit from their labour.

Corporate solutions for addressing global warming have been largely addressed by creating new high-tech fixes that become part of a global technological super-contagion/super-spreader, which is the main driver of globalized economics and climate change. Goleman (2009) suggests that humans need to fix our "ecological intelligence" by becoming whole again, reconnecting with the natural world. University of British Columbia (UBC) Architecture and Landscape professor Patrick Condon (2020) writes: "It is said that one should never let a crisis go to waste. To still pretend we can inhabit a happy high-tech Tomorrowland would be to waste the chance

this pandemic has given us to get serious about strengthening the fine-grained foundational economy upon which our futures truly rest.” With addition to endless digital technology innovation, the foundation of global corporate capitalism, climate change will likely accelerate until multiple global crises force government, commerce, industry, and education to change tack and come around to valuing Indigenous ways, including those of “ecological ethnicities” (Parajuli 1996), relating to the natural world. Employing only technological fixes for technological problems is no more realistic in terms of strategic thinking, than using only reason to extricate (essentialize) oneself from crises created by reason. Planned obsolescence like endless digital technological innovation is recognized as a primary contributing agent of climate change and ecological and social injustice.

Wiedmann et al (2020) discovered that over-consumption by the economically richest 10 percent has more impact on environmental destruction than any other factor, including pollution caused by fossil fuels and industrial agriculture, deforestation, and extractivism. Their study illustrates that a move to “green” technologies is not enough, rather what is needed are changes in consumption behaviors by those who hold the most wealth, combined with bottom-up action by citizens and local communities to restore the shattered human-nature relationship that has been expedited by government with industry separating workers from means of production and net benefit. The authors provide the examples of India, Brazil, and South Africa having sufficient living standards using 90 percent less per-capita energy than economically more prosperous countries. Remarkably, the study concludes, the material affluence accumulated by the super-rich has not correlated with their happiness, health, or wellbeing. This might signal that great wealth is not a significant factor of wellness and contentment and that no amount of wealth will ever make the super-rich healthy or well in any sense or spirit of the word. Or the world.

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IBPES) report “shows a planet in which the human footprint is so large it leaves little space for anything else” (Watts 2019). The ultra-rich, however, have plans for escaping the mess they have created and expedited. Their plan continues in the spirit and practice of non-accountability, non-transparency, and non-compassion regarding other citizens of the natural world that gained them their ill-gotten wealth. As Vandana Shiva (2020) writes: “Musk wants to create a ‘self-sustaining’ Space X city on Mars over the next century for a privileged faction of humanity. He ignores the fact that there is no Planet B, that the Earth is our only living planet; she is Gaia, she is alive.” Some ultra-rich are planning “seasteading” ocean communities built on floating pods where they have autonomous governance not tied to any nation. If their governments fail, they can simply disassemble and rebuild elsewhere (Wainright 2020). Leaving their garbage behind.

Indigenous Peoples across the globe have traditionally foregrounded the wellness of all living systems and beings as the source of their spiritual, mental, emotional and physical health, including their sense of justice and compassion for all beings:

we did not and do not believe in economic growth
because it always means destroying the earth
what is this obsession with growth
with what are euphemistically called market forces ‘stimulating the economy’
they are talking about premeditating the wounding of their mother
and their mother’s mother (Cole 2000, 20).

Alternative proposals to global neoliberal economics have been put forward such as “economies without growth” (Victor 2008), “walking lightly, carefully, and gracefully on the Earth” (McKibben 2010), and “economics of enough” (Coyle 2011). There is also an emerging shift from global economics toward more human economies of scale that emulate how Indigenous Peoples have lived since time immemorial (de Souza 2012; Schumacher 2010). Writing about post-Anthropocene possibilities, Glenn Albrecht (2019) proposes a new meme

“Symbiocene” in which “almost every element of culture, agriculture, economy, habitat, and technology will be seamlessly re-integrated back into earthly symbiotic life.” This has echoes with Indigenous and other land-based peoples’ ways of living based on reverence, humility, compassion and reciprocity. It also aligns with the ground-breaking work by Lynn Margulis (Sagan 1967) on symbiogenesis and endosymbiosis that builds on the work of Russian botanist Konstantin Mereschkowski (Martin and Kowallik 1999) whose research on chromatophores extends that of botanist Andreas Schimper (1903) with chloroplasts and cyanobacteria. They all address symbiosis as life systems growing together in harmony.

Re-Localization and Economics of Happiness

Environmental educator Chet Bowers (2009) writes about the erasure of “cultural commons,” local, intergenerational, democratically run, self-sufficient, ecologically sustainable communities of shared knowledge, skills and practices. Bowers is concerned about the “enclosure” of the cultural commons since the beginning of, and the lead-up to, the Industrial Revolution that consolidated small community land-holdings into exclusive privately owned large farms and estates. With the enclosure and restriction of land came the ending of traditional land rights, disruption of self-sustainability and self-sufficiency, the displacement of localized governance systems, and the erasure of local cultural, intellectual and linguistic diversity.

Tzaninis et al (2020) deliberate on a topical iteration of enclosure of the commons, “urbanization of nature.” They write that seeking solutions to the (sub)urbanization of nature beyond urban/nature binaries makes manifest what Donna Haraway (1990) refers to as the “god-trick” and the “view from nowhere” through the urbanization of nature that produces “nature” and “space” well beyond the metropolis impacting peoples and ecologies across the planet. An illustration of urbanization of nature is the building of mines, oil and gas pipelines, refineries, factory farms and ports across Indigenous lands in Canada and around the world, an extension of the ongoing settler-colonial order. The authors provide the examples of the movement of contaminated air across bodies and territorial boundaries, concretization of urban centres creating serious environmental impacts on CO₂ emissions, soil erosion, water depletion, lung disease from the dust, and commodification of animals, affecting cross-species contagions, not to mention disruption of the sentient experiences of the animals. Keil et al (2020) write: “it isn’t urbanization alone that caused the pandemic, and it isn’t capitalism alone either. It is the political ecology of extended urbanization that created the conditions under which COVID-19 could emerge, proliferate and go global.”

