Planetary Praxis & Pedagogy

Transdisciplinary Approaches to Environmental Sustainability

Richard C. Mitchell and
Shannon A. Moore (Eds.)

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SENSE PUBLISHERS
ROTTERDAM/BOSTON/TAIPEI

A C.I.P. record for this book is available from the Library of Congress.

ISBN: 978-94-6300-212-7 (paperback)
ISBN: 978-94-6300-213-4 (hardback)
ISBN: 978-94-6300-214-1 (e-book)

Published by: Sense Publishers,
P.O. Box 21858,
3001 AW Rotterdam,
The Netherlands
https://www.sensepublishers.com/

All chapters in this book have undergone peer review.

Cover image by Zsolt Kiss

Printed on acid-free paper

This book is dedicated to our Brock colleague, mentor, and series editor Michael Kompf who passed away during the editing of this volume, along with our parents Dorothy and C. David Moore, and Nancy and Robert Mitchell, each of whom also died during related research and writing.

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ACKNOWLEDGEMENTS

Thanks to photographer Zsolt Kiss for our cover photo who captured this spectacular view in January, 2014 in a Norwegian fjord north of the 68th parallel during a midnight celestial display of the Aurora Borealis. The breath-taking beauty of this wilderness reminds us of the many spaces on our planet yet to be populated, plundered and polluted. In addition, the Aurora calls to mind the necessary transition to a planetary consciousness noted by Kerry Arabena (2006, 2008) and Richard Kahn (2010) among others that must evolve in the minds and hearts of conscious humans for all manner of life, and the fragile ecosystems upon which we depend, to survive in coming centuries.

S. A. MOORE AND R. C. MITCHELL

1. INTRODUCTION AND OVERVIEW OF VOLUME

As an entry point into this final project in a trilogy linking Freirean pedagogies with transdisciplinarity, our Introduction offers a brief synopsis of the chapters focused on this volume's theme of environmental sustainability, along with an analysis of key conceptual themes, at a time of unparalleled crisis and uncertainty for our planet. This assessment was underscored during our writing with the United Nations Intergovernmental Panel on Climate Change (2014) Fifth Report, and their assertion that changes already underway in our global environment threaten peace, global stability and food supplies at an increasingly unsustainable pace.

Our contribution nevertheless aims away from fear and cynicism toward pedagogies of hope such as those envisioned by the Brazilian educator Paulo Freire (1970, 1999) throughout his time in the world. Also at the current juncture, the relatively unheralded rollout of the U.N.'s Decade of Education for Sustainable Development or DESD (2014), which began in 2005, has drawn to a close, and so we find ourselves less cautious in proposing such pedagogies as pathways for transformation. As editors, we are certain that praxis in a planetary context may be informed by such U.N. meta-narratives, yet global instruments of consensus must be coupled with local prioritization of the personal with collective action through grassroots organization and activism. In this instance, the Indigenous "Idle No More" movement is called to mind, as well as the specific activities of the "People's Climate Summit" which paralleled the recent U.N. Climate Summit in New York (Prupis & Lazare, 2014).

United Nations member states have accomplished an extensive body of international law, treaties, norms, practices and institutions that help members manage the emergent facets of interstate relations. All told, over 500 multilateral treaties have been concluded under U.N. auspices, making the organization the world's "central operating system" by performing its functions through member-states in order to generate such policy frameworks as the Millennium Development Goals, notes former U.N. Ambassador for Canada Paul Heinbecker (2013). In the case of Canada, its international stature continues to shrink from a previous reputation as a primarily pristine wilderness and human rights haven (Mitchell & Moore, 2012), a reduced status reinforced by Canada's 2013 withdrawal from participation in (and paltry financial support for) the U.N.'s International Convention on Desertification. The following year Canada was the only member state to raise objections to a

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ground-breaking treaty establishing greater protection for the rights of Indigenous people (Lum, 2014). Heinbecker (2013) notes further that while the United Nations is far from perfect in its frequent level of systemic paralysis, as the one organization that can convene the world under one roof on major issues of the day it remains necessary and its effectiveness is in every nation's interest except, he dryly observes, Canada these days.

In a comparative discussion of how Indigenous and European worldviews are colliding to reconstruct the environmental debate, Canadian historian John Ralston Saul (2008) notes how truncated notions constraining efforts toward sustainable development are "scarcely more than modified industrial planning" (p. 86). Problematizing further, he argues "we are trying to impose the European, linear view of a human-centred world" and thus have suffered "from the specialization and narrow silos that dominate our education, administration and policies" (*ibid.*). Canadians, he concludes, "including many within the environmental movement, put more energy into their relationships with technology" than into their relationship with place. This sort of discourse is designed to distract Canadians and garner domestic votes, but "cuts no ice internationally" (*ibid.*). Indeed, he cites leading Australian climate change palaeontologist and mammologist Tim Flannery's description that Canadians have become "spectacularly – almost proudly – cavalier" about global warming and our maladroit exploitation of commodities playing a key role in the increase in global carbon emissions (Ralston Saul, 2008; see also Goldenberg, 2009; McCarthy, 2009). Internationally renowned environmental scientist, activist, and retired Canadian geneticist David Suzuki (2010) also roundly castigates those making dominant economic choices in this nation for jeopardizing the access future generations will require to clean air, clean water, clean soil, clean energy and biodiversity.

This complexity and interconnectedness of all forms of life on our terrestrial biosphere was captured succinctly by American philosopher J. Baird Callicott in preparation for a conference at the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2012) headquarters in Paris:

> We humans are intimately connected – with every breath we take, every sip of liquid we drink, and every morsel of food we eat – to the surrounding bio-chemical-physical world. We are as vortices in a flux of energy and materials, distinguishable only as ephemeral structures in that flux. We cannot – that is, we should not – conceive of ourselves as in any way independent of the natural environment. Rather we are continuous with it. The protection of human health and wellbeing is indistinguishable from the protection of environmental health and wellbeing. (Electronic cite, para. 3)

As Callicott notes, all aspects of human experience in the current era are being shaped by plurality and increasingly intimate ontological connections with our environments that call for reconstructing 'science', and its reductionistic claims with cousins in 'economics', to a more reflexive, integrative understanding of sustainability that

embraces the planet holistically. This profound yet easily embraced ontology showing humanity's interconnected relationship with their bio-ecosytemic environments is similarly described within Indigenous epistemologies (Arabena, 2006, 2010; Kahn, 2010; Malott, 2008). Richard Kahn's (2010) astute analysis considers how modern Western science has evolved in large measure through "the assimilation (i.e., 'stealing') of knowledge from non-Western and indigenous traditions" (p. 105). His notion of an emergent, critical expression of "planetary citizenship" (2010, p. 46) in response to the environmental crisis is similar to Murray Island Indigenous scholar Kerry Arabena, who theorizes a "universe referent citizenship" connecting such epistemologies with more balanced ecological perspectives aimed at revolutionizing twenty-first century life on this planet (2010, pp. 260–267). Such 'transdisciplinary' perspectives on how humanity will survive and adapt in coming generations are the focus of each of our contributors to this volume.

SUMMARY OF CHAPTERS

As in the case of our previous projects (Moore & Mitchell, 2008; Mitchell & Moore, 2012) the story of this volume began in an Ontario, Canada post-secondary education (PSE) setting, and quickly evolved from the local to the global. Our university, along with universities around the globe, finds itself in an era of intense transition and such transformations must involve questions of how to effectively and fairly evaluate research, teaching and service metrics at post-secondary institutions. E. L. Boyer (1997) discusses this process of engagement as a revolution in reform of higher education through four dimensions: the initial stages of discovery research and dissemination scholarship, of integration scholarship, of application scholarship, and finally of pedagogical scholarship. Our call for papers resulting in this final collection of contributors to transdisciplinarity in PSE was initially informed by a small, critical qualitative study undertaken at our own institution that collated various definitions of 'sustainability' to inform and then shape our university's first carbon footprint measure (Mitchell, 2011, pp. 13–18; Mitchell & Parmar, 2010; Mitchell, May, Purdy, & Vella, 2012).

Apart from the emissions data in the resulting audit, an additional key finding was the implication of our university's geographical location within one of UNESCO's 600-plus World Biosphere Reserves – the 700 kilometre-long Niagara Escarpment – which to that point had been largely overlooked as a research, evaluative, or recruitment framework. In that study, measures of conservation, socio-economic development, and education were revealed as "transdisciplinary" metrics (Mitchell, 2011, pp. 8–9; see also Giroux & Searls-Giroux, 2004; Robinson, 2008; UNESCO, 2014 for definitions) for researching and understanding these ecosystems as sites of excellence, and for evaluating improvements in sustainable relationships between and amongst human and non-human stakeholders. Similar to Aussie scientists Brown, Harris, and Russell (2010), Canadian geographer John Robinson contends that "transdisciplinarity has less to do with new theoretical frameworks and the unity

of knowledge" than with the emergence of problem- and solution-oriented research incorporating participatory approaches (Robinson, 2008, p. 71).

As Freirean educators, we attempt daily to avoid being co-opted in these pursuits, though we found some solace while editing this volume in the trenchant views of Naomi Klein (2014) while we similarly grapple with the tensions between climate change and capitalism in the research engines of higher education. In addition, the debates regarding transformations necessary for planetary survival and renewal that we carry out on a daily basis with students, colleagues and community partners offer additional refuge from the "tower of babble" wherein we frequently find ourselves (Moore & Mitchell, 2009, p. 30). In this project, we are guided by various ontologies of optimism, and how Paulo Freire looked at anti-oppressive teaching in a mutuality of respect for both teacher and learner (see also Hyslop-Margison & Thayer, 2008; Kincheloe, 2008, 2010). We have taken these ontologies forward and found both formal and informal rhizomatic linkages within diverse discourses from nursing, quantum physics, chemistry, and biology (Holmes & Gastaldo, 2004; Koizumi, 2001; Nicolescu, 2002, 2008; Suzuki, 2010), cardiac epidemiology (Albrecht, Freeman, & Higginbotham, 1998), climate change science and activism (Apgar, Argumedo, & Allen, 2009; Brown, Harris, & Russell, 2010; Klein, 2014), and with theorists in the humanities, social sciences, and critical scholarship grounded in feminist, queer, social justice and interpretive epistemologies (Kincheloe & McLaren, 2005; Leavy, 2011).

As child and youth studies scholars, (we) Mitchell and Moore open the volume with a chapter, *Leveraging Transdisciplinarity in Higher Education: A Study in Transformation*, that presents findings from a two-year investigation aiming to understand some of the competition and contradictions in our own institution through the lens of the U.N.'s Decade of Education for Sustainable Development. The chapter incorporates local/global connections between and amongst themes of environmental sustainability, transdisciplinarity and Freirean pedagogies within Canadian higher education in one PSE institution in Ontario, Canada.

From New Zealand, University of Waikato marketing professor Richard Varey's chapter, *Marketing for Sustainable Living: A Problem of Crisis Calling for Pragmatism*, grounds the reader first with knowledge of three centuries of a Western, reductionistic worldview that has shaped foundational knowledge creation from classical science to economics, then with his argument for a post-normal standpoint. This "Great Transition" calls for social- cultural learning and a communal participatory strategy that rests on an integrated transdisciplinarity. The process is challenged by the inconvenience of dealing with complexity, and with instrumental, individualistic, corporatist fragmentation that must be abandoned along with its hypnotic qualities of blinding humans to the consequences of our actions. Varey offers pragmatism as a pathway for securing a praxis from which reflective action flows organically toward an emergent map of sustainability.

Congruent with Varey's articulation of the destructive drive of rampant consumerist worldviews also pervasive within the rhetoric of "sustainable development",

Indigenous Peruvian feminist Ana Isla presents a discussion that argues forcefully against the inadequacy of market-based solutions for ecological problems. She makes explicit their role in social and ecological destruction in her chapter *Greening Costa Rica: The Political Ecology of Sustainable Development*, and critiques the rhetoric and practices that attempt to link ongoing development and exploitation of the environment with the conservation movement. The historical pathway cultivated by neo-liberal political ecology is documented as the disingenuous argument that "green capital" will move the planet toward "sustainable development." Isla uses the example of Costa Rica to demonstrate that market-based solutions will continue to perpetuate social and ecological destruction as evidenced in the social injustice, inequity, poverty and environmental destruction ongoing in that state. As an eco-feminist, Isla links the expansion of political ecology and "sustainable development" with "housewifization" and "recolonization" representative of structural violence resulting in the removal of land and products with little or no compensation to Indigenous peasants. She further compels the reader to discern the crisis in nature as one also of women and children being disseminated by global "sustainable development movements" promoted through the United Nations Conference on Environment and Development (UNCED, or "Earth Summits"), by Environmental Non-Governmental Organizations (ENGOs), and by mainstream environmental thinking.

Similar to preceding contributors, the chapter by Canadian playwright and drama professor David Fancy moves us beyond Cartesian binary thinking in the direction of a deeper intersectional appreciation of social, political, economic and environmental ecologies. In contrast to notions of either pragmatism or eco-feminism, Fancy calls on concepts of "immanence" and "rhizomatic thought" as transformative pathways towards a more harmonious, though frequently turbulent, sustainable planetary praxis. His chapter, *Sustainability, Immanence and the Monstrous in Caryl Churchill's 'The Skriker'*, compels the reader toward understanding both an ontological and epistemological "sustainability" as a transdisciplinary praxis by establishing the links between creative arts and environmental education. Infused with rhizomatic reflection, action and being, Fancy's chapter is complex and invitational while his narrative is interwoven with arguments for "immanence" being found in both the everyday and the grotesque, as evidenced in our frequently wounded identities impervious to the environmental crises swirling around us. His vehicle for such a transcendent integration is further informed by somatic, affective and deeply personal levels of critique, criticism that identifies the subjugation of the so-called "science of sustainability" and understanding the intersectional, social and political ecologies necessarily a part of any redress of planetary degradation.

From a deep reading and understanding of Global Environmental Sustainability movements and consistent with arguments put forth by Fancy, Canadian educator Parris Garramone's chapter renders an in-depth understanding of structural inequity by emphasizing on the role of affect and creativity in order to redress the complexity of environmental derogation through educational contexts. '*Digging Where We*

Stand': Unearthing Race, Place and Sustainability in Ontario, explores the integration of knowledge from colonial histories, ecological racism and genocidal politics of empire in the establishment of an education for a sustainable future through place-based pedagogy. This chapter challenges the hegemony of natural sciences as the conventional epistemological and methodological approach to environmental sustainability. Garramone's contention is that science education alone cannot fully account for the complexity of social, ecological and structural issues that impact environmental sustainability. Hers is a similar focus to each of our contributions linking the local with the global.

The chapter co-authored by Canadian and Brazilian environmental scientists Dawn Bazely, Patricia Perkins, Miriam Duailibi and Nicole Klenk, *Strengthening Resilience by Thinking of Knowledge as a Nutrient Connecting the Local Person to Global Thinking: The Case of Social Technology/Tecnologia Social*, rethinks sustainability spaces through the local/global nexus of knowledge from Indigenous peoples. They argue that shared knowledges from disenfranchised, Indigenous communities and individuals, coupled with notions of Social Technology/Tecnologia Social, can form "nutrients" to build capacity for resilience and adaptation through increased knowledge flows. Accordingly, knowledge in this context is simultaneously conceptualized ecologically and trandisciplinarily in an integrated political, ethical, social and scientific response to climate change. Their model was developed on Freirean principles within a Brazilian context, and they argue it has the potential to increase community resilience and adaptive capacity in all regions of the world.

Closing out the text is Patricia Perkins' chapter, *Building Commons Governance for a Greener Economy*, which reinforces themes found throughout the volume by pointing to the need for local, participatory responses in partnership with global movements to address environmental degradation. Through the lens of political ecology/economy, Perkins contends that transformative education praxis and transdisciplinarity facilitate education for all ages, and that policy and grassroots change may foster renewal of the "commons" for democratic governance aimed at mitigating climate change.

PROLOGUE TO TEXT

World-renowned activist and award-winning Canadian author Naomi Klein (2014) rightly identifies climate change as a "civilizational wake-up call", and distills all of this complexity into a convincing dichotomy in her latest volume "This Changes Everything – Capitalism vs. The Climate". She poignantly considers what many of us are beginning to wonder – *is it too late?* (2014, p. 25).

> Right now, the triumph of market logic, with its ethos of domination and fierce competition, is paralyzing almost all serious efforts to respond to climate change. Cutthroat competition between nations has deadlocked U.N. climate negotiations for decades: Rich countries dig in their heels and declare that

> they won't cut emissions and risk losing their vaulted position in the global hierarchy; poorer countries declare that they won't give up their right to pollute as much as rich countries did on their way to wealth, even if that means deepening a disaster that hurts the poor most of all. (Klein, 2014, p. 23)

And so, while the complex world systems for the pricing of oil close out 2014 with unprecedented gyrations, we close our Introduction with a similar question to Klein's having been implicitly addressed by each of our contributors, though now as an explicit query for each of our readers: "*Is it too late?*"

REFERENCES

Albrecht, G., Freeman, S., & Higginbotham, N. (1998). Complexity and human health: The case for a transdisciplinary paradigm. *Culture, Medicine and Psychiatry*, *22*(1), 55–92.

Apgar, J. M., Argumedo, A., & Allen, W. (2009). Building transdisciplinarity for managing complexity: Lessons from indigenous practice. *International Journal of Interdisciplinary Social Sciences*, *4*(5), 225–270.

Arabena, K. (2006). The universal citizen: An indigenous citizenship framework for the twenty-first century. *Australian Aboriginal Studies*, *2*(1), 36–45.

Arabena, K. (2010). All knowledge is indigenous. In V. A. Brown, J. A. Harris, & J. Y. Russell (Eds.), *Tackling wicked problems through the transdisciplinary imagination* (pp. 260–267). London, UK and Washington, DC: Earthscan.

Boyer, E. L. (1997). *Scholarship reconsidered: Priorities of the professoriate*. Ann Arbor, MI: University of Michigan and Wiley Publishers.

Brown, V. A., Harris, J. A., & Russell, J. Y. (Eds). (2010). *Tackling wicked problems through the transdisciplinary imagination*. London, UK and Washington, DC: Earthscan Publications.

Freire, P. (1970). *Pedagogy of the oppressed*. New York, NY: Herder and Herder.

Freire, P. (1999). Education and community involvement. In M. Castells, R. Flecha, P. Freire, H. A. Giroux, D. Macedo, & P. Willis (Eds.), *Critical education in the new information age* (pp. 83–92). Boston, MA: Rowman & Littlefield Publishers, Inc.

Giroux, H. A., & Searls Giroux, S. (2004). *Take back higher education: Race, youth and the crisis of democracy in the post-civil rights era*. New York, NY: Palgrave Macmillan.

Goldenberg, S. (2009, December 14). Copenhagen spoof shames Canada on the truth about its emissions. *The Guardian Online*. Retrieved December 15, 2014, from www.guardian.co.uk/environment/blog/2009/dec/14/

Heinbecker, P. (2013, April 1). It's not just the drought treaty: Canada is vanishing from the United Nations. *Globe and Mail*. Retrieved December 15, 2014, from http://www.theglobeandmail.com/commentary/its-not-just-the-drought-treaty-canada-is-vanishing-from-the-united-nations/article10600939/

Holmes, D., & Gastaldo, D. (2004). Rhizomatic thought in nursing: An alternative path for the development of the discipline. *Nursing Philosophy*, *5*, 258–267.

Hyslop-Margison, E. J., & Thayer, J. (2009). *Teaching democracy – Citizenship education as critical pedagogy*. Rotterdam, The Netherlands, Boston, MA and Taipei, Taiwan: Sense Publishers.

Kahn, R. (2010). *Critical pedagogy, ecoliteracy, & planetary crisis*. New York, Berlin, and Oxford: Peter Lang Publishing.

Kincheloe, J. L. (2008). *Critical pedagogy* (2nd ed.). New York, NY: Peter Lang Publishing Inc.

Kincheloe, J. L. (2010). *Knowledge and critical pedagogy – An introduction*. New York, NY: Springer.

Kincheloe, J. L., & McLaren, P. (2005). Rethinking critical theory and qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (3rd ed., pp. 303–342). Thousand Oaks, CA, London, England and New Delhi, India: Sage Publications.

Klein, N. (2014). *This changes everything – Capitalism vs. the climate*. New York, London, Toronto, Sydney and New Delhi: Simon & Schuster.

Koizumi, H. (2001). Trans-disciplinarity. *Neuroendocrinology Letters*, *22*, 219–221.
Leavy, P. (2011). *Essentials of transdisciplinary research: Using problem-centered methodologies*. Walnut Creek, CA: Left Coast Press.
Lum, Z. (2014, October 2). Canada is the only UN member to reject landmark indigenous rights document. *Huffington Post*. Retrieved December 15, 2014, from http://www.huffingtonpost.ca/2014/10/02/canada-un-indigenous-rights_n_5918868.html
Malott, C. S. (2008). *A call to action – An introduction to education, philosophy, and Native North America*. New York, NY, Berlin, Germany and Oxford, England: Peter Lang Publishing.
McCarthy, S. (2009, December 8). Canada's strategy: Promise now, implement later. *Globe & Mail*. Retrieved December 15, 2014, from http://www.theglobeandmail.com/news/world/canadas-strategy-promise-now-implement-later/article4297477/
Mitchell, R. C. (2011). Sustaining change on a Canadian campus: Preparing Brock university for a campus sustainability audit. *International Journal of Sustainability in Higher Education*, *12*(1), 7–21.
Mitchell, R. C., & Moore, S. A. (Eds.). (2012). *Politics, participation & power relations: Transdisciplinary approaches to critical citizenship in the classroom and community*. Rotterdam, The Netherlands, Boston, MA and Taipei, Taiwan: Sense Publishers.
Mitchell, R. C., & Parmar, J. (2010). *Research report for Brock university on ghg (carbon) footprint – Executive summary 2008* (Unpublished report available from the authors).
Mitchell, R. C., May, B., Purdy, S., & Vella, C. (2012). UNESCO biosphere reserves: Towards common conceptual ground. In N. Ishwaran (Ed.), *The biosphere* (pp. 285–302). Shanghai, China and Rijeka, Croatia: InTech Open Access Publishers.
Moore, S. A., & Mitchell, R. C. (Eds.). (2008). *Power, pedagogy and praxis: Social justice in the globalized classroom*. Rotterdam, The Netherlands, Boston, MA and Taipei, Taiwan: Sense Publishers.
Moore, S. A., & Mitchell, R. C. (2009). Rights based restorative praxis: Promoting compliance with international standards. *Youth Justice: An International Journal*, *9*(1), 27–43.
Nicolescu, B. (2002). *Manifesto of transdisciplinarity*. New York, NY: State University of New York Press.
Nicolescu, B. (Ed.). (2008). *Transdisciplinarity – Theory and practice*. Cresskill, NJ: Hampton Press, Inc.
Prupis, N., & Lazare, S. (2014, September 23). Front-line communities rising up: Dispatches from people's climate. *Common Dreams* [online]. Retrieved December 15, 2014, from http://www.commondreams.org/news/2014/09/23/front-lines-communities-rising-dispatches-peoples-climate
Ralston Saul, J. (2008). *A fair country – Telling truths about Canada*. Toronto, Canada: Viking Canada and Penguin Group (Canada).
Robinson, J. (2008). Being undisciplined: Transgressions and intersections in academia and beyond. *Futures*, *40*, 70–86.
Suzuki, D. (2010). *The legacy – An elder's vision for our sustainable future*. Vancouver, BC: Greystone Books.
United Nations Decade of Education for Sustainable Development: 2005–2014. (2014). Retrieved December 15, 2014, from http://unesdoc.unesco.org/images/0014/001416/141629e.pdf
United Nations Educational, Scientific and Cultural Organization (UNESCO). (2012). *The road to harmony between humans and nature lies in a philosophical revolution* [Interview with Professor J. Baird Callicott]. Retrieved December 15, 2014, from http://www.unesco.org/new/en/social-and-human-sciences/themes/global-environmental-change/sv1/news/the_road_to_harmony_between_humans_and_nature_lies_in_a_philosophical_revolution_interview_with_pr_j_baird_callicott/#.VKsjdSvF-So
United Nations Educational, Scientific and Cultural Organization (UNESCO). (2014). UNESCO MAB biosphere reserves directory. Retrieved December 15, 2014, from http://www.unesco.org/mabdb/br/brdir/directory/database.asp
United Nations Intergovernmental Panel on Climate Change. (2014). *IPCC fifth assessment synthesis report*. Retrieved December 15, 2014, from http://ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_LONGERREPORT.pdf

R. C. MITCHELL AND S. A. MOORE

2. PLANETARY PRAXIS AND PEDAGOGY

Transdisciplinary Approaches to Environmental Sustainability

LOCAL TO GLOBAL CONTEXT

Our chapter presents a thematic analysis of a large, qualitative dataset collected during a two-year "critical ethnography" (Kincheloe & McLaren, 2005, p. 324), at one Ontario, Canada university campus.[1] As social science researchers in a political and cultural context increasingly viewed with skepticism and dismay throughout the world (Ralston Saul, 2008; Suzuki, 2010), we draw upon epistemological, ontological and methodological approaches from across and outside disciplinary boundaries, including Indigenous frameworks, to introduce and understand our study. The investigation focused on "transdisciplinarity" as an organizing principle for both educational reform and building contemporary research partnerships, and a subset of data focusing on "environmental sustainability" is included. Our purpose was to examine and analyze how these concepts were being epistemologically and methodologically defined and deployed at our University. Our approach echoes that of Australian sustainability scientists Brown et al. (2010, p. 4), and their efforts to tackle the wicked problems presented by climate change wherein they propose "transdisciplinarity" as the "collective understanding of an issue [that] is created by including the personal, the local and the strategic, as well as specialized contributions to knowledge". Open transdisciplinarity, they observe, includes traditional disciplines, but goes further than multi-disciplinarity to include all validated constructions of knowledge, their worldviews and methods of inquiry.

Ontario's population of 13.6 million people comprises nearly 40% of Canada's latest census, and 44 public universities and colleges have evolved to support the province's post-secondary education (PSE) demands. As part of a reform agenda in 2012, the provincial Ministry of Training, Colleges and Universities requested that each institution submit a Strategic Mandate Agreement (SMA) proposal – an outline in response to "three priority objectives" requiring each institution to avoid duplication of programming under their rubric of "differentiation" (Government of Ontario, 2013).[2] These differentiation objectives are similar to many of the goals found in the Organization of Economic Cooperation and Development (OECD) educational research, particularly those of the United Kingdom and Australia, as governments throughout the world grapple with fallout from decreased revenues after 2008's global economic meltdown (OECD, 2014).

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Canada's national association for university faculty members reported that these differentiation agreements represent "one of the most difficult periods since the formation of CAUT in 1951" (Canadian Association of University Teachers, 2012). Within the government's third objective, for example, through top-down efforts Ontario's PSE sector is being compelled to "focus on productivity, innovation, and sustainability through differentiation (strengths and areas of excellence), cost management through shared/integrated services, managing enrolment and program growth, improving productivity through teaching, technology, infrastructure, and program and degree organization innovations" (Government of Ontario, 2013, Introduction). CAUT's outgoing executive director, James L. Turk, sharply criticized the reform policy:

> In short the Minister is attempting to force presidents to reshape their institutions' priorities to meet his vision of what universities should be, as laid out in his consultation paper and elaborated in his consultation process. The Minister's mandatory timeline of doing this over the summer ensures there is not adequate opportunity for proper consultation within each institution nor time for proper involvement of the universities' collegial governance structures. (CAUT, 2012, para. one)

Canada's national newspaper further reported that the implementation of the differentiation policy framework was Ontario's "boldest step yet to compel universities and colleges to make hard choices about how they spend their resources…a draft policy designed to stretch limited provincial dollars by narrowing some schools' missions" (Bradshaw, 2013, para. two). Within our own University's agreement, the central organizing principle is "transdisciplinarity", a concept which framed the 2013 draft document through its 24 separate citations, and through the seven that remained in its final iteration (Brock University and Ontario Ministry of Training, College and Universities, 2014, p. 3). Our University has now committed its 18,750 students and 582 faculty members to a "special focus on transdisciplinary research hubs highlighting areas of strength that contribute to the social, economic, and cultural development of the Niagara Region". Further on, under "Areas of Institutional Strength" the University has pledged to focus resources "on transdisciplinary community-based research with five new transdisciplinary hubs" (2014, p. 7):

- The Brock-Niagara Centre for Health and Well-Being;
- The Institute for Advanced Bio-manufacturing;
- The Lifespan Development Research Institute;
- The Social Justice Research Institute; and
- The Centre for Sustainability: A Transdisciplinary Space for Transformative Change.

The above final new research Centre chosen for "differentiation" from all other remaining PSE institutions in the province is Brock's 'Centre for Sustainability'

(now known as the Environmental Sustainability Research Centre) where we were engaged as founding members from 2010 to 2012. As Freirean educators and researchers interested in taking forward our focus on children, we were initially enthusiastic to contribute to new climate change research by linking our previous work on human rights and transdisciplinary partnerships (Mitchell, 2003, 2005, 2010, 2011, 2015; Mitchell & Moore, 2012; Moore & Mitchell, 2008, 2009, 2011a, 2011b; Moore, Tulk, & Mitchell, 2005). The international intellectual and political scaffolding for these developments actually took shape in December 2002 when the United Nations General Assembly adopted resolution 57/254 and launched a Decade of Education for Sustainable Development (DESD, 2005–2014 by designating the U.N. Educational, Scientific and Cultural Organization (UNESCO) as lead (United Nations, 2002; see also Kahn, 2010; Mitchell, 2011; Pigozzi, 2010; UNESCO, 2014a). UNESCO's mandate for organizing the Decade encouraged member States to adopt new practices that challenge traditional educational hierarchies through promotion of:

- Interdisciplinary and holistic learning rather than subject-based learning;
- Values-based learning;
- Critical thinking rather than memorizing;
- Multi-method approaches: word, art, drama, debate, etc.;
- Participatory decision-making; and
- Locally relevant information, rather than national.

Conversely, the same decade witnessed the largest global increase in greenhouse gas emissions ever measured, and as we craft this chapter, the beautiful planet that we humans have unconsciously taken for granted for so long appears to be dying. A spate of recent scientific studies supports this dim view including the U.N.'s own International Panel on Climate Change (IPCC) 2014 assessment arguing that the world's electricity must be produced by non-carbon energy sources by 2050 in order to avoid "severe, pervasive and irreversible damage" (United Nations IPCC, 2014; Carrington, 2014). They further declare that our inaction will cost humanity much more than the price of timely and concerted actions taken by those in business and government power centres. In his analysis of the innumerable challenges facing post-secondary educators interested in pursuing the U.N. Decade's goals, Kahn (2008) observes:

> [L]iving beings and organic habitats are being culled and destroyed in the name of human production and consumption at staggering rates. Tree consumption for paper products has doubled over the last thirty years, resulting in about half of the planet's forests disappearing… while throughout the oceans, global fishing has also doubled resulting in a recent report finding that approximately 90 percent of the major fish species in the world's oceans have disappeared.
>
> Forty mile-long drift nets are routinely used to trawl the ocean bottoms, causing incalculable damage to the ocean ecosystem. Giant biomass nets, with mesh

> so fine that not even baby fish can escape them, have become the industry standard in commercial fishing and, as a result, there is expected to be no extant commercial fishery left active in the world by 2048… Further, such nets are drowning and killing about one thousand whales, dolphins, and porpoises daily, some of the very species already near extinction from centuries of commercial hunting. (Kahn, 2008, pp. 4–5)

Another startling yet similar set of conclusions was provided by the World Wildlife Fund (WWF) and its partners in the Zoological Society of London, the Global Footprint Network, and the Water Footprint Network in their biannual Living Planet Report (World Wildlife Fund, 2014). Measuring more than 10,000 species populations, they highlight the overall global decline since 1970 of more than 50% of total numbers for amphibians, reptiles, fish, birds and mammals. The current Director General of WWF, Marco Lambertini, declares: "Heads of state need to start thinking globally [and] businesses and consumers need to stop behaving as if we live in a limitless world" (World Wildlife Fund, 2014, online). In another dismal investigation that documents the poaching of African elephants, findings indicate that more than 100,000 of these gentle co-inhabitants of our world have been slaughtered just since 2010, and simply to feed an insatiable black market for ivory in China (Wittemyer, Northrup, Blanc, Douglas-Hamilton, Omondi, & Burnham, 2014).

In an investigation from the Harvard School of Public Health by Lu, Warchol, and Callahan (2014) their analysis revealed how two widely utilized pesticides from a new group known as neo-nicotinoids (those stemming from chemicals found in nicotine) were found responsible for 50% of deaths in a large sample of honeybee colonies during the winter of 2012–13 in the United States. Their findings echo research from Germany (and other Euro-states) by Benjamin (2008) that prompted the European Commission to impose a two-year ban on three of these predominantly U.S. imports while further research is carried out and reviewed (European Commission, 2013).

Indeed, award-winning Canadian author and activist Naomi Klein (Canadian Broadcasting Corporation, 2014; Flood & Irvine, 2009) notes how one waggish, US-based complex systems scientist named Bradley Werner presented his version of the climate apocalypse, "Is the Earth F-----d? Dynamical Futility of Global Environmental Management and Possibilities for Sustainability via Direct Action Activism", to 24,000 peers at a 2013 gathering of the American Geophysical Union in San Francisco (Klein, 2014, pp. 449–450; Werner, 2014). Klein also cites a group of 21 prestigious winners of the *Blue Planet Prize*, including former president of Norway Gro Harlem Brundtland whose influential 1987 Report (United Nations, 1987) has provided the world's most widely referenced definition of 'sustainability': *development that meets the needs of the present without compromising the ability of future generations to meet their own needs*. Yet in 2012, Brundtland's group suggested that "in the face of an absolutely unprecedented emergency, society has no choice but to take dramatic action to avert a collapse of civilization" (Klein, 2014, p. 22). In a similarly framed essay entitled "Can we save civilization?", Lester Brown

of the Global Policy Institute (synopsis from Crone, 2013, pp. 13–20) offers a more hopeful dichotomy than Klein's or Werner's, but one that nevertheless serves as a wake-up call challenging to those of us involved in academic research and teaching to do with environmental 'sustainability' to do more than simply shuffle the deck chairs while padding our CV's.

Glass Half-Empty

1. Soil erosion and continent-sized dust storms visible from outer space.
2. Falling water tables from massive over-pumping of aquifers throughout the world.
3. Population growth and unprecedented, ensuing destruction of natural habitats.
4. Melting ice sheets with catastrophic flooding anticipated in low-lying areas particularly such as Vietnam and Bangladesh.
5. Shrinking mountain glaciers and the largest threat to food security in history.
6. Destruction of forests everywhere which are shrinking worldwide by 17 million acres per year.
7. Environmental and climate refugees by the advance of deserts.
8. Disappearing species resulting in the 6th largest period of extinction in geological time due to habitat destruction, climate change and pollution.
9. Spreading hunger due to rising food prices spiking to one billion in 2009 with population growth, grain used to fuel cars, and shortages in irrigation water.
10. Failing states including North Korea, Sudan and Somalia – also Iraq, Syria and the Democratic Republic of the Congo – head a growing list.

Glass Half-Full

1. Wind power emerges as centrepiece of the new energy economy due to low-costs, abundance and endless capacity especially when compared to oil, gas and coal.
2. Solar power, due to increased production in the U.S., Japan, Germany – now China, Taiwan, the Philippines, and South Korea – doubles worldwide every two years.
3. Intensifying solar power which is one of the fastest growing sources of new energy due to its use of mirrors to concentrate sunlight – particularly in Northern African nations. Energy from the earth through geothermal resources.
4. Energy from the earth through geothermal sources as the U.S. experiences a geothermal renaissance.
5. Lighting revolution through LEDs which could save enough energy to close 700 of the world's 2,700 coal-fired power plants.
6. Electrifying transportation as the 21st century world shifts to highbrids, all-electric and high-speed intercity rail.
7. Bicycles are back climbing from 94 million units in 2002 to 130 million in 2007.

8. Fish farming takes off and (while not without multiple detractors) one example is China's aquacultural output at 31 million tonnes annually – double that of poultry.
9. India leads the world in milk production increasing five-fold since the 1970s.
10. Localization of food production driven by desires for fresh, safe and the smaller carbon footprint of local sources (also cited in Mitchell, 2013, pp. 511–512).

In light of our analysis so far, it's worth re-emphasizing Callicott's ontology of interconnectedness from our volume's Introduction since we agree with his basic premise that all humans "are as vortices in a flux of energy and materials, distinguishable only as ephemeral structures in that flux. We cannot – that is, we should not – conceive of ourselves as in any way independent of the natural environment" (UNESCO, 2012). Could there be additional evidence for optimism that reflects both the paradigm shift in critical thinking and the concomitant need for new behaviour regardless of the lateness of the hour? Using Brown's "glass half-full" analogy, our short answer is 'yes'. One significant domestic example was initiated in British Columbia in 2008 where the provincial government established North America's first-ever carbon tax, pricing fossil-fuel emissions within a revenue neutral scheme by taking in fuel taxes while lowering personal and corporate levies – all without the sky falling on anyone's head. Through a comparison of changes in fuel consumption, legal research from the University of Ottawa's Sustainable Prosperity Institute (Elgie & McClay, 2013; SPI, 2013) finds that British Columbia's "per capita consumption of fuels subject to the tax has declined by 19 percent compared to the rest of Canada". Enacted mere months before the global markets plunged, and with an economy that draws upon fewer than five million residents, Elgie and McClay (2013) report that the province has nonetheless "kept pace with the rest of Canada. British Columbia's experience mirrors the European experience with carbon tax shifting, and should inform the federal debate on climate change policy" (p. 1).

The *New York Times* has observed how key stakeholders in the U.S. are also giving greater urgency and legitimacy to critical frameworks for thinking about environmental sustainability and climate change research (Smith, 2013). A global U.N. summit held in New York in September, 2014 was a watershed event if only for its hundreds of significant public demonstrations and announcements indicative of this shift. Perhaps the most significant of all declarations from that week came not from the tired delegates of the General Assembly, but from a Global Investor Statement with signatories representing 361 investors and $24 trillion in assets. This group not only recommended divestment from carbon-producing fossil fuel corporations, but took concrete steps to do so (International Investors Group on Climate Change, 2014). While these events may be too little and too late for many observers, in an unexpected twist of fate one of the main players in crafting the Statement was the Rockefeller Brothers Fund, whose Asset Management group announced they have divested nearly U.S. $1 billion in holdings from fossil fuel companies – a move that must have their forebears in the founding family of Standard Oil turning in

their graves. The divestment movement could rightly be described as student-led with a gathering momentum on more than 300 campuses over the past couple of years alone, with participants encouraging college and university endowment funds – including Harvard University (2013) – to uncouple their significant holdings from fossil fuel businesses to avoid further profiting from the release of carbon into Earth's shared atmosphere. Such campus-based movements are one of numerous academic research/civil society partnerships, and such student-led activism has now led directly to hundreds of North American faculties reviewing their holdings and divesting from oil and gas related industries, including members from the University of Victoria Faculty Association (2014) in British Columbia who recently voted two to one to divest their pension funds.

As a postscript to the U.N.'s Climate Summit, U.S. President Obama and President Xi of China signed the first climate change agreement between the two nations, and signalled a sea-change in the debate particularly for the Canadian government. One popular Internet blog from *The Daily Energy Report* (Esguerra, 2014) notes:

> After several months of negotiations, the U.S. and China have acceded to fight carbon emissions in what could lead to a global pact next year. President Obama promised broader U.S. cuts in greenhouse gas emissions and China will for the first time set a target for capping its carbon emissions. Obama is setting a new target of greenhouse gas emission reduction to 26 to 28 percent below 2005 levels by 2025, up from the current target of 17 percent by 2020. Xi committed China to begin reducing carbon dioxide emissions by 2030, with the intention of trying to reach the goal sooner. (para. 1; see also Parlapiano, 2014)

In the 'glass half-full' tradition then, we present this critical ethnography at a time of intense neo-liberal reform efforts in our provincial PSE sector while observing how similar efforts are being mirrored in institutions of higher education throughout the world.

CRITICAL PEDAGOGY AND PLANETARY CITIZENSHIP

As we have noted previously (Mitchell & Moore, 2012; Moore & Mitchell, 2009), myopic uni-disciplinary worldviews and their narrow research agendas have been significant contributors to the current tenuous times for modern democratic states as world society drifts rudderless towards an apparent neo-liberal capitalist collapse (see also Giroux, 2010; Giroux & Searls-Giroux, 2004; Hyslop-Margison & Thayer, 2009; Luhmann, 1986). In one of his many seminal texts, *Knowledge and Critical Pedagogy*, Kincheloe (2010) emphasizes how "we live in an era of disinformation – self-interested data distributed by those with the most power and resources" (p. vii). "Critical pedagogy", he contends, "is a complex notion that asks much of educators and students who embrace it … critical knowledge seeks to connect with the corporeal and the emotional in a way that understands at multiple levels and

seeks to assuage human suffering" (Kincheloe, 2010, pp. 8–9; also Kincheloe, 2008, 2001). He argues "[c]ritical educational knowledge emerges neither from subjects nor from objects but from a dialectical relationship between the knower (subject) and the known (object)" (Kincheloe, 2010, p. 29).

The values espoused by Kincheloe are those of world-renowned Brazilian educator and 20th century intellectual Paulo Freire, and his writings now take our discussion into a pedagogy of sustainability – the "ecopedagogy" movement noted by Bowers and Apffel-Marglin (2008, p. viii), Kahn (2010) and others, and for which the coming generation will be held to greater account than the one departing. In their trenchant critique of Freire, Bowers and Apffel-Marglin remind us that in his final written work, he urged educational reformers to fully understand the implications of the environmental crisis. They also warn us that "it is even more important to understand that he did not recognize that the Western cultural assumptions that are the basis of his classic *Pedagogy of the Oppressed* cannot be reconciled without addressing the cultural roots of the ecological crisis" (2008, p. viii). The major limitation with Freire's ideas, claim these authors, is being "reproduced in the writings of his followers" and as such they argue some of the blame for the current planetary crisis must be placed at his own feet (*ibid*.).

Their wholesale jettison of Freire's half-century of anti-capitalist critique seems a bit of a stretch though since the 'Western' assumptions about education and capitalist expansion upon which his body of critique was founded had been readily transported and redeployed for some time previous to his work. It should also be pointed out that each re-deployment has either ignored or expunged altogether the ontological assumptions present in Indigenous cultures noting how all humans, those in the east, west, north, and south – along with all other living creatures including plants and microscopic entities – draw from the same web of life for our brief temporal journeys (Albrecht, Freeman, & Higginbotham, 1998; Apgar, Argumedo, & Allen, 2009; Arabena, 2006, 2010; Holmes & Gastaldo, 2004; Callicott, as cited by UNESCO, 2012). While Freire is rightly remembered as the "leading theorist of an ecopedagogy" by Gadotti (2000, p. 8), Kahn (2010), and others, his critical analysis of the abuse of educational power as the midwife of capitalist oppression stands out in our mind for both clarity and constancy, as it implicitly includes the underlying oppression and abuse of our planetary ecosystems.

Similar to those theorizing the interconnected dimensions of human and global complexity cited above, Kincheloe and McLaren (2005) observe that in order to "expose the various structures that covertly shape our own and other scholars' research narratives, the bricolage highlights the relationship between a researcher's ways of seeing and the social location of his or her personal history" (p. 316). This process allows for the development of new epistemological and political tools, and new ways of seeing how to apply older ones. In our own context, bricoleurs move into this domain, and the research bricolage exists out of a profound respect for complexity in the lived world, and the inherent complications of power relations. One dimension can be illustrated by explicating the relationship between research

and domains of social theory, they further suggest (2005, p. 317) while contending that when one appreciates "research as a power-driven act, the critical researcher-as-bricoleur abandons the quest for some naïve concept of realism, focusing instead on the clarification of his or her position in the web of reality" (*ibid*., p. 316). In her review of Kincheloe's (2001) earlier, clear-headed analysis of this notion, Lincoln (2001) observes:

> [The] bricoleur is far more skilled than merely a handyman [as its definition implies]. This bricoleur looks for not yet imagined tools, fashioning them with not yet imagined connections. This handyman is searching for the nexuses, the linkages, the interconnections, the fragile bonds between disciplines, between nodes of knowledge, between knowing and understanding….it is "boundary-work" taken beyond the extreme, boundary-work beyond race, ethnicity, sexual orientation, class. (pp. 693–694)

In the same review, Kincheloe's sometime co-author Peter McLaren observed how "Joe's quest for transdisciplinary rigor in the spirit of his ongoing concern with working class struggle, social transformation, and social injustice in contemporary capitalist society" might preclude an inherent danger "of the *bricoleur* in the thrall of deep interdisciplinarity lapsing into a form of epistemological relativism" (McLaren, 2001, p. 701). To our minds, Kahn's (2010) 'boundary-work' towards the liberation of all forms of eco-systemic oppression, including that being waged against the animals of the planet, is another example of Kincheloe's quest for 'transdisciplinary rigor' to address humanity's myriad problems in an uncertain time.

> In an age of unsustainable transnational capitalism, the democracy project then becomes one of *planetary citizenship*. But what is the nature of this citizenship? Are we simply extending the figure of the human in its humanist guise to the ends of the earth through a rubric of sustainable development?
>
> While it might be possible to argue that even this is more of an emancipatory political and educative vision than is presently being offered by global neoliberals…it is not clear how a global paedia [upbringing of children; related to pedagogy and pediatrics] serves to monkeywrench the anthropological machine. To my mind, planetary citizenship as imagined by the ecopedagogy movement demands the retooling of this machine as a necessary, though not clearly sufficient condition, for ecoliteracy in a time of planetary crisis. (p. 46)

Kahn's cogent argument for the growing recognition of our shared planetary citizenship is echoed by Australian Indigenous scholar Kerry Arabena (2006, 2010) in her expression of "universal citizenship". As an academic of Merriam descent from Murray Island in the Torres Strait between Australia and Papua New Guinea, Arabena envisages a framework for transforming citizenship that connects "Indigenous philosophies with ecological perspectives to underwrite strategies for living into the twenty-first century" (2006, p. 36). In so doing, she recasts

"successful Indigenous peoples as the teachers and leaders of society by contesting contemporary depictions of indigeneity" since "many ecological agendas have been marginalized in the pursuit of a global modernity" (*ibid.*). She interprets this agenda for "Universal Citizenship as an unfolding systemic framework in order to synthesise the relationships between Indigenous and ecological knowledges, place, and sustainable citizenship" (*ibid.*). Perhaps most importantly for our project and its investigation of transdisciplinary sustainability research, she emphasizes "all knowledge is Indigenous" (2010, p. 260; also Mitchell, 2015).

Kahn's (2010) work also highlights the need for "organizational transformation" within the systems related to sustainability knowledge production. While also reflecting on the U.N.'s Decade of Education for Sustainable Development, he derides the processes related to "greening the academy" (p. 103), and the hiring of lower-level technical administrators as sustainability managers whose task it is "to document for presidents and provosts how their campuses are fiscally responsible users of cutting edge sustainability technologies, even when the truth is often something other" (*ibid.*; Mitchell & Parmar, 2010; Mitchell, 2011). Moreover, he argues that programs related to PSE environmental studies (such as the object of our study herein), will often have little or nothing to do with post-colonial and feminist critiques of "*Western modern science* and *white male science*" (Kahn, 2010, p. 104, emphasis in original).

Congruent with Kahn's (2010) and Kincheloe and McLaren's (2005) analyses, we were fully aware of our need to understand the variety of complex ways that power operates to dominate and shape individual and collective consciousness, "a set of tacit rules that regulate what can and cannot be said, who can speak with the blessings of authority and who must listen, whose social constructions are valid and whose are erroneous and unimportant" (*ibid*., p. 310). Power, these critical theorists contend, is extremely ambiguous and demands detailed study and ongoing analyses. We also agreed with their sense of the emerging consensus among criticalists that *power*, as the basic constituent of human existence, also works to shape both the oppressive and productive nature of many human traditions. Indeed, "we are all empowered and we are all un-empowered" since we all possess abilities and "we are all limited in our attempts to use those abilities" (*ibid*., p. 309). However, Kincheloe and McLaren (2005, citing Carspecken, 1993, 1999) emphasize that rather than relying on…

> perceptual metaphors found in mainstream ethnographic accounts, critical ethnography, in contrast, should emphasize communicative experiences and structures as well as cultural typifications…critical ethnography needs to differentiate among ontological categories (i.e., subjective, objective, normative-evaluative) rather than adopt the position of "multiple realities" defended by many constructivists…research orientations should not determine research findings, as much as this is possible. Rather, critical ethnographers

> should employ a critical epistemology; that is, they should uphold epistemological principles that apply to all researchers. (2005, p. 327)

This chapter, and indeed the entire collection in our volume, utilizes similar Freirean principles that have been aimed at reforming and re-crafting sustainability science in higher education as more than the research assistant for multi-billionaire "extractive industries" decried by Klein (2014, pp. 79, 121, 133), Kahn (2010), Ralston Saul (2008), and Suzuki (2010). Along with Arabena (2006, 2008), Kahn (2010), and our contributors, we are suggesting that Freire's prescient final contribution to a "pedagogy of the Earth" may actually be on the verge of being manifest "for the creation of a new planetary citizenship – one that is based on a 'unifying vision of the planet and a world society'" (Gadotti, 2000, as cited in Bowers & Apffel-Marglin, 2008, p. viii).

THEORIZING SUSTAINABILITY THROUGH TRANSDISCIPLINARITY

The ethnographic study drawn on to frame this volume and the data texts utilized in this chapter were built upon student-led initiatives previously completed at our campus[3] that were also aimed at contributing to the U.N. Decade of Education for Sustainability. A pilot project had been conducted by one of us in partnership with a campus-based and pan-Canadian student's organization known as the Public Interest Research Group within the scope of the University's *Sustainability Coordinating Committee* (Mitchell, 2011; Mitchell & Corman, 2009; Mitchell & Parmar, 2010). While such efforts may be legitimate, many similar efforts noted by Kahn (2010) and Ralston Saul (2008) are actually half-hearted attempts to 'green-wash' academic facilities in order to attract ever-growing populations of new students interested in an institution promoting its environmental credentials (see also Potstra, 2008; Wallace, 2009). Similar projects have been ongoing on thousands of university and college campuses at least since 1990's Talloires Declaration made by university presidents in France (University Leaders for a Sustainable Future, 1990; also Council of Ontario Universities, 2009; Victoria University, 2014). Our own campus-wide movement was taken forward by an inaugural carbon footprint measure, and apart from the emissions data, the key finding of that investigation was the policy and research intersection with our geographical location within a UNESCO World Biosphere Reserve (UNESCO, 2014b). While this local to global connection had been fundamentally overlooked as a scholarly, teaching, funding, or branding framework (Mitchell, May, Purdy, & Vella, 2012; Van Dongen & Mayer, 2009; Van Dongen, 2011), related developments since then have generated broad, international recognition for the institution – the most prestigious to date the announcement of a UNESCO Research Chair in Community Sustainability[4] (Brock News, 2014). Kahn (2010, p. 104) notes that university-based programs built upon environmentalism and sustainability studies are most frequently housed and developed within natural

science departments who then interpret these concepts "whether due to practical necessity in chasing grant funding or ideological biases" as opportunities "to teach a curriculum of general environmental science with a small smattering of supportive ethics thrown in for good measure".

Increasingly though, transdisciplinarity is the *á la mode* international framework being adopted by problem-focused educators and researchers operating within environmental studies, climate change and complex systems scholarship (Lawrence & Després, 2004; Brown et al., 2010; Klein, 2004; see also Apgar et al., 2009; Krasny & Dillon, 2013; Kueffer et al., 2012; Leavy, 2011; Robinson, 2008; Wainwright, 2010). We also note that most European scholars writing within the tradition of transdisciplinary studies have travelled some distance from where we find ourselves in a medium-sized Canadian university, particularly in terms of evaluation and funding of such research (Brock University Trans-disciplinary Centres, 2014). While not overtly signifying their espousal of open transdisciplinarity, one such example is housed within the Institute for Advanced Study in the Humanities (2014), in a consortium of three German universities known as UA Ruhr which embodies similar principles associated with complexity and deep interdisciplinarity, particularly within their Climate and Culture research projects. Transdisciplinary studies have taken root primarily as a global reform movement in higher education, and in the foreword to an edited text by Romanian quantum physicist Basarab Nicolescu (2008), arguably the most widely referenced author in this discourse, the term is defined and delimited by Montuori (2008). Transdisciplinarity is an emancipatory project, he argues, one that is also inquiry-driven, not discipline-driven, since it recognizes we are living in an uncertain and pluralistic world and so provides us with ways of organizing knowledge and informing action to assist in tackling that complexity. It is not multi-disciplinary since it does not approach problems solely from the perspective of a number of different disciplines, neither is it inter-disciplinary which involves using the methods from one discipline to inform another discipline (Montuori, 2008, pp. ix–x). U.S. based sociologist Patricia Leavy (2011) has also defined the notion in a basic primer entitled "Essentials of Transdisciplinary Research: Using Problem-centered Methodologies":

> Transdisciplinarity is an approach to conducting social research that involves synergistic collaboration between two or more disciplines with high levels of integration between the disciplinary sets of knowledge. Transdisciplinary research practices are issue- or problem-centred, and prioritize the problem at the center of the research over discipline-specific concerns, theories or methods. Transdisciplinary research is responsive to public needs, and methodologically it follows responsive or iterative methodologies requiring innovation, creativity and flexibility often employing participatory research designs [and] has the potential to greatly enhance public scholarship. (p. 9)

Finally, as child and youth studies researchers, we also appreciated how common ground for our human rights research could open up new ways from the entrenched

"tower of babble" we had experienced, and where children's research is so often absorbed (Moore & Mitchell, 2009, p. 30; see also Moore & Mitchell, 2008; Mitchell & Moore, 2012; Mitchell, 2015). Arguing in a similar vein, Freirean theorists Giroux and Searls Giroux (2004) observe:

> [T]he cultural studies emphasis on transdisciplinary work provides a rationale for challenging how knowledge has been historically produced, hierarchically ordered, and used within disciplines to sanction particular forms of authority and exclusion. Transdisciplinary work often operates at the frontiers of knowledge, and prompts teachers and students to raise new questions and develop models of analysis outside the officially sanctioned boundaries of knowledge and the established disciplines that control them. (p. 102)

Such approaches, Giroux and Searls Giroux (2004) contend, stress both historical relations and broader social formations "while remaining attentive to new linkages, meanings, and possibilities" (*ibid*.). They argue that while educators may be forced to work within academic silos, "they can develop transdisciplinary tools to challenge the limits of established fields and context the broader economic, political, and cultural conditions that reproduce unequal relations of power" (*ibid*.). McGregor and Volckmann (2011, pp. 13–14) acknowledge the huge challenges that exist in traditionally-oriented and hierarchically managed post-secondary institutions attempting to promote such activities on their campuses. The practical necessity of integrating disciplines within the academy while at the same time integrating academics within civil society partnerships poses many challenges, not the least of which are attempts to:

1. Secure tenure, promotion and reappointment
2. Obtain grants for scholarship that spans disciplines and embraces civil society; and,
3. Engage in scholarship that intentionally zigzags back and forth among comfortably siloed disciplines, each with their own departments, library holdings, professional associations and scholarly dissemination venues.

Canadian scholars Somerville and Rapport (2002) emphasize that transdisciplinary approaches to science, politics, education, and cultural studies of media and the arts are fundamentally "associated with critique". In their description of peace research and education, they argue there is a great need for "breaking through disciplinary barriers, disobeying the rules of disciplinary etiquette. In contrast to disciplinarity…this transcendence is heretical. It is a generic rebel pushing beyond orthodoxy… the term connotes transformation". In this regard, "Michel Foucault, not Aristotle or Plato…is the paradigmatic figure of transdisciplinary studies", they declare (pp. 6–7). Similarly, Montuori (2008, p. ix) argues that "the project of transdisciplinarity is an emancipatory one", and in agreement, Kincheloe and McLaren (2005) observe "[a]s critical researchers attempt to get behind the curtain, to move beyond assimilated experience, to expose

the way ideology constrains the desire for self-direction, and to confront the way power reproduces itself in the construction of human consciousness, they employ a plethora of research methodologies" (p. 324; see also Mitchell, 2003, 2013). In addition, Somerville and Rapport maintain that transdisciplinarity provides a new framework and context for understanding the most important and difficult issues humanity currently faces, "whether in environmental protection, maintaining our health care systems, drafting new laws, formulating public policy, accommodating religious and cultural pluralism, or dealing humanely and respectfully with an ageing population" (2002, p. ii).

Developmental psychologist Jean Piaget is widely credited with coining the term in 1970, but the definition underpinning our chapter builds primarily upon Nicolescu's elucidation within his *Manifesto of Transdisciplinarity* (2002). He observes that the term "retains a certain pristine charm, mostly because it has not yet been corrupted by time" (p. 1), but that time may have arrived. Julie Thompson Klein (2004) emphasizes Nicolescu's preeminent contribution through his identification of the three pillars of transdisciplinary thought including complexity thinking, multiple levels of reality and the "logic of the included middle". In contrast to the traditional one-dimensional linearity of classical thinking, Nicolescu's transdisciplinarity embraces the logic of including a middle intellectual ground capable of coherently describing and researching different levels of reality, as well as an "open structure of unity", reports Klein (2004, p. 516). McGregor and Volckmann (2011) also note Nicolescu's critical notion of this epistemological middle ground within transdisciplinary research, assuming "that knowledge creation happens in the space among disciplines and between the academy and civil society" (p. 15). Also worth noting, the institutionalization of transdisciplinarity within universities has U.N. antecedents that began in 1987 through the creation of the International Centre of Transdisciplinary Research and Studies in Paris by Nicolescu and other colleagues. In 1995, he co-founded the Reflection Group on Transdisciplinarity in a project with UNESCO initially involving 16 scientific and cultural personalities focused on the implementation of transdisciplinary methodologies in various international fields. One of its main aims was the implementation of these principles in education, and slowly but decisively the notion has gained international impact as universities from all over the world have opened themselves to experimenting with transdisciplinary curricula, research activities and conferences (Dincă, 2011).

We've previously commented how the U.N.'s Decade of Education for Sustainable Development passed with little fanfare in many PSE institutions (Mitchell, 2011; Mitchell et al., 2012) including our own, but increasingly, intersections amongst and between economic wealth and social inequities are nevertheless emerging as integrally related to environmental integrity (Kahn, 2010; Klein, 2014). However, living, working and raising our children in a colonialized nation state – one with the world's only race-based legislation known as the *Indian Act* with statutes stemming from 1876 (Government of Canada, 1985) controlling relations for ourselves and nearly two million First Peoples – draws our attention to a previously unrecognized

disjuncture in transdisciplinary scholarship. We argue here that this disjuncture may prove integral to the environmental and social awakening that must occur if life on our planet is to sustain itself, a disjuncture that could make the difference in thinking and acting appropriately in the crucial decades to come.

Indigenous notions of environmentalism that previously produced the concept of "minimal impairment" may also be useful, observes historian John Ralston Saul (2008, p. 86). He, too, utilizes a transdisciplinary rationale in his analysis of how pluralism in Canadian society evolved from Indigenous governance systems in place at time of European contact. Like the "Eurocentric marginalization" noted by Kahn (2010, p. 105), Ralston Saul acknowledges the potential for romanticism in making these connections, although a philosophy in which humans are simply a part of nature and not a species chosen to master it is now a central assumption for most scientists whether they are looking at health, climate change, water pollution or species decimation (Albrecht et al., 1998; Arabena, 2006, 2010; Koizumi, 2001). Ralston Saul contends that the "great weakness" in mainstream appreciation of the environment today is that "we have not looked seriously at how these ideas came about and what their implications are" (2008, p. 86). He argues that Canadians are attempting to "impose the European, linear view of a human-centred world" onto the current crisis, and thereby suffer from "specialization and narrow silos that dominate education, administration, and policies […] rushing about to impose single-faceted solutions to problems we have represented simplistically" (*ibid*.).

Australian educator Michael Christie (2006) notes further that "Indigenous transdisciplinary researchers need to fight to justify the ethics of their engagement," as well as having the challenges associated with "how to obtain and maintain ethical/ethics approval from Aboriginal elders" (p. 85). Christie's work reveals a disjuncture within the literature on transdisciplinarity between those writing from European sources (see particularly Klein, Thompson, Grossenbacher-Mansuy, Häberli, Bill, Scholz, & Welti, 2001; Nicolescu, 2002, 2008) who have thus far omitted Indigenous epistemologies from theorizing and evaluation of such research altogether. In contrast, those from [post]colonial sources have included and described Indigenous thinking in transdisciplinary discussions originating in Australia (Albrecht et al., 1998; Arabena, 2006, 2010; Brown et al., 2010; Christie, 2006), in Canada (Moore & Mitchell, 2008, p. 9; Mitchell & Moore, 2012), in the United States (Leavy, 2011; Krasny & Dillon, 2013), and in South America (Apgar et al., 2009). As Christie highlights, transdisciplinary Indigenous research is different from interdisciplinary research because it moves beyond the university to take into account traditional knowledge practices which many university-based researchers will never fully understand.

This has been our experience in the current study, since the "Indigenous knowledge traditions" that Christie (2006) notes "resist definition from a Western academic perspective". There are, he further notes, Indigenous knowledge practices which will never engage with the academy, just as there are "branches of the academy which will never acknowledge Indigenous knowledge practices" (pp. 78–79). Moreover, it is clear that a quarter of a billion people on our planet operate within such knowledge

traditions, and these are highly bound up with local ecologies and participatory initiatives. As such, they are also "of key value to the development of sustainable futures, yet little work is being done to prevent the assimilation of these knowledge traditions to a Western positivist ontology", he warns (2006, p. 79).

This omission of Indigenous knowledge frameworks in a large part of the scientific and social science discourses on 'transdisciplinarity' strikes us as familiar though, especially recalling Linda Tuhiwai Smith's (1999/2012) pivotal volume – *Decolonizing Methodologies*. She notes how "'[r]esearch' is probably one of the dirtiest words in the indigenous world's vocabulary" (1999, p. 1), and with her exposition of European settler colonialism throughout the world, she recalls that its accompanying genocides were frequently facilitated through partnerships with academic researchers who played a direct role in the subjugation and assimilation of Indigenous populations (see Canadian Science Writers Association, 2013 for one example). We are mindful then of potentials for new transdisciplinary "regimes of truth" as Foucault warned us (1975, p. 30), but more specifically, that privileged attempts at decolonization of research methods may simply be aimed at reclaiming control over Indigenous ways of knowing (Fine, 2012). Nevertheless, we shed light on this disjuncture in the growing international discourse on transdisciplinarity, and particularly its reform agenda for higher education, as we navigate the "treacherous waters of colonial science" noted by Fine (2012), Tuck and Yang (2012), and others in the attempt to de-colonize ourselves, our students and our research projects.

DESIGN AND METHODOLOGY

Nestled in the 750 kilometre-long Niagara Escarpment Biosphere Reserve (which was designated by UNESCO in 1990) Brock University is one of a small cadre of academic institutions located within the boundaries of one of the nearly 600 global ecosystems comprising the World Network of Biosphere Reserves (UNESCO, 2014b) at time of this writing. More are being contemplated as the international work of UNESCO continues apace in this critical area of setting aside unique ecosystems on our planet to be understood and evaluated through its three transdisciplinary metrics. Canada's growing roster of Biosphere Reserves is currently made up of 16 such ecosystems, and their integrally related educational measures of conservation, socio-economic development, and culture are *de facto* transdisciplinary units of analysis for understanding potential improvements in sustainable relationships between humans and their environments within and beyond these sites. Following the release of findings from the University's first carbon audit (Brock News, 2009; Mitchell, 2011; Mitchell & Corman, 2009; Mitchell & Parmar, 2010), co-author Shannon Moore and I began to collaborate with colleagues whose research interests intersected with various aspects of environmental sustainability initially asking if they might be interested in partnerships aimed at more fully exploring our geographical and epistemological relationships with UNESCO (Brock News, 2011; Van Dongen & Mayer, 2009).

It is in this light particularly that we have attempted to explicate some of the complexity of Kincheloe and McLaren's "communicative experiences and structures" (2005, p. 327) in designing our study and in the analysis and reporting of this subset of findings. In short order, our University Senate unanimously approved an application to become the Environmental Sustainability Research Centre, and in a concurrent move that reflected government plans for 'differentiation' of the PSE sector in Ontario noted above, our Office of Research Services invited tenured faculty whose research had moved across Departments and Faculties to apply for internal grants of $1 million each. Through this competitive process, five overarching fields of inquiry were eventually chosen from a field of 17 applications representing 160 of the University's 582 full-time faculty members. These fields of inquiry were identified as "trans-disciplinary spaces" due to their potential to demonstrate evidence of existing strengths, and to showcase new research Centre/Institutes for discovery on local, national and international levels. One of the recipients was the Environmental Sustainability Research Centre[5] to which we had both contributed as co-founders (Brock News, 2011, 2014; Mitchell et al., 2012). It may be true that the constraints and opportunities we face in our own geographical and political location are similar to those facing many scholars writing in Western academic institutions, but understanding of this was not our main research focus. We do want to highlight as well that this research (along with each chapter from our contributors) represents an expression of 'grassroots' participatory effort that aims towards connecting the global complexity known as 'sustainability' with local realities through our theorizing, our findings, and our pedagogical concerns – an aim of critical educators everywhere. Also highlighted in the Introduction to this volume, we consider that the literature and dataset related to this project are interconnected and integral to understanding our scholarly, political, and geographical positions of privilege. As part of this bricolage of contemporary research partnerships, we turn to Kincheloe and McLaren (2005) once again to focus our attention:

> Whereas traditional researchers see their task as the description, interpretation, or reanimation of a slice of reality, critical researchers often regard their work as a first step toward forms of political action that can redress the injustices found in the field site or constructed in the very act of research itself. Horkheimer (1972) puts it succinctly when he argues that critical theory and research are never satisfied with merely increasing knowledge …
>
> Research in the critical tradition takes the form of self-conscious criticism – self-conscious in the sense that researchers try to become aware of the ideological imperatives and epistemological presuppositions that inform their research as well as their own subjective, intersubjective, and normative reference claims. Thus, critical researchers enter into an investigation with their assumptions on the table, so no one is confused concerning the epistemological and political baggage they bring with them to the research site. (pp. 305–306)

Moreover, they argue critical ethnographers are "always encountering new ways to irritate dominant forms of power", and through "operating in this way, an evolving criticality is always vulnerable to exclusion from the domain of approved modes of research" (2005, p. 306). Kincheloe and McLaren further affirm that researchers taking up this standpoint are positioned "in some places as an outsider, an awkward detective always interested in uncovering social structures, discourses, ideologies, and epistemologies that prop up both the status quo and a variety of forms of privilege. In the epistemological domain, white, male, class elitist, heterosexist, imperial, and colonial privilege often operates by asserting the power to claim objectivity and neutrality" (ibid). Indeed, the owners of such privilege often own the 'franchise' on reason and rationality, they astutely point out. Nevertheless, proponents of such an "evolving criticality" also possess a variety of tools to expose such oppressive power politics.