For Kirk and Ladha (2020), re-localizing and humanizing economies will make them resilient and able to replace the “reductive logic of GDP,” creating meaningful structural change that includes a universal basic income, shorter work week, and taxing extreme wealth. This will also require acknowledging ecological limits and valuing of all peoples and lifeforms. Determining the conditions for being and enacting “all our relations”:

if you’re going to entice something to grow how about nurturance
how about compassion as a goal as a journey
there is not much of a return at least in terms of what is called assets dividends
but is loving the world as it is not part of the equation? (Cole 2000, 20)

The government of Bhutan has instituted a GNH (Gross National Happiness) index that measures societal happiness and well-being rather than GNP (Gross National Product). Local Futures, a non-profit new economy international alliance made up of academics, community organizations, and grassroots communities, has worked for four decades to catalyze and support “economics of happiness” in the Global North and Global South. They are guided by a holistic

worldview that fosters human and ecological well-being (Local Futures n.d.). For Helena Norberg-Hodge, the founder and director of Local Futures:

The two paths before us lead in radically different directions. One takes us relentlessly towards fast-paced, large-scale, monocultural, techno-development. It's a path that separates us from each other and the natural world, and accelerates our downward social and ecological decline. The other path is about slowing down, scaling back and fostering deep connection, in order to restore the social and economic structures essential for meeting our material and deeper human needs in ways that nurture the only planet we have. (Norberg-Hodge 2019)

Much of the work of Local Futures is to rebuild the land-based cultures and economies of Indigenous Peoples and other ecological ethnicities that have been exploited by global capitalism, and to seek ways to bring their ancestral wisdom and ecological practices into the present-to-future. The focus of this growing global alliance is on what is possible, rather than on what is not working. It strives to look at root-causes and adventitious pathways of global inequities, rather than examining individual problems for resolution. To do this comprehensive, multi-generational work requires listening to our own hearts and listening to "the thousand other ways of learning that still exist all over this planet" (Black 2014), non-anthropocentric collective actions bringing about a livable common world for all.

Internationally renowned scholar, ecofeminist, and anti-globalization activist Vandana Shiva has worked with grassroots agricultural movements across the globe, including in Asia, Africa, and Latin America, on renewal of biodiversity and local traditional ecological knowledges. For decades she has fought against corporate patenting and biopiracy of Indigenous seeds and plants such as basmati rice:

Only as one earth community and one humanity, united in our diversities, can we hold ourselves together and step away from the precipice, and escape the destructive, ecocidal, genocidal rule of the 1% and the hallucinations of the mechanical mind. The 1% have brought us to this point, like sheep to slaughter. But we can turn around and walk away, to our freedom. To live free. To think free. To breathe free. To eat free. Seeding the Future is in our minds, our hearts, our hands. (Shiva 2020)

Ashish Kothari (2020) provides an example of women farmers in villages across India "seeding the future" by acquiring control over their lands, water, seeds and knowledge through the assistance of the 5,000 women members of the grassroots organization Deccan Development Society. The women, poorest of the poor in India, are now able to grow and harvest their own food and medicinal plants, as well as regain places of cultural and spiritual significance. By revitalizing their rural livelihoods, they can earn a living other than being forced to work in assembly-line factories. Returning lands to the communities encourages the return of those who have had to migrate to survive; it helps to reinstitute autonomy within local communities, to return control over their food production, distribution, and harvesting. It allows for collective mobilization in resisting foreign extractive industries, as well as control of their own village markets. During this COVID-19 pandemic, the women have been providing millet porridge to health and service workers. The women have recently formed an international organization, Seed Rights, to share their knowledge and skills about millet cultivation and biodiversity with millet-growing women in West Africa.

Through the intervention of our Quechua friend and associate Miguel Angel Paredes Garces, we were invited to visit the Quechua community of Paru-Paru in the Parque de la Papa in the Andes of Peru. We became friends with Miguel in 2008, when he was our guide for two grueling treks that ended at Machu Picchu. We also arranged to have him act as trek guide for

our UBC undergraduate and graduate students who attended the biennial Peru Summer Institute that we taught in the High Amazon. Parque de la Papa is located 40 kilometers from Cusco at an altitude between 3,200 and 5,000 meters above sea level. The biocultural rhythms of the Andean ways of life have been disrupted by climate change due to warming temperatures, melting glaciers, millennial seasonal changes, more frosts, stronger winds, and increased incidences of disease. Parque de la Papa is a jointly-led initiative of six Quechua communities with the goal of protecting the ecological integrity of their lands (*Pachamama*), enhancing their well-being (*Sumaq Qausay*), documenting their ancestral knowledge, and restoring and conserving the genetic diversity of their native crops, in particular, more than 2,300 varieties of native potatoes (Argumedo 2010). The Parque de la Papa is grounded in Andean cultural knowings and holistic practices that have been shaped and informed over millennia of reciprocal relationships with their natural environments, a human-ecological-spiritual equilibrium they refer to as *ayllu*.



Figure 2: Dr. Peter Cole and Research Team at Parque de la Papa near Cusco, Peru. February 2018

Source: Pat O'Riley

Plant and Soil Epistemologies and Ontologies

Robin Wall Kimmerer, celebrated botanist and enrolled member of the Citizen Potawatomi Nation, envisions a different and encouraging narrative to the current pandemic stories overshadowing the media and our lives (Yeh 2020). She speaks about the potential of enacting a “contagion of gratitude” as a pandemic and way to increase human compassion and understanding of our sentient interrelationships with the natural world. Indigenous Peoples view all land as home, with responsibility for this gift guided by a moral compass grounded in justice for land and people. Kimmerer (2020) suggests that humans can learn survival and resilience from plants that have outlasted 350,000,000 years; she gives the example of the wearing down of rocks by mosses as an ancient poetic conversation. Most Indigenous Peoples in the Americas acknowledge that rocks, stones, pebbles, and mountains are not insensate, but are beings of spirit that have power, agency, and deeply significant ceremonial value. Humans can learn

generosity from the cedar, a vital plant relation and teacher for the *St'at'imc* in British Columbia and the *Kanien'kehá:ka* of Quebec; it provides medicines, clothing, housing, baskets, and canoes. Traditional medicines teach interdependency, humility, mutual nurturance, and kinship with other sentient worlds, the worlds of shared being and becoming.