Finally, they assert that critical theory is well-served by drawing upon numerous liberatory discourses to facilitate diverse groups of "marginalized peoples and their allies in the nonhierarchical aggregation of critical analysts" (2005, p. 309). Our analysis is also framed by assumptions highlighted within the critical literature review – particularly Freirean pedagogy and notions of qualitative research as a part of a global bricolage related to the exercise of power – along with meanings and values associated with the concepts of 'transdisciplinarity' and sustainability. As suggested by Kincheloe and McLaren (2005, p. 3015), our ontological assumptions are "subjective, intersubjective, and normative" although we integrated these assumptions with a nascent, but growing and urgent sense of our collective planetary citizenship. As Arabena (2006, 2008) contends, we consider that these assumptions will play an increasingly important role in a greater understanding of ourselves as 21st century citizens through research frameworks that interconnect with all forms of elemental, plant, marine, animal and cosmological life (see also Callicott, 2012; Kahn, 2010; Mitchell, 2015).

Our main research question was: 'How has the concept of transdisciplinarity facilitated or hindered development of research partnerships on a Canadian campus?' Repeated invitations to members from all five Centres/Institutes yielded interviews from representatives of just three of these collaborations including the Environmental Sustainability Research Centre, with the overall dataset drawn from the following sources: academic, policy and international legal literature; fourteen face-to-face semi-structured, audio-taped and transcribed interviews[6] with key Brock University stakeholders and participants in the development of funded transdisciplinary research Centres and Institutes; and from dozens of participant observations during partnerships that conceived and launched the Environmental Sustainability Research Centre.

Our semi-structured interviews included in-depth discussions ranging from 45 to 90 minutes with key faculty informants in the early development of Brock's Environmental Sustainability Research Centre, and colleagues and administrators

involved in related transdisciplinary research endeavours at both faculty and institutional levels. Participant genders, while not a variable of analysis, were eight males compared to six females, with six of the total interviewees choosing anonymity and eight consenting to have their names associated with their comments. While a majority of interviewees consented to the latter, including participants directly engaged with the Environmental Sustainability Research Centre, a former Vice President of the University, a chemistry Professor Emeritus responsible for and engaged in public relations for the University's transdisciplinary hubs, and faculty members who reviewed competitive applications for the approval of the five $1 million awards, we've nonetheless chosen to anonymize all quotes included here due to expressed minority concern for identification by association (i.e., Quotations A-I). The following main questions guided interviews:

- Can you define any principles of 'transdisciplinarity' as you have come to know and apply them in your research, teaching or service initiatives?
- How have these principles facilitated development of research partnerships within your own program or within the institution?
- Could you describe any institutional impediments you have encountered that hindered the growth and perpetuation of 'transdisciplinary' partnerships?
- Could you describe any characteristics of individuals or organizations that have demonstrated 'transdisciplinarity' in their research, teaching and service initiatives?
- Are there any models of good practice or good governance that you have adopted, observed here, or in other institutions that have facilitated growth in 'transdisciplinary' research partnerships?
- How have the above issues played a role in the development of "sustainability" research partnerships?

DISCUSSION OF FINDINGS

While ethnographic procedures defined our larger institutional data collection, our analytical steps were further integrated with the constant "comparative analysis" of data to data, of data to literature, and of data to theory first made popular by the originators of "grounded theory" (Glaser & Strauss, 1967, p. 21; also 2009). This analytical process took place throughout 2012 with participant observations by both authors, during audio-taped research interviews from 2013–2015, before and after the transcription of those interviews, and after formal data collection had ceased. Such a close and constant analytical process revealed four distinct and recurring themes: *transdisciplinary catalysts; transdisciplinary co-opting; transdisciplinary praxis;* and *transdisciplinary Entelechy*.

The following sections review and briefly discuss salient quotes representative of these four themes. In another traditional method associated with grounded theory, we

have illustrated these themes within a diagram designated as an "Entelechy Model" for understanding the key concepts of 'transdisciplinarity' and 'sustainability' as they relate to post-secondary education in Canada and beyond (PSE). We further posit our model has portability and additional potential application across the disciplinary and paradigmatic continuum noted by Albrecht et al. (1998), Brown et al. (2010), Leavy (2011), and others cited within our literature.

Transdisciplinary Catalysts

Uni-disciplinary knowledges have a range of epistemological and methodological premises albeit with some demonstrating characteristics of "*transdisciplinarity*" as they "*build upon the insights of a variety of disciplines to create something new*", suggested participant A. Disciplines that are inherently transdisciplinary reflect a "*holistic*" directionality towards a more "*universal*" teleos or wholeness in their efforts, they continued. This contrasts reductionist and/or deterministic analyses, through a "*shared goal*" or "*common ground*", contended participant B. This same interviewee suggested these characteristics drive the "*problem solving process*" in transdisciplinary research, and are innately "*problem focussed*" with some domains such as "*environmental sustainability*" obviously transdisciplinary since related research projects cannot claim any "*existing disciplinary boundary around the ideas of sustainability*", argued A. Transdisciplinarity is the essence of a "*holistic*" way of being in the world, and an ontology that is aimed at "*moving beyond*", A observed. The same participant expanded the notion with an example from pedagogy:

> *I tell my students the only people who think they can divide up the world into history, politics, economics, psychology, and so on, are academics.*

Disciplinary categories create a "*disjuncture*" for knowledge mobilization argued this key informant. It is also necessary for academically-based scholars to be "*drawn*" out of the "*safety*" of their own disciplinary "*silos*" said A, while participant I suggested "*to do TD really does require a particular attitude*". This kind of movement allows educators to become "*catalysts for transdisciplinarity*", suggested informant B. Once again, participant I mused "*you definitely have to have respect for other people…I would use the word 'curious'- I honestly think TD is not for everybody"*. The process can be "*applied to any problem"* suggested B, but may only be facilitated through the support of governance and institutional structures. Since individual ideologies and attitudes lean away from sharing the "*range of knowledge forms and ideas*", noted B, these ideas being the "*currency of the academy*". "*Like fortresses*", A argued, disciplines are framed by "*walls, jargon*, *journals and careers….and sustained by pretentious notions of autonomy, status, prestige, income and other relations of power."* These pretensions are *"driven*

by the false concept that the world is also organized around our disciplines" maintained A. The transition from uni- or inter-disciplinary frameworks also "*takes an ontology of humility and realization that in the act of sharing our specialized knowledge forms we don't lose our power but create something larger than the sum of the ego-centric parts*", stated E.

Similarly, research relations of "*power must be addressed and equalized .... among the constellations of transdisciplinary partners*", said B, since rather ironically, transdisciplinary work calls for "*good interpersonal boundaries, transparent communication*", and a strong commitment to explicit principles. Otherwise, continued B, academic "*egos will be too insecure to open the power/ knowledge nexus…and enter the world of uncertainty that comes with the complexity*" of such problem-centred research projects. The challenge also comes when fissures become obvious between "*academic training that is designed to make us experts*", and the need to be "*open*" and "*engage in disciplinary humility*", said B within our exchanges of knowledge. Transdisciplinary approaches include the appreciation of the "*situated-ness of knowledge*", stated C, and how socially situated knowledge "*informs decisions and policy related to human- environmental relationships and problems*". In the context of environmental sustainability it is also essential that scholars open themselves to understanding various "*traditional and/ or Indigenous knowledges*", argued E, as well as the enhanced roles of "*civil society actors*". "*Transdisciplinary research is action orientated….and impacts…processes outside the university*", suggested C. This infers and involves a re-orienting towards community–centric, rather than the typical CV-centric or institutionally-centred, research aims and intentions.

Related *catalysts* for transdisciplinarity within the context of sustainability research must "*engage in self-critique*", contended B. At the same time, observed C, these catalysts must be capable of "*problematizing how different types of knowledges that impact climate change policy*" are assessed. There must be consistent "*ontological and methodological assumptions*", agreed B, and a style of "*epistemic equity*", contended C, among diverse knowledge claims and their holders. Such transdisciplinary scholarship needs a "*champion*", argued D, and C observed that because of this "*complexity*", praxis "*doesn't happen naturally and organically without facilitation or leadership*".

Numerous interviewees referred to the individual scholarly attitude towards knowledge and power in transdisciplinary relations. Qualities of "*openness to others*", said A, and "*flexibility*" considered C, help individual academics and transdisciplinary teams access the realm of "*complexity"* noted B, or the "*unities"* and "*totalities*" identified by A. When tackling the "*wicked problems of complexity and climate change*" noted by E, the greatest opportunities are found "*when space is created for individual and community partnerships outside of the walls of academe*", emphasized B.

Transdisciplinary Co-Opting

For most individual scholars, as participant H suggested "*the only way forward was to completely abandon* [my discipline] "*since working together in a TD way – it was an absolute, complete failure*". This challenge, while noted by most contributors to the burgeoning 'TD' literature, implied the concept of transdisciplinarity had simply and readily been co-opted "*as a widget to be replicated in previously established research programs built within existing uni-disciplinary frameworks*", as participant E observed. This co-opting occurs primarily due to incentive systems within PSE. Observing the process within our own University by simply adopting the term as a tool to "*advance personal research agendas*" is par for the course, suggested participant D. This interviewee also observed a very "*shallow commitment*" to any of the evaluative dimensions we've noted in the literature. This approach may also be used as a "*weapon to silence dissenting voices*", further argued B. Individuals are simply attempting to open dialogue along disciplinary lines said D, "*and talk philosophically about transdisciplinary principles*", but the actual depth of such collaborations is revealed when grants are awarded and the "*money comes out*". Then the "*old rules*" of the academy and the *"school yard*" fall into place, D further maintained.

It is apparent that these 'old rules of the school yard' have fully co-opted dominant notions of transdisciplinary collaboration in our University. As further evidenced by interviewee H, "*the only 'principle of TD' I see in these research relationships is 'commonality of theme'… all you have is multiple conversations within your own discipline, and nothing going across the disciplines*". This participant continued: *"I haven't seen transdisciplinarity here, here's how it plays out* [in the review process]. *You are in a room, you are reviewing a grant, and one of the criteria is: 'is this proposal interdisciplinary?' And not in the grant room, but over lunch, informal and off the record 'oh yeah. I know about these people'. They said 'we need to be interdisciplinary' so 'a general paediatrician, let's put them on'. And having seen how the grant functions, afterwards of course, the people who are tapped to make the grant interdisciplinary are then dropped, or shunted, or pushed away".*

These conversations observed B, are also being shaped to "*fit*" existing research agendas "*into the favoured modus operandi*" of granting and governing structures "*without understanding the established principles of the discourse present within transdisciplinary literature*", opined E. This same participant declared:

> *The likelihood of any enduring research/community partnerships based on transdisciplinary thinking here at Brock is minimal since no one I've spoken to seems to know what the hell the notion really means or how to appropriately evaluate research projects making these claims.*

The hierarchical organizational structures of academic institutions are entrenched within the type of "*top-down funding structures*" noted by C that "*act not for*

knowledge to bloom" but for the "*self-preservation of power elites*", observed B. "*Academic work has always been an elite world*", noted C, and for which certain forms of "*knowledge are privileged"*. This is a "*linear notion of how knowledge production happens*", they continued.

Under the current guise of transdisciplinary research, there "*exists a vibrant kind of branding*", says B, that simply "*rewards traditional power structures and reifies academic regimes of 'so-called' truth*". These regimes are built upon "*a priori assumptions about what works"*, said C, and thereby greatly "*limit*" how knowledge is produced and disseminated. This is demonstrated by what research is considered "*legitimate by funding agencies*" and for which much of the related transdisciplinary scholarship in our own University to date is still beholden along strict disciplinary lines of knowledge production, C further complained.

Transdisciplinary Praxis

To enact the Greek notion of praxis, or in this context *trans*disciplinarity, many scholars retain their disciplinary knowledge while in the same instance attempt to "*reach beyond our disciplinary silos*", said E. This is very different from uni-disciplinarity or multi-disciplinarity which is simply "*one plus one plus one*", observed F. Transdisciplinary praxis may be conceptualized as a "*new participatory methodology*", B pointed out, through a form of "*dialectics*" noted C, that are enacted as a "*emergent form of participatory action research that is problem focussed, community-centric*" and driven towards "*critical consciousness*", said B, and the "*collective action"* highlighted by D.

Methodologically, participatory-dialectics actualize transdisciplinary praxis. This is achieved by removing "*structural constraints*" (D) and by being institutionally led by a "*champion*" (D) for the shared goal. The transdisciplinary team needs to be open to "*moving outside of their comfort zone*" (F). The leader needs to encourage the team to acknowledge multiple perspectives to engage the fullness of understanding our complex world rather than a series of "*partial pictures*" (A) that fragment "*a vision for solution focussed action"* (E). This knowledge mobilization is aimed at "*solving problems*" (C) through "*dialectics*" (C) across "*formal and informal disciplinary contexts*" (B). This process when applied so "*social-ecological problems*" (C) necessitates having an "*eye towards complexity, an eye towards transdisciplinarity, an eye towards participation, an eye towards equity, knowledge and action*" (C), It is to "*reach further and further*"(C) beyond "*disciplines*" (C) for the benefit of "*rigorous*" (C) and "*comprehensive*" (C) "*solution-focussed praxis*" (B).

The central challenge to transdisciplinary praxis is this prerequisite of "*work in teams*", argued B, and "*collegially*" suggested D, with "*openness*", by C, and "*open-ness, respect, safe environments where it's good to disagree and be civil, having complexity, a curious personality and being humble"* as emphasized by

interviewee I. It is necessary to find others who "*share enough principles*" said B, and who are actually interested in "*looking beyond their own standpoints*", they continued, to work on "*complex problems*", and across "*disciplinary battle lines*" added interviewee E. In reality this is "*extremely difficult*", acknowledged B), and "*time consuming*" said A, and often "*painful*" they admitted A. There is also a direct relationship between the "*amount of positional power or expertise*" that an individual perceives in themselves and "*their fear of abandoning that stature by breaking down barriers to knowledge mobilization…It is easier not to work in transdisciplinary teams*" admitted B; however, when achieved, this apparent "*contradiction in motion*" A contended, has the unique potential of finding "*solutions that have never been imagined prior to these complex partnerships*" E offered.

Transdisciplinary Entelechy

Entelechy is "*a subtle and complex gestalt*", suggested B, for which the whole is greater than the sum of the parts and "*ever moving*" observed A. This is how participant B expressed the notion:

> *Transdisciplinary research is extremely difficult to authentically achieve if we consider the principles…that ask scholars to continually be critically conscious of what is not being understood and to bring in partners to help increase understanding. It is important to bring in community non-academic partners as well as indigenous and traditional knowledge. Then you need to struggle to find a common language to communicate…it is this struggle and often conflict that creates the pathway to new knowledge and solutions—and that is when it gets rewarding…this is an ever evolving process that is not finite yet is directed towards a shared goal—an Entelechy.*

The notion of Entelechy appears and was first articulated by ancient Greek philosopher Aristotle, and for an insightful discussion see Lindsay (1998). The notion was also described in the writings of 18th century German philosopher Hegel who explains Entelechy as "self-replicating" and describes "living Entelechy as the unity of multiplicity, not a unity over multiplicity" (Ferrarin, 2001, p. 189; see also Luhmann's autopoietic discussion, 1986). To achieve this style of *trans*formational knowledge production, we've turned again to the literature and to some of those who have actually accomplished these next steps in reforming academic relations in the way many of our participants aspired. In key findings from their collaborations in a Swiss-based, global sustainability consortium, Kueffer et al. (2012) point out that within academic systems, decisions made by scientists about what to study and how to allocate their time are "strongly influenced by many factors, both formal and informal, that constitute the incentive system" (p. 6). The most important factor remains "success in academic publishing" and the great pressure is to "publish their work as effectively as possible" (*ibid*.).

Rather than uni-dimensional metrics for making appointments and promotions with "high bibliometric impact" being the overriding evaluator, when reaching for transdisciplinarity, they argue, this concern simply becomes one of equal value with "other metrics related to the societal impact of the research" (*ibid*.). This progressive thinking was not present during our study, and is still quite foreign to individual academics anchored in Cartesian-style logic and decision-making procedures about what counts, or even how to count what counts. This traditional dichotomized approach was also prevalent in decision-making and resource allocation in our study, exercised by those with power dominating those with less rather than choosing to serve the larger constituencies to which we all belong beyond our professional and intellectual regimes. From their sustainability collaborations, Kueffer et al. (2012) argue for opening up the variety of measures utilized within PSE to promote and encourage diversity in transdisciplinary collaborations. These new measures include periods spent in industry, public administration and civil society organizations being seen as beneficial along with non-academic sabbaticals, staff exchanges within applied and non-academic institutions, and co-location of researchers with external partners.

To achieve Entelechy, scholars and non-academic partners operating within transdisciplinary teams need be open to "*changing and learning*" emphasized C, and moving beyond single disciplines or even interdisciplinary knowledge towards a style of "*simple complexity*" contended B. To "*authentically weave academic scholarship with Indigenous and community-based knowledges"* observed B, a grasp of the "*complex whole in motion"* is also a necessary consideration, argued participant A. They continued, in actuality it is "*impossible to fully grasp*", and this "*humbles us*" as we struggle to imagine our limited "*individual part within this totality*" acknowledged A. In the same instance, this complexity can be tethered by our sense of institutional "*stability*" said D, and as A maintained, academic support systems evident through the "*dynamics, actors, structures and processes*" with whom we intellectually engage. In the final analysis, transdisciplinary approaches to sustainability are "*solution focussed and part of a perpetual cycle of questioning, acting, being and knowing*" observed B, one that is also open to "*change, growth and uncertainty*", as observed by participant E. The result is a contradictory relationship between the arcane traditions and power relations within academe on one side, and complexity, uncertainty and access to Indigenous partnerships necessitated by Entelechy on the other. This disjuncture defining how transdisciplinary catalysts operate (as opposed to co-opting the opportunities for reform and transformation) is similar to the omission in TD literature we noted, and the challenges of "*trying to reach from the bottom up through to the top down*" observed F, in a single continuous motion. This bifurcation can be transcended when working towards a common goal with the support of governance structures and leaders willing to interface with holders of competing worldviews through transdisciplinary praxis and participatory-dialectic engagement.

To address problems of sustainability transdisciplinary teams must address their questions at the "*global ecosystem level"* (F) while also accounting for "*non-human, and human adaptation*" (E) in local communities. The end result, *Transdisciplinary Entelechy*, is not finite but an ever-moving and evolving complex similar to Niklas Luhmann (1986) notion of communicative systems transforming through social autopoiesis. Figure 1 is an illustration of such *Entelechy.*

Figure 1. Transdisciplinary Entelechy Model

CONCLUSION

In order to avoid *Co-opting Transdisciplinarity*, Figure 1 demonstrates both the system and process called for by Urry (2005) if our emergence from simple forms of environmental knowledge created by disciplinarity are to take the turn toward the *Catalysts* required to create planetary *Praxis*. These transformations are non-linear, and non-negotiable if collectively humans are going to achieve the *Entelechy* required to transform Earth's ecosystems from the current status as a toxic dump to the truly terrestrial habitat necessary for intergenerational hand-off. In Figure 1, *Transdisciplinary Catalysts* are circles representative of traditional academic faculties, uni-disciplinary departments and programs, Centres and Institutes, linked with new and emergent professions related to post-disciplinary thinking and applied in partnership with Indigenous, business, community-based and civil society actors—some of which have distinct boundaries, while some offer diffuse borders where knowledge and skills overlap or are interlinked. *Transdisciplinary Praxis* is enacted with a critical consciousness and intellectual humility, as argued by Kincheloe (2008), and others cited in our literature. Such intentions are focused on the creation of new knowledge and intelligent dissemination and application between and among academics, professionals and social actors whose places of privilege within social, cultural and academic hierarchies offer innumerable opportunities to transform individuals and regions located at the margins of political and positional power in both local and world society. What other choices are left?

In the PSE provincial reform context and our own University's response with five differentiated research 'hubs', *Transdisciplinary Praxis* appears rather remote due to our vast assemblage of epistemologies, ontologies and methodologies.

Yet, the whole project still has real potential for evolving towards the type of *Transdisciplinary Entelechy* described by our participants. Any resultant movement towards critical, integrated, *trans*formational knowledge production also has potential for the type of projects characterized by research driven by non-academic partnerships, holistic frameworks and socially inclusive procedures. The embrace of growing complexity and non-expert approaches towards tackling societal problem-solving also seems remote given the hierarchical reward systems we inhabit and the ego-centric character of most academic researchers. Thus, as noted in our literature and as our participants observed, the map of transdisciplinary power relations should be re-drawn to include planetary-wide, non-linear, and Indigenous epistemologies that exhibit open-ness, respect, humility, and equity in resource allocation and governance structures.

NOTES

[1] The study *"Leveraging Transdisciplinarity in Higher Education: A Study in Transformation"* was reviewed and received clearance through Brock University Research Ethics Board [File #12-137 Mitchell].

[2] Brock University Strategic Mandate Submission to Ontario Government (2013). Available from https://www.brocku.ca/webfm_send/29427 and accessed December 15, 2014.

[3] The initial sustainability study leading to the investigation reported in this chapter was reviewed and received clearance through Brock University Research Ethics Board [File #08-067 Mitchell and Corman].

[4] See Brock Launches UNESCO Chair in Community Sustainability (25 June, 2014). Available from http://www.brocku.ca/brock-news/?p=28727 and accessed December 15, 2014.

[5] Brock University Environmental Sustainability Research Centre – A Transdisciplinary Research Initiative (2014). Available from http://www.brocku.ca/trans-disciplinary-research/engines-of-trans-disciplinary-research and accessed 15 December, 2014.

[6] Gratitude is expressed for the hard work of transcribing taken on by our departmental colleague Ms. Ellen Carter, and Child and Youth Studies Master of Arts candidate Ms. Yana Lakman.

REFERENCES

Albrecht, G., Freeman, S., & Higginbotham, N. (1998). Complexity and human health: The case for a transdisciplinary paradigm. *Culture, Medicine and Psychiatry*, *22*(1), 55–92.

Apgar, J. M., Argumedo, A., & Allen, W. (2009). Building transdisciplinarity for managing complexity: Lessons from indigenous practice. *International Journal of Interdisciplinary Social Sciences*, *4*(5), 225–270.

Arabena, K. (2006). The universal citizen: An indigenous citizenship framework for the twenty-first century. *Australian Aboriginal Studies*, *2*(1), 36–45.

Arabena, K. (2010). All knowledge is indigenous. In V. A. Brown, J. A. Harris, & J. Y. Russell (Eds.), *Tackling wicked problems through the transdisciplinary imagination* (pp. 260–267). London, UK and Washington, DC: Earthscan.

Benjamin, A. (2008, May 23). Pesticides: Germany bans chemicals linked to honeybee devastation. *TheGuardian.com*. Retrieved December 15, 2014, from http://www.theguardian.com/environment/2008/may/23/wildlife.endangeredspecies

Bowers, C. A., & Apffel-Marglin, F. (2008). *Rethinking Freire: Globalization and the environmental crisis*. New York, NY: Routledge.

Bradshaw, J. (2013, September 18). Specialize or risk losing funding, Ontario tells universities and colleges. *The Globe and Mail* (online). Retrieved December 15, 2014, from http://www.theglobeandmail.com/news/national/specialize-or-risk-funding-ontario-tells-universities-and-colleges/article14393294/

Brock News. (2009, November 27). *New audit will size up Brock's carbon footprint*. Retrieved December 15, 2014, from http://www.brocku.ca/news/6725

Brock News. (2011, March 1). *Brock launches new unit for environmental sustainability*. Retrieved December 15, 2014, from http://www.brocku.ca/brock-news/?p=8412

Brock News. (2014, June 25). *Brock launches UNESCO chair in community sustainability*. Retrieved December 15, 2014, from http://www.brocku.ca/brock-news/?p=28727

Brock University. (2013). *Strategic mandate agreement* (Draft Submission to Ontario Government). Retrieved December 15, 2014, from https://www.brocku.ca/webfm_send/29427

Brock University. (2014). *Trans-disciplinary research: Beyond boundaries*. Retrieved December 15, 2014, from http://brocku.ca/trans-disciplinary-research

Brock University and Ontario Ministry of Training, Colleges and Universities. (2014). *Brock university strategic mandate agreement (2014–2017)*. Toronto, Ontario: Queen's Printer. Retrieved December 15, 2014, from http://www.tcu.gov.on.ca/pepg/publications/vision/BrockAgreement.pdf

Brown, L. R. (2013). Can we save our civilization? In J. A. Crone (Ed.), *15 Disturbing things we need to know* (pp. 13–20). Los Angeles, Australia, London, UK and New Delhi, India: Sage Publications.

Brown, V. A., Harris, J. A., & Russell, J. A. (Eds.). (2010). *Tackling wicked problems through the transdisciplinary imagination*. London, UK and Washington, DC: Earthscan Publications.

Canadian Association of University Teachers. (2012, September 21). *Assault on labour rights and post-secondary education* (Memorandum from Executive Director James L. Turk). Retrieved December 15, 2014, from Queen's University Faculty Association website: http://qufa.wordpress.com/2012/09/21/caut-memorandum-assault-on-labour-rights-and-post-secondary-education-21-september-2012/

Canadian Broadcasting Company. (2014, October 14). *Naomi Klein wins 2014 Hilary Weston prize*. Retrieved December 15, 2014, from http://www.cbc.ca/books/2014/10/naomi-klein-wins-2014-hilary-weston-prize.html

Canadian Science Writers Association. (2014). *Meet Ian Mosbey, the man who exposed Canada's experiments on Aboriginals*. Retrieved December 15, 2014, from http://sciencewriters.ca/2013/10/30/meet-ian-mosby-the-man-who-exposed-canadas-experiments-on-aboriginals/

Carrington, D. (2014, November 2). IPCC: Rapid carbon emission cuts vital to stop severe climate change impacts. *The Guardian*. Retrieved December 15, 2014, from http://www.theguardian.com/environment/2014/nov/02/rapid-carbon-emission-cuts-severe-impact-climate-change-ipcc-report

Christie, M. (2006). Transdisciplinary research and aboriginal knowledge. *Australian Journal of Indigenous Education*, *35*(1), 78–89.

Council of Ontario Universities. (2009). Ontario universities going greener. *Report of campus sustainability initiatives*. Retrieved December 15, 2014, from http://www.cou.on.ca/news/commentary-events/events/events-pdfs/going-greener-full-report-on-sustainability-init

Crone, J. A. (Ed.). (2013). *15 disturbing things we need to know*. Los Angeles, Australia, London,UK and New Delhi, India: Sage Publications.

Deleuze, G., & Guattari, F. (1988). *A thousand plateaus: Capitalism and schizophrenia*. London, UK:Bloomsbury Publishing.

Dincă, I. (2011). *Stages in the configuration of the transdisciplinary project of Basarab Nicolescu*. Retrieved December 15, 2014, from http://basarab.nicolescu.perso.sfr.fr/Basarab/Docs_Notice/Irina_Dinca.pdf

Elgie, S., & McClay, J. (2013). BC's carbon tax shift is working well after four years (attention Ottawa). *Canadian Public Policy*, *39*(Supplement 2), S1–S10.

Esguerra, M. (2014, November 13). US, China pledges milestone agreement versus climate change. *The Daily Energy Report*. Retrieved December 15, 2014, from http://www.dailyenergyreport.com/us-china-pledges-milestone-agreement-versus-climate-change/

European Commission. (2013). *Bees & pesticides: Commission goes ahead with plan to better protect bees*. Retrieved December 15, 2014, from http://eurlex.eropa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:139:0012:0026:EN:PDF

Ferrarin, A. (2001). *Hegel and Aristotle*. Cambridge, UK: Cambridge University Press.
Fine, M. (2012). *Decolonizing methodologies* (Review of the 2nd ed.). Retrieved December 15, 2014, from http://www.zedbooks.co.uk/node/16704
Flood, A., & Irvine, L. (2009). Outstanding 'complexity' wins Naomi Klein £50,000 inaugural Warwick prize. *The Guardian News* (online). Retrieved December 15, from http://www.theguardian.com/books/2009/feb/24/naomi-klein-warwick-prize
Foucault, M. (1975). *Discipline and punish – the birth of the prison*. New York, NY: Vintage Books.
Gaddotti, M. (2000). *Pedagogy of the earth and culture of sustainability*. Sao Paulo, Brazil: Instituto Paulo Freire.
Giroux, H. A. (2010, November 23). Lessons to be learned from Paulo Freire as education is being taken over by the mega rich. *Truthout/OP-ED* [online]. Retrieved December 15, 2014, from http://archive.truthout.org/lessons-be-learned-from-paulo-freire-education-is-being-taken-over-mega-rich65363
Giroux, H. A., & Searls Giroux, S. (2004). *Take back higher education: Race, youth and the crisis of democracy in the post-civil rights era*. New York, NY: Palgrave Macmillan.
Glaser, B. G., & Strauss, A. L. (1967, 2009). *The discovery of grounded theory: Strategies for qualitative research*. Piscataway, NJ: Transaction Publishers.
Government of Canada. (1985). *Indian Act, R.S.C. 1985*, C. I-5. Retrieved December 15, 2014, from http://laws-lois.justice.gc.ca/eng/acts/i-5/
Government of Ontario. (2013). *Ontario's differentiation policy framework for post-secondary education*. Toronto, Ontario, Canada: Queen's Printer, and Ministry of Training, Colleges and Universities. Retrieved December 15, 2014, from http://www.tcu.gov.on.ca/pepg/publications/PolicyFramework_PostSec.pdf
Hahn, S. S. (2007). *Contradiction in motion: Hegel's organic concept of life and value*. Ithaca, NY: Cornell University Press.
Harvard University. (2013). *Harvard university fossil fuel divestment statement*. Retrieved December 15, 2014, from http://www.harvard.edu/president/fossil-fuels
Holmes, D., & Gastaldo, D. (2004). Rhizomatic thought in nursing: An alternative path for the development of the discipline. *Nursing Philosophy*, *5*, 258–267.
Hyslop-Margison, E. J., & Thayer, J. (2009). *Teaching democracy – Citizenship education as critical pedagogy*. Rotterdam, The Netherlands, Boston, MA, & Taipei, Taiwan: Sense Publishers.
Institute for Advanced Study in the Humanities. (2014). *KWI – Climate and culture*. Retrieved December 15, 2014, from http://www.kulturwissenschaften.de/en/home/index.html
International Investors Group on Climate Change. (2014). *Global statement on climate change*. Retrieved December 15, 2014, from http://investorsonclimatechange.org/
Kahn, R. (2008). From education for sustainable development to ecopedagogy: Sustaining capitalism or sustaining life? *Green Theory & Praxis: The Journal of Ecopedagogy*, *4*(1), 1–14.
Kahn, R. (2010). *Critical pedagogy, ecoliteracy, and planetary crisis*. New York, NY: Peter Lang Publishing.
Kincheloe, J. L. (2001). Describing the Bricolage: Conceptualizing a new Rigour in qualitative research. *Qualitative Inquiry*, *7*(6), 679–692.
Kincheloe, J. L. (2008). *Critical pedagogy primer*. New York, NY: Peter Lang Publishing.
Kincheloe, J. L. (2010). *Knowledge and critical pedagogy – An introduction*. New York, NY: Springer.
Kincheloe, J. L., & McLaren, P. (2005). Rethinking critical theory and qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (3rd ed., pp. 303–342). Thousand Oaks, CA: Sage Publications.
Klein, J. T. (2004). Prospects for transdisciplinarity. *Futures*, *36*(4), 515–526.
Klein, J. T., Grossenbacher-Mansuy, W., Häberli, R., Bill, A., Scholz, R. W., & Welti, M. (Eds.). (2001). *Transdisciplinarity: Joint problem solving among science, technology and society – An effective way for managing complexity*. Basel, Boston and Berlin: Birkhäuser Verlag.
Klein, N. (2014). *This changes everything – Capitalism versus the climate*. New York, NY: Simon & Schuster.

Koizumi, H. (2001). Trans-disciplinarity. *Neuroendocrinology Letters*, *22*(4), 219–221.
Krasny, M. E., & Dillon, J. (2013). *Trading zones in environmental education – Creating transdisciplinary dialogue*. New York, NY: Peter Lang Publishing.
Kueffer, C., Underwood, E., Hirsch Hadorn, G., Holderegger, R., Lehning, M., Pohl, C., … Edwards, P. (2012). Synthesis – Enabling effective problem-oriented research for sustainable development. *Ecology and Society*, *17*(4), 1–16.
Lawrence, R. J., & Deprés, C. (2004). Futures of transdisciplinarity. *Futures*, *36*(4), 397–405.
Leavy, P. (2011). *Essentials of transdisciplinary research: Using problem-centered methodologies*. Walnut Creek, CA: Left Coast Press.
Lincoln, Y. S. (2001). An emerging new Bricoleur: Promises and possibilities—A reaction to Joe Kincheloe's "describing the Bricoleur". *Qualitative Inquiry*, *7*(6), 693–696.
Lindsay, S. A. (1998). *Implicit rhetoric: Kenneth Burke's extension of Aristotle's concept of entelechy*. Lanham, MD: University Press of America.
Lu, C., Warchol, K. M., & Callahan, R. A. (2014). Sub-lethal exposure to neonicotinoids impaired honey bees winterization before proceeding to colony collapse disorder. *Bulletin of Insectology*, *67*(1), 125–130.
Luhmann, N. (1986). The autopoiesis of social systems. In F. Geyer & J. van der Zouwen (Eds.), *Sociocybernetic paradoxes* (pp. 172–192). London, UK: Sage Publishers.
McGregor, S. L. T., & Volckmann, R. (2011). *Transversity – Transdisciplinary approaches in higher education*. Tucson, AZ: Integral Publishers.
McLaren, P. (2001). Bricklayers and Bricoleurs: A Marxist Addendum. *Qualitative Inquiry*, *7*(6), 700–705.
Mitchell, R. C. (2003). Ideological reflections on the DSM-IV-R (or pay no attention to that man behind the curtain, Dorothy!). *Child and Youth Care Forum*, *32*(5), 281–298.
Mitchell, R. C. (2005). Postmodern reflections on the UNCRC: Towards utilising article 42 as an international compliance indicator. *The International Journal of Children's Rights*, *13*(3), 315–331.
Mitchell, R. C. (2010). Who's afraid now? Reconstructing Canadian citizenship education through transdisciplinarity. *Review of Education, Pedagogy and Cultural Studies*, *32*(1), 37–65.
Mitchell, R. C. (2011). Sustaining change on a Canadian campus: Preparing Brock university for a campus sustainability audit. *International Journal of Sustainability in Higher Education*, *12*(1), 7–21.
Mitchell, R. C. (2013). Reflections on the UNCRC from a transdisciplinary bricoleur. Special issue on the future of children's rights. *The International Journal of Children's Rights*, *21*(3), 510–522.
Mitchell, R. C. (2015). Re-theorising child citizenship through transdisciplinarity: From the local to the global. In W. Vandenhole, E. Desmet, D. Reynaert, & S. Lembrechts (Eds.), *The international handbook on children's rights studies* (pp. 164–182). Abingdon, Oxon and New York, NY: Routledge Publishers. ISBN: 978-1-315-76953-0
Mitchell, R. C., & Corman, J. (2009). *Sustaining change at Brock: Research report – Preparing Brock university for the campus sustainability audit 2008–09* (Unpublished report available from the authors).
Mitchell, R. C., & Moore, S. A. (Eds.). (2012). *Politics, participation and power relations: Transdisciplinary approaches to critical citizenship in the classroom and community*. Rotterdam, The Netherlands, Boston, MA and Taipei, Taiwan: Sense Publishers.
Mitchell, R. C., & Parmar, J. (2010). *Research report for Brock university GHG (carbon) footprint – Executive summary 2008* (Unpublished report available from the authors).
Mitchell, R. C., May, B., Purdy, S., & Vella, C. (2012). UNESCO biosphere reserves: Towards common conceptual ground. In N. Ishwaran (Ed.), *The biosphere* (pp. 285–302). *InTech Open Access*, ISBN: 978-953-51-0292-2. Retrieved December 15, 2014, from http://www.intechopen.com/books/howtoreference/the-biosphere/unesco-biosphere-reserves-towards-common-intellectual-ground
Montuori, A. (2008). Foreword. In B. Nicolescu (Ed.), *Transdisciplinarity – Theory and practice* (pp. ix–xvii). Cresskill, NJ: Hampton Press, Inc.
Moore, S. A., & Mitchell, R. C. (Eds.). (2008). *Power, pedagogy and praxis: Social justice in the globalized classroom*. Rotterdam, The Netherlands, Boston, MA and Taipei, Taiwan: Sense Publishers.

Moore, S. A., & Mitchell, R. C. (2009). Rights-based restorative praxis: Promoting compliance with international standards. *Youth Justice: An International Journal*, *9*(1), 27–43.

Moore, S. A., & Mitchell, R. C. (2011a). Theorising rights-based restorative justice: The Canadian context. *The International Journal of Children's Rights*, *19*(1), 81–105.

Moore, S. A., & Mitchell, R. C. (2011b). Human rights within/without education: A critical pedagogy for troubling times. In J. A. Kentel (Ed.), *Educating the young: The ethics of care* (pp. 189–210). Oxford, England: Peter Lang Publishing.

Moore, S. A., Tulk, W., & Mitchell, R. (2005). Qallunaat crossing: The Southern-Northern divide and promising practices for Canada's Inuit young people. *First People's Child and Family Review*, *2*(1), 117–129.

Nicolescu, B. (2002). *Manifesto of transdisciplinarity*. New York, NY: State University of New York Press.

Nicolescu, B. (Ed.). (2008). *Transdisciplinarity – Theory and practice*. Cresskill, NJ: Hampton Press, Inc.

Organization for Economic Cooperation and Development (OECD). (2014). *The education policy outlook*. Paris, France: Directorate for Education Policy and Skills, OECD. Retrieved December 15, 2014, from http://www.oecd.org/edu/policyoutlook.htm

Parlapiano, A. (2014, November 12). Asia Pacific - Climate goals pledged by China and the U.S. *The New York Times*. Retrieved December 15, 2014, from http://www.nytimes.com/interactive/2014/11/12/world/asia/climate-goals-pledged-by-us-and-china-2.html?_r=0

Pigozzi, M. J. (2010). Implementing the UN decade for education in sustainable development (DESD): Achievements, open questions and strategies for the way forward. *International Review of Education*, *56*(2–3), 255–269.

Potstra, A. (2008, October 7). How green is Brock? *Brock Press*. Retrieved December 15, 2014, from http://www.brockpress.com/2008/10/how-green-is-brock-3/

Ralston Saul, J. (2008). *A fair country: Telling truths about Canada*. Toronto, Canada: Viking Canada and Penguin Group (Canada).

Robinson, J. (2008). Being undisciplined: Transgressions and intersections in academia and beyond. *Futures*, *40*(1), 70–86.

Smith, L. T. (2012). *Decolonizing methodologies* (2nd ed.). London, UK: Zed Books. (Original work published 1999)

Smith, R. (2013, September 5). New divestment focus on campus: Fossil fuels. *The New York Times*. Retrieved December 15, 2014, from http://dealbook.nytimes.com/2013/09/05/a-new-divestment-focus-fossil-fuels/?module=Search&mabReward=relbias%3Ar%2C{%221%22%3A%22RI%3A10%22

Somerville, M. A., & Rapport, D. J. (2002). *Transdisciplinarity: Recreating integrated knowledge*. Oxford, UK: EOLSS Publishers Co. Ltd.

Sustainable Prosperity Institute. (2013). *BC's carbon tax shift after five years: Results – an environmental (and economic) success story*. Retrieved December 15, 2014, from http://www.sustainableprosperity.ca/article3685

Suzuki, D. (2010). *The legacy: An elder's vision for our sustainable future*. Vancouver, BC: Greystone Books.

Tuck, E., & Yang, K. W. (2012). Decolonization is not a metaphor. *Decolonization: Indigeneity, Education & Society*, *1*(1), 1–40.

United Nations. (1987). *Report of the world commission on environment and development* (The Brundtland report). Retrieved December 15, 2014, from www.worldinbalance.net/intagreements/1987-brundtland.php

United Nations. (2002). *Resolution 57/254 – United Nations decade of education for sustainable development*. New York, NY: United Nations General Assembly. Retrieved December 15, 2014, from http://www.un-documents.net/a57r254.htm

United Nations Educational, Scientific and Cultural Organization (UNESCO). (2012). *Interview with professor J. Baird Callicott*. Retrieved December 15, 2014, from http://www.unesco.org/new/en/media-services/single-view/news/the_road_to_harmony_between_humans_and_nature_lies_in_a_philosophical_revolution_interview_with_pr_j_baird_callicott/#.VF_LLfnF-So

United Nations Educational, Scientific and Cultural Organization (UNESCO). (2014a). *Decade for education in sustainable development (DESD) 2005–2014*. Retrieved December 15, 2014, from http://www.unesco.org/new/en/education/themes/leading-the-international-agenda/education-for-sustainable-development/

United Nations Educational, Scientific and Cultural Organization (UNESCO). (2014b). *Man and the biosphere (MAB): Biosphere reserves directory*. Retrieved December 15, 2014, from http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/man-and-biosphere-programme/

United Nations International Panel on Climate Change (IPCC). (2014). *IPCC climate change 2014 synthesis report*. Geneva, Switzerland and New York, NY: United Nations.

University Leaders for a Sustainable Future. (1990). *Talloires declaration*. Retrieved December 15, 2014, from http://www.ulsf.org/programs_talloires.html

University of Victoria Faculty Association. (2014). *Faculty association delivers letters on fossil fuel divestment*. Retrieved December 15, 2014, from http://www.uvicfa.ca/1/faculty-association-delivers-letters-on-fossil-fuel-divestment/

Urry, J. (2005). The complexity turn. *Theory, Culture & Society*, *22*(5), 1–14.

Van Dongen, M. (2011, March 14). Carbon count just the beginning for Brock. *The Welland Tribune*. Retrieved December 15, 2014, from http://www.wellandtribune.ca/2011/03/14/carbon-count-just-the-beginning-for-brock

Van Dongen, M., & Mayer, T. (2009, November 30). Brock takes steps to determine carbon footprint. *The St. Catharines Standard*. Retrieved December 15, 2014, from http://www.brocku.ca/webfm_send/3957

Victoria University. (2014). *Environmental sustainability at Victoria university in Melbourne, Australia*. Retrieved December 15, 2014, from http://www.vu.edu.au/about-us/vision-mission/environmental-sustainability-at-vu

Wainwright, J. (2010). Climate change, capitalism, and the challenge of transdisciplinarity. *Annals of the Association of American Geographers*, *100*(4), 983–991.

Wallace, K. (2009, February 4). Universities' ivory towers going green: Driven by idealism and academic research energy-saving projects are flowering on campus. *The Toronto Star* (Section GT, p. 3). Retrieved December 15, 2014, from http://www.thestar.com/news/gta/2009/02/04/universities_ivory_towers_going_green.html

Werner, B. (2014). *Complex systems laboratory – University of California at San Diego*. Retrieved December 15, 2014, from http://complex-systems.ucsd.edu/

Wittemyer, G., Northrup, J. M., Blanc, J., Douglas-Hamilton, I., Omondi, P., & Burnham, K. P. (2014). Illegal killing for ivory drives global decline in African elephants. *Proceedings of the National Academy of Sciences*, *111*, 13117–13121.

World Wildlife Fund. (2014). *Living planet report 2014*. Retrieved December 15, 2014, from http://wwf.panda.org/about_our_earth/all_publications/living_planet_report/

RICHARD J. VAREY

3. MARKETING FOR SUSTAINABLE LIVING

A Problem of Crisis Calling for Pragmatism

INTRODUCTION

The great accomplishment of the past 300 years has been the building of a pervasive classical science and derivates, including economics. Yet we are resolutely acknowledging that continued unreflective employment of this worldview is now getting us deeper into trouble. We need a pragmatic (practical, sensible) alternative – we can find it through *Pragmatism*.

On a lifetime's reflection, David Suzuki observes the cataclysmic changes in society and our relationship with and the dire effect on Earth's ecosystems, and consequently on our own well-being. He points out the limits of scientific reductionism and the need to adopt a more holistic point of view: the laws of nature have priority over the forces of economics and the planet cannot sustain unfettered growth. In this state of crisis, we must join together to make a better future by re-visioning to determine the way we need to act. We need to re-think accepted thinking, and not only what we think (know) but also how we come to get to that thinking. Suzuki draws on Thomas Berry's appreciation of the *story* in human understanding. Humanity's old story is now leading us astray. We need to learn a new one about the future we want so as to move from discomfort, confusion, and debate into transformational personal and collective action towards sustainable living. Everyone has an interested role so we need *social learning*, the necessary future of teaching and learning. Sages of socio-cultural evolution Lester Milbrath and Marshall McLuhan called for us to learn our way out and thus escape into understanding.

Praxis is the process by which a theory, lesson, or skill is enacted, practiced, embodied, or realised. Praxis may also refer to the act of engaging, applying, exercising, realising, or practicing ideas. Knowledge is held if acted upon. In the educational sense, praxis is a recurring passage through a cyclical process of experiential learning. Paulo Freire defines praxis as "reflection and action upon the world in order to transform it" (1996). Through praxis, we can acquire a critical awareness of our own condition and make an intelligent wise choice: destroy, pollute, and degrade in chasing profit maximisation, or live in harmony with supporting ecosystems to protect, conserve, and regenerate for human betterment and well-being. Wisdom is a product of contemplation, knowledge, and sound judgement. Robert Sternberg's balance theory of wisdom addresses intelligence, creativity,

R. C. Mitchell & S. A. Moore (Eds.), Planetary Praxis & Pedagogy, 41–71.

values, balanced intra/inter/extra-personal interests for the common good in the short and long term, adaptation, shaping and selection.

(American) Pragmatism, most widely known in John Dewey's educational philosophy, is based on the premise that the human capability to theorise is necessary for intelligent practice. Theory and practice are not separate spheres; rather, theories and distinctions are tools or maps for finding our way in the world. As Dewey put it, there is no question of theory versus practice but rather of intelligent practice versus uninformed practice. Pragmatism offers an alternative to classical scientific understanding – thus away from seeing individuals who connect, to seeing society as the whole and an individual as an abstraction from the inherently social collective. Characteristics of Pragmatism are *organic* – emergence, holism, continuity, quality, and indeterminism, whereas classical science offers thinking that is reductionist, atomistic, quantitative, deterministic – i.e., mechanistic. Pragmatism offers a strong stance for defining and understanding the value(s) of transdisciplinary thinking, and is increasingly recognised as a strong basis for building a philosophy of sustainable development (Holden, 2008).

In learning our story for the future, we are creating it through what Freire called *shared investigation*: "we make the road by walking". Such *social learning* is communicative and collective cultural learning for the future, as distinct from and transcending the as yet more common individual/personal transmissive informational and instrumental learning for the now whilst looking in the "rearview mirror".

To illustrate the power of stories of the future, well-known in science fiction, but less well realised in the social sciences, and especially in the instrumentally rational business sphere, a forward thinking short story of the humanistic provisioning system beyond consumerism is told. This draws on Lawrence Lessig and Yochai Benkler for the notion of 'social production', Paul Raskin's 'great transition', Ernest Callenbach's 'ecotopia', and several other consonant inspirations. It is somewhat rare for a business school professor to take a philosophical stance beyond reductionist economic thought – indeed it is actively discouraged in favour of expediency and proficiency. I remain committed to investing in learning my way out of the confusion and often self-defeating partiality of disciplinarity and into democratic inquiry.

FOR WHAT PROBLEM IS PRAGMATISM THE SOLUTION?

This chapter is a transdisciplinary review of the societal problem that is largely treated by the applied discipline of Marketing – the fulfilment of needs in a social life. The mainstream disciplinary treatment does not recognise the totality of the whole system within which it operates, and thus does not address the consequences and limits that are observable from the transcendent understanding. A transdisciplinary understanding recognises the complexity of the problem – how to flourish within limits – that does not emanate from within the science sub-disciplines, even if

so-called 'marketing science' can be scientific (in method and purpose) in its partial understanding from its limiting perspective. That is, the pursuit of proficiency for profit without appreciation of costs that can be discerned from a higher level of knowledge. When we fragment the world in our thinking – to make it easier to deal with the complexity – we lose sight of the consequences of our actions. We need contextual knowledge.

Max-Neef (2005) helpfully outlines a hierarchy of knowledge discipline domains, comprising base logics that describe and explain empirically what exists, on which is founded technological knowledge of what we are capable of doing, overseen by political (planning) knowledge of what we want to do, and ethical (ecological) knowledge concerned with how we should do what we want to do (see Figure 1). These levels of knowledge may be thought of as, in turn, foundational, orientational, and realisational.

The empirical and technological knowledge is purposive, whilst the political and ethical knowledge is normative. In the context of business, this can be represented as strategic, operative, and normative (Figure 1). At the base, the motivation for business is seen as wealth accumulation, whilst the whole system view reveals provisioning within limits as the 'higher' purpose. Hirsch Hadorn et al. (2006) consider how problems are identified and defined, and distinguish three kinds of 'normal-science' research: Applied research is mission-oriented, Professional consultancy is client-serving, and Basic research is curiosity-motivated. On the other hand, Post-normal (transdisciplinary) science is issue-driven, focusing more on problems than on intellectual tools and knowledge models.

Marketing is (generally) understood and researched at the technological level of purposive communication and control, drawing from logics of economics, psychology, sociology, etc. This division fails to recognise consequences of actions for the whole society system at the political/normative and ethical/values levels. Marketing ('professional') practice is typically operative (skills and resources) as the basis for determining strategy (what to do?), or strategic as the basis for operational decisions (what is required to accomplish goals?). This can be seen in the case of ethical tests applied to what can be done with minimal contention (Varey, 2011a). Ethics is seen to be an extraneous incursion into normal practice from another realm (Clegg et al., 2007). Founding proponents of the recently emergent 'service-dominant logic for marketing' (Vargo & Lusch, 2004) claim the logic to be "accommodating, integrating, and transdisciplinary" (Lusch & Vargo, 2010). Co-creation is a central concept. The inherent ethicality of the logic suggests it is a framework for the whole system understanding, and as such is a focus for integrating the marketing discipline into the higher purpose of provisioning, with reward following from effective and efficient betterment of lives. This is in stark contrast to the technological money-making purpose of corporate (micro-) marketing.

<table>
<tr><td rowspan="4">Macromarketing: ditto, <u>also</u> political, ethical
Marketing Science:
empirical, technological</td><td>Values</td><td rowspan="2">Post-normal-science, Synoptic</td><td rowspan="3">Integrated, Transdisciplinary</td></tr>
<tr><td>Planning</td></tr>
<tr><td>Business (marketing)</td><td>Applied, Consulting</td></tr>
<tr><td>Economics</td><td>Basic, Abstractive</td></tr>
</table>

Figure 1. A hierarchy of knowledge disciplines

Marketing Science draws assumptions and values from abstractive economics, whereas Macromarketing transcends disciplinary boundaries to integrate empirical and technological knowledge of basic and applied domains with political and ethical knowledge for a synoptic or integrative whole system understanding (Figure 1). This isn't, however, the common practice. Macro and micro perspectives compete for relevance and legitimacy, as do associated methodological preferences (MacInnes, 2005). Base understanding is reductive and transactional. At the higher level, thinking is systemic, embracing complexity. Looking again at the hierarchy, we can observe that the normative can be the basis for determining strategy, and then operations: How should we do what we want to do?" precedes "what is it we want to do?" before answers to "What are we capable of doing?' need to be considered. Amoral marketing (if it truly exists!) usually begins with skills, capabilities ("resources") and a "gap in the market" ("opportunity"). Yet, business can have a higher purpose than mere competitive profiting. From within a disciplinary view, this complexity is not evident or is to be avoided as complicating in the pursuit of efficiency for wealth. The transdisciplinary understanding is both transcendent and integrative. Instead of worrying about, and accepting the inevitability of, an academic-practitioner divide (actually, both academics and practitioners practice – it is what and why that matters here), we need to organise for integration of the discipline in the transdisciplinary understanding. Following C P Snow's notion of 'two cultures', Marketing Science needs to evolve from the base in normal science, to a humanistic marketing that serves society by rehumanising the logic in a "human science" (Varey & Pirson, 2013). The transcending (synoptic) fields don't engage with the 'applied' discipline of marketing, believing there to be a paucity of intellectual/scholarly ambition and theory development. But without such intellectual excursions, the thinking that results in crisis isn't challenged and solutions are not synthesised and holistic. It is overly simplistic to imagine that marketers apply knowledge produced by academics. Perhaps the role of the scholar is to 'test' what 'practitioners' know in a complexity worldview! The outcomes of a hungry community competitively fishing a small lake will change when an ecologist joins!

The transdisciplinary process is a communal participatory strategy for integrating knowledge, reconciling values and preferences, and creating 'ownership' of problems and solution choices among multiple options. The knowledge, needs and interests of those involved in the problem are accounted for in bringing about societal changes

'where facts are uncertain, values in dispute, stakes high and decisions urgent' (Funtowicz & Ravetz, 1993, p. 744). Knowledge production assumes application – for and with participatory society. Knowledge is co-managed as a public good, not as private property. Max-Neef (2005) discerns weak transdisciplinarity and strong transdisciplinarity. In the former is practical application of logic and methods of multiple (differentiated) disciplines in attempting to be more systemic, yet this remains analytic, linear, and transactional. Strong transdisciplinarity, on the other hand, is inherently holistic and integrative, recognising disciplinary complementarity and relationality, towards synthesis around actionable themes.

Is the scholar's role to think, read, write, and otherwise profess in the transdisciplinary mode (transdiscursively)? With a will to change, for the better, and a social conscience, transdisciplinarity seems necessary in addressing the interrelationship of society and science. To not do so reduces the intellectual effort of the 'researcher' to that of tinkering technician. The challenge is to study interacting and co-evolving ecological and social systems for understanding that is holistic, critical, constructive, participatory, adaptive for a continuing education guided by the principles of sustainability (an integrative concept). It is interesting to note that transdisciplinarity is an essentially European philosophical, social tradition—synoptic rather than analytic. The emergent 'meta-disciplines' of *Sustainability Science* (e.g., Kajikawa, 2008; Lang et al., 2012) and *Ecological Economics* (e.g., Costanza, 1991; Funtowicz & Ravetz, 1994; Costanza et al., 2007; Baumgärtner et al., 2008) each move beyond 'normal science' (itself based on and operating with normative assumptions and valuations despite an ambition to 'objectivity') and might be classified as transdisciplinary in character and purpose.

PRAGMATISM AND TRANSDISCIPLINARY THINKING

Multidisciplinary understanding comes from studying a topic in several disciplines simultaneously, always in service of the focal discipline and limited to disciplinarity. Interdisciplinarity applies methods from a discipline to another and addresses language differences, and remains discipline-bound. Transdisciplinarity, on the other hand, understands the world in the unity of knowledge, at once across, between, and beyond all disciplinary assumptions of legitimate sources/bases of knowing, thus drawing on the original scientific spirit of questioning, intuition, and imagination to reconcile effectiveness and efficiency. Disciplinary research recognises and addressees fragments of single levels of reality, whilst the complementary purpose of transdisciplinary research is to deal with multiple levels of reality and with complexity and the lived experience of self-transformative knowledge of the self, the unity of knowledge, and the creative art of living – of human being – in society (Nicolescu, 2002).

UNESCO have positioned transdisciplinarity – the study of the universal humanism – as required for a 21st Century education that emphasises learning to know, learning to do, learning to live together (in collectivity), and learning to be. The challenges

facing society are not uni-discplinary, thus requiring integrative understanding, but education remains largely so. An integrating synthesis is necessary to deal with the "disciplinary big bang' of applied science/technology and the complexity of ill-defined, confused 'wicked problems' that when treated by separate disciplines bring forward solutions in a given sphere that can produce problems in others.

The problem to be solved – with a transdisciplinary perspective – isn't 'tolerated' or 'tamed' marketing as an antidote to consumerism and over-consumption, but rather sustainable provisioning. Whereas the common understanding is that a practitioner-academic divide must be bridged with better communication, we see here instead that the stubbornly rational linear reason of economics is incapable of solving the problems it addresses, and yet remains powerfully influential on decisions affecting nature and society destructively, even devastatingly, and often irreversibly. Instead of a discipline focus, problem-centred integral thinking aims to harmonise relational and rational thought in complementary convergence to solve problems that don't fit neatly into socially constructed ("partial") disciplines. Integral education – learning to live – within the complexity worldview is free of reductionist and mechanistic assumptions.

It is increasingly apparent that the focus of knowledge making in Marketing is shifting from short-term how to do it (method and technique and proficiency), to clarifying purpose – why is marketing necessary? The other shift evident is from understanding a supply (firm) driver in which firms use marketing to push consumption, to appreciating demand doing the initiating, valuing, and shaping of business in which people use marketing to pull resources towards better lives, thus marketing is (once again) in service of society. With the rise of the active, deliberative, and thus sophisticated citizen-customer the firm is invited into value creation by the citizen-as-consumer. That the 'problem' of achieving a sustainable way of living is without doubt complex is an understatement. It is perhaps not simply a matter of societal values shifting and marketing responding, or even of marketing shifting to support a societal movement. Political processes and business processes are not independent.

In his recent review of business and the scientific worldview, Buchholz (2012) urges each of us to ask what does it cost me and the society of which I am a member to maintain the classical scientific worldview of 'normal science' economism? The industrial age business of scientific business is founded on and reinforces a certain view of culture, government, and nature, and how business relates. The 'new science' understanding has implications for business and marketing. Buccholz argues that the classical scientific worldview brings values into aspects of life – ethics, economics, politics, culture, and our relationship with nature – such that we are deprived of true meaning. The characteristics of classical science are reductionism, atomism, quantification, determinism, and the assumption of mechanism – that the meaning of the parts provides meaning of the whole. This science is supposed to be passive, disinterested; there are only facts, there are no values. But, the new science shows a view of a world that is organic, and holistic. The meaning of the whole is the basis

for the meaning of parts. There is a fact-value distinction, and both are necessary to understanding.

In applying classical science in Economics, dominance of the market system over the social system is entailed. Thus, we have a confusion of thinking about society-oriented markets and market-oriented society. The environment is not valuable only in discrete units of exchange. The imperfections of the classical viewpoint have led to the emergence of social responsibility thinking for business embedded in a market economy, in society, recognising not two separate, autonomous, bounded linked entities in which firms are separate independent agents. From the macro view, it is clear that business has been understood as a collection of colliding atoms in a mechanistic process of transactions and interactions. But, in this way of thinking there is no moral theory that ascribes obligation to work towards social betterment. Such social responsibility has remained rooted in the classical scientific worldview. Atomistic individualism, that there are individual selves distinguishable from other selves and defined apart from any social context, is also embedded in stakeholder theory to describe the business-society relationship – the firm's identity is formed independent of its stakeholders.

Whereas the original idea of the social responsibility of business was expressed in terms of economic growth for progress, it is now recognised that single-minded growth pursuit produces negative effects imposing social costs on society. The newly emerging business-society contract with new "rules of the game" requires quality of life outcomes beyond quantity of output – value for society in terms of a wider range of values. Yet again, however, society and business are understood as separate entities with conflicting interests, so negotiated trade-offs are assumed to be the way to make decisions, not realising the embeddedness of business in society. A relational view of commercial firms and society goes some way to broaden the view of role and responsibility, but they are both trapped in the mechanistic scientific way of thinking, rather than understood as facets of society seen through different ontologies within the integral worldview.

Politics for community, not a collection of isolated individuals, seeks commonality of courses of action towards good for all participants, but this understanding is undermined by the scientific worldview. The reduction of society to the clashing of individuals makes true community impossible, evidenced in long-standing rivalry of public and private interests, as debated among libertarianists and communitarianists in a continuing dichotomisation such as individual identity vs group conformity, and individual rights vs community interests. But is this any more than simplistic collectivism and majoritarianism? The reductionist view places persons as isolatable individuals with absolute rights, rather than as inherently social persons integral in a community. The moral basis for democracy is eroded by reductionism and atomism, as then government is only the co-ordination of supply and demand of public goods and services, with no particular conception of good life or purpose in promoting the common good, and not representing and helping create a true community.

In discussing culture, Buchholz explains the scientific basis in which what we now term technology for using resources emerged, and thus is a capitalistic culture to exploit, and the rise of the science of economics. He charts the rise and demise of the (Protestant) (work) ethic, and the associated "cult of consumption." The moral justification of capitalism became hedonism in the mid-20th century in a value shift that forwarded immediate gratification and narcissism. There was an absence of a higher moral purpose for capitalism above the materialistic conception of the good life. Science and technology provide the means for supply to meet demand. More is better in the quantitative way of life, and in the pursuit of growth a better life comes through continued exploitation of nature.

In an era of rapid population growth and associated concentration and consumption, resulting affluence brings more buying power and increased awareness and expectations for greater affluence, but also effects on environment that have now exceeded the absorbtive, dilutive capacity of the natural environment. "Sustainable growth" is pursued to increase the size of "the pie" to "lift everyone's boat" to meet the needs of the present without compromising the ability of future generations to meet their own needs and aspirations. This is assuming common-sense status in everyday thinking. In this rhetoric, all boats are lifted by a rising tide, although tides rise and fall, and those who can't afford a boat are prone to drowning in the swirling waters of the rising storm.

What is the viability and morality of a society that constantly pursues ever-increasing quality of life by using up habitat resources (i.e., those parts of the life-sustaining biosphere valued by humans) and creating pollution at an accelerating rate? Such questions raise issues of sustainability and justice in terms of intra-generational and inter-generational equity and recognition of the falsity of the assumptions of consumer society: that the supply of resources for use to satisfy material wants and needs is inexhaustible, the outcomes of material consumption are always desirable, and resulting material waste can be disposed of in bottomless sinks without damaging effects. Could we benefit from a moral basis for production and consumption that provides further meaning and/or limits to economic activity, such as enrichment of human existence? The scientific worldview conceives of life as materialistic and progress as expansive.

The economy determines use and abuse of nature and operates on scientific economic terms without a moral basis, devoid of an ecological perspective. Instrumental reason determines roles of producer and consumer in Western culture, supporting domination and exploitation of people and nature as resources for capitalist interests in selling ever more commodities in the market. Such rationality excludes moral considerations.

In his consideration of Nature, Buchholz sees that the scientific worldview objectifies nature as a useful resource for humans to manipulate to their interests, otherwise it is of no value. In terms of use (-up) and waste disposal, the environment poses a challenge to continued economic growth – is overconsumption a real problem? Sustainable development – an organic process – cannot undermine the

integrity of the environment on which it depends, so what will become of the corporations whose primary purpose is to convert natural resources into saleable goods and services to enhance material well-being, if resources are conserved and pollution reduced, thus curbing such economic activity? For how long and to what extent is consumer culture sustainable? How just is it for developed nations to over-use more than their fair share? An ethic is needed to provide moral limits on consumption and direct production into a less harmful path whilst consumption nourishes and enriches human existence. What is needed is a reconceptualisation of the relationship of humans and nature.

Having interrogated the consequences of the traditional scientific worldview, Buchholz then turns his attention to a 'new understanding of science', adopting the American classical philosophical school of thought known as Paragmatism as an alternative way to understand the multiple environments in which business is embedded. The way in which business relates to them has profound implications for the society in which businesses operate. Re-thinking science in a holistic, relational philosophy treats ordinary lived experience as a form of knowledge, and does not reject scientific knowledge, but crucially accepts morality as essential in human experience. General characteristics of Pragmatism (originated by Charles Peirce, William James, John Dewey, and also C. I. Lewis and George Herbert Mead) are emergence, holism, continuity, quality, and indeterminism (recall that classical science deals in reductionism, atomism, discreteness, quantitativeness, and determinism).

The (American) Pragmatism movement flourished from the 1870s to the early 1930s before being replaced (perhaps temporarily) with Positivism as the dominant worldview. It seems to be re-emerging in the 21st Century context of development and sustainability. Pragmatism is an account of the way people think ideas (mental representations), form beliefs (rules or instruments for action, both mental and corporeal), and make decisions. It is a practical philosophy that accounts for values in action. For some, pragmatism is the method for cultural transformation, hence its significance in thinking about radical societal change. The emphasis is on the practicality of ideas in terms of their effectiveness in helping to manage problems. The legitimacy of knowledge comes from correct procedures not in immutable premises, in experience over fixed ideas. In William James' philosophy, Pragmatism is a method of resolving disputes by judging reality and truth in terms of workability and utility or value, and truth-in-experience in the process of verification – faith and unreasoned belief are rejected.

Charles Peirce's pragmatism was also a practical philosophy in pursuit of a better life. Peirce borrowed the idea of pragmatism from Kant's Critique of Pure Reason (1788) (an idea shared with other contemporaries, including Chauncey Wright, Nicholas Green, Oliver Wendell Holmes, and William James). For Peirce, inquiry is the way out of the state of unease (doubt) into a satisfying state of settled belief, but this can only happen if the method used is the method of science (requiring rational self-control to ensure responsible and effective progress to the 'truth'). This

is the only way that investigators can converge on beliefs. Peirce had little patience with anyone who doubts that there are mind-independent ('real') things to know, and did not accept a correspondence theory of truth as sufficient. Yet, earlier in his writings, he insisted that science had nothing to do with what one was prepared to act upon, only with truth. In reviewing our common sense opinions, according to Peirce, we could find real doubts that would motivate our further inquiry to find reasons to believe them. For Peirce, truth is the opinion to which scientific inquiry would converge if prolonged. Reality is its object. Peirce does not define truth, but rather gives an account of the commitments incurred in asserting a proposition. Since inquiry (a form of the more general cognition) is itself an activity, epistemic norms produce actions just as do practical norms.

For Piece, all 'experience' involves interpretation. This 'experience' is the entire complex semiotic event ('semiosis') in which object and meaning are linked via the mediation of a sign. Mediation is present in all experience. Reflective clarity about the meaning of a thought, word, or concept involves reflective clarity about the cognitive role of a sign. Peirce's pragmatist principle was presented as a tool for clarifying the contents of concepts, ideas, and hypotheses, to ensure reflective awareness of the content of these as representations.

In Peirce's pragmatic method, notions are interpreted in regard to practical consequences – his was an attitude of orientation – away from principles, categories (he called these first things) and towards consequences and facts (last things). Viable theories are instruments, not answers – not transcripts of reality, but each is useful – from some point of view. Ideas – parts of our experience – become true (concrete) in helping us to get into satisfactory relation with other parts of our experience. Theories are 'plastic' and viable in regard to how well each solves problems, but only ever in approximation. Truth is what we say about facts we assimilate to our experience, thus a personal appreciation, hence plural truths. The pragmatist's concern is for how well they work for a purpose. What is their value for concrete life, for doing good? A "moral holiday" is not possible when action is required.

Interestingly, James adopted the idea of "pragmatism" from Peirce, but preferred the term "humanism" (as did F. C. S. Schiller) (Dewey used the term "instrumentalism"). James saw pragmatism as a democratic method, wedded neither to the logic of Rationalism nor to sensate Empiricism. James wanted an alternative to the flawed scientific practice that allowed the articulation of multiple private personal values, opinions, experiences, and moralities. Pragmatism was to be a 'public' philosophy that brings inquiry out of the realm of private truth. James opposed dualisms and was far more concerned with doing good than the pursuit of being right. Jamesian pragmatism is process not product, relationships not individuals. The pragmatic rationality is aspirational rather than analytical, with orientation towards the future.

John Dewey expanded on Peirce and James, rejecting the dualistic epistemology and metaphysics of modern philosophy in favour of a naturalistic approach that saw knowledge as arising from an active adaptation of the human to the environment.