Increasingly, food insecurity is becoming acknowledged as one of the top crises facing humanity with far-reaching geopolitical security implications. In the award-winning documentary film *The Need to Grow* (Dawson 2019), we learn of the alarming revelation that there may be fewer than sixty years of farmable topsoil left on Earth if humans do not take immediate action. The film shares inspirational stories of soil regeneration projects, human resilience and ingenuity: school gardening and seed saving by an 8-year old girl; a regenerative urban farming/composting project; and a biochar (black earth) project. Solutions such as organic farming and permaculture are not enough to counter the world's wellness and nutrition crises brought on by the depletion of nutrients in our foods, genetic modifications to plants, soil degradation due to agrochemical pollution and heavy industrial farming methods, and deforestation that removes soil. *The Need to Grow* speaks of the urgency for significant course direction change, in order to remap and live more ecologically sustainable narratives of human-soil relations.

For Anna Krzywoszynska and Greta Marchesi (2020), one of the most urgent crises at this time is the state of Earth's soil ecosystems. They offer a critical reflection on human-soil relations, soil epistemologies, and understandings and their onto-political effects with the goal of revitalizing more just and sustainable human-soil relations. Bringing together the sciences, social sciences and multispecies relations, they examine the dynamic ecologies of soils, including what and whose soils epistemologies and ontologies are given attention. "Negating the relationality of soils continues to enable wide-spread destruction of socio-ecosystems, pushing vital soil ecologies and the populations of humans and non-humans who depend on and develop with them beyond recovery" (Krzywoszynska and Marchesi 2020, 194). They call for a revaluing of local knowledges systems, land justice, and engaging local communities in the restoration and caring for soils. For former Jain monk and environmental activist Satish Kumar (2013), the anthropocentric worldview is short-sighted and narrow-minded—humans are codependent with other species. We are members of one Earth community and need a new affiliation of soul, soil and society. "We need to take care of the soul, as we take care of the soil. But we can only take care of the soul when we slow down. Take time for ourselves. Meditate on the fact that you represent the totality of the universe" (Kumar 2013).

Since 2013, we have taught a biennial *Peru Summer Institute: Ecology, Technology & Indigeneity in the High Amazon* for undergraduate and graduate students at the Sachamama Center for BioCultural Regeneration, located on the outskirts of the town of Lamas, Peru. Through a combination of seminars and immersion learning in local Kichwa-Lamista communities, our students engage mind, body, heart, and spirit as they experience worldviews, knowings, and community practices that value other than global capital and geopolitical systems. The experiential immersion learning provides opportunities for the students to intellectually, materially and spiritually experience what Frédérique Apffel-Marglin (2018), Director of Sachamama, refers to as "post-materialist integral ecology," an intertwining of humans, ecology, and spirit.

A key research project at the Sachamama Center has been the revival of a pre-Columbian anthropogenic Amazonian soil, referred to as *terra preta do indio* [black earth of the Indians]. It is an alternative to swidden (slash and burn) agriculture. *Terra preta* production is helping to support the Kichwa-Lamista communities in their food security and climate mitigation efforts. The regeneration of bio-char at Sachamama promotes a "cosmocentric economy" grounded in Kichwa-Lamista cultural practices that acknowledge the intelligences and agencies of the natural world (Apffel-Marglin 2018). With the growing global recognition of the need for soil health, biochar production has been taken up worldwide in the past several decades. Biochar

production builds on Indigenous knowledges and worldviews that regard soil as sacred and the regenerative process as co-creation with nature. The earth-based wisdom and ceremonial practices of *terra preta do indio* represent ecotechnological knowings at least 9,000 years old (Sohi et al 2010) that led to the flourishing and diversification of the Amazon rainforest along with its direct effect on adjoining waterways, glaciers, skies, oceans, weather, climate, as well as fauna and micro-organisms. The ownership and continued initiative of this project is overseen by the local Kichwa-Lamista communities.

Spirit Whisperings from the Global South

During our visit with Dr. Apffel-Marglin at the Sachamama Center in 2011, she took us to visit several Kichwa-Lamista communities located in the San Martín Region of Peru. She had been working with them for more than two decades on Quechua language regeneration. An *Apu* [community leader] and several other community members invited us to bring our university students for immersion stays in their communities. They were very clear about what they wanted: “We see what Western knowledge is doing to the climate, our land, our water, our communities, our way of life. We invite you to come to our communities to learn from us. We would like your students to go back to your university and share what they have learned about our way of life.”



Figure 3: University of British Columbia Students in a Peanut Planting Ritual Ceremony, Shukshuyaku, Peru. June 2017

Source: Pat O'Riley

The Kichwa-Lamista bring living knowledge of Indigenous ways of thinking and being in the world to the conversation on addressing climate change and other global social and ecological crises. They live agrocentric daily lives, a reciprocal intertwining of food nurturing humans and humans nurturing food. Their *el mundo Kichwa* [Kichwa world] teachings come from millennial land-water-sky interactive relationships, including with the sun, moon, stars, clouds, trees, and animals. Planting and harvesting on their *chacras* [fields] is determined by the phases of the moon. Planting ceremonies are integral enactments of compassion, humility, respect, and gratitude to powers and spirits and beings, including the ancestors, who are

everywhere present and in conversation. Although *chacra* can refer to a field, it has a broader, deeper meaning that relates to mutual nurturance.

Our Peru Summer Institute students participated in making *terra preta do indio* with their hands, heads, and hearts as they engaged in the peanut-, bean-, or corn-planting ceremony and the collecting of micro-organisms (a key ingredient of *terra preta*) in the surrounding forests. As well, they participated in three shamanic ceremonies: a protection ritual (*Ikarada*); ritual offering to *Mama Quilla* (moon spirit); and, sunrise ceremony (*Inti Raymi*). A colleague from Canada who joined us in our first offering of the Peru Summer Institute shares her experience of the protection *Ikarada*:

As darkness descends, the night opens to possibilities of becoming dense with storytelling. We enter the small tambo—into the interior darkness—sitting on low wooden benches one beside the other; women on one side, men on the other side. The shaman enters and remains standing by the door. I watch intently as the first person is smudged by the shaman. The darkness is broken only by the sparks of the flames as the mapacho lights up and flickers out—the shaman chanting and smudging us one by one in a sacred ritual to protect us. And then it is my turn—an invocation into the spirituality of the sacred tradition. Rituals become an integral part of our experience at Sachamama [E]ntangled in the smudging and chanting of the shaman—attending to a sonata in the chorus of frogs and cicadas. (Palulis 2018, 222–223)

The building of a ceremonial healing tambo and the large beautiful lagoon-like bathing pool in close proximity, with non-toxic, non-chemical means of filtering and purifying the water at the Sachamama Center, brings a great variety of birds, insects, spiders, ants, monkeys, amphibians and reptiles to the changing ecosystem, together with harmony and an enlarged feeling of cross-species community-building. All of our voices blend across species, across time and place.

Ritual practice has been common to humanity throughout history in religions, spiritual and mystical traditions, including Druidism, shamanism, and Indigenous spirituality. “One of the most crippling implications of the rejection of the reality of this living, sentient and numinous cosmos and our integrality with it is for finding our way out of the present global ecological and climate crisis that threatens the very survival of countless species, including our own, and of the planet as we know it” (Apffel-Marglin 2020, 13). Much of the mainstream literature on human-ecology-spirituality interdependencies has been in response to the externalized values of materiality and consumerism. Human-ecology-spirituality interfaces are variously articulated in relation to “aesthetics” (Morton 2009), “sensuality” (Abram 1997), “religion” (Grim and Tucker 2014), “spiritual ecology” (Vaughan-Lee 2013), “ecofeminism” (Gaard 2011), “posthuman discourses” (Haraway 1991), and “human-animal bonds” (Haraway 2007).

Equivalency of Epistemologies and Ontologies for a Post-Capitalist World

There has been an emerging global awakening to the need for widening of the circle of knowledges on sustainability by bringing together scientific empiricism and Indigenous ecological knowledges (UNESCO 2017). In the late nineteenth and early twentieth centuries, the groundwork for quantum physics thinking led to radical revisioning of classical notions of physics and other sciences. Niels Bohr’s principle of “complementarity” ([1937] 1958) put forward the revolutionary theory that a quantum of energy cannot be separated from the apparatus and system. In other words, all of life is connected. In conversations with physician Dr. Jacques Mabit, Director of the Takiwasi Centro de Rehabilitación de Toxicómanos y de Investigación de Medicinas Tradicionales (Takiwasi Center for the Rehabilitation of Drug Addicts and Research on Traditional Medicines) and one of the most respected shamans in Peru, we have learned that like quantum physics, Indigenous High Amazon ceremonial practice collapses space-time. The wonders of modern science, and far beyond, have been known for

millennia by the peoples of the Amazon through observation, ritual, and ceremony, including learning from plant teachers. For evolutionary biologist Richard Lewontin (1993), organism and environment create each other. Building on Bohr's work and Donna Haraway's "posthumanist performativity" (1991), Karen Barad's "agential realism" (2007) acknowledges the interdependent entanglements of mind-body-spirit. Donna Haraway, writing about the acknowledgement by biology and Western philosophy of the notion of interdependent organisms in the environment, offers the meme "sympoeisis" (Haraway 2016) to describe the interweaving of "companion species" (Haraway 2007). Sympoeisis resonates with Deleuze and Guattari's "rhizomatics," Vizenor's "trickster discourse," and Cage's "poethics" (mentioned above), as cartographic narrative strategies for remapping, and enacting, dynamic, non-dichotomous, heterogeneous politics of alliances for a post-capitalist world in which all matter, all have a voice and being of equivalent value.

There is much to learn from Peru's Indigenous Peoples about *buen vivir*, or as a Quechua speaker might say—*sumaq qausay*, a broad understanding across Latin America that embraces well-being and cohabitation of humans and non-humans that has become the basis of the new Constitutions of Bolivia and Ecuador. At the UN Convention of Biological Diversity, Juan Carlos Jintiaich, advisor of Coordinadora de las Organizaciones Indígenas de la Cuenca Amazónica (Coordinator of Indigenous Organizations of the Amazon River Basin) states:

This is a confusing and risky time....It requires social mobilizations that transcend left and right and connect us to each other and the land. *Buen vivir* contains the concepts, but it's a language the other society doesn't always understand. We're building alliances to show there is another way. It's not our fight, it's everyone's. Right now, there is a storm, a bad storm. But the moment we wake up, we'll see the sky. (Zaitchik, 2019)

Eduardo Fernandez Grillo, Peruvian Andean agronomist and a co-founder of PRATEC (El Proyecto Andino de Tecnologías Campesinas/Andean Project for Peasant Technologies), wrote about the need for "healing ourselves of the plague" (Grillo 1998, 134) that arrived at the beginning of the sixteenth century. The "plague" came in the form of conquistadores, priests, and colonial administrators. Grillo calls for "equivalency of epistemologies" that recognizes the role of more-than-human intelligences and agencies in maintaining "mutual nurturance," ecological harmony and balance. "Everyone (be it man, tree, stone) is a person, complete and indispensable, with its own inalienable way of being ... with its specific responsibility in the keeping of the harmony of the world. It is in such condition of equivalence that this living world relates with each one and the other" (Grillo 1998, 224). Equivalency invokes "interdependence" (Calliou 1996; Cullis and Suzuki 2010), and "*comunalidad*" (Meyer and Maldonado 2010), multi-dimensional, multi-species enactments of mutuality and reciprocity between humans and more-than-humans, intimate pedagogies of place that profoundly affect life and cycles of interactive living on Earth: "Advancing Indigenous ecological wisdom and practices as 'equivalent' is not about transplanting Indigenous knowledge systems into Western systems, rather it is companion planting cultivars with wild types, regenerating more diverse possibilities for the global ecological sustainability conversation" (Cole 2016, 8). It is neither intellectual nor political, rather a "vital attitude of our living our world" (Grillo 1998, 144).