Thus, inquiry should not be understood as consisting of a mind passively observing the world and drawing ideas from this that if true correspond to reality, but rather as a process initiated by an obstacle to successful action, that proceeds to active manipulation of the environment to test hypotheses about what can be done, and then results in a re-adaptation to the environment that allows action to proceed.

Dewey was fundamentally sceptical about the finality of any particular set of beliefs and sought the avoidance of foreclosure in problem solving. He argued that considering all options would find the best conclusion, for moral and social, as well as scientific, questions using the *ideal* of scientific method of inquiry: values-free communication, un-dogmatic, 'fallibilist' attitude towards beliefs, and continued peer debate and testing for intelligent and adaptive problem solving and dispute resolution. A margin of difference is necessary to allow good outcomes to emerge when there are choices among philosophical options, and his necessary plurality of voices included minority and dissenting voices. For Dewey, ideas and beliefs are always in the service of interests – to get what we want. What people choose to believe is what they think is good to believe – thus, a belief is that upon which a person is prepared to act. Beliefs are fixed by verification in the active and social process of experience, not justified by correspondence with reality – minds are not simply mirrors.

Dewey understood thinking and acting as two names for a single process of making way in the face of contingency in answering "what's to be/can be done?" For Dewey, mind and reality are abstractions from a single indivisible process. Things are what they are experienced as – knowledge is not a copy of something that exists independently of its being known – it is an instrument of successful action. We don't act because we have ideas, we have ideas because we must act, to achieve ends. People are agents of their own destinies. The world is 'in progress' – all problems are amenable to 'intelligent action' – there is no completed cosmology. Dewey was against the idolatry of ideas.

Dewey was a reformer for the improvement of quality of life. He promoted democracy as "associated living": co-operation on the basis of tolerance and equality, towards a more just societal order, and the avoidance of antagonism as unnecessary, based as it is on misunderstanding of best interests, and leading to violence.

In Pragmatism's understanding of our world, knowledge emerges through intelligent reflection on experience within nature, and is thus fallible and tested by its consequences in experience. The nature of value is not considered real, i.e., objective, knowledge in a scientific worldview – it is no more than a subjective feeling. In Pragmatism, values emerge out of human experience in interaction with the environment in which humans live. Things experienced possess qualities (for example, fulfilling, stultifying, appealing or unappealing) that are real emergents in the context of interactions with cultural and natural environments: "valuing experiences are not the experience of evaluating experience from the outside. but arise from the immediate "having" of experience" (Buchholz, 2012, p. 142). Further, "valuings are turned into the valuable by the organizing activity of the mind in the

ongoing course of experience as experimental" (p. 143). The consequences of actions yield that which is valuable because they produce enriching valuing experiences.

Buccholz considers Economics reviewed in Pragmatism and reviews the fundamental ideas of capitalism, wealth, and growth. The economy is intelligible as only one inseparable dimension of the socio-cultural matrix, a discriminable dimension of a total existence, and inherently social. Value is emergent in social experience, and more than just monetary wealth. Capitalism is more than an economic system: a social system that enhances the efficient use of materials to enrich and not exploit the total existence of the community in which each person is embedded. There is a moral direction for production and consumption. They are not ends in themselves, but rooted in the goal of enhancing human existence for human "growth", not mere quantitative increase or accumulation. The experience is fuller, richer, more inclusive, and more complex interactions with multiple environments in which the person is relationally embedded. Pragmatism denies the nonsense of so-called economic development that destroys these environments in which growth is accomplished.

Politics in Pragmatism is concerned with public goods and services, public policy and markets, competition, science and democracy. Culture has a relational/ contractual understanding of the social, of the intersubjective and self and community (the individual and the common other), and rights/responsibilities, and entitlements/ obligations. This is a holistic view of society that rejects the individualistic. Each human is contributor and recipient in a reciprocal relationship.

Pragmatism examines Nature as an environmental consciousness that doesn't dehumanise nature in the way that classical science treats it objectively for manipulation to suit human interests, and doesn't denaturalise humans in the way that the Christian religion takes humans out of nature to provide supernatural meaning and purpose. Pragmatism conceptualises humans and nature in relation. Humans are natural organisms embedded in and dependent upon a natural environment.

Buchholz considers implications of the Pragmatic philosophy for business. The corporation (firm, business) is not a legal device solely for the self-interested economic purpose of creating material wealth for shareholders, but rather understood as a social community in a larger community. There is a 'new' (i.e., different, alternative) social contract based on 'new' understandings and relationships between employees and employers to better function as a corporate community (see also Swan et al., 2000; Varey, 1997). Business is conducted in society. In the community, the corporation has multiple purposes, both economic and non-economic for stakeholders.

In the relationship of business and science, it is readily apparent that the scientific culture continues to be pervasive and dominant in business schools. Currently academic credibility and respectability is assumed to require scientific methods and outputs, but there is questionable impact on management practice. The 'modern' business studies/management science has been based in mathematised economics since the 1960s, and business is thus largely understood as a solely economic institution for increasing economic wealth. Yet there are obvious limitations of

reductionist quantification in understanding socially complex phenomena, especially when there are moral concerns in a world of uncertainty and thus judgement is essential to effective management. Buccholz shows that much of the 'common-sense' of the modern economy is based on myths of free and rational beneficent market (but what does the free market costs us?), scientific laws of the market, and shareholder wealth maximisation as the primary purpose of the corporation. This is founded on a misguided sense of scientific knowledge and the denial of the validity of other forms – of the significance of communal knowledge.

LEARNING SOCIALLY

Social learning is a pragmatic concept. Over the past 20 years, there has been a shift from focusing on individual learning towards organisational learning. This is a shift from privileging ideas, facts and concepts in individual minds, to recognising learning in social units. However, it is important to move beyond concepts of organisational learning to address advances in psychology and education (Reed et al., 2010). Social learning is not merely the aggregate of individual learning, in terms of process or purpose, as can be seen in many examples of citizenship education.

Social (or collaborative) learning is a more inclusive, inherently participatory and purposeful, explanation of learning and refers to processes among a group of people who seek to improve a common situation and take action collectively. Unlike individual learning, a human brain is not the main site of social learning (Milbrath, 1989). This understanding extends experiential learning into collective learning. This is a form of governance, in that governance is how society manages to allocate resources and co-ordinate or control activity. It is in essence adaptive management or 'learning-by-doing' to enhance capacity to adapt (see, for example, the extensive resources of the Learning for Sustainability network).

Such co-learning as a process of social change has become a normative goal in natural resource policy and management. Reed et al. (2010) argue that social learning arises through social interaction in a social network, resulting when there is a change in understanding that is beyond the individual and is situated in social units or communities of practice. It is the social unit that learns rather than independently learning individuals, and the learning spreads beyond the units to the wider social networks in which persons are active. Studies show that collective learning performs better than aggregated individual learning (e.g., Surowiecki, 2004) in dealing with social and societal problems.

It is important to distinguish facilitators and conducive conditions (such as active participation in decision making), from the phenomenon of social learning, and outcomes that may stem from it arising. Thus social learning may be understood as a means to an end (changed conditions, problem solution, etc.) and as an outcome of a social process. Social learning doesn't necessarily emerge from participation, and indeed social learning can arise absent any planned participatory process, for example in mass and 'social' media. Thus, social learning isn't simply intentional

collective self-reflection in dialogue, nor is it learning how to collaborate. Desirable outcomes may be arrived at by other means, and social learning may occur without associated outcomes (Reed et al., 2010).

The kind of interaction influences the kind of learning, as does the congruence of differing epistemological beliefs and commitments concerning what and how we know. Indeed social learning implies the necessity of bringing people of different worldviews and systems of knowledge together co-operatively, yet lots of interaction may not in itself bring about social learning for reasons of context, power, and values.

Communication is at the core of processes of interaction, essential to developing knowledge and understanding. Kolb (1984) explains learning as deep reflection on concrete experiences, and deriving abstract concepts applied in active experimentation. We socially construct our knowledge, meanings, and identity, so rather than learning arising in the 'communication' (i.e., dissemination of information) of knowledge from person to person, informative and communicative interaction produces (constructs) learning among people (Deetz, 1992; Dervin et al., 1989, 2003; Leeds-Hurwitz, 1995). Such communicative interaction changes values and beliefs in social networks, and as well as changing the content, it also brings about changes in the network and institutional structures.

Social learning has come to the fore in the growing eco-consciousness and acknowledgement of the sustainability imperative for positive social-ecological outcomes from human action. This necessitates social evolution in which humans participate and direct their own learning. This notion of a learning society goes beyond the learning organisation, and is manifest in the growth of social movements intent on "learning our way to a new society" (Milbrath, 1989). The post-industrial societal environment requires a capability for double loop learning at the social and personal level (Trist, 1980). Double loop learning (Argyris & Schon, 1978) is experiential incremental learning (single loop learning) in which the learner attains awareness of the values and assumptions on which it is based and is thus aware of and can shift their frame of reference. In this process a shift in dominant social paradigm is created, and social learning has occurred when a dominant social practice or institution replaces another – society has adapted.

Following the ancient Greeks, a society that can readily supply sufficient goods and services, in other words has made itself affluent, can turn its attention to nourishing personal and social learning. The *paideia* promotes lifelong learning and self-development and is thus the major project for society. This is facilitated by the accumulation of knowledge, by the driving force of technological challenge, and by elaborate forms of communication. These are the very resources of the early 21st century.

HUMANISTIC MARKETING

Marketing practice and scholarship are facing unprecedented challenges. The unsustainability of resource use, the increasing inequity of the market, and the

continuous decline in societal trust pose a threat to business and 'marketing as usual'. Capitalism is at a crossroads and scholars, practitioners and policy makers are being called to rethink their purpose and assumptions in light of major societal and environmental changes. As current marketing thinking is based on the exchange paradigm it is largely informed by economics. Therefore it draws substantively from neo-classical theories of human beings. Accordingly, a human is a materialistic utility maximiser that values individual benefit over group and societal benefit. A 'homo economicus' engages with others only in a transactional manner to fulfil his or her stable and predictable interests. He/she is amoral, values short term gratification, and often acts opportunistically to further personal gain. Business strategy and marketing organisation are largely based on these limited and limiting assumptions and, in turn, are blamed for creating negative externalities. Such can be seen in unhealthy consumption patterns such as smoking or overeating, or an increasingly consumerist and materialist society that cherishes the "What I have" more so than the "Who I am" and "What I do", resulting in widespread instances of depression.

We are facing a 'Kuhnian' paradigm crisis in business research at large and marketing research specifically. This collection of contributions was invited on the basis of a novel, humanistic paradigm for marketing practice, research, and policy. In response, the emerging humanistic business and management movement does not accept perpetual economic expansion as a sustainably viable means of meeting individual and collective needs in society and Nature, and instead seeks balance in place of excess. Humanistic Marketing recognises the harm that comes with the unfettered desire for more of more. We ask how can Marketing's principles and practice be founded in humanistic values such as altruism, empathy, respect, trustworthiness, honesty, integrity, care, compassion, service, intelligence, beauty, justice, virtue? Furthermore, how can marketing help to protect human dignity and promote sustainable human (not consumer) well-being?

Marketing is currently mostly conducted as puzzle-solving 'normal science', in which practitioners and scholars accept the exchange paradigm, and perform experiments that test and prove its efficacy in a range of situations. New explanations may extend the paradigm but do not change its fundamental nature – by pursuing a rationalist ideal, marketers limit their interventions within an objectivist, positivist ontology to matters of 'fact' and assumptions of control and manipulation. Within the classical science worldview of reductionism, atomism, quantification, determinism, and the assumption of mechanism, value is objectified, fixed, and deliverable. Within modernist thought marketing research remains embroiled in transactions within a society understood scientifically as a collection of independent self-sufficient individuals labelled in commercial marketing discourse by the narrow and partial term 'consumer'. In this way, the paradigm may grow with many extensions to explain the various exceptional cases that are not easily covered by the original paradigm (e.g., consumer behaviour, relational commerce, gift giving, business ethics, or social marketing). In line with this perspective, marketing failures with regard to the societal crises are then explained through the lens of the old paradigm

(e.g., lack of transparency, uninformed choice and information deficit, profit-maximising competition, and so on).

The marketing discipline has to be reinvented, in practice and in principle. The marketing system designed and developed to solve the 20th Century 'need for affluence in industrialised society' problem is therefore not effective for the 21st Century need for well-being for all within limits and carrying capacity of the ecosystems that support life on Earth. In its orthodox form, marketing's harm and costs are greater than generally recognised, whilst the gains all too frequently fall short of the desirable. Whilst many business and management academics are busy addressing the problem of how to incorporate sustainability in management and marketing, the other more profound problem facing the marketing discipline, and as yet the road less 'travelled', is the integration of management and marketing (i.e., business) into the precepts of a sustainable society. Thus we need to work towards a constructive response to changing stakeholder expectations about the role of business in society. With the various initiatives emerging around macromarketing, social marketing, sustainable marketing, positive marketing, or conscious marketing it seems as if a different consciousness is already emerging.

Guided by reason in caring about others as well as the self, such humanistic marketing is founded on a re-formed marketing concept: focused not on short-term gratification of wants but truly on the prosperity of well-being in the satisfaction of needs/interests, and for the business purpose of rewarding effective and efficient provisioning for healthy prosperity rather than limited and limiting competitive growth-derived profit maximising. This requires a systemic "re-design" of prosperity – in authentic, sustainable, and meaningful value creation of real worth – for authentic human well-being and betterment in sustainable living. Authors contributing to this collection analyse the problem, propose and demonstrate alternatives, highlight the challenges, and propose ways forward to address the issue of marketing's contribution to a human-centred transformation of the socio-economic system – by protecting human dignity and promoting well-being. The challenge lies in the integration of this alternative "humanistic" form of marketing to become the mainstream in the foreseeable future pathway to sustainable society. This not a problem of integrating morality in the form social responsibility and sustainability into marketing, but rather a challenge to tap into the social power of marketing to drive change for the betterment of society.

Marketing as if humans mattered is founded on and operates with civic values beyond efficiency – humane values including justice, fairness, dignity, well-being, freedom and equality. Taking the necessarily highly selective body of work presented here as a whole, we envision a humanistic approach that centres on preserving human dignity, moving away from the treatment of people as mere consumers and sources of revenue to recognise and identify with the richness of people as flourishing citizens. The core purpose of Humanistic Marketing is increasing authentic well-being (rather than materialistic partial wealth) sustainably for stakeholders now and in future

generations. Such a human-centred economy preserves dignity and increases citizen well-being well beyond the limits of consumption value.

The humanistic call is not a new idea in academic Marketing circles, indeed Philip Kotler proposed thinking beyond the marketing concept and Elizabeth Hirschman promoted humanistic philosophy, method, and criteria for "qualitative" marketing research some 30 years ago. The "quantitative" vs "qualitative" research tribal warfare continues to this day. Actually Kotler had written a working paper on a theory of humanistic marketing in 1977 (recently republished in Sage's Marketing Legends series). Despite this continuing contention and debate, however, there is little explicit discussion of humanistic values – of both the observed and the observer – in business and management schools. This "soft science" is largely left to the humanities in other faculties. Mainstream business and management education and research doggedly follows the holy grail of "hard science".

The differing beliefs about the nature of our reality in positivistic science and truly 'social' science provide different understandings of society as a complex of human relationships and a system of interaction. Modernist thought on 'the social' sees marketing as an industrial technology, whereas humanistic thinking recognises a socially constructed enterprise not an objective mechanism to be exploited efficiently as a tool for extending our reach in accumulating resources. Humanists see multiple stakeholders, long-term effects and consequences, and non-logical relational sentimental and emotional commitments. When approached as humans doing things with materials, a holistic 'consumer culture' perspective considers expenditures and effects in regard to bettering lives within the humane domain of life experience. With a technological perspective, our understanding is reduced to accelerated and expanded acquisitive actions of 'consumers'.

Complexity is not well understood in the neoclassical social science with the classical science worldview of reductionism, atomism, quantification, determinism, and the assumption of mechanism, in which value is objectified, fixed, and deliverable. The 'new understanding of science', and adopting the American classical philosophical school of thought known as Pragmatism, provides an alternative way to understand the social phenomenon of valuing, and thus value co-creating interactions. Re-thinking science in a holistic, relational philosophy treats ordinary lived experience as a form of knowledge (indeed valuing is a form of knowing), and does not reject scientific knowledge, but crucially accepts morality – value judgments – as essential in human experience.

Humanistic marketing re-humanises by retiring the modern marketing ideology of domination, exploitation, unfettered growth – and raising to the fore quality, truth, intelligence, conversation, and conditional growth. This is a radical movement from the dominant social paradigm of the domination of market-logic over humanity and understanding business as profiting from turning things into consumables. It is a basic rethink on what business is for that necessitates the move beyond knowledge silos and paradigm commitments to form the knowledge communities requisite for

solving societal problems among practitioners, policy-makers, political bureaucrats, and change activists.

Business is becoming more social and this places marketing as the ethical link between production and consumption and thus shaping a culture of sustainability. This is not merely a strategic business choice, since it is the very interactions in ethical relationships that conserve and co-create. Humanistic values can be seen coming to the fore in the maturing of society and thus in the discipline of business management/marketing for a humane working and trading environment, in which emotional, experiential, and social value, as well as economic value is created. The growing number of "loved" firms are held up as ultimate creators of value, in all forms, that are committed to working with, partnering with, and investing in all stakeholders to the purpose of the business, and recognisant that they are just part of a complex network of interests in a matrix of interdependencies.

The Marketing discipline has the tools and resources for the transformatory organized processes required for the "necessary revolution to create a sustainable world" (Senge et al., 2010). These can be used not only as a managerial tool for competitive profiting on the perpetuated assumption of growth but as a social process for co-creating value post hyper-consumption. This presents us with prospects for a much more positively constructive overall effect of marketing: innovative drive, equitable provisioning, efficient resource use, capital enhancement in its various forms, and so on. What we need now for the new context is holistic transformative design and application of a form of marketing that can be integrated into the making and support of a sustainable society. This may be forthcoming in the humanistic business movement.

So for us the challenge isn't merely to adopt qualitative research philosophy, methods, and criteria to increase the efficacy of a marketing technology, it is more profoundly to contribute to enhancing human provisioning within limits through the study of human culture to understand the self and society. The higher purpose of marketing scholarship and professional practice can be a more cultivated, more civilised realisation of well-being for all. Then, marketing can be the noble practice of the humanist. Following sociologist Peter Berger (1966), the challenge both academically and professionally is to exercise intellectual liberation from scientism.

Recently, voices calling for normatively broadening and elevating marketing thinking have been more clearly heard. Proposals expand corporate social responsibility to transcendent inclusive societal (stakeholder) responsibility, to address the total value creation system and resource effectiveness and efficiency for bettering lives in the long-run (see Sheth & Sisodia (2006), Lusch & Vargo (2006), Varey (2010, 2011, 2012, 2013), Webster & Lusch (2013), and Murphy et al. (2013), for example). The influence of managerial decisions and policy on stakeholders is too crucial a problem to leave to (marketing) experts. Good citizens contributing to the betterment of Society are challenging the premises and implicit models of (managerial) Marketing. If we don't accomplish this enhancement in democracy, business will decline in relevance and legitimacy or create ever increasing negative

impacts because they won't appreciate fully the consequences of their choices and actions.

MARKETING IN A SUSTAINABLE SOCIETY

Diary Date: 1st June 2063

There came a time when our future as a society wasn't certain, and we began to see that our headlong pursuit of more wealth was perilously leading us towards catastrophe.

Looking back now we can see that by the end of the 20th Century society largely recognised that human economic activity was over-reaching the point at which the biosphere could operate healthily. Free-market economies had flourished at the expense of the environment, so a profound choice had to be made: repair the damage with piecemeal technology innovation, substitute 'clean' energy, or reduce economic production below the level of biosphere tolerance. It was the practical philosophers who pointed this out. For business, the first two options appeared to present new product-market opportunities. The third required a rethink on the purpose of business, and thus the role and form of marketing.

Thought leaders in the Great Transition movement were among many who set out our options. The conventional perspective of the future assumed that the dominant forces then driving economic development and globalisation would persist and that these strategies had resilience to tolerate and recover from socio-ecological crisis and to succeed in maintaining rapid economic expansion, and that this was desirable. The conventional perspective encompassed two possibilities. The Market Forces view assumed that free market optimism would remain dominant so the prevailing view was market-centred growth-oriented globalisation (development). There was uncertainty about sufficiency of resources and the maintenance of ecological resilience. The challenge was seen as maintaining bio-physical and economic sustainability in conditions of profound inequalities of rich and poor. Policy Reform was seen as a corrective substitute for Market Forces in which government-led redirection of growth toward sustainability goals required massive sustainability efforts in redirecting the economy and promoting technological innovation to meet wide-ranging sustainability targets, with continued growth in developing countries and redistribution of wealth based on deep widespread commitment to economic equity.

The Market Forces model was simply unsustainable and the Policy Reform model would have required an unprecedented degree of political will for the necessary regulation and economic, social, technological, and legal mechanisms to be enacted. Successive failures of environmental summits to bring about policy reforms anywhere near radical enough to be termed 'sustainable' were evidence that a shared political will and co-operation remained remote. Even in the midst of a global recession in the first decade of the new century brought about by an irresponsible

banking sector, which eschewed its own canons in favour of an unfettered belief in market forces, world governments deepened their resolve for market-led recovery strategies. In the face of all of this, Raskin and colleagues articulated two "Alternative Visions" of the future, the first of which recognised the failure to respond effectively and efficiently to the challenge of resource depletion, habitat degradation, and diminishing quality of life. They termed this bleak vision of the future "Fortress World." This would have been an authoritarian path in response to mounting crises as instability and conflict triggered societal descent into chaos as market adaptations and policy reform were insufficient to avoid destabilisation. Powerful elites would have imposed authoritarian order in an attempt to control a damaged environment and intolerant and resistant people. In some nations and regions, this happened. Sustainable development would have been abandoned to emergency measures and fragmented initiatives in response to habitat degradation and social conflict.

We chose another path, and by means of a radical cultural transformation that transcended and ecologically revitalised, the possibility of a brighter future emerged in the recent decades. This came to be called the Great Transition. There has been a fundamental transformation to sustainable civilisation brought about in values-led change in the paradigm of global development. This was driven by deepening crises and the desire for a global sustainable just civilization. The good life has been redefined in terms of creativity, leisure, relationships, and community engagement. A steady-state economy is being reached, with egalitarian income distributions, resulting in most people's life being better with greater social cohesion. Remaining crises of sustainability are being confronted for reconciliation and co-operation with more effective pluralistic governance arrangements.

We've just lived through the era of transformative marketing, in which the power of democratic trade was applied to bring about and maintain sustainable living. Those of us who have persisted in following the radical reformation of marketing over the past 50 years or so had wanted to understand what form marketing must take to support transformation to sustainable society, then maintenance of life-enhancing production and consumption within limits. A change of values from those that were ecologically damaging to values that promote ecological health has been required since orthodox marketing – mostly product presentation and preference management – was really little more than stimulation and manipulation of consumer demand. What a lost opportunity to do good for people and society!

We stopped thinking of exploitative tools, and our systemic understanding, tracing back to scholars who resisted reductive over-specialisation, such as Kenneth Boulding, Geoffrey Vickers, Marshall McLuhan, Fritjof Capra, Peter Senge, Ken Wilber, and other transdisciplinary 'systems' thinkers, led to a rethink on both purpose and form. Marketing is best understood as meaning making – a system of knowledge construction that largely drives society's interaction with the rest of nature. The sustainability of affluent human life is dependent on renouncing the values of consumerism and instead the realisation of humanistic provisioning. This

was the higher purpose for business enterprise marketing that we can now see had begun to emerge back then when this book was originally published 50 years ago.

Humankind chose a positive and constructive pathway into our future by addressing the question of sustainability from several viewpoints, but predominantly resource use and the consequent environmental impacts. Our forebears acknowledged that these two dimensions of sustainability rely upon the mitigation of greenhouse gas emissions, protection of natural resources, and the preservation of habitats, and these became recognised as critical factors in determining the future quality of society and human life. In turn, the quality of human development is now understood in terms of degree of well-being in human lives, the strength of communities, and the resilience of the biosphere under the weight of human habitation. The social dimensions of sustainability are expressed as enhancement of social stability and resilience, reduction of poverty and hunger, and de-materialisation of lifestyles.

We stopped being 'normal' some time ago when we finally accepted that this way of thinking was at the root of our mega crises. The industrial era emphasised linear analytic thinking, and holistic thinking from the East was thought a mere peculiarity. The market seemed to dominate our thinking, although when we spoke of 'value' in the market we didn't always refer to things especially worthy, or of any careful approval – merely that exchange could bring wealth (to some of us). We were assailed by wealth-motivated corporate marketers to acquire ever more products for pleasure, comfort and convenience. We were treated as unsatisfied profitable consumers, else we were ignored. Today, we flourish as citizens who have shrugged off the damaging unjust, inequitable, and unfair lifestyles sold to us in the past, and today we live in moderation, simplicity, patience, contentment, equity – we no longer consume unnecessary things. Instead, we pursue health, education, and personal development, It's our well-being that thrives through personal growth and not economic growth. Understood as a technology, marketing's purpose and what we want to do with it became bigger questions in more minds.

Marketing is for everyone – but it had been appropriated by corporate interests in the middle of the last century for manipulative profiting. This was a corruption of the marketing concept that always maintained a democratic intent – to benefit through participation in fair dealing. It was distorted from need fulfilling use of tool and techniques, to corporate deviance in money making, always at someone's expense, but usually telling only part of that story. In just 50–60 years to the end of the 20th Century, the market had been turned into such a pervasive source of things for our lives that circumventing the market, do-it-yourself and self-service seemed like peculiar eccentric behaviour and this was reinforced in the discourses of business and government.

Today we maintain the marketing concept as a central part of our way of doing things – creating valuable outcomes through collaborative work and careful resource use. Marketing is still a big idea in our society, only now it's no longer solely a corporate tool. You see, like our ancestors who lived before the industrialisation

of society, we don't get all that we need from the market. The dominant way of provisioning is no longer mass-production-and-distribution. Whilst this is a small part of our way of life now, social production has become the mainstay of meeting needs. Today, the creative energy of large numbers of people is co-ordinated online into large, meaningful projects, mostly without any overriding assumption of financial compensation for contributors. The means to well-being in our lives are mostly created by the people who will use them. Participation brings rewards, not all financial. Often, end-users are creating products on their own, without the interference or assistance of third-parties. When firms are involved by users, they are firmly in a respond-and-support mode and those that have not been able to adapt have declined. There's a whole new role for professional advocates who find resources and value co-creation capabilities.

We realised that the pursuit of wealth drove 'corporate marketing' that stimulated consumer demand for things that brought short-term gratification, comfort, and convenience for those with the means to buy products from companies. This all enabled the corporates to increase production, and eventually the overload on our habitat was just too great. We had to change our social values and the consumer society began to give way to a citizenry that saw profits as rewards for doing the thing that we all benefited from – provisioning our needs with highly effective low-cost service.

In the "century of the environment", we have regained an integral understanding through collaborative co-creation. The beginning of the 21st Century was, looking back now, a real millennial turn from normal-science reductionism and abstractive thinking, to see our world as a living system in which we are a powerful, but requisitely wise, part. In our real-world Ecotopia, the modern-day assumption that people are born to produce has been abandoned in favour of a more modest place for each person and our collective society in a stable-state living web, in balance with nature. Energy, knowledge, skills and materials are resources for the necessities of life and sustainable wellbeing. Technologies that are harmful to the ecosystems are deliberately rejected, and many consumer goods are considered ecologically offensive and are not allowed. Industrial proliferation is restricted; basic necessities are standardised and of the highest quality – sturdy, durable and self-repairable. Electronic devices are compact, light, low energy-users and simply recycled when no longer functional.

Business is conducted online. Some media platforms are now parts of the government structure – citizens watch and expect to participate. News isn't merely provided by this apparatus: the apparatus *is* the news. The entertainment channels present advertisements in a block between shows, and these are limited to 'public service' product presentation announcements without simulations and adjectives; many are directly comparative, providing sane information among the viewpoints, personalities and imagery of so-called normal content we once just accepted. The government now operates this service with strict controls on claims and content, so that anyone considering entering into marketing to find selling or

buying opportunities when the make-or-buy decision suggests the possibility of added value is assisted rather than assailed. It's available online on-demand just like Geoffrey Vickers proposed way back in the 1970s. Since productivity and output growth are not goals, the types and amounts of advertising are regulated, and is augmented with public service broadcasting. Corporate media monopolies are no longer tolerated, and decentralised responsibility and personalisation is prolific and craft-based. Much of the time we don't need advertising of the old style 'mass message' type, because direct relationships are more important for value creation and need satisfaction. Businesses have public profiles that make their pro-social and environmental performance common knowledge and open to scrutiny, so reputations are authentic and seriously scrutinised and cherished.

We came to see preference management by sellers as pernicious when what was being pushed to us as desirable was profitable for the seller and offered pretty much only what people had learned, as consumers, to value. Advertising of things that don't make life better is considered evil! Our civic-minded governors prohibit advertising that is contrary to human dignity and moral principles. On ethical grounds, we consider advertising to be immoral if it stimulates consumption, thus production, and the resulting degradation of the biosphere. So we've changed what is promoted and/or changed the values basis of our valuations. Value creation is sustainable and we understand when the usefulness of products creates positive value for all and profit-taking is a burden on the majority for the benefit of a few of the already rich. We are now more beneficiaries than benefactors of business. Long supply chains that extract value for profiting firms are not tolerated. Actually, nowadays, the market is a much more efficient and effective process for meeting needs. It comes into play when we seek support from those with resources that can be integrated to change things for the better. When we make our 'make-or-buy' decisions we see marketing as a rewarded facilitator of problem solving, and not as a money-making technology for business owners. Marketing is a key part of a democratic way of life.

No longer do we tolerate lifestyles that undermine the ecosystems on which our lives depend, nor squander resources needed for the future, nor sacrifice other living species for economic production. In our society, we see justice, equity, and fairness, as, practically, the same. Almost all of us are content with our lives, and the biosphere has steadily improved as we transitioned from the old industrial way of life. In the spirit expressed by Buckminster Fuller, another visionary from way back when, we chose to be the architects of our future, not victims. We 'unplugged' and avoided the actions of those who were once rewarded for inducing consumer spending and corporate profit maximisation (often at any cost), and those who believed in the necessity of perpetual growth. We punished businesses who damaged our world. That all came to an end, and we're all better off now. Nowadays, marketing is democratised – supporting our healthy democracy and engaged in when support-seeking to meet authentic needs. These days we call it "provisioning" and everyone contributes and benefits.

(This story draws on the discussion herein and on several reviews (Raskin et al. (2002, 2010); Sheth & Sisodia (2006); Sisodia et al. (2006); Hollender & Breen (2010); Senge et al. (2010); Varey (2010, 2011b, 2012, 2013); Sayre (2010)), as well as Ernest Callenbach's (1975) story of those who chose a different life pathway. Even Canada entered the fold eventually!).

INSPIRATION AND EXTRADITION…

This chapter could end with the story of an envisioned future in which marketing truly serves society, but it seemed more appropriate to ponder the creative thought or impulse that I am encouraging here. What is the take out from this discussion and vision?

Transdisciplinary thinking brings a greater perspective to the discipline of marketing. Transdisciplinarity is not merely the co-ordination/co-operation of (excessively) specialist experts, but more intentional going beyond disciplines and multi-disciplinary and inter-disciplinary borrowing of knowledge. The intent is collective understanding – integrating, unifying – thus necessarily transgressing knowledge boundaries in long-term dialogue within a complexity worldview among involved actors – researchers, practitioners and stakeholders. This convergence towards an ideal unity requires bridges between disciplines, and seems to be an inevitable "e-mergence" in the online age.

Whereas experts start from what they know in their focal discipline and often focus effort on progressing method and theory in the discipline, what is needed in the face of wicked problems is to start from recognising what we don't understand the problems, and how to learn what is necessary to move beyond trying to solve 'simple' problems with the very same values and assumptions that caused them. Most academics pay attention only to that which their favoured techniques can master – technologists can only do this – but neither "is entitled to cut the real world down to the measure of its ideology" (Vickers, in Adams et al., 1987, p. 196). Transdisciplinary knowledge making is problem-centred and issue-driven, not discipline driven, in an open, inclusive mode of inquiry necessary to learn in the face of complex problems.

There is emerging agreement that quality of life and sustainability challenges require new ways of knowledge production and decision-making. One key aspect of so-called "sustainability science", therefore, is the involvement of actors from outside academia into the research process in continuous communicative interaction in order to integrate the best available knowledge, reconcile values and preferences of multiple voices, as well as create ownership for problems and solution options. Transdisciplinary, community-based, interactive, or participatory research approaches are often suggested as appropriate means to meet both the requirements posed by real-world problems as well as the goals of sustainability science as a transformational scientific field. 'Sustainability' is founded on the pragmatic notion of truth as collective transformation (Norton, 1999) in relational social learning

continually bridging fact-value. Vickers (1983) coined a term for this endless cycling from what is to what to do and back as *appreciation*.

Detached specialists build disciplines and professions, whereas engaged and accountable generalist problem solvers (Pohl, 2005) in producer-user collaboration in civic space emphasise practice over profession and context over abstraction. Very much adopting the Pragmatists' notion of what constitutes knowing to make transformational change for the better through effective collaboration among diverse knowings and understandings in business, civil society, academia, and government. This is systems thinking to understand the complexity of the human environment of community, employment, business, governance, education within the finite natural world, drawing on the collective power of partnership in inclusive, participatory problem-solving with humanistic values – also found in ecological economics – of justice, equity, and human dignity.

In a comprehensive review of principles and practices of the marketing system within corporate social responsibility and sustainable development frameworks, I argue that responsible marketing and sustainable marketing are not synonymous ideas, concluding with an outline of an emergent set of transdisciplinary propositions that reflect disillusionment with current values and beliefs pertaining in the 'marketing science' community, including:

The role of transdisciplinary synthetic research is not yet sufficiently recognized and thus undervalued in the marketing discipline, yet it is the pathway to transformation. Marketing scholars and educators have much to offer, and to learn from, other knowledge disciplines, especially in the political arena. Core values and vision for the future must be the catalyst for transformative change (Varey, 2010, p. 124).

This necessitates transcending the 'applied' normal-science business school mind-set that prevails in the pursuit of scientific legitimacy, to address the effective and efficient use of the academy's huge stock of intellectual and other resources for knowledge making for a sustainable way of life.

The Future Reason for Marketing

Practical reasoning is the basis for making choices of courses of action (Audi, 1989). Practical reasoning derives a logic – an explanation that fits the purpose. What is the reason for marketing in the operative worldview? The mental map, a representation of the empirical (sensory) world, when created intellectually can be used to change the landscape (Normann, 2001). The worldview determines the 'reasonable' purpose and form of marketing. A 'marketing worldview' is formed.

A synthesis of studies that propose the evolution of worldviews (Leonard, 2004) identifies the contemporary 'dominant' (western) worldview as modern (secular) Rational-Achievist, characterised by values of materialism, individualism, rationalism – often referred to as economic rationality. The emerging worldview, on the other hand, is the Pluralistic-Communitarian – this values belonging, relationship,

sacred pluralism, cultural diversity, feelings, caring, sensitivity, consensus, harmony, enrichment.

We see this shifted value set in the marketing discipline in the rise to prominence of concepts of human interaction, relationship, network, dialogue, social responsibility, ethics, social conception of communication, participatory democracy, social networking, co-constructed value, experience, etc. (Varey, 2000, 2002a, 2002b, 2003). However, the communitarian worldview considers the development of relationships over time, and the 'intensity' of the experience, not relationships as things in themselves, as valued by the scientific rationalism of the industrial mind-set. Much relationship marketing isn't relational because the logic draws from mechanistic thinking.

An alternative emergent logic (Sheth, Gardner, & Garrett, 1988) refers to this as "non-economic" but this term doesn't fully capture the profound shift in values. For many, marketing is a neutral technology that does things for (and to) people. It is used in a certain way for particular purpose(s). Of course, the rational-achievist sees marketing as a tool for growth, competitive advantage, and profit.

What is at stake is not merely refinements of the 'marketing paradigm' ("dominant logic"), but an alternative paradigm of knowledge in a different worldview, with implications for both what we claim to know and how it is that we come to know what we know, as well as what is legitimised reason for action. The debate about 'logic' brings this transformation to awareness, but conceptual (and value) clarity is needed.

Modern (transactional, translational) marketing is a short-term satisfier – customers are 'seen' as buyers. Marketing has been understood as a microeconomic level activity, with the firm as unit of analysis. Management has been 'focused' on exchange transactions to bring about change of ownership of tangible outputs (goods). In the extreme, it has been the public manifestation of the "destructive behaviour" of the "psychopathic personality" of the legally-constituted corporation in "the pathological pursuit of profit and power" (Bakan, 2004).

We miss out by treating marketing as a mechanism of tools and techniques for efficient selling of production outputs. In the communitarian worldview, marketing can be so much more constructive. The development potential lies in the integral, transformative enrichment process. This is the more balanced, comprehensive, interconnected, holistic social process, and can be understood as transcendent – it includes the modern rationalism – yet is an evolutionary step. The social potential of marketing is as a diffusion process of communicative action that brings about social wellness and transformation. It is inherently socially responsible, sustainable, and regenerative. Transformative marketing emerges from socio-cultural evolution, to treat citizens as creators and users of resources in pursuit of well-being. Experience and learning arise in group interaction.

Some early evidence of the shift can be found in a comprehensive review of marketing purpose and form which asks "does marketing need reform?" (Sheth & Sisodia, 2006). From this study, the answer to this question is, yes it does need reform

from the conservative private profit technology mindset, it must adapt within the socio-cultural system it is a part of, and it is being adapted as we speak – marketing is consciously evolving. Marketing's 'dominant logic' or 'practical reason' will be that of a mode of social development rather than a means of economic growth for private wealth. And as we speak, we will need to learn a different vocabulary. The next project is a 'logical' revision of the marketing lexicon – because we do things when we talk (Austin, 1962; Cooren, 2000; Cooren, Taylor, & Van Every, 2006; Searle, 1969). To do the *right* things, we need a *proper* vocabulary for an integrative discourse. This will ensure that the emergent Service-Dominant Logic isn't embedded in an inherently rational-achievist worldview. The pragmatic test for marketing knowledge is what difference the various knowings make to practice and consequential impact.

The Future Marketing

For the ancient Egyptians, the pervasive worldview centred on the afterlife, and this gave them a logic for body preservation and pyramid building. We need the right story that we understand and believe in, to give direction and meaning. The story of marketing needs to be consistent with the life story. Marketing has a history of, and reputation for, irresponsibility – even deception – in practice, and, increasingly, for irrelevance in principle. We need a different story. It is time to recognise the evolution. Marketing is undergoing a transformation towards transcendence of a receding 'commercial life' worldview. Sustainability is just a part of that story. Just as advocates of the 'new social/relational business' argue that marketing is not a departmental function but the mode of doing business, transdisciplinarity is the next requisite evolutionary step towards making a sustainable society. The value creation system will be a free market if we make it democratically so, and if we properly account for the costs.

REFERENCES/BIBLIOGRAPHY

The following list includes sources cited in this chapter, and also recommended additional and necessarily eclectic sources for insight and further exploration.

Adams, G. B., Forester, J., & Catron, B. L. (Eds.). (1987). *Policymaking, communication, and social learning: Essays of Sir Geoffrey Vickers*. New Brunswick, NJ: Transaction Books.

Applbaum, K. (2004). *The marketing era: From professional practice to global provisioning*. London, UK: Routledge.

Applbaum, K. (2011). Broadening the marketing concept: Service to humanity, or privatization of the public good? In D. Zwick & J. Cayla (Eds.), *Inside marketing: Practices, ideologies, devices* (pp. 269–298). Oxford, England: Oxford University Press.

Argyris, C., & Schon, D. A. (1978). *Organizational learning: A theory of action perspective*. Reading, MA: Addison-Wesley Publishing Co.

Audi, R. (1989). *Practical reasoning*. London, UK: Routledge.

Austin, J. L. (1962). *How to do things with words*. Oxford, England: Clarendon Press.

Bakan, J. (2004). *The corporation: The pathological pursuit of profit and power*. New York, NY: The Free Press.

Baumgärtner, S., Becker, C., Frank, K., Müller, B., & Quaas, M. (2008). Relating the philosophy and practice of ecological economics: The role of concepts, models, and case studies in inter- and transdisciplinary sustainability research. *Ecological Economics*, *67*(3), 384–393.

Benkler, Y. (2006). *The wealth of networks: How social production transforms markets and freedom*. New Haven, CT: Yale University Press.

Berger, P. L. (1966). *Invitation to sociology: A humanistic perspective*. London, UK: Pelican Books.

Buchholz, R. A. (2012). *Reforming capitalism: The scientific worldview and business*. London, UK: Routledge.

Burkhardt, F. (Ed.). (1979). *The will to believe and other essays: The works of William James*. Cambridge, MA: Harvard University Press.

Callenbach, E. (1990). *Ecotopia: A novel about ecology, people and politics – The notebooks and reports of William Weston*. London, UK: Bantam Books.

Clegg, S., Kornberger, M., & Rhodes, C. (2007). Business ethics as practice. *British Journal of Management*, *18*, 107–122.

Cooren, F. (2000). *The organizing property of communication*. Amsterdam, The Netherlands/Philadelphia, PA: John Benjamins Publishing Co.

Cooren, F., Taylor, J. R., & Van Every, E. J. (Eds.). (2006). *Communication as organizing: Empirical and theoretical explorations in the dynamics of text and conversation*. Mahwah, NJ: Lawrence Erlbaum Associates.

Costanza, R. (Ed.). (1991). *Ecological economics: The science and management of sustainability*. New York, NY: Columbia University Press.

Costanza, R., Cumberland, J., Daly, H., Goodland, R., & Norgaard, R. (Eds.). (2007). *An introduction to ecological economics*. Boca Raton, FL: St Lucie Press.

Coupland, D. (2010). *Marshall McLuhan: You know nothing of my work!* New York, NY: Atlas.

Deetz, S. A. (1992). *Democracy in an age of corporate colonization: Developments in communication and the politics of everyday life*. Albany, NY: State University of New York Press.

Dervin, B., Grossberg, L., O'Keefe, B. J., & Ellen, W. (Eds.). (1989). *Rethinking communication: Paradigm issues*. Newbury Park, CA: Sage Publications

Dervin, B., Foreman-Wernet, L., & Launterbach, E. (Eds.). (2003). *Sense-making methodology reader: Selected writings of Brenda Dervin*. Cresskill, NJ: Hampton Press.

Edwards, M. G. (2009). *Organizational transformation for sustainability: An integral metatheory*. London, UK: Routledge.

Esbjörn-Hargens, S. (2009). *An overview of integral theory: An all-inclusive framework for the 21st century* (Resource Paper No. 1). Louisville, CO: Integral Institute.

Freire, P. (1996). *Pedagogy of the oppressed* (M. B. Ramos, Trans., Rev. ed.). London, UK: Pelican Books.

Funtowicz, S. O., & Ravetz, J. R. (1993). Science for the post-normal age. *Futures*, *25*, 739–755.

Funtowicz, S. O., & Ravetz, J. R. (1994). The worth of a songbird: Ecological economics as a postnormal science. *Ecological Economics*, *10*(3), 197–207.

Glover, D., & Pirsig, R. M. (2003). *Lila's child: An inquiry into quality*. Milton Keynes, UK: AuthorHouse.

Gordon, W. T. (1997). *Marshall McLuhan: Escape into understanding – A biography*. New York, NY: BasicBooks.

Hadorn, G. H., Bradley, D., Pohl, C., Rist, S., & Wiesmannd, U. (2006). Implications of transdisciplinarity for sustainability research. *Ecological Economics*, *60*(1), 119–128.

Hart, H. (1984). *Understanding our world: An integral ontology*. Lanham, MD: University Press of America.

Holden, M. (2008). The tough minded and the tender minded: A pragmatic turn for sustainable development planning and policy. *Planning Theory & Practice*, *9*(4), 475–496.

Hollender, J., & Breen, B. (2010). *The responsibility revolution: How the next generation of businesses will win*. San Francisco, CA: Jossey-Bass.

Horton, M., Freire, P., Bell, B., Gavent, J., & Peters, J. (Eds.). (1990). *We make the road by walking: Conversations on education and social change*. Philadelphia, PA: Temple University Press.

Kajikawa, Y. (2008). Research core and framework of sustainability science. *Sustainability Science*, *3*, 215–239.

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development.* New Jersey, NJ: Prentice-Hall.

Kotler, P. (1977). *Considerations in a theory of humanistic marketing* (Working paper). Graduate School Of Management, Northwestern University.

Kotler, P. (1987). Humanistic marketing: Beyond the marketing concept. In A. F. Firat, N. Dholakia, & R. Bagozzi (Eds.), *Philosophical and radical thought in marketing* (pp. 269–283). New York, NY: Lexington Books.

Kotler, P., Kartajaya, H., & Setiawan, I. (2010). *Marketing 3.0: From products to customers to the human spirit*. New York, NY: Wiley.

Lang, D. J., Wiek, A., Bergmann, M., Stauffacher, M., Martens, P., Moll, P.,. Thomas C. J. (2012). Transdisciplinary research in sustainability science: Practice, principles, and challenges. *Sustainability Science*, *7*(1), 25–43.

Leeds-Hurwitz, W. (Ed.). (1995). *Social approaches to communication*. New York, NY: The Guilford Press.

Leonard, A. B. (2004). *Integral communication* (Unpublished Master of Arts in Mass Communication). Gainesville, FL: University of Florida.

Lessig, L. (2005). *Free culture: The nature and future of creativity*. New York, NY: Penguin Books.

Lusch, R. F., & Vargo, S. L. (Eds.). (2006). *The service-dominant logic of marketing: Dialog, debate, and directions*. Armonk, NY: M E Sharpe

Lusch, R. F., & Vargo, S. L. (2010, September 23). *S-D logic: Accommodating, integrating, transdisciplinary*. Paper presented at the Grand Service Challenge, University of Cambridge.

MacInnis, D. J. (2005). Them versus us: Woes on the bifurcation of the academic marketing discipline. *Journal of Marketing*, *69*(4), 14–16.

Max-Neef, M. A. (2005). Foundations of transdisciplinarity. *Ecological Economics*, *53*, 5–16.

McDermott, J. J. (Ed.). (1977). *The writings of William James: A comprehensive edition*. Chicago, IL: University of Chicago Press.

Menand, L. (1997). *Pragmatism: A reader*. New York, NY: Vintage Books.

Menand, L. (2002). *The metaphysical club: A story of ideas in America*. London, UK: Flamingo.

Milbrath, L. W. (1989). *Envisioning a sustainable society: Learning our way out*. Albany, NY: State University of New York Press.

Moore, E. C. (1985). *American pragmatism: Peirce, James, and Dewey* (Reprint ed.). Westport, CT: Greenwood Press.

Murphy, P. E., Oberseder, M., & Laczniak, G. R. (2013). Corporate societal responsibility in marketing: Normatively broadening the concept. *AMS Review*, *3*(2), 86–102.

Nicolescu, B. (2002). *Manifesto of transdisciplinarity* (K.-C. Voss, Trans.). Albany, NY: State University of New York Press.

Normann, R. (2001). *Reframing business: When the map changes the landscape*. Chichester, England: John Wiley & Sons.

Norton, B. G. (1999). Pragmatism, adaptive management, and sustainability. *Environmental Values*, *8*(4), 451–466.

Paulson, D. S. (2002). *Competitive business, caring business: An integral business perspective for the 21st century*. New York, NY: Paraview Press.

Pirsig, R. M. (1974). *Zen and the art of motorcycle maintenance: An inquiry into values*. London, UK: Vintage/Bantam Books/Bodley Head.

Pirsig, R. M. (1991). *Lila: An inquiry into morals*. London, UK: Transworld Publishers/Corgi Books/ Bantam Books.

Pohl, C. (2005). Transdisciplinary collaboration in environmental research. *Futures*, *37*(10), 1159–1178.

Raskin, P. D., Electris, C., & Rosen, R. A. (2010). The century ahead: Searching for sustainability. *Sustainability*, *2*(8), 2626–2651.

Raskin, P., Banuri, T., Gallopin, G., Gutman, P., Hammond, A., Kates, R., & Swart, R. (2002). *The great transition: The promise and the lure of the times ahead*. Boston, MA: Tellus Institute/Stockholm Environment Institute.

Ray, P. H. (1996). *The integral culture survey: A study of transformational values in America*. Institute of Noetic Sciences/Fetzer Institute.
Reed, M. S., Evely, A. C., Cundill, G., Fazey, I., Glass, J., Laing, A., … Stringer, L. C. (2010). What is social learning? *Ecology and Society*, *15*(4), r1 [online]. Retrieved from http://www.ecologyandsociety.org/vol15/iss4/resp1/
Sayre, K. M. (2010). *Unearthed: The economic roots of our environmental crisis*. Notre Dame, IN: University of Notre Dame Press.
Searle, J. R. (1969). *Speech acts: An essay in the philosophy of language*. Cambridge, England: Cambridge University Press.
Senge, P. M., Smith, B., Kruschwitz, N., Laur, J., & Schley, S. (2010). *The necessary revolution: Working together to create a sustainable world*. New York, NY: Broadway Books.
Sheth, J. N., & Sisodia, R. S. (Eds.). (2006). *Does marketing need reform? Fresh perspectives on the future*. New York, NY: M E Sharpe.
Sheth, J. N., Gardner, D. M., & Garrett, D. E. (1988). *Marketing theory: Evolution and evaluation*. Chichester, England: John Wiley & Sons.
Sisodia, R. S., Wolfe, D. B., & Sheth, J. N. (2006). *Firms of endearment: How world-class companies profit from passion and purpose*. Upper Saddle River, NJ: Prentice Hall.
Smart, B. (2010). *Consumer society: Critical issues and environmental consequences*. London, UK: Sage Publications.
Snow, C. P. (1993). *The two cultures* (Canto Imprint ed.). Cambridge, England: Cambridge University Press.
Sternberg, R. J. (1989). *Wisdom: Its nature, origins, and development*. New York, NY: Cambridge Univerity Press.
Surowiecki, J. (2004). *The wisdom of crowds: Why the many are smarter than the few and how collective wisdom shapes business, economics, society and nations*. London, UK: Little, Brown.
Suzuki, D. T. (2011). *The legacy: An elder's vision for our sustainable future*. Vancouver, Canada: Greystone Books.
Swan, W., Langford, N., Watson, I., & Varey, R. J. (2000). Viewing the corporate community as a knowledge network. *Corporate Communications: An International Journal*, *5*(2), 97–106.
Trist, E. (1980). The environment and system-response capability. *Futures*, *12*(2), 113–127.
Varey, R. J. (1997). Corporate community and the new technologies: Concepts for communicators. *Corporate Communications: An International Journal*, *2*(3), 117–123.
Varey, R. J. (2000). A critical review of conceptions of communication evident in contemporary business & management literature. *Journal of Communication Management*, *4*(4), 328–340.
Varey, R. J. (2002a). *Marketing communication: Principles and practice*. London, UK: Routledge.
Varey, R. J. (2002b). *Relationship marketing: Dialogue and networks in the e-commerce era*. Chichester, England: John Wiley & Sons.
Varey, R. J. (2003). A dialogical foundation for marketing. *The Marketing Review*, *3*(3), 273–288.
Varey, R. J. (2007, December 3–5). *Reasons for marketing: On pyramid building, Kosmos, evolution, and marketing futures*. Paper presented at the Annual ANZMAC Conference, University of Otago.
Varey, R. J. (2008). Marketing as an interaction system. *Australasian Marketing Journal*, *16*(1), 79–94.
Varey, R. J. (2010). Marketing means and ends for a sustainable society: A welfare agenda for transformative change. *Journal of Macromarketing*, *30*(2), 112–126.
Varey, R. J. (2011a). *Ethical marketing practice: The ethical strength of the service-dominant logic for marketing*. Paper presented at the strengthening our ethical practices: The 18th Annual AAPAE Conference, University of Tasmania, Hobart, June 7–9.
Varey, R. J. (2011b). A sustainable society logic for marketing. *Social Business*, *1*(1), 69–83.
Varey, R. J. (2012). The marketing future beyond the limits of growth. *Journal of Macromarketing*, *32*(4), 421–430. doi:10.1177/0276146712454883
Varey, R. J. (2013). Marketing in the flourishing society megatrend. *Journal of Macromarketing*, (forthcoming). doi:10.1177/0276146713489150
Varey, R. J., & McKie, D. (2010). Staging consciousness: Marketing 3.0, post-consumerism and future pathways. *Journal of Customer Behaviour*, *9*(4), 321–334.

Varey, R. J., & Nolan, T. (2013a). Re-cognising the interactive space: Marketing for social transformation. *Marketing Theory*, *14*(4), 431–450.

Varey, R. J., & Nolan, T. (2013b). Towards transition: Resourcing socially learned decisions. *International Journal of Sustainable Development*, *17*(2), 208–226.

Varey, R J., & Pirson, M. (Eds.). (2013). *Humanistic marketing* (Humanism in Business Series), London, UK: Palgrave Macmillan.

Vargo, S. L., & Lusch, R. F. (2004). Evolving to a new dominant logic for marketing. *Journal of Marketing*, *68*(1), 1–17.

Vickers, G. (1972). *Freedom in a rocking boat: Changing values in an unstable society*. London, UK: Pelican Books.

Vickers, G. (1976). Values, norms and policies. In F. G. Castles, D. J. Murray, D. C. Potter, & C. J. Pollitt (Eds.), *Decisions, organisations and society: Selected readings*. London, UK: Penguin Education/ Open University.

Vickers, G. (1983). *Human systems are different*. London, UK: Harper & Row.

Webster, F. E., & Lusch, R. F. (2013). Elevating marketing: Marketing is dead! Long live marketing! *Journal of the Academy of Marketing Science*, *41*, 389–399.

Wilber, K. (2001). *A theory of everything: An integral vision for business, politics, science and spirituality*. Boston, MA: Shambhala Publications.

ANA ISLA

4. GREENING COSTA RICA[1]

The Political Ecology of Sustainable Development

INTRODUCTION

During the 1992 Earth Summit in Rio de Janeiro, Brazil, Agenda 21, a negotiated plan of action, linked together development and the environment as "sustainable development" (Pearce & Warford, 1993). The argument is that sustainable development is good and desirable for the entire world, including and most particularly for the "underdeveloped" world. This redefinition of conservation within a development paradigm translates nature into something with monetary value.

The term "greening" is used here to indicate how, under the conditions of neoliberal political ecology (so-called sustainable development), the ecosystems of an indebted Costa Rica are increasingly becoming destabilized, especially through an ever-growing pressure for resource extraction. During the 1980s, the Costa Rican economy was so strangled by debt repayments that the government accepted assistance from the United States Agency for International Development (USAID), allowing it to become virtually a parallel state power. In a so-called green economy, goods and services provided by nature now depend on the stock exchange.

The "greening" of Costa Rica entails new instruments, new experts, new types of nature, and new labourers. New instruments – debt-for-nature swaps – are used to facilitate the implementation of sustainable development programs. From the sustainable development perspective, debt-for-nature swaps are financial mechanisms supposedly used to confront the environmental crisis. The debtor country's "obligation" is to allocate domestic resources for financing ecological projects in exchange for extinguishing a limited portion of the country's foreign debt. Debt-for-nature investments are based on a negative assessment of the debtor country, meaning that the debt must be considered beyond the country's ability to pay. In practical terms, this means the debt titles can be sold at a fraction of their value in the secondary market where one investor purchases a debt title from another investor rather than from the issuer country.

The new experts are environmental non-governmental organizations (ENGOs) that claim debt-for-nature swaps can reduce the burden of indebted countries' external debt, as well as confront the environmental crisis. By the end of the 1980s, under the neoliberal agenda, ENGOs emerged as new models of modernization and environmental

R. C. Mitchell & S. A. Moore (Eds.), Planetary Praxis & Pedagogy, 73–93.

protection by using the discourse of "protecting" land, air, and water. Conservation International (CI) initiated the first debt-for-nature transaction in Bolivia, in 1987 (Conservation International, 1991). The "new experts" in this Costa Rican case study are three NGOs: (a) The World Wildlife Fund-Canada chapter (WWF-C); (b) the National Biodiversity Institute, or in Spanish, the Instituto Nacional de Biodiversidad (INBio), both of which use the Canada/Costa Rica debt-for-nature swap; and (c) the ANDAR Association of Costa Rica (Asociación ANDAR de Costa Rica), using the Netherlands/Costa Rica debt-for-nature swap.

The new types of nature are located in conservation areas. A conservation area is a designated domain where private and public activities are interrelated in order to manage and conserve the area's nature for capital accumulation. In 1989, the National System of Conservation Areas (Sistema Nacional de Areas de Conservación) (sinac) was organized in Costa Rica. SINAC divided the country into 11 conservation areas comprising wildlife, private lands, and human settlements, under the supervision of the Ministry of the Environment and Energy (Ministerio de Ambiente y Energia) (MINAE). In 2006, the total number of wildlife areas administered by MINAE was 26.3% of the national territory. The total size was 1,332,601 hectares (Estado de la Nacion, 2007). The Arenal-Tilaran Conservation Area (ACA-Tilaran, now the Arenal-Tempisque Conservation Area), the case study examined in this chapter, is one of these 11 nationally designated conservation areas.

The new labourers are rural women working to produce medicinal plants in micro-credit schemes, as well as peasants and Indigenous people who acquired new roles as service providers in the new industries: biotechnology, eco-tourism, forests as carbon credits, and open-pit mining. In researching ENGOs, I used the ecofeminist framework, subsistence perspective.

THEORY

Ecofeminists argue that sustainable development within the framework of capital accumulation means enclosure and "housewifization." Enclosure is the fencing of the commons (or common land, water, and air), appropriating the "common wealth" of workers through the elimination of customary right. According to Hobsbawm (1996) enclosure was initiated in England circa 1500 (E. J. Hobsbawm, 1996, p. 31). However this antique practice continues today, revitalized by the sustainable development policies of international institutions, particularly the World Bank. In this process, according to Maria Mies (1986), unwaged or poorly paid rural women, peasants, and Indigenous peoples dependent on the commons for their subsistence, autonomy, and sociality are housewifized.

Housewifization is applied to such socially marginal and "externalized" economic sectors and actors as Indigenous people and peasants when their land and products are taken from them with little or no compensation through structural violence. Housewifization is the outcome of an economic policy, which assumes that unpaid

work has no value. It reflects an ideology that defines some human beings and nature as a "resource" – to be appropriated, exploited, raped, extracted, and destroyed. That is, what were stable biological, cultural, and communitarian patterns – both human and nature – are transformed into colonies of "extracted commons" (Salleh, 1997).

RESEARCH HYPOTHESES

The research hypotheses in this chapter are grounded in the fact that the arrangements of subsistence forest-dwelling households in a market context continue to be encompassed by two sets of objective conditioning: 1) free access to natural resources and disposable resources, and knowledge and means of production to use and transform them; and 2) dependence on the availability of natural resources and market goods. If the second condition induces us to think that forest-dwelling societies are in a situation of 'conditioning', knowledge of and free access to forest resources also makes them 'free'. In the margin between conditionality and freedom thrives what I call a forest-dweller's 'art of life', which I argue, is at the source of the conflict we observe today.

I hypothesized that the penetration and the expansion of political ecology of sustainable development will alter the definition of common land and the notions of women and men in the subsistence unit of production and reproduction by introducing new forms of disciplined body behaviour and social relations. It offers a framework of description and interpretation of a sector of the Costa Rica rural population that has for a long time been seen as a 'deculturized people'. Ariel Salleh (Salleh, 2004) uses the term "meta-industrial class" (2004, p. 2) to describe all these invisible reproductive labourers whose unwaged labour and knowledge sustain natural processes but who are exploited by capitalist markets.

THE POLITICAL ECOLOGY OF "GREEN CAPITALISM"

World Bank official Kirk Hamilton (2001) argues that one possible definition of sustainable development is the process of creating, maintaining, and managing a nation's portfolio of assets in national-asset accounting. These assets include built infrastructure (roads), natural capital (minerals, energy, genetics, agricultural land, forests, rivers), human capital (education, health care), and social capital (networks, the court system, the political regime). Hamilton (2001) further argues that many of the critically important ecological and life-support functions provided by natural systems – the genetic material, the forest, water, the atmosphere – are not yet measured as part of the wealth of nations. These elements must be embedded in the economic system as "natural capital" to become integrated within the sustainable development framework and thereby ensure sustainable growth (Hamilton, 2001, p. 30). Hamilton also states that "natural capital, the base for all life, is much more equitably distributed than other forms of capital. What matters is how this resource

is managed and whether the rents from the natural capital endowment are invested or consumed" (Fenech et al., 1999, p. 6). Following this logic, the World Bank developed "genuine" saving measures that expanded the national accounts definitions of assets to include minerals, energy, forest resources, and the stock of atmospheric CO_2 (Hamilton, 2001), thus legitimizing the privatization of the commons.

GENETICS AS A SITE OF BIOTECHNOLOGY OR BIOPIRACY: DISPOSSESSION OF INDIGENOUS PEOPLES' AND PEASANTS' KNOWLEDGE

The Convention on Biological Diversity (CBD) of the Earth Summit in 1992 opened the Costa Rica gene resources to NGOs and corporations, turning nature and community knowledge into areas of secrecy and paranoia. Different levels of dispossession and expropriation from the land are to establish a wide terrain for corporate science research. The collection of highly selective genes from plants and animals was initiated in the conservation areas by parataxonomists working for international NGOs, and further developed through experiments by the pharmaceutical, medical, and agricultural industries of the developed world.

The WWF-C Style of Sustainable Development

The World Wildlife Fund using the Canada-Costa Rica Debt-for-Nature agreement, in association with the Ministerio de Ambiente y Energía (MINAE) of Costa Rica, organized the Arenal Conservation Area – Tilaran. It covers 250,561.5 hectares of land, and is located in the North West part of Costa Rica. Between 1991 and 1993, ACA-Tilaran drafted the *General Land Use Plan* (ACA-Tilaran Ministerio del Ambiente y Energia, 1993), hereafter referred to as the Land Plan, as a first step of their management strategy. The Land Plan was an instrument of land organization that regulated land access and use. In addition, ACA-Tilaran established the Development Foundation for the Arenal Conservation Area or FUNDACA, an organization that provides loans for micro-enterprises by using debt-for-nature funds to finance local projects.

The Land Plan has:

a) Changed the community land availability. The land base of a human population of some 100,000, grouped in 108 communities, was reduced to a living space of little more than half of the area they had been living in, that is, from 204,000 to 133,871 hectares (ha), as nearly 77,000 hectares – almost 40% of this enclosure – are "nucleus areas" reserved for the research of genetic material on behalf of multinational and environmental corporations.

b) Recolonized the country by appropriating community genetic material. The Land Plan allowed managers to strategically move the right to land from small- and medium-sized farms, and placed the farmland into the hands of NGOs and

MINAE. This action was taken in order to promote competition for inventory and prospecting of the local folkloric knowledge of plants and animals. For instance, the WWF-Canada, in partnership with ACM, the Monteverde Conservation Association (*Asociación Conservacionista Monteverde*), collects material and researches flora and fauna in national parks, biologic reserves, protected zones, the National Sanctuary of Wildlife, and forestry reserves (Asociacion Conservacionista de Monteverde & World Wildlife Fund-Canada, 1996).

c) Made criminals of community members. The newly declared "nucleus area" as private land was patrolled by seven park rangers organized into a Police Control Unit, trained and designated to counter "land invasions." When park rangers find community members in designated research areas without permission or without having paid the necessary fee, they confiscate any fish or game these individuals might have obtained and whatever tools they used to do so. They then report the offence to the Office of the Public Prosecutor. In July 1998, one park ranger stated:

> A year ago, three of us were patrolling *Quebradon Patusi* where many people used to hunt. We heard barking dogs and saw a *chavalo* (young man) walking behind the dogs. We walked in silence to corner him, but one of us tripped. The *chavalo*, scared to death, started to run, then swam, and then ran again, this time on a wall of rocks. To try to stop him, we shot at the air, but he never stopped, because he knew that he was breaking the law. (Park Ranger, 1998)

The Land Plan continues to undermine the rights of local communities to use their surrounding environment because conservation areas are used as collection centres of single samples for potential profits by interested industries.

INBio: Establishing Hegemony

The Convention on Biological Diversity in 1992 established rules and regulations to benefit the "whole humanity," a euphemism for technologically advanced countries able to expropriate the biochemical components from diversity through biotechnology. Biotechnology is the use of biological processes in industrial production. Since 1992, international multinational industrial corporations have started to assault rainforests around the world arguing that biodiversity is for "everyone," by which they mean for the first to register a patent. As a result of the patent system, the laboratories of large multinational seed companies and genetic banks are allowed to accumulate and preserve biodiversity, and to enjoy a monopoly over its commercial exploitation.

Bioprospecting for biotechnology ignores Indigenous peoples' collective property and knowledge, and the fact that they have been enjoying and using biological diversity for millennia. It also ignores peasants' contributions in the creation of biodiversity.

Following the Convention's framework, INBio has:

a) Established a monopoly on local knowledge. In Costa Rica, in 1994, INBio was granted rights with respect to conservation areas or state-owned land in order to sell biodiversity to global industry. INBio established a partnership with MINAE to collect samples from the conservation areas for interested industrial concerns. The 10th clause of the partnership agreement stipulated that in cases of bioprospecting research, INBio must contribute at least 10% of the original budget to support the management and protection of the conservation area. Part of this clause stated that any royalties awarded to INBio from successful discoveries were to be shared 50/50 with MINAE for management and conservation of the land.

INBio's bioprospecting began with the appropriation of local knowledge about some of the attributes of the non-human life forms that thrived in the conservation areas. It hired daughters and sons from rural communities as parataxonomists who initiated the collection using the common rural knowledge. Parataxonomist workers are necessarily from the local rural area because they bring intimate knowledge of the ecosystem. Parataxonomists are considered non-specialists because they have no formal degree, although INBio uses the parataxonomists' knowledge to initiate every process.

b) Robbed local genetic material. INBio has claimed a monopoly on local knowledge and devalued local communities as ecological authorities. Under the bioprospecting framework, Indigenous lands have been expropriated and denominated conservation areas. As noted previously, within the Convention on Biological Diversity, the knowledge of Indigenous peoples and peasants have become global capital resources.

Similar to Indigenous peoples' knowledge, the knowledge produced by traditional selection and improvement of plants by peasants, has become invisible, and since this knowledge is not monetized it is not included in United Nations System of National Accounting (UNSNA). But biodiversity is not an exclusive product of nature; peasants have actively bred and improved traditional plants and medicines, and they continue to identify and produce genetic material of great value, by selecting, improving, and developing local varieties. These materials reflect the creativity, inventiveness, and value of peasants' knowledge production.

c) Privatized life and facilitated the property rights of multinational corporations for value added. INBio receives "donations" from industry and participating core countries. Both the donors and INBio seek to commercially exploit biodiversity, especially from the rich rainforest – yet they do so under the guise of conservation. For instance, Canada/Costa Rica debt-for-nature funds were used to set up a microbiology laboratory and associated labs that fragment and extract essences of major interest to industry (INBio, 1995). These labs extract a desired ingredient from other components of the organism. The process is repeated many times until an

active component is identified and isolated from the myriad of other components present in the natural product.