As well as inviting us to bring our university students into their communities, the Kichwa-Lamista communities asked if we would partner with them to document and share their knowledges and ways of living with the land before they disappear. Peru's governments have a long history of corruption and state-led dispossession and liquidation of Indigenous lands and peoples in favour of foreign extractivist corporations. It is primarily Canadian and other mining, natural gas, oil, and logging corporations headquartered in the Global North that are the source of the social, ecological, and ecojustice conflicts with Indigenous communities in the Global South. Concerned about the systemic de-sacralization and desecration of their ancestral lands, the Kichwa-Lamista want their voices to be heard in the academy and in seats of government,

about respecting, protecting, and living sustainably on their lands, something they have been doing for millennia. They have much to contribute to the knowledge and practice base on ecojustice sustainability, including bringing discourses on human/non-human/more-than-human interdependencies into the academy.

Together with the communities, we determined the research project protocols and the following key foci: documenting Kichwa-Lamista cultural ecological knowledges and ecotechnological practices, including rituals and ceremonies (in Quechua and Spanish); strategizing how to share these knowledges and practices in the academy and beyond to encourage cross-cultural Global North/Global South alliances and solidarities; and, advancing Indigenous narrativity and orality as equivalent academic genres for the (re)generation and dissemination of knowledges. Although Indigenous Peoples are supposed to be the primary beneficiaries of the research into their lives, as per university research ethics principles, university systems worldwide continue the colonizing and racializing practices of valuing peer-reviewed journal publication as the pinnacle of data dissemination. Journal articles written in academese, predominantly in the English language, are not accessible or culturally relevant, to our Indigenous co-researchers. We provided training and video equipment for two Kichwa-Lamista research assistants deemed by the communities as shamans-in-training. We also hired a Mestiza research project administrator, who is well-known and trusted by the communities, to coordinate the research project logistics in each of the communities, finances (across three international currencies), community feasts, and monthly reports. Over a period of four years several documentaries were made specific to Kichwa-Lamista food production, medicinal plants, weaving, ceramics, building *tambos* (dwellings made with bamboo walls and palm leaf roof), ritual ceremonies, and intergenerational teaching practices. Screenings of the documentaries were held in each of the communities to get their feedback and input using diesel-powered generators to provide power for the computer and projector. The screens were white bedsheets hung from the bamboo rafters of the community *tambos*. Below, we share a few words from one of the documentaries that has been translated from Quechua and/or Spanish into English by our research assistants (Cole, O'Riley, and Sangama Sangama 2020):

Royner Sangama Sangama, Kichwa-Lamista Research Assistant/Filmmaker:

Our Kichwa communities have maintained relationships with the natural world for thousands of years. Our actions are made with much love and respect to the *chacra* [fields], the *monte* [forest] and the water. In our *el mundo Kichwa* [Kichwa world], when we enter the *monte* the first thing we always do is sing *icarnos* [ritual chants] so nature can open its path to us. It is in this way that we ask permission for entry. Today this sustainable life of respect and caring is being undervalued, but despite that the grandparents are still guiding, sharing and maintaining their knowledge and customs.

Simion Cachique, Kichwa-Lamista Elder :

The *dieta* [ritual ceremony] is to give yourself with heart and open spirit to the plant and in this way you do a spiritual cleansing for your soul. These practices are done day by day and the children know that to be strong and healthy we need care and *dietas*.

Wilder Sangama Guerra, Kichwa-Lamista *chacarero*:

It's not all beautiful in *el mundo Kichwa*. There is also sorrow because now our *monte*, water and *chacra* are feeling blows from nature, changes that are ruining our way of life. Weather has gone crazy because it rains whenever it wants and that ruins our *chacras*, and it is now that we need to raise awareness and maintain our practices.

Our colleague Dr. Pat Palulis shares her reflections on an immersion stay she experienced with our students and ourselves during the Peru Summer Institute we offered in the summer of 2013: “A visit to the Kichwa-Lamista village of Shukshuyaku brought us closer to this earth whose humus nourishes us. We were taught the biocultural skills of the indigenous people who use the local habitat to build shelter and to provide nourishment. The people offer hospitality. They welcome us. They teach us. So that we can begin to unlearn and relearn. Working against the grain of the progress narrative” (Palulis 2018, 224).

As SARS-Cov-2 virus and its COVID-19 manifestation expand into the intimacy and vulnerability of our human being and becoming, many of us who are physically and otherwise isolating are experiencing the relationalities and blended, layered awarenesses that, like the wisdom from teacher plants and other states of reawakening, evoke openness to interconnectedness with all things. Albert Einstein came to this understanding through mathematical physics, languaging it as *spukhafte Fernwirkung*: a “spooky remote effect” or quantum entanglement; objects millions of light years apart are shown to be intimately connected (Palmer 2017). But how does one make sense of the *Fernwirkung* as a manifestation or even theoretical concept, operating between or across or within Newtonian and quantum ways of knowing? Both/and rather than either/or. Perhaps like post-rational quantum entanglement, *quipu* as an ancient Andean story-and-computation weaving narrative, is at once a macro pattern of entangled threads spun from a llama’s fleece, knotted and coloured and patterned as knowledge-process existing beyond representation, translation, or interpretation—like the links between the thrown sticks of the I Ching, T’ai Chi Ch’uan, and the Tao Te Ching. Finding shared spaces beyond language-based truth regimes; finding those places of awe and wonder from early childhood that become muted in the noise and busyness of today’s world.

COVID-19 has shown the fragility, hermeticism, presumed entitlement, and apathy of some human societies and the humility, creativity, cohesiveness, and compassion of others across geo-socio-economic spectra. With governments and institutions unable to change fast enough to address the current global crises, local communities and individuals are demonstrating that they are more than capable of acting in innovative ways that can heal the Earth’s beating heart through non-anthropocentric collective actions and a spirited trans-species chorus of voices across the Global North and Global South. Perhaps, at this time, the hubris of human beings needs to give way to the wisdom and generosity of the natural world that still remembers and enacts its original instructions. We think of our grandchildren and those yet to come; we hold out hope that they will inherit a kinder, more ecologically just world, a place to wonder, to imagine, to sing and dance their own words and worlds into existence.

Kukwstum’c Ó:nen:ki’wáhi

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REFERENCES

- Abram, David. 1997. *The Spell of the Sensuous: Perception and Language in a More-than-human World*. New York: Vintage Books.
- Albrecht, Glenn. 2019. "After the Anthropocene." *The Ecologist*, February 27, 2019. <https://theecologist.org/2019/feb/27/after-anthropocene>
- Anderson, Virginia. 2006. *Creatures of Empire: How Domestic Animals Transformed Early America*. New York: Oxford University Press.
- Apffel-Marglin, Frédérique. 2011. *Subversive Spiritualities: How Rituals Enact the World*. Oxford, UK: Oxford University Press.
- . 2018. "Post-Materialist Integral Ecology: Experiments in the Peruvian High Amazon." *Worldviews* 22 (1): 56–83. <https://doi.org/10.1163/15685357-02201004>.
- . 2020. *Contemporary Voices from Anima Mundi: A Reappraisal*. New York: Peter Lang Publishing.
- Argumedo, Alejandro. 2010. "The Ayllu System of the Potato Park, Cusco, Peru. The Satoyama Initiative." https://satoyama-initiative.org/case_studies/the-ayllu-system-of-the-potato-park-cusco-peru/.
- Barad, Karen. 2007. *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*. Durham, NC: Duke University Press.
- Black, Carol. 2014. "A Thousand Rivers: What the Modern World has Forgotten about Learning and Children." *Schooling the World*. <http://carolblack.org/a-thousand-rivers>.
- Bohr, Neils. (1937) 1958. *Atomic Physics and Human Knowledge*. New York: John Wiley & Sons.
- Bowers, Chet. 2009. "Educating for a Revitalization of the Cultural Commons." *Canadian Journal of Environmental Education* 14: 196–200.
- Bruns, Gerald L. 1994. "Poethics: John Cage and Stanley Cavell at the Crossroads of Ethical Theory." In *John Cage: Composed in America*, edited by Marjorie Perloff and Charles Junderman, 206–225. Chicago, IL: University of Chicago Press.
- Cage, John. 1961. *Silence: Lectures and Writings*. Middletown, CT: Wesleyan University Press.
- Calliou, Sharilyn. 1996. "Shaking Rattles in all Directions: A Case Study/Story of a Female 'Indian' Student Attending a EuroCanadian University." PhD diss., University of British Columbia, 1996.
- Cole, Peter. 2000. "First Peoples Knowings as Legitimate Discourse in Education: Coming Home to the Village." PhD diss., Simon Fraser University, 2000.
- . 2016. "Education in an Era of Climate Change: Conversing with Ten Thousand Voices." *Transnational Curriculum Inquiry: The Journal of the International Association for the Advancement of Curriculum Studies* 3 (1): 3–13.
- Cole, Peter, and Pat O'Riley. 2017. "Performing Survivance: (Re)Storying STEM from an Indigenous Perspective." *Critical Education* 8 (15): 24–39.
- Cole, Peter, Pat O'Riley, and Royner Sangama Sangama. 2020. dirs. *Allpanchikpa Shunkun/El Mundo Kichwa/Kichwa World*. Wayku, PE: Yachay Runa, Film.
- Condon, Patrick. 2020. "Time for BC and Vancouver to Stop Glorifying Global Tech Jobs." *The Tyee*, June 10, 2020. <https://thetyee.ca/Analysis/2020/06/11/Stop-Glorifying-Tech-Jobs-Vancouver/>.
- Coyle, Diane. 2011. *The Economics of Enough: How to Run the Economy as If the Future Matters*. Princeton, NJ: Princeton University Press.
- Cullis, Tara, and David Suzuki. 2010. *The Declaration of Interdependence*. Vancouver, BC: Greystone Books.
- Davis, Wade. 2009. *The Wayfinders: Why Ancient Wisdom Matters in the Modern World* (CBC Massey Lecture). Toronto, ON: House of Anansi Press.