INBio has/had agreements with Bristol Myers Squibb, Recombinant Biocatalysts, Analyticom AG, Merck, INDENA (a phyto-pharmaceutical company in Milan, Italy), Givaudan-Roure Fragrances of New Jersey (to identify and collect interesting odours from forest organisms), British Technology Group, Strathclyde Institute for Drug Research, and many others (Eduardo Gudynas, 1998; Mateo, 1997). With INBio's first agreement in 1991, Merck awarded INBio a USD$1.1 billion research budget to carry out a two-year, non-exclusive collaboration. Intellectual property law assures Merck exclusive rights over the industrial use of plants, insects, and micro-organism. Under the terms of the 1991 agreement with Merck, INBio used 90% of the funds for research, certain start-up costs, and training four Costa Rican scientists at Merck, while conservation areas received 10% of the original budget to support their conservation efforts.

RESISTING SUSTAINABLE DEVELOPMENT AND CRIMINALIZATION

Within the Canada/Costa Rica debt-for-nature agreement, INBio organized a conference in 1998 between some business-oriented Indigenous peoples of Canada and subsistence-oriented Indigenous peoples of Costa Rica. The Indigenous people from Canada told the Costa Ricans that they could help them defend themselves, and at the same time, reap the benefits from biodiversity negotiations. The Talamanca Indigenous People, who saw biodiversity as priceless and therefore as non-negotiable, answered:

> We do not want to know about making business with biodiversity, we are happy living like we are. What we want is just to keep and use the land, with the knowledge our ancestors handed down to us. (Anonymous source, 1999)

In the Arenal Conservation Area, some peasants and Indigenous people still manage to live a traditional lifestyle and work in groups because of the risks of bites from poisonous snakes, broken legs, and rolling boulders ejected from the Arenal Volcano. But the separation of people from nature has created a sense of disorder, alienation, fragmentation, and uncertainty. By 1999, when they hunted and fished for survival, self-sufficient local people were labeled as criminals, even though, they argued, their hunting methods were less harmful than those used by outsiders who could afford the required fees. One hunter says:

> If ACA-MINAE stops selling licenses for hunting to the rich who can pay, I will stop hunting, because I will see that it is not just the poor who have to conserve wildlife. I can live happy if this inequality stops. If they permit hunting to the rich but bother the poor, I cannot be happy. I can see rich hunters drinking in bars, while in their station wagon dogs bark and dead *tepezcuintles* hang in baskets. They are openly showing off the proceeds of their hunting.

> But if I have a *tepezcuintle* in a bag, MINAE confiscates it from me, and if I do not confront them I also risk losing my dogs, because I do not have a car and I am walking. That is the reason why we do not stop hunting. Why is it that those who have money can hunt and those who are poor must become "conservationists?" (Anonymous Hunter, 1999)

FORESTS AS CARBON SINKS: DISPOSSESSION OF PEASANT ACCESS TO THE FOREST

Since Kyoto, 1997, a rainforest has been valued economically in terms of the amount of carbon it sequesters. As carbon emissions became subject to trading in an open market, the rainforest in Costa Rica became valued as a carbon sink. Costa Rica was the first country to package the Joint Implementation Program organized by the United Nations (United Nations, 2005). It "voluntarily collaborated" to achieve emission reductions by selling carbon credits. In the maldeveloped countries, the Kyoto Protocol (now Reducing Emissions from Deforestation and Forest Degradation-REDD) generate an economic value from forests, cast in a role as carbon sinks.

Since the industrial world is not held responsible for mitigating its own level of emissions, this type of "solution" allows the industrial world to continue polluting as long as it can purchase carbon credits from indebted rainforest-dense countries. Meanwhile, energy-related emissions produced by the increasing amounts of coal and oil burned, mainly in the industrial world, proceed unimpeded.

The Kyoto Protocol has created two crises: a crisis of nature and a crisis of peasants.

Crisis of Nature

The new mono-arboriculture of introduced species for commercial export is being subsidized by both Costa Ricans and the international aid community in the name of sustainability, while drastically reducing the diversity of the pre-existing ecosystem. Costa Rica's forests are home to hundreds of species, but the scheme to sell oxygen or carbon credits is transforming the rainforests' biomass.

Kyoto values commercial wood. It appraises the ability of private forest farms to sell carbon credits, particularly promoted by large-scale agricultural entrepreneurs in association with international capital. This commercially produced wood has encouraged the establishment of monocultural tree planting. Lands categorized as Forest Reserves, which receive environmental service payments, are exempted from property taxes. Tax relief, under a scheme called Fiscal Forestry Incentives (ffi), subsidizes plantations owned by international capital to promote foreign forest species of high yield and great market acceptance, such as gmelina (*Gmelina arborea* used by Stone Forestall, a United States corporation) and teak (*Tectona grandis* used by Bosques Puerto Carrillo and Maderas of the Netherlands). These

trees are native to south and southeast Asia. Mono-arboriculture has been defined in this system as "reforestation" even though these plantations constitute artificial ecosystems, and corporations are allowed to cut the trees down after 15 years of growth and transform them into wood for floors and/or paper, boxes for fruit export, or furniture. Jorge Lobo (2003), a professor at the University of Costa Rica, says the practice of cutting trees and vegetation on plantations in the service of monoculture can be highly damaging to soil carbon, which is important to the carbon mass existing in the ecosystem. He argues that "it is ridiculous to promote carbon fixation as an environmental service separated from the other ecosystem services and properties" (p. 7).

The large-scale commercial mono-arboriculture applied chemical fertilizers on a massive scale, with negative effects on soil fertility, water retention, and on biological diversity. Sonia Torres, a forestry engineer, explains how teak plantations have resulted in the erosion of flat lands:

> Since the planting of these foreign species, I have observed that teak has a root system that grows deep into the soil, but in the rainforest the systems of nutrient and water absorption are at the surface. In general, nutrients and water are concentrated at a depth of between 70 and 100 centimetres. As a result, teak trees are encircled by flaked soil. In addition, when it rains, the large-sized leaf accumulates great amounts of water that then pours violently onto the soil. A drop of water, at a microscopic level, forms a crater; when water falls from 15 metres or more it forms holes. Water descending on soft soil destroys the soil. The far-reaching spread of the roots and the shade produced by the leaves obstruct the vegetative growth on the lower forest layer, which could prevent the soil damage from the violent cascades. (Sonia Torres, personal interview, July 2000)

Crisis of Peasants

To comply with the Letter of Intent for Sustainable Development, Cooperation and Joint Implementation, in 1996 President Jose Maria Figueres signed a decree known as the Forestry law (No. 7575) and put into effect Article No. 2 on land expropriation. The state's project of selling carbon credits meant expropriating land from small- and medium-sized landholders in most cases without compensation to the owners.

The Kyoto Protocol has become an instrument to expand poverty. Under the Forestry Incentive Programs (fip), ACA-Tilaran receives, evaluates, and approves the terms of the program and promotes and compensates forestry plantation owners. FIP recognizes small farmers (*finca* owners) as providers, and eligible to receive payments for the environmental services they provide. In this system, MINAE gives peasant landowners USD$50 dollars per hectare, in recognition of the environmental services generated from private property lands. These payments are

short-term, usually contracted for five years. These short-term contracts give rise to insecurity among farm owners. In addition, tree plantations require between 10 and 15 years to grow before any income can be obtained, but peasants are annual cash croppers, which is their only source of income and livelihood. But the law on land expropriation prevents or dissuades peasants from changing the land use. If they have a contract to produce carbon credits, peasants cannot use their land for short-term income or subsistence production because their land can be expropriated with or without compensation.

Conservation areas also are sellers of carbon credits. For instance, the ACA-Tilaran national parks such as Arenal Volcano National Park, and forestry reserves such as Cerro Chato, sell oxygen. But to put the oxygen on the market in 1994, ACA-Tilaran declared the Arenal Volcano to be a national park, extending its area from 5 hectares to 12,010 hectares. The change of category and extension of the Arenal Volcano expelled local people from the land and transformed their lives.

Resisting Dispossession

Peasants became cannon fodder in the face of the sustainable development that considers them and their concrete needs to be obstacles to reducing carbon emissions that will "benefit all mankind."

The 1996 expropriation law left thousands of peasants without land and without money as they were not paid for their expropriated land. Communities that used to live off the forest have been declared enemies of the rainforest. In 1996, La Cuenca de Aguas Claras was declared a forestry reserve and the land expropriated. Peasants throughout Costa Rica understand that land has been expropriated by the government in exchange for crumbs of money from international markets, while they have been abandoned. In Aguas Claras, MINAE's argument for expropriating farmers' land was based on the claim of water scarcity in the area and the resulting need for reforestation. Mr. Fuentes [NOTE: First name? Who is he?] had seen the forced eviction of the rainforest dwellers and the breaking of the regenerative cycle of life. Forced eviction of peasants for carbon credits destroys sustainable ways of living of entire communities. He stated:

> Until 1996, in La Cuenca de Aguas Calientes, 200 families lived there and the land was organized as follows: 70% was pastureland, holding around 2,000 cows; 10% primary forest; and 20% combined secondary forest with farmland, which was used for beans and pig production. By 2001, we were only three families; the majority was forced into exile. And the land has been reorganized as follows: 90% is primary and secondary forest; 10% is pastureland with less than 200 cows; and land to produce beans has been eliminated. (Fuentes, personal interview, July 2001)

SCENERY AS ECO-TOURISM: DISPOSSESSION OF PEASANT AGRICULTURAL LAND AND THE RISE OF PROSTITUTION

Malestream environmentalism is environmentalism organized by white males; in Costa Rica environmentalism has been dominated by a patriarchal male hierarchy that aims to enclose "wild areas" (nature and women) for recreation. Eco-tourism sells the whole country including its biodiversity, culture, and identity, and involves the high volume movement of people over long distances, which can have a violent impact on vulnerable people or communities, species and their habitats (Pleumaron, 1999). Eco-tourism also sells women and children, as sex tourism offers their bodies as pure, exotic, and erotic, making Costa Rica a sex tourism "paradise." Critics see eco-tourism as an extension of the commodification of modern life and an integral part of modern consumer culture.

With eco-tourism, the building of hotels, cabins, bed and breakfasts, and ecotourist lodges (*albergues*) has meant that volcanos, mountains, rivers, forests, and woodlands took on new value, and were packaged, branded, marketed, and ultimately sold as recreation products. The resident community has simultaneously also been turned into a branded product for sale to "customers" (tourists) in a variety of forms. Some community members have become eco-tourism specialists in bird-watching and guided adventure tourism, while others have become waitresses serving liquor, servants stretching beds, and/or prostitutes.

Eco-tourism has thus created two crises: a crisis of nature and a crisis for women and children.

Crisis of Nature

In ACA-Tilaran, eco-tourism is concentrated around the Arenal Volcano, which is an active cone with an elevation of 1,633 metres, close to the city of La Fortuna and the town of Z-Trece. The volcano is a spectacular natural show that erupts 24 hours a day. The Arenal Volcano has become the central attraction for eco-tourism.

ACA-Tilaran developed an "enclave tourist model" for the volcano. The volcano's ball of flame, eco-tourism advertisements, scientific publications on taxonomy, ecology, plants, and animal behaviour orient the tourist and attract wealthy Costa Rican and foreign businessmen, who set up tourist-resort centres.

The ecosystem surrounding the Arenal Volcano has become overcrowded with hotels and resorts that have negatively altered the local environment. The volcano's hot springs (39 degrees Celsius), previously accessible to the public without cost, have been privatized. Since 1995, the forests surrounding the volcano have been converted into resorts, endangering wildlife habitats, contributing to biotic impoverishment and the forced migration of species. As species' nesting sites have been invaded by ecotourists, species reduction has become a significant problem. A *Tabacon* Resort worker who wished to remain anonymous said:

> Before building the swimming pools, we carried hundreds of frogs out of the area. After five years of activity, the frogs disappeared and the toucans do not stand in the trees any longer. Massive use of chemicals to clean hot spring swimming pools, washrooms, etc. left chemical residues that forced the animals to leave the surrounding areas. (Anonymous worker, personal interview, August 1999)

Ecotourists want to experience solitude, so ecotourist packages are manufactured to take them to distant, unspoiled areas. Eco-tourism harms rural and local people because it exacerbates the same economic inequalities, social injustices, and ecological problems associated with conventional tourism. Consequently, eco-tourism as a form of sustainable development suppresses the human rights of local communities in favour of the rights of those with money to spend.

Crisis for Women and Children

As the ecosystem disintegrates, it has powerful effects on the degree of oppression endured by women and children. Eco-tourism links conservation areas and promises a risk-free world of leisure and freedom. At the same time, sex tourism offers women's and children's bodies as pure, exotic, and erotic. This image of Costa Rica entangles two aspects of capitalist patriarchal economics: the domination of creditors (the core) over debtors (the indebted periphery); and the psychology of the patriarchy in which men develop their "masculation" (G. Vaughan, 2004) over compliant women's bodies. As Costa Rica is increasingly impoverished by foreign debt and the enclosure of the commons, the mark of international power relations is stamped on the bodies of its children and women.

For peasant women, the disappearance of forests is an issue of survival, forcing them to migrate to San Jose, the capital of Costa Rica, and eco-tourist areas in the hope of earning an income for themselves and their dispossessed families. Introduced into the cash economy, some impoverished women have little option but to earn all or part of their living as prostitutes. Prostitutes in Costa Rica are women at work supporting children and other loved ones. They are prostitutes not by choice but out of necessity. According to Casa Alianza, a U.S. non-profit organization for children at risk, an astonishing number of children are bought, sold, and abused (Alianza, 2001). By complying with the desires of men from the developed world, these children and women contribute to the global tourism industry, to the wealth of businesses, and to state coffers.

White men in their 40s and 50s from industrial countries (the U.S., Canada, Germany, and Spain) and from all classes move across borders for ethnicized sex tourism. Jacobo Schifter (2007), author of *Viejos Verdes en el Paraiso: Turismo Sexual en Costa Rica*, an investigation of Costa Rica's sex tourism industry, estimated there were between 10,000 and 20,000 sex workers in the country, and 25,000 to 50,000 sex tourists who visit each year, 80% of them U.S. citizens (Schifter, 2007).

He further reported that the U.S. has become Costa Rica's pimp as "crack", and sex with prostitutes helps them "escape reality" (T. Rogers, 2009).

MEDICINAL PLANTS IN MICRO-ENTERPRISES: THE DISPOSSESSION OF RURAL WOMEN'S LABOUR AND KNOWLEDGE

ENGOs use the micro-enterprise model of sustainable development to incorporate rural women's knowledge and labour into the international markets. Under neo-liberalism, micro-enterprises first strengthen NGOs with access to international donors, in order to achieve the dismantling of state responsibility for upholding the rights of their citizens, particularly women's rights. Second, as women are incorporated into the markets, the model makes individuals solely responsible for their lives. The micro-enterprise model ignores the reality that in a primary agricultural economy the family-based household is the site of production as well as of reproduction. Within this context, the sexual division of labour conventionally allocates different roles to men and women in terms of productive activities as well as parenting. The burden of responsibilities falls more on women than men.

These inequalities are reflected in the exclusion of women from the control of land. Men hold the power in terms of decision-making, control of assets and resources, and leadership. Women's life is constrained by hierarchical and authoritarian social forms springing from the authoritarian structure of the society.

Since the 1992 Earth Summit in Rio, medicinal plants have been promoted as a source of income for many Costa Rican women, who have been encouraged to develop micro-enterprises to grow and market them. Since then, every project of international cooperation has included both sustainable development and women in development (WID) components. The concept of sustainable development promoted the production of organic medicinal plants and agriculture – a system that uses regional components and avoids the use of agro-chemicals and growth regulators – as socially and ecologically sound. The preference of Northern consumers for organic production of medicinal plants and vegetables is seen as a growing market expected to economically benefit rural areas of the maldeveloped world.

In the process of income generation, medicinal plants become commodities and the women who grow them become commodity producers. The concept of WID, promoted by the World Bank, sees women as active agents of development. The stated objective of the World Bank in this regard is the reduction of disparities for women and the enhancement of women's participation in the economic development of their countries. Since women's programs have no government support, Engos have used debt-for-nature swaps as a credit source to initiate income-generating activities in the women's sector of the economy. Proponents of sustainable development recognized gender relations as a central issue if women were to be incorporated into the market successfully.

Expropriating Women's Knowledge of Medicinal Plants

Until the end of the 1980s, medicinal plants had no market value, but were used by rural populations whose health depended on the local ecosystems where they lived. Having grown medicinal plants for centuries, women have acquired the skills and the knowledge of seeds, soil preparation, and optimum growing seasons. Women in Costa Rican rural areas can identify more than 43 wild medicinal plants and herbs and they also have the knowledge to make *cocimientos*, which are combinations of plants used for healing purposes.

Abanico Medicinal Plant and Organic Agriculture (the Abanico Project), a Women in Development (WID) initiative, was one of the 30 cooperation agreements signed by FUNDACA, the debt-for-nature loan provider of ACA-Tilaran, and ANDAR de Costa Rica. andar became responsible for developing and managing micro-enterprises as WID projects. In the micro-enterprise model credit is given to a group, which manages the money and within which individuals can borrow and repay small amounts that they use to set up a small business or micro-enterprise.

The Abanico micro-enterprise showed mixed results. Despite the fact that they had experienced some increased status and sense of agency in the community, the members of the Abanico Project had suffered serious negative consequences from their involvement with the project. Six key issues were identified:

First, the women recognized that the Abanico Project allowed them to renegotiate their situation in the community. Here are two comments from the members:

> ANDAR gave us opportunities for education and training (*capacitación*) in organizations, marketing, organic identification, organic fertilizers, credit, exchange of experience. (Oregano)

> People in the community started to value our work. One day I heard a comment, these ladies are working hard and making money. This comment was made by people outside our families because our families know that we work hard, but we do not make money. However, that comment made me proud. (Basil)

Second, each stage of the Abanico Project was built on loans from NGOs acting as banks. A credit from FUNDACA for ACA-Tilaran, using the Canada/Costa Rica debt-for-nature swap, provided a loan of cAD$4,480 (*colones* 700,000) at an annual interest rate of 20%. Each member received CAD$497. In addition, ANDAR, using a Netherlands/Costa Rica debt-for-nature swap, lent the group CAD$6,400 (*colones* 1,000,000) at an annual interest rate of 33% to buy an old house, which was expected to be turned into a processing plant as well as a site to sell the products. According to the NGOs, since the 1990s with neo-liberal policies in place, credits must be sustainable; that is, credits to micro-enterprises must cover operation costs.

Third, to develop a micro-enterprise, families had to convert a substantial part of their land from food production to the production of medicinal plants. Yet the financial return to the women proved to be so small that it was not sufficient to buy

food for the family's subsistence needs, which no longer came from their plot of land. The research showed that women involved in the project earned on average 11 cents an hour in 1998, well below the Costa Rican minimum agricultural wage of 97 cents an hour.

Fourth, the marketing was monopolized by ANDAR. This agency controlled the collection, transportation, and delivery to the markets of the group's products. It collected and weighed the dry leaves once a month at the women's plot. ANDAR typically paid these women a month after they collected the dry leaves. It was always possible for them to claim that they had experienced a loss and to pay them less than they had promised because leaves weigh less after the drying process. The marketing activity led to a high degree of pressure and social control over the women's group because ANDAR was the only buyer.

Fifth, the women's work time expanded, decreasing the time they could spend on activities important to the community and their families. On average, they spent nine hours a day weeding, seeding, or harvesting. Their work was time- and labour-intensive. The most time-consuming task was the weeding, done with machetes rather than herbicide. A typical day on the plot started around 5:30 a.m. with cutting, selecting, and cleaning the leaves. From 8:30 to 9:00, they spread the leaves in the solar drier, before it became too hot to work inside the drying house. When they were not cutting plants or weeds, they were preparing natural pesticides using gavilana (*Neurolaena lobata*), garlic, and onions; or applying fruit fertilizers using guayaba, papaya, sweet potato; or preparing seed beds. Despite working nine hours in the medicinal plant plots, the women also worked many more hours at home cleaning, cooking, washing, ironing, caring for the elders and rearing children, and doing community work. The women were active members of the Abanico Development Association's Board of Directors, the church, the school, and ANDAR's credit committee.

Sixth, in the face of daily inflation and devaluation imposed by the IMF and World Bank, wages were inadequate. Working for less than the minimum wage led these women to eventual physical collapse, exhausted by a never-ending competitive spiral of reduced real wages.

MOUNTAINS AS OPEN-PIT MINING SITES: DISPOSSESSION OF PEASANTS' WATER AND LIVELIHOOD

Since the 1992 Earth Summit, mining corporations have been unwaveringly supported by the United Nations (Rio Earth Summit, 1992 and the UN Economic Commission for Latin America and the Caribbean), the World Bank, the Global Mining Initiative, the Toronto Declaration (Declaration, 2002), and the World Conservation Union (World Conservation Union, 2001). But it was during the Johannesburg Earth Summit (Rio + Ten), in 2002, that mining was officially deemed as sustainable development, despite its fossil fuel-centred industrial model, which greatly contributes to global warming.

Since colonial times, the natural concentration of mineral resources throughout the world has diminished in both quantity and quality. What remains are dispersed particles of low concentration, in areas which are rocky, icy, forested, and mountainous, making it difficult to extract using traditional mining methods and technologies. Open-pit mining is a cheap method available to collect what remains. Open-pit mining may kill the surface matter (e.g., forests, mountains, glacier covers) through the use of dynamite to remove surface soil, which increases soil erosion. This results in desertification, while the rivers and streams suffer increased sedimentation, which multiplies the possibility of floods. Open-pit mining eliminates biological diversity (e.g., flora, fauna, and micro-organisms) and scars the landscape with giant craters.

In fact, mining is a fundamentally unsustainable activity. It is based on the extraction of non-renewable concentrations of minerals formed over millions of years. Once extracted, the destruction is permanent. Use of the cyanide lixiviation technique in gold mining – in which the shattered rocks are combined with cyanide – poisons water resources, contaminates ecosystems, and pollutes the atmosphere, thereby affecting all life. This central part of the mining process has a shattering impact on communities close to mining operations, as contaminated runoff continues to seep into the water, land, and air long after mine closure. The devastation brought by the chemical cocktail is never the concern of governments and mining corporations. Environmental justice groups note that, due to the use of cyanide, open-pit gold mines have become the near equivalent of nuclear waste dumps that must be monitored and tended to in perpetuity.

Mining in Costa Rica has pitted municipalities and communities against the national government that allows mining in its territory, despite its rhetoric of rejecting mining. In Miramar city, Costa Rica, the Bellavista Gold Mining project is located two kilometres north of Miramar de Montes de Oro, in the province of Puntarenas. Bellavista Gold Mining belonged first to Galaxie S.A. (POGGSA), a subsidiary of Rayrock Corporation, then to Wheaton River Minerals Ltd., later to Glencairn Gold Corporation, and is now owned by B2Gold. As mining initiated its operations, a full-fledged water war was waged because the mining operation forcibly disconnected the spring water from local residents. Women and men in the *Miramar* community, North East side of Costa Rica, have for generations used traditional ways of life and livelihood based on agriculture. By custom, forests and mountains provide rural communities with access to water, agriculture, and animals. Since 1996, Sonia Torres, Marta Blanco, and Nuria Corrales from *Miramar* organized *Frente de Oposición a la Mineria* (Front of Opposition to Mining) and initiated a campaign against Bellavista Mining. Mining establishments have used different strategies to harass local community members opposed to mining. One of these instruments is the use of legal intimidation. In 1997, Sonia Torres was taken to court by Galaxie S.A. (POGGSA). Following the demonstration of the technical weaknesses of the project, in 1999, the Rayrock Corporation sold the project to another Canadian corporation, Wheaton River Minerals Ltd. In 2001, Wheaton River, through its figurehead Rio Minerales, accused Marta Blanco (a teacher and municipal councillor) of falsely claiming that

thousands of trees had been cut down by the Wheaton River project. Blanco stated that for years that: "the mining company has been sending contracted individuals with tape recorders to every municipal meeting to intimidate the members. They pressure the municipality to keep silent about the problems they are creating. On the day of our municipal meeting where strip garbage collection was discussed, a person of the company was there."

Marta maintains that:

> On one occasion, I said that large projects are synonymous with the total destruction of nature, because they cut down thousands of trees. For these words, I was taken to court, despite the fact that I did not refer to the Wheaton River Minerals project…. We went to a conciliation meeting, at the Puntarenas Court. At the court, the lawyer for the company told me that the conciliation consisted in my resignation from the municipal post…. I made it explicit that my position was not going to change and that I was not going to resign.

Failing the court conciliation, Marta was taken to court by the corporation. In 2001, the Puntarenas court declared Marta responsible for defamation and ordered her to pay for damages and legal and procedural charges. Marta, with the support of the *Miramar* municipality and the Front Committee of Opposition to Mining in Miramar, appealed to the Tribunal of *Casacion Penal*, *Segundo Circuito Judicial San Jose*. On March 1, 2002, the court found a lack of grounds for the corporation to accuse Marta Blanco who, as a municipal councillor, was only carrying out her responsibilities and her rights to defend the environment as she had done. Consequently, the court annulled the sentence. Following this court case, Wheaton River sold the mining project to Glencairn Gold Corporation, another Canadian mining company (Isla, forthcoming). In July 25, 2007, the corporation suspended its operations, and in October 22, 2007, at 5:00 a.m. the processing plant collapsed over the lixiviation lagoon (Reuters, 2007; Torres, 2007). Miramar women and their supporters were enraged as the water system, the source of their livelihood, became contaminated (Torres, 2007). They became further enraged as Glencairn Gold Corporation was able to change its name to Central Sun Mining Inc. to avoid paying for the action urgently needed to control the sliding of the mining infrastructure in the mountain (Reuters, 2007). Currently, the owner is Vancouver-based B2Gold.

CONCLUSION

This chapter examines the limitations of sustainable development as a solution for the social (debt) and ecological crises as presented at the three linked United Nations Conferences on Environment and Development (UNCED) – the first, or the Earth Summit, held Rio de Janeiro in 1992, the second, or Rio+10, held in Johannesburg in 2002, and the third, Rio+20, held in Rio de Janeiro 2012. Dominant corporations in collaboration with national governments and ENGOs seek to expand the economic growth of globalized capitalist accumulation by appropriating the everyday

commons of women, households, Indigenous people, and peasants. Enclosing the commons and establishing the economic value of genes, scenery, forests, mountains, and medicinal plants required breaking an interconnected socio-ecological unit.

As a result, the mercantile reductionisms and economicisms of sustainable development have deepened housewifization in Costa Rica's people and nature. The concept of housewifization, within sustainable development, was enlarged to include:

a. Populations constructed internationally as unwaged or poorly paid labour. Neo-liberal thinking views subsistence living as an obstacle that must disappear in order to expand wealth. Subsistence living is not recorded as wealth production in the GDP; thus rural women's, peasants', and Indigenous people's sustainable ways of living were destroyed and dispossessed, while local inhabitants' labour has been housewifized, that is, constructed internationally as cheap or unwaged labour.

   The political ecology of the political economy has forced unwaged subsistence people off the land to join an urban population, where they have been victimized by the Stabilization and Structural Adjustment Programs of the IMF and the World Bank, respectively, In practical terms, this means privatization and growing unemployment, devaluation of the currency leading to inflation, budget austerity, lack of a minimum wage, the liberalization of prices, the privatization of education and health care, etc.

   At the Arenal-Tilaran Conservation Area (ACA-Tilaran), the sustainable development that encloses the commons believes that micro-entrepreneural women should be the innovators of the markets with their cheap labour and the injection of new products coming from biodiversity. It also holds that under a good management system eco-tourism is beneficial to women as it increases money in their pockets and minimizes the impact of the transactions on nature; thus it mobilizes local groups in favour of eco-tourism. As the forest is enclosed, women and men peasant and Indigenous rural communities are dispossessed and forced to sell their bodies for survival. As a result, the sexual division of labour and women's oppression is exacerbated. In this context, the gender relations of neo-liberal political ecology have also constructed rural women as cheap labour through the mechanism of cheap sex.

b. Nature as commons (land, genes, forests, scenery, mountains), on which rural peasants and Indigenous peoples depended for provisions, were incorporated into Wall Street. For most of Costa Rica's history, peasants and Indigenous peoples experienced life in terms of natural cycles, in a non-monetized biodiversity. This knowledge is humanity's oldest and most integrated integral cognition. In this framework, peasants and Indigenous forest-dwellers (hunters, fishers, and gatherers) achieved self-sufficiency and self-sustainability since they derived their livelihood from free access to forests and waters. In combination with the domestic market, they were able to satisfy the basic needs of everyone, and the

rainforest was exuberant with life. Free access to forest resources and knowledge also freed them for the organization of daily activities.

In the Arenal-Tilaran Conservation Area (ACA-Tilaran), violent interventions were carried out to tap the very conditions of survival of the unwaged commoners and stop them from living on their own terms. Violence forced them to give up their hunting, recreation, and agriculture, and destroyed food security, clean water, and a biodiversity knowledge system. Only through violence – expropriation and privatization of subsistence production and the local commons – was the money-valued economy able to expand. Without the destruction of self-sufficient and self-sustaining subsistence systems of the non-monetary economy, economic growth is not possible. Self-sufficiency and provisioning cannot be bought with money.

We need to undo the social and ecological crises by creating local alternatives to large-scale international development. The ecofeminist agenda is to increase the capacity of local unwaged or poorly waged communities in two ways: first, by restoring dignity to the communities and individuals who are grounded in nature and have been uncounted or labelled as regressive within the capitalist system; and second, by supporting an alternative based on models of already existing subsistence communities found in the global South (Bennholdt-Thomsen & Mies, 1999) or meta-industrial workers (Salleh, 2004). According to ecofeminism, the subsistence perspective is the best way to overcome divisions between the global South and global North and mitigate the social and ecological crises that threaten the very existence of human civilization.

NOTE

[1] This chapter is based on my book *The "Greening" of Costa Rica: Women, Peasants, Indigenous Peoples, and the Remaking of Nature*, published by University of Toronto Press Publishing (2015).

REFERENCES

Alvarado, G. (2010, February 16). Explotacion desenfrenada puede devastar la Amazonia Peruana en el ano 2041. *La Republica,* p. 10.

Antentas, J. M. (2009). The Madeira river complex: Socio-environmental impact in Bolivian Amazonia and social resistance. *Capitalism Nature Socialism, 20*(3), 12–20.

Association for Women in Development (AWID). (2002a). *Globalizing actions against impunity of feminicides in Ciudad Juarez*. Paper presented at the Reinventing Globalization, Guadalajara, Mexico, October 3–6.

Association for Women in Development (AWID). (2002b). *Solidarity with the independent movement of women in Chiapas: Resistance to neoliberal globalization*. Paper presented at the Reinventing Globalization, Guadalajara, Mexico, October 3–6.

Bennholdt-Thomsen, V., & Mies, M. (1999). *The subsistence perspective, beyond the globalized economy*. London, UK and New York, NY: Zed Books.

Escobar, A. (2001). Culture sits in places: Reflexions on globalism and subaltern strategies of localization. *Political Geography, 20*, 139–174.

Figueroa, E. (2003). *Plan Puebla Panama.* Paper presented at the Guatemalan-Maya speaker at Brock University, Ontario, ON.
Goldman, M. (Ed.). (1998). *Inventing the commons: Theories and practices of the commons' professional*. New Brunswick, New Jersey, NJ: Rutgers University Press.
Hamilton, K. (2001). *Genuine savings, population growth and sustaining economic welfare.* Paper presented at the Natural Capital, Poverty and Development Conference, Toronto, Canada, September 5–8.
Hecht, S., & Cockburn, A. (1990). *The fate of the forest: Developers, destroyers and defenders of the Amazon*. England: Penguin Books.
Isla, A. (2003). Land management and ecotourism: A flawed approach to conservation in Costa Rica. In A. Fenech, R. Hansell, & K. Hamilton (Eds.), *Natural capital, poverty and development*. Amsterdam, The Netherlands: Kluwer Academic Publishers.
Isla, A. (2009). The eco-class-race struggles in the Peruvian Amazon Basin: An ecofeminist perspective. *Capitalism Nature Socialism, 20*(3), 21–48.
Kato, K., & Quintela, S. (2012). *Companhia Siderurgica Do Atlantico – TKCSA: Impactos e Irregularidades na Zona Oeste do Rio de Janeiro* (3rd ed.). Rio de Janeiro, Brazil: Instituto Politicas Alternativas para o Cono Sul – PACS.
Khor, M. (2002). TWN briefings for WSSD no.1. *WSSD Jo'burg 2002: Where we are and what's needed now*. Retrieved from http://www.twnside.org.sg/title/jb1.htm
Khor, M. (Producer). (2012, June 15). *Rio+20 summit: The key issues*. Retrieved from Policy Innovations website: http://www.policyinnovations.org/ideas/briefings/data/000238
La Republica. (2009, September 8). Defensoria detecta 18 nuevos casos de conflicto: Report. *La Republica,* pp. 6–7.
La Republica. (2010, March 3). Dicen no al proyecto Inambari. *La Republica,* p. 11.
La Republica. (2010, March 16). Central de Inambari destruira la biodiversidad. *La Republica,* p. 14.
Luna, A. N. (2010, 25 April). La Integracion sobre el tapete. *ElComercio,* p. a8.
Martinez-Alier, J. (1994). Ecological economics and ecosocialism. In M. O'Connor (Ed.), *Is capitalism sustainable? Political economy and the politics of ecology.* New York, NY: The Guilford Press.
McMurtry, J. (2001). The life-ground, the civil commons and the corporate male gang. *Canadian Journal of Development Studies* (special issue, edited by Turner & Brownhill), *XXII*, 819–854.
Mendoza, R. (2009). Cazador de conflictos. *La Republica*. Retrieved from http://www.larepublica.pe/12-07-2009/cazador-de-conflictos
Mies, M., & Shiva, V. (1993). *Ecofeminism*. London, UK & New Jersey, NJ: Zed Books.
Muñoz, G. (2005). Diez años de lucha y resistencia zapatista. *Rebeldia*, 3–16.
Ornelas, J. (2003). El plan Puebla Panama y la globalizacion neoliberal. In E. A. S. Forero & R. S. Perez (Eds.), *Lectura critica del plan Puebla Panama* (pp. 19–54). Mexico, North America: Insumisos LatinoAmericanos – Libros en Red.
Pearce, W. D., & Warford, J. J. (1993). *World without end: Economics, environment and sustainable development*. New York, NY: Oxford University Press.
Pizango, A. (2010). *IIRSA*. Iquitos, Peru.
Prado, E. (2009, March 8). Hidroelectrica Inambari genera discordia. *La Republica,* p. 9.
Salazar Perez, R. (2003). El Vinculo Militar del plan Colombia y el plan Puebla Panama. In E. A. S. Forero & R. S. Perez (Eds.), *Lectura critica del plan Puebla Panama* (pp. 135–165). Mexico, North America: Insumisos LatinoAmericanos – Libros en Red.
Saldivar, A. (2003). El plan Puebla Panama: Una Locomotora sin Vagones de Segunda. In E. A. S. Forero & R. S. Perez (Eds.), *Lectura critica del plan Puebla Panama* (pp. 75–110). Mexico, North America: Insumisos LatinoAmericanos – Libros en Red.
Salleh, A. (1997). *Ecofeminism as politics: Nature, Marx and the postmodern*. London, UK & New York, NY: Zed Books.
Sandoval, G. (2010). *IIRSA*. Iquitos, Peru.
Schiefter, J. (2007). *Viejos Verdes en el Paraiso: Turismo sexual en Costa Rica*. San Jose, CA: Editorial Universidad Estatal a Distancia.