- Dawson, Rosario. 2019. *The Need to Grow*. Film. Earth Conscious Films. <https://grow.foodrevolution.org/>.
- Deleuze, Gilles, and Félix Guattari. 1987. *A Thousand Plateaus: Capitalism and Schizophrenia*. Minneapolis, MN: University of Minnesota Press.
- de Souza, Lynn Mario. T. 2012. "Engaging the Global by Resituating the Local. (Dis)locating the Literate Global Subject and His View from Nowhere." In *Postcolonial Perspectives on Global Citizenship*, edited by Vanessa Andreotti and Lynn Mario T. de Souza, 68–83. New York: Routledge.
- Gaard, Greta. 2011. "Ecofeminism Revisited: Rejecting Essentialism and Re-placing Species in a Material Feminist Environmentalism." *Feminist Formations* 23 (2): 26–53.
- Grillo, Eduardo Fernández. 1998. Development or Decolonization in the Andes? In *The Spirit of Regeneration: Andean Culture Confronting Western Notions of Development*, edited by Frédérique Apffel-Marglin, 193–243. London, UK: Zed Books.
- Grim, John, and Mary Evelyn Tucker, eds. 2014. *Ecology and Religion*, 2nd ed. Washington, DC: Island Press.
- Haraway, Donna. 1990. *Primate Visions: Gender, Race and Nature and the World of Modern Science*. New York: Routledge.
- . 1991. *Simians, Cyborgs and Women: The Reinvention of Nature*. New York: Routledge.
- . 2007. *When Species Meet*. Minneapolis, MN: University of Minnesota.
- . 2016. *Staying with the Trouble: Making Kin in the Chthulucene*. Durham, NC: Duke University Press.
- Harvey, Fiona. 2020. "Covid-19 Pandemic is 'Fire Drill' for Effects of Climate Crisis, Says UN Official." *Guardian*, June 15, 2020. <https://www.theguardian.com/environment/2020/jun/15/covid-19-pandemic-is-fire-drill-for-effects-of-climate-crisis-says-un-official>.
- Horton, Richard. 2020. *The COVID-19 Catastrophe: What's Gone Wrong and How to Stop It Happening Again*. Cambridge, UK: Polity Press.
- Intergovernmental Panel on Climate Change (IPCC). 2007. *IPCC Fourth Assessment Report: Climate Change 2007*. Geneva: Intergovernmental Panel on Climate Change.
- Keil, Roger, Maria Kaika, Tait Mandler, and Yannis Tzaninis. 2020. "Global Urbanization Created the Conditions for the Current Coronavirus Pandemic." *The Conversation*. <https://theconversation.com/global-urbanization-created-the-conditions-for-the-current-coronavirus-pandemic-137738>.
- Kimmerer, Robin Wall. 2020. "Greed Does Not Have to Define Our Relationship to Land." *Literary Hub*. <https://lithub.com/robin-wall-kimmerer-greed-does-not-have-to-define-our-relationship-to-land/?fbclid=IwAR2wFXHJHcOEQGulrrCiD0H6tBYPgkv-9HodPNEczgGk69m8RRVJ7bBXhq4>.
- Kirk, Martin, and Alnoor Ladha. 2020. "The Poverty of Progress." *New Internationalist*, February 24, 2020. <https://newint.org/features/2020/02/24/poverty-progress>.
- Klein, N. 2014. *This Changes Everything: Capitalism vs. the Climate*. New York: Simon & Schuster.
- Kothari, Ashish. 2020. "What Does Self-Reliance Really Mean? Amazing Stories Emerge from India's Villages." *The Hindu*, June 5, 2020. https://www.thehindu.com/society/what-does-self-reliance-really-mean-amazing-stories-emerge-from-indias-villages/article31756580.ece?fbclid=IwAR1tPU19afgqgFTNsR_45xEvjrmznibEo51Eggb1nta2DIwtMZIAhCfBxz4.
- Krzywoszynska, Anna, and Greta Marchesi. 2020. "Toward a Relational Materiality of Soils: Introduction." *Environmental Humanities* 12 (1): 190–204. <https://doi.org/10.1215/22011919-8142297>.
- Kumar, Satish. 2013. "The Link between Soil, Soul and Society." *Guardian*, October 12, 2013. <http://www.theguardian.com/sustainable-business/satish-kumar-soil-soul-society>.

- Leser, David. 2020. "Call of the Wild: Listen up, People, Time is Running Out." *Sydney Morning Herald*, May 29, 2020. <https://www.smh.com.au/environment/climate-change/call-of-the-wild-listen-up-people-time-is-running-out-20200424-p54mqz.html>.
- Lewontin, Richard. 1993. *Biology as Ideology: The Doctrine of DNA*. New York: Harper Perennial.
- Local Futures. n.d. "Local Futures: Economics of Happiness." Accessed October 11, 2020. <https://www.localfutures.org>.
- Magni, Caterina. 2012. "2008 Olmec Writing: The Cascajal Block: New Perspectives." *Arts & Cultures* 9: 64–81.
- Marlens, Neal, Jim Hurst, and Mark Grossan. *Schooling the World: The White Man's Last Burden*. Film. Directed by Carol Black. 2010. Telluride, CO: Lost People Films. <https://www.youtube.com/watch?v=oDxYWspiN-8>.
- Martin, William, and Klaus Kowallik. 1999. "Annotated English Translation of Mereschowsky's 1905 Paper 'Über Natur und Ursprung der Chromatophoren im Pflanzenreiche'." *European Journal of Phycology* 34 (3): 287–295.
- Mavelli, Luca. 2019. "Resilience beyond Neoliberalism? Mystique of Complexity, Financial Crises, and the Reproduction of Neoliberal Life." *Journal of Resilience: International Policies, Practices and Discourses* 7 (3): 224–239. <https://doi.org/10.1080/21693293.2019.1605661>.
- McKibben, Bill. 2010. *Eaarth: Making a Life on a Tough New Planet*. New York: Henry Holt and Co.
- . 2019. *Falter: Has the Human Game Begun to Play Itself Out?* New York: Henry Holt and Co.
- Meyer, Lois, and Benjamin Maldonado, eds. 2010. *New World of Indigenous Resistance: Noam Chomsky and Voices from North, South, and Central America*. San Francisco, CA: City Lights Books.
- Monbiot, George. 2017. *Out of the Wreckage: A New Politics for an Age of Crisis*. Brooklyn, NY: Verso Books.
- Morton, Timothy. 2009. *Ecology without Nature: Rethinking Environmental Aesthetics*. Cambridge, MA: Harvard University Press.
- Norberg-Hodge, Helena. 2020. "Global or Local: Two Paths to the Future." *Small Giants Academy*, May 27, 2020. <https://www.smallgiants.com.au/storytelling/global-or-local-two-paths-to-the-future>.
- O'Riley, Pat. 2003. *Technology, Culture and Socioeconomics: A Rhizoanalysis of Educational Discourses*. New York: Peter Lang Publishing.
- Palmer, D. Jason. 2017. "What is Spooky Action at a Distance?" *Economist*, March 16, 2017. <https://www.economist.com/the-economist-explains/2017/03/16/what-is-spooky-action-at-a-distance>.
- Palulis, Patricia. 2018. "Black Earth Green Moon Mama Allpa: Polyphonic Moments from Temple to Tambo." In *International Perspectives on the Theory and Practice of Environmental Education: A Reader, Environmental Discourses on Science Education*, 3, edited by Giuliano Reis and Jeff Scott, 221–232. Cham, CH: Springer International Publishing.
- Parajuli, Pramod. 1996. "Ecological Ethnicity in the Making: Developmentalist Hegemonies and Emergent Identities in India." *Identities: Global Studies in Culture and Power* 3 (1–2): 14–59. <https://www.tandfonline.com/doi/abs/10.1080/1070289X.1996.9962551>.
- Posner, Michael. 2011. "Olive Dickason Wrote the Book on Aboriginal History in Canada." *Globe and Mail*, April 17. [Please provide URL]
- Reid, Jennifer. 2010. "The Doctrine of Discovery and Canadian Law." *Canadian Journal of Native Studies* XXX (2): 335–359.

- Sagan, Lynn. 1967. "On the Origin of Mitosing Cells." *Journal of Theoretical Biology* 14 (3): 225–274.
- Schimper, Andreas Franz Wilhelm. 1903. *Plant-Geography upon a Physiological Basis*. Translated by William Rogers Fisher. Oxford, UK: Clarendon Press.
- Schmandt-Besserat, Denise. 1992. *Before Writing: From Counting to Cuneiform*, vol. I. Austin, TX: University of Texas Press.
- Schumacher, Ernst Friedrich. 2010. *Small is Beautiful: Economics as if People Mattered*. Scarborough, ON: Harper Perennial.
- Scoville, Priscila. 2015. "Ancient History Encyclopedia: Egyptian Hieroglyphs." https://www.ancient.eu/Egyptian_Hieroglyphs/.
- Shiva, Vandana. 2015. *Earth Democracy: Justice, Sustainability, and Peace*. Berkeley, CA: North Atlantic Books.
- . 2020. "The Path beyond Extinction and Escape: Return to Earth, Regenerate and Share." *Common Dreams*, June 5, 2020. <https://www.commondreams.org/views/2020/06/05/path-beyond-extinction-and-escape-return-earth-regenerate-and-share>.
- Simpson, Leanne. 2014. "Land as Pedagogy: Nishnaabeg Intelligence and Rebellious Transformation." *Decolonization: Indigeneity, Education & Society* 3 (3): 1–25.
- Sohi, Saran P., Evelyn Krull, Elisa Lopez-Capel, and Roland Bol. 2010. "A Review of Biochar and its Use and Function in Soil." In *Advances in Agronomy*, edited by Donald L. Sparks, 47–82. San Diego, CA: Academic Press.
- Stanley, Isaac. 2019. "Beyond High-Tech Patriarchy." *Open Democracy*, October 20, 2019. <https://www.opendemocracy.net/en/oureconomy/beyond-high-tech-patriarchy/>.
- Stengers, Isabelle. 2015. *In Catastrophic Times: Resisting the Coming Barbarism*. London, UK: Open Humanities Press.
- Swimme, Brian. 1999. *The Hidden Heart of the Cosmos: Humanity and the New Story*. Maryknoll, NY: Orbis Books.
- Tzaninis, Yannis, Tait Mandler, Maria Kaika, and Roger Keil. 2020. "Moving Urban Political Ecology beyond the 'Urbanization of Nature'." *Progress in Human Geography* XX, (X): 1–24. <https://journals.sagepub.com/doi/pdf/10.1177/0309132520903350>.
- UNESCO. 2017. "Local and Indigenous Knowledge Systems: Climate Change Assessment and Adaptation." <http://www.unesco.org/new/en/natural-sciences/priority-areas/links/climate-change/>.
- . 2019. "Linking Indigenous and Scientific Knowledge to Counter Biodiversity Erosion." <https://en.unesco.org/news/linking-indigenous-and-scientific-knowledge-counter-biodiversity-erosion>.
- United Nations. 2020. "Policy Brief: The Impact of COVID-19 on Food and Nutrition." https://reliefweb.int/sites/reliefweb.int/files/resources/sg_policy_brief_on_covid_impact_on_food_security.pdf.
- Victor, Peter. 2008. *Managing without Growth: Slower by Design, not Disaster*. Northampton, MA: Edward Elgar Publishing.
- Vizenor, Gerald, ed. 1993. *Narrative Chance: Postmodern Discourse on Native American Literatures*. Norman, OK: University of Oklahoma Press.
- . 1999. *Manifest Manners: Narratives on Postindian Survivance*. Lincoln, NE: University of Nebraska Press.
- Watts, Jonathan. 2019. "Human Society under Urgent Threat from Loss of Earth's Natural Life." *Guardian*, May 6, 2019. <https://www.theguardian.com/environment/2019/may/06/human-society-under-urgent-threat-loss-earth-natural-life-un-report>.
- Wainright, Oliver. 2020. "Seasteading—A Vanity Project for the Rich or the Future of Humanity?" *Guardian*, June 24, 2020. <https://www.theguardian.com/environment/2020/jun/24/seasteading-a-vanity-project-for-the-rich-or-the-future-of-humanity>.

- Wiedmann, Thomas, Manfred Lenzen, Lorenz T. Keyßer, and Julia K. Steinberger. 2020. "Scientists' Warning on Affluence." *Nature Communications* 11: 3107. <https://doi.org/10.1038/s41467-020-16941-y>.
- World Wildlife Fund (WWF). 2020. "COVID-19: Urgent Call to Protect People and Nature." *World Wildlife Federation*. <https://www.worldwildlife.org/publications/covid19-urgent-call-to-protect-people-and-nature>.
- Wright, Ronald. 2004. *A Short History of Progress*. Toronto: House of Anansi Press.
- Yeh, James. 2020. "Interview: Robin Wall Kimmerer: 'People Can't Understand the World as a Gift Unless Someone Shows Them How'." *Guardian*, May 23, 2020. https://www.theguardian.com/books/2020/may/23/robin-wall-kimmerer-people-cant-understand-the-world-as-a-gift-unless-someone-shows-them-how?fbclid=IwAR3x7QLdT8jTkKy6kFTzgJQ_6r-mm-Baa6EINNdEpGGoQbE5bC3rmFpEBW4.
- Zaitchik, Alexander. 2019. "Under Left-Wing and Right-Wing Leaders, the Amazon has Burned. Can Latin America Reject Oil, Ranching, and Mining?" *Intercept*, December 7, 2019. <https://theintercept.com/2019/12/07/amazon-latin-america-extractivism/>.

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