Shiva, V. (1989). *Staying alive, women, ecology and development.* London, UK: Zed Books.

Smith, R., & Simard, C., (2001, September 5–8). *A proposed approach to environment and sustainable development indicators based on capital.* Paper presented at the Natural Capital, Poverty and Development Conference, Toronto, Canada.

United Nations. (2002). *The Johannesburg summit test: What will change?* Retrieved from United Nations website: http://www.johannesburgsummit.org/html/whats_new/feature_story41.html

Verdum, R. (2010). *The new developmental extractivism in South America*. Washington, DC: Center for International Policy. Retrieved January 25, 2010, from Americas Program Report website: http://americas.irc-online.org/am/6658

World Bank. (2003). *Briefing: Shareholders and donors of MesoAmerican biological corridor*. Conference Center of the World Bank in Paris from 12–13 December.

World Commission on Environment and Development. (1987). *Report of World Commission on Environment and Development: Our common future*. New York, NY: Oxford University Press.

DAVID FANCY

5. SUSTAINABILITY, IMMANENCE AND THE MONSTROUS IN CARYL CHURCHILL'S *THE SKRIKER*

This paper investigates how a variety of issues raised during the course of a Canadian university-based theatre production of English author Caryl Churchill's play *The Skriker* (1994) can contribute to the discussion of the role of creative practice in environmental education. Immanentist perspectives on embodied performance practice and on the environment, informed by the work of Gilles Deleuze and Felix Guattari, will be foregrounded in a discussion of the play, its rehearsal, and some potential implications of its staging. The impetus for writing this paper comes from a conviction I share with Michael Mikulak, who suggests that:

> While it may seem trite to focus on questions of narrative, representation, agency and subjectivity in the face of more 'pressing' material concerns, the environmental crisis is more than a problem for scientists; it is a problem of narrative, ontology and epistemology. It is as much a failure of the imagination as it is a technological problem, arising from maladapted social and political ecologies that fail to establish healthy and sustainable networks of kinship imaginaries. (2008, 66)

For its part, given that it can variously involve somatic, intellectual, reflexive, expressive, and affective engagements for its participants—performers and spectators alike—the theatre has been often recognized for its pedagogical potentials (Gallagher & Booth, 2003; Carlson, 2003). Similarly, in view of the art form's complex involvements with the material circumstances in which it is produced and received, theatre's inherent capacity for variously sustaining and/or challenging the dominant social orthodoxies of its milieu is also frequently recognized within the fields of theatre studies and performance studies (Carney, 2006; Knowles, 2004). It was with an awareness of these potentials that I conceived the project as an opportunity to have the cast of actors and educators-in-training undergo a creative process that would find resonance with some of the broadly 'environmental' themes inherent within Churchill's text with a view to exploring an immanentist incarnation of sustainability. Since her plays were first produced in the 1980s, Churchill has developed a reputation as an author whose work—including texts such as

R. C. Mitchell & S. A. Moore (Eds.), Planetary Praxis & Pedagogy, 95–106.

Cloud Nine (2010), *Top Girls* (2013), *Serious Money* (2013b), and *Mad Forest* (1996)—usefully problematizes questions around class, ethnicity, and gender and their theatrical representations.

CHURCHILL'S *SKRIKER*

The Skriker features the story of two young women who are haunted by spirits and monsters from English folk tales, who have become wounded and alienated by a contemporary world seemingly bent on capital accumulation, environmental degradation, and general anomie. The Skriker is a changeling spirit issued from the earth, described as "a shapeshifter and death portent, ancient and damaged" (Churchill, 1994, 1) who takes different forms throughout the play and appears to be motivated by a desire to generate a retributive and often painful intimacy with the humans from whom she and the other spirits have become alienated. Churchill employs her characteristically original and inventive use of language to have the Skriker speak in an opening soliloquy with a mix of language from English folk tale and nursery rhyme. The Joycean assemblage, invention and fracture of language emphasizes the spirit's frustration with how the humans with whom she shares the earth are changing it:

> They used to leave cream in a sorcerer's apprentice. Gave the brownie a pair of trousers to wear have you none? Now they hate us and hurt hurtle faster and master. They poison me in my rivers of blood poisoning makes my arm swelter. Can't get them out of our head strong. (ibid., 12)

The problem with the humans, the Skriker affirms, is that they "then get in their head body" in other words, humans are moving away from a fuller corporeality and a self-understanding that could provide them with a capacity to more richly actualize complexities with the earth's other creatures. The Skriker warns how she and her fellow spirits—such as Brownie, Kelpie, Spriggin, Rawhead and Bloodybones—in response to the humans' assault, are themselves now on the offensive. Humans, she suggests, had best be on guard:

> We'll be under the bedrock bye and bye. We'll follow you on the dark road at nightingale blowing. No but they're danger thin ice pick in your head long ago away … Revengeance is gold mine, sweet. Fe fi fo fumbledown cottage pie crust my heart and hope to die. … Ready or not here we come quick or dead of night tight sleep tightarse. (ibid., 13)

Josie and Lily become targets of the Skriker. Lily visits Josie in a psychiatric institution, where she is being held for killing her baby daughter. Lily is nearing the end of a pregnancy, and so is hesitant around her former friend. Josie, afraid of the spirit's attentions, wishes the Skriker on Lily, and the spirit begins to haunt the pregnant woman instead. The Skriker explains to Lily that she is "an ancient fairy… not a major spirit, but a spirit" from a time "long before England was an

idea, a country of snow and wolves where trees sang and birds talked and people knew we mattered" (ibid., 23). The spirit finds herself lost in this new world of neo-liberal incursion into what humans like to call 'the environment'. In attempting to help Skriker to negotiate complex and highly mediated contemporary technocultural reality, Lily is unable to explain how a television works:

> LILY: it's in bits like waves like specs and you need an aerial / to
> SKRIKER: This is crap
> LILY: catch it and this changes it back into the picture / and it's not a solid thing, it's all dots
> SKRIKER: But how for fuck's sake? (ibid., 19)

The Skriker, in her spirit form, notes how the world is become a "toxic waste paper basket case, salmonelephantiasis, blue blood bad blood blue blood, blah blah blah" and that humans who used to taste good with "sweet blood like seawater" now taste as "foul as shipandemonium" with the upshot being that there is "poison in the food chain saw massacre" (ibid., 37). At a different point in the text, when she has adopted a more conventional use of language and syntax and momentarily adopted human form, the Skriker mourns how the human species has interrupted a previous predictability in the world's natural cycles:

> It was always possible to think whatever your personal problem, there's always nature. Spring will return even if it's without me. Nobody loves me but at least it's a sunny day. This has been a comfort for people as long as they've existed. But it's not available anymore. Sorry. Nobody loves me and the sun's going to kill me. Spring will return and nothing will grow. (ibid., 49)

To punish the two women for their complicity in this degradation, the spirit makes gold coins and toads issue from their mouths when they are trying to speak: She terrifies and confuses them by changing into a child and punching Lily's stomach, and also threatens to have the other spirits kill them. Ultimately, since humans have already taken so much of her sustenance away, the Skriker schemes to have Lily's baby as her own so that she can draw from the life force of the unborn child. Imagery of end times taints the promise of rebirth and, even as the world dies all around, the sardonic spirit wishes to celebrate the destruction threatening to consume them:

> Don't you want to feel global warm and everything and happy ever after? Warm the cackles of your heartless. Make you brave and rave. Look at the colourfull and smell the tasty. Won't you drink a toasty with me, Josie, after all we've done for? (ibid., 36)

MONSTERS AND ONTOLOGY

Amit S. Rai notes that "Monsters gave birth to modernity: those unnamable figures of horror and fascination shadow civilization as its constitutive and abject

discontent" (2004, 539). Laura Davis and Cristina Santos suggest that the figure of the monster "speaks to real anxieties about our vulnerability in an age of rapid globalization" (2010, xi). The fine line between human and monster that the Skriker comfortably crosses as she adopts a variety of roles can be understood to "make the monster somehow even more alluring" while at the same time making the individual "more vulnerable to it" in turn (ibid). Other boundaries that help sustain established bourgeois social structures, including gender and family arrangements, are also traversed by the Skriker, adding to the sense of "a fear of anarchy" that she enacts within the fiction of the play and serving to further present to the audience "our horrifying 'reality' or that which we fear our 'reality' could become" (ibid., i).

Key to my inquiry here is the extent to which the Skriker and the other spirits establish boundary breaching and seemingly more complex and sustained relationalities with the 'nature' that is described as being imperiled throughout the text. Central to the play's capacity to invite potentials for a less objectified relationship with 'nature' is the very way in which the poetic stream of consciousness language the Skriker delivers refuses easy interpretive closure and consumption by a reader or audience. Ann Wilson, writing about the limits of representation in *The Skriker*, has aptly noted that Churchill's play successfully explores the failure of traditional linguistic procedures that "depen[d] on a structure of replacement (the sign stands for the signified) and displacement (the deferral of desire through subsequent repressions from sign to sign)" (1998, 180). In short, the play's language "doesn't allow the audience to arrive at a satisfactory understanding of the action," instead staging its rupture, excess, and de- and re-codification into complex new syntactical arrangements comprised of puns, neologism, portmanteau words and double entendre. The dominant perspective on signification, one complicit in objectification and instrumentalization of the nature referred to as withered and poisoned throughout the text—a problem that humans instigate through their retreat into their 'head body'—is itself being questioned and overturned, a procedure of Churchill's that Wilson describes as "an act of political resistance" (ibid., 187). The fact that questions of birth, maternality, and women's historically constructed social roles as being more prone to 'hysteria' are central elements to the plotting and thematic register of the text serve as evidence that the Lacanian paradigm of substitution for the figure of the Father—who, like language, comes to stand in for what has been repressed in its function as the regulation associated with the social—is being questioned in the text as well. When the Skriker wonders of Josie, "Haven't I wrapped myself up rapt rapture ruptured myself in your dreams, scoffed your chocolate screams, your Jung men and your Freud eggs, your flying and fleeing?" (Churchill, 1994, 38), it would seem that the very notion of the human, traditionally understood as being constituted by conscious and unconscious elements of a coherent self, is in question.

How can these various forms of interventions into orthodox notions of objectivity and language, capitalized gender and family associations, and bourgeois notions of

the subject, be understood to be contributory to the potentials for more equanimous relationships between the planet's various life forms? Wilson points out many of the first professional critics and reviewers of the play found it to be a 'failed play' in that the textual devices discussed above made it difficult for a clear allegorical structure—such as the ones that had marked her previous texts—to emerge, with many critics such as Micheal Billington finding the work "strangely opaque" (in Wilson, 1998, 174). We might ask ourselves—given the absence of a precise textual allegorical and interpretive structure—how does this play in production then 'work' to develop a sense of other interpretive and postidentitarian possibilities that can open up room for the more "healthy and sustainable networks of kinship imaginaries" that Mikulak calls for possible as a result? What can arrive in the wake of the carefully staged implosion of significances the text undertakes? Is the result destined to simply be the anarchy that these traditional forms of social, ontological and epistemological structuration purport to regulate, repress and keep at bay? Can we find ourselves to be resonant with the affirmative aspects of the destruction of convention that the Skriker pursues so ardently?

The play finishes with the Skriker, reverted away from human form to once again "the ancient creature it was at the beginning of the piece" (Churchill, 1994, 56), describing a dystopian distant time in which Lily, like a character from a fairy tale, wakes up from a long sleep to discover that the Skriker herself has become Lily's own great-granddaughter. "What a horror storybook ending," the Skriker exclaims, as she then intimates that Lily, in a similar fashion to Josie's murder of her own child, eats "a mortal morsel", and in consuming her own offspring, "bit off more than she could choose. And she was dustbin" (ibid., 57). Although framed in the discourse of the monstrous, the collapse of categorical distinctions between human and animal via this recursive loop of the consumption of flesh need not be understood simply as a *symptom* of the various ecological and social crises evoked in the text. Rather this act of auto-cannibalism can be understood paradoxically to be the text's final and powerful manifestation of the many openings or invitations to move beyond the orthodoxies that contributed to these collapses in the first place. In other words, understanding the intimate relationship between so-called self and world through the return of a repressed abject act of being forced to consume one's self invites broader critique of ontological and epistemological distinctions that would understand self and world to be separate to begin with.

IMMANENCE AND 'ENVIRONMENT'

In an introductory essay to a volume on French thinkers Deleuze and Guattari and thinking 'environments', Bernd Herzogenrath articulates the way in which a Deleuzo-Guattarian approach to nature understands what is described as the environment to be an "open and dynamic whole" in which "agency […] is not restricted to one side—the human/cultural side" of the equation (2004, 1). Deleuze and Guattari state that:

> We make no distinction between man and nature: the human essence of nature and the natural essence of man become one within nature in the form of production or industry… man and nature are not like two opposite terms confronting each other—not even in the sense of bipolar opposites within a relationship of causation, ideation, or expression (cause and effect, subject and object, etc.); rather they are one and the same essential reality, the producer-product. (1983, 4–5)

Key here is understanding that Deleuze and Guattari's model refutes "Al Gore's fantasy of The World Formerly Known as the Harmonious Universe, thrown out of proper balance by mankind, the dominator and exploiter, to be restored by man, its steward" (ibid., 3), instead emphasizing "flowing, turbulent balance" (ibid.). These notions are sustained by what Patrick Hayden describes as a philosophical "naturalism" that resists essentialism, in other words, a description of "natural processes" "compatible with critiques of essentialism and dualism" addressed in Deleuze's many writings (Hayden, 2008, 23). Indeed, Hayden convincingly argues that Deleuze's thought provides "overlooked philosophical resources for integrating ethical and political considerations with ecological concerns, while resisting the temptation to turn nature into static metaphysical foundation" (ibid., 24), a process concomitant with the Skriker's critique of humans' objectification and abuse of the planet. Central to these resources is a commitment to overturning anti-naturalistic tendencies in the Platonic tradition informing much of Western thought, a procedure undertaken in texts such as Deleuze's *Logic of Sense* involving a call for "the abolition of the world of essences *and* the world of appearances" (2004, 24). Such an approach involves the recognition of the false duality between presumed essence and secondary appearance, a problematic result of Platonism that posits a realm of pure transcendent Being that would "circumscribe the rules of the natural world of becoming and diversity" (ibid., 25). The naturalistic answer posited in response is one that eliminates the dualism of essence and appearance while instead "affirming the continuous becoming of a fully natural reality that is in no way indebted to or derived from any hidden, metaphysical transcendence" (ibid.). Drawing on authors as diverse as Lucretius and Spinoza, Deleuze undertakes to construct a philosophical model sufficiently *processual* in nature to capture nature's changing forms, sufficiently immanent and monistic to posit the existence of only one substance not dependent on a transcendent outside cause, and sufficiently anti-identitarian to provide a concept of pure difference the role of continuously affirming and generating reality's differentially interrelated elements. Rather than one single combination of these elements being able to express all of reality, instead "there are particular finite compositions of elements and relations produced in the continuous movements of becoming" (ibid., 26). Deleuze is quick to indicate the ethical implication of such a naturalistic perspective, given that "the responsibility incumbent upon humans is respect for the diversity produced by the immanent nature within which all things reside and live." Indeed, Hayden stresses that it is the "primary object in recognition

of the fact that if natural diversity is harmed or diminished, the potential for a joyful existence is lessened" (ibid.).

The role of the monster such as the Skriker is an interesting one from such an immanentist perspective, as myths such as gods and eternal souls that "mysteriously escape natural existence" can be understood in philosophical terms to be evocations that, as a result of their extra or supernatural status, are "scornful of the material sensuous, and temporal existence accepted by naturalism" (Deleuze, 2004, 27). The monsters from fairy tales featured in *The Skriker*, while not entirely gods or eternal souls (the Skriker is quick to admit that she is a small spirit), are nonetheless as far as we know an excressence of human imagination. As the various authors we have quoted above posit, their incursion into the material (rather than imaginative plane) at this point in capitalism's rupture of the world's capacity to sustain human and other forms of life suggests that they embody the return of the repressed and othered beings on the planet whose existences have been denied as a result of humanity's seemingly insatiable desire to objectify, to minoritize and to intrumentalize other life forms. The Skriker and her companions' monstrous and retributory force would seem to incarnate and give body to the dualisms that haunt the history of conceptualizations of the distinction between man and nature. Their arrival and 'negative' presence would appear to be the by-product of humanity's inability to generatively affirm all of life in its complexity, favouring instead the species' own needs and limited self-concept so as to actively pursue planetary resources for the purposes of comfort, consumption, and ultimately the negativity inherent in dualistic separation.

THE PRODUCTION

Considering this potential reading of the play and its generative resonance with elements of immanentist thought, the pedagogical challenge was then to explore the ways in which this experience of immanence could be actualized corporeally and affectively and brought into the undergraduate students' experience of the text and its staging, and to think through the implications of the overall production's emerging immanentist perspective on sustainability. It is worth noting that over the past thirty-odd dd years, theatre studies has been marked by what Pavis Pavis describes as a Copernican revolution (1998, 385) away from recognizing the text as the foundational element of the experience of the art form. A wholesale recognition of the significance of the material realities of the conditions of production and reception of the theatrical event have complemented investigations of dramatic literature, as have refined semiotic, phenomenological and other forms of analysis that permit a detailed understanding of how what is occurring both on and off the stage generates meaning.

Key to the aesthetic and pedagogical success of the production was an acting training model premised on the notion of the rhizome developed by Deleuze and Guattari in a collaborative text, *A Thousand Plateaus* (1987). They understand rhizomatic logic to be more productive and generative than the arborescent logic to

which they counterpose it. The image of the "radicle-system" (5), ever proliferating and creating new nodes while at the same time avoiding the centralizing tendencies of "the tree," is set up in distinction to the trunk that would aim to capture and canalize all energies in one location. Whereas "binary logic is the spiritual reality of the root-tree" (ibid.), when the tip of the principal root descending from the trunk has been aborted or destroyed, "an immediate, indefinite multiplicity of secondary roots grafts onto it and undergoes a flourishing development" (ibid.). The figure of the rhizome and multiplicity as generative of new connections is understood to be a more accurate understanding of reality than an emphasis on sole, bound, and complete identities characterized by arborescent logic. Grafting this logic onto acting training and character preparation results in a series of studio exercises that privilege complex interrelationality, and the actualization of a mutually generative creative potential.

The exercises comprising the rhizomatic acting training are comprised of movement improvisation based on variations in weight, space, time and flow that do not necessarily aim to be representative of or capture recognizeable human forms of behaviour, of vocal work that explores many extra-daily tonalities of expression, and the creation of intensive affective states in which the actor experiences fullness of affect in various emotional registers. The overall processual result of the training is the generation of a matrix or field of creative potential established in an ensemble of performers out of which, further on in the process, can then gradually precipitate the individual actor's character. It is certain that much acting training explores the various ways in which complex multi-level (physical, affective, emotional, spiritual) connection with other performers and the audience contributes to more compelling performances and engaged performances (Hodge, 2010). Nonetheless, very few if any of the established traditions and tributaries of acting training currently extant even in more experimentally oriented centers of acting training in North America involve the level of postidentitarian or immanent basis that we were attempting to instantiate with this production and the pursuit of the rhizome work. In many ways, the canonical exemplar is Stanislavski, as when he is working on seemingly postidentitarian notions of rhythm as they affect the actor in training and performance, still manages to recuperate his explorations towards what Deleuze and Guattari would understand to be a transcendent perspective on the human as the basis for all approaches to the work of the performer. Stanislavski notes that "We make combinations of all sorts of different speeds and measures," as well as "You cannot get along with just one tempo-rhythm. You must combine several of them" (1989, 213). Stanislavski acknowledges the unpredictability of the outcome of these explorations of rhythmic attunement when he states that, "The overall tempo-rhythm of a dramatic production usually creates itself accidentally, of its own accord" (214). This commitment to process and variation and tempo resonates with immanentist tendencies developed by Deleuze that propose that what we understand to be identities are in fact singularities comprised of various speeds and slownesses (Deleuze & Guattari, 1994). Stanislavski quickly veers back to the identitarian

by articulating that despite the emphasis on process, there are established and transcendent velocities and possibilities representative of specific identities towards which the creative work of the studio must tend. For my part, it was imperative that I maintain the immanentist and postidentitarian commitments so as to be able to cultivate the experience of what Deleuze and Guattari call "becoming imperceptible" (1987), that kind of porousness of borders and fixed identities that allows for the kinds of interspecies relationalities that the text of *The Skriker* calls for.

In fact, it was central to the actualization of the environmental elements of the production to establish early in the process a postidentarian sense of possibility to all the characters in the play, even (in fact, especially) the strictly human and other-than-monstrous characters. In order to really establish this work, the first extensive rehearsal the group undertook involved a trip to a local nature reserve consisting of lines of small hills, dense forests, and streams. Following a half hour walk to the more remote part of the park, the cast was invited to observe and resonate with the various speeds and slownesses of the world of trees, animals, and falling snow around them in a sharply descending ravine. A number of hours of hunting and playing occurred, drawing on the parashamanic kinds of work established by Polish acting trainer Jerzy Grotoswki (Grimes, 1997) before the cast walked in silence out of the forest and was transported by van to a regional Walmart, where they were instructed to enter the store and do the same kinds of improvised movement and vocal work. The experience was curated in order to have the actors experience, as the spirits in the play would, the kinds of deterritorialization of types of speed and slowness expected in a natural setting that would take place in the disjunctive circumstances of one of the very different affective environments, what one of the actors, clearly drawing on the elements of the monstrous in the project, described as a "capitalist hell mouth". The actors in training spoke of how the rhizome work allowed them to de-habituate certain speeds, slownesses and behaviours that they brought to the studio with their everyday corporeality, associated types of movement and thought. Participants wrote in journals of moments in which "we as a group acted on impulse as if we were moving for the first time" in a "Petri dish; a safe container brimming with chaos" that leads to "all types and elements of action as well as openness, forgiveness, and generosity." In her notes at the time, Joanna Maselli, the dramaturg on the production, demonstrated how the discoveries about the play were made during the rhizome improvisations in rehearsal. Drawing on Deleuze and Guattari's statement that "The rhizome itself assumes very diverse forms, from ramified surface extension in all directions to concretion into bulbs and tubers. … The rhizome includes the best and the worst: potato and couchgrass, or the weed." (Deleuze & Guattari, 1983, 7), she explained that:

> This past Wednesday scenes 11 and 10 were rehearsed, but my reflection will focus on the rehearsal of scene 10. The rehearsal of this scene was approached through a long improv activity in which many discoveries were made about our family of monsters. In a previous rehearsal we referred to this type of activity

> as a rhizome; we don't begin the activity with a set and defined structure, but instead a sense of structure or narrative emerges through the discoveries made over the course of these activities, and these discoveries will often feed back into the directions and prompts given during the improv, forming a bulb-like 'concretion' of connecting images, ideas, actions, or narrative lines. We call this activity (and not just the discoveries made which we choose to pursue) the rhizome because "The rhizome includes the best and the worst: potato … weed" there are many avenues of possibility explored in the activity, but only a few may actually be taken up and cultivated into potatoes.

The process of discovery of the material and the rhizomatic growth of the experience had direct resonance with the way in which the acting training and creation process invited the actors to experience fully the relationship between the characters and the wounded earth. She continued:

> The discoveries (of both the potato and the weed variety) helped the actors to develop character backgrounds, relationships, and narrative lines which helped them make sense of how the monsters came to be in the states and situations which they find themselves in by the time of our production. The rhizome activity, as practiced last night, also greatly aided the actors to understand their characters' relationships to the many worlds around them, including the spiritual, natural, and human world; this is adding to their growing understanding of our specific approach to the production. Over the course of the rhizome activity we discovered how the creatures turned from spirits to monsters as a result of the damage done to them via the damage done to the natural world by humans. Lily and Josie were brought into the improvisation in order to act out various harmful human activities while the creatures reacted and responded to the environmental effects of these activities. Later in the improvisation, the girls go on a pick-nick in the woods and end up confronting the hysterical and terrified spirits. The girls beg for forgiveness as the spirits all huddle together for protection, but the spirits are unable to forgive the humans and through their anger, frustration, and hurt, transform into the monsters that they become by the time of our production. Their anger, frustration, and hurt builds to such a point that they attack, kill, dismember, and then consume the humans (all while the humans still plead for forgiveness), mimicking the ancient Greek Dionysian ritual of sparagmos, where a scapegoat is attacked, dismembered, and eaten raw, and bringing us back to the name David has given to scene 10: Sparagmos. This is where one line of connection has been extended and explored through multiple others, which are all brought back onto one another to form a bulb-like concretion of connecting images, ideas, actions, or narrative lines. This bulb-like form represents only one of many which are being developed, explored, and cultivated, and is only one structure within the larger rhizomatic system, leaving it open to other possible directions of growth either out of, away from, or back onto itself.

In order to foreground the process of language generation—that stuttering language of the Skriker that breaks with regularized syntax and morphology— we decided to have the actor playing the character of Rawhead and Bloodybones write text for himself that he would deliver. Again it is worth quoting his writing at length as it demonstrates how the creative active training and release of language from certain parameters finds its way back to the main concerns of a global ecosystem in radical decay:

> Lay Lie liar, liest in the bed you've made, cover cowards crook and crow too little too late. Riseup and shine, wake up and smell the concrete; consecrate concise creations constructed concrete catacombs through your brain. Drains the thought from your noggin cloggin up the interstate, information super highway, my way or the highway baby. Born Born into times and fly by the seat of your pants to tight, up tight suit and tie blinded by the light, lifted illuminations in the night sky, star gazers to fog and smog detectors. Detect the population pollution increase, upbeat tempo fords forge the freeway, mainstay away from the ordinary. Mr. Clean, spic and brand spanking new or used hand me down world spins round and round we go. Pop goes the weasel wheeze and sleaze sleazes sleep slut smack my bitch up. Uppers, downers, laughers, screamers, crack cocaine, Novocain, champagne, chardonnay take away the pain and suffering. Suffrage subterfuge sabotage Taj Mahal, Hollywood would you rather? Blood banks, baths, wrongs, drunk, diamonds of Sierra Leone.

With these kinds of preparation, a succession of stage moments were created that attempted to generate the conditions in which the ethics of immanent sustainability could be instantiated via artistic practice, namely, inviting spectators to open themselves to the actualities of other than human forms of life being explored and inhabited by the human actors on stage. This kind of sustainability is predicated on a complex understanding of interrelationalities that a creative and corporeally integrated creative process such as theatre practice is well-positioned to develop. Sustainability becomes less of a potentially reductive economistic articulation of resource allocation, but instead more about "de-centering athropocentrism in the new complex compound" that Deleuze and Guattari describe to be "nomadic subjectivity" (Braidotti, 6). The nomadic figure in this instance is not that which is separated from community or polis—forced to become monstrous like the Skriker—but rather one who does not become restricted by limiting, identitarian and profoundly unsustainable notions of the bound identity of the bourgeois subject. Instead, this flexible, mutable subjectivity,

> brings together ethical, epistemological and political concerns under the cover of a non-unitary vision of the subject. 'Life' privileges assemblages of a heterogeneous kind: animals, insects, machines are as many fields of forces or territories of becoming. The life in me is not only, not even, human. (Braidotti, 6)

REFERENCES

Braidotti, R. (2008). *The ethics of becoming imperceptible*. Retrieved December 13, 2013 from http://deleuze.tausendplateaus.de/wp-content/uploads/2008/01/trent-final.pdf

Carlson, M. (2003). *Performance: A critical introduction*. New York, NY and London, UK: Routledge.

Carney, S. (2006). *Brecht and critical theory: Dialectics and contemporary aesthetics*. New York, NY and London, UK: Routledge.

Churchill, C. (1994). *The Skriker*. New York, NY: Theatre Communications Group.

Churchill, C. (1996). *Mad forest: A play from Romania*. New York, NY: Theatre Communications Group.

Churchill, C. (2010). *Cloud nine*. New York, NY: Samuel French.

Churchill, C. (2013a). *Top girls*. London, UK: Methuen Drama.

Churchill, C. (2013b). *Top girls in Churchill plays 2*. London, UK: Methuen Drama.

Davis, L., & Santos, C. (2010). *The monster imagined: Humanity's recreation of monsters and the monstrous*. Witney, UK: Inter-Disciplinary Press.

Deleuze, G. (2004). *The logic of sense*. London, UK: Continuum.

Deleuze, G., & Guattari, F. (1983). *Anti-Oedipus: Capitalism and schizophrenia*. Minneapolis, MN: University of Minnesota.

Deleuze, G., & Guattari, F. (1987). *A thousand plateaus: Capitalism and schizophrenia*. Minneapolis, MN: University of Minnesota.

Deleuze, G., & Guattari, F. (1994). *What is philosophy?* New York, NY: Columbia University Press.

Gallagher, K., & Booth, D. (2003). *How theatre educates: Convergences and counterpoints with artists, scholars, and advocates*. Toronto, Canada: University of Toronto Press.

Hayden, P. (2008). Gilles Deleuze and naturalism: A convergence with ecological theory. In B. Herzogenrath (Ed.), *An [un]likely alliance: Thinking environment[s] with Deleuze|Guattari* (pp. 23–45). Newcastle, UK: Cambridge Scholars Press.

Herzogenrath, B. (Ed.). (2008). *An [un]likely alliance: Thinking environment[s] with Deleuze|Guattari.* Newcastle, UK: Cambridge Scholars Press.

Hodge, A. (2010). *Actor training* (2nd ed.). New York, NY and London, UK: Routledge.

Knowles, R. (2004). *Reading the material theatre*. Cambridge, UK: Cambridge University Press.

Mikulak, M. (2008). The rhizomatics of domination: From Darwin to biotechnology. In B. Herzogenrath (Ed.), *An [un]likely alliance: Thinking environment[s] with Deleuze|Guattari* (pp. 66–83). Newcastle, UK: Cambridge Scholars Press.

Pavis, P. (1998). *Dictionary of the theatre: Terms, concepts, and analysis*. Toronto, Canada: University of Toronto Press.

Rai, A. S. (2004). Of Monsters: Biopower, terrorism and excess in genealogies of monstrosity. *Cultural Studies, 18*(4), 538–570.

Stanislavski, K. (1989). *Building a character*. New York, NY and London, UK: Routledge.

Wilson, A. (1998). Failure and the limits of representation in the Skriker. In S. Rabillard (Ed.), *Essays on Caryl Churchill: Contemporary representations* (pp. 174–188). Winnipeg, Canada: Blizzard.

PARISS GARRAMONE

6. "DIGGING WHERE WE STAND"

Unearthing Race, Place and Sustainability in Ontario

INTRODUCTION

This chapter is situated in the current debate surrounding the role of education in sustainability. If we are to use education as a meaningful and effective tool to stop and reverse the trend of environmental degradation, all of our research and pedagogical efforts need to begin with an understanding of sustainability that encompasses restructuring social, physical and economic relationships in more equitable ways (Bell, 2002; Sandilands, 2001). My research examines the curricular and pedagogical aspects of sustainability education for teacher candidates. In particular, this chapter focuses on examining the ways critical place-based pedagogy, as developed by David Gruenewald (2003) for its uses in sustainability, can develop dialogues of empire and a focus on *affect* in order to fully engage with the more than human (Haraway, 1991). I begin by investigating an undergraduate university course I taught, where pre-service teacher candidates used a local eco-racial controversy to deepen their understanding of social justice, eco-racism and globalization in order to understand the complexities of sustainability. Sustainability education seeks to promote strong communities, social equity, and engaged citizenry through investigative, inquiry-based educational processes that are tantamount to student understanding and motivation (Sipos, Battisti, & Grimm, 2008). In this project, I examine how my class of pre-service teachers engaged with archival material (a documentary film, writings, photographs and digital stories) from the Black Settler community on the Old Durham Road, in Southern Ontario. The eco-racial controversy that was "unearthed" was the intentional destruction of the only Black Settler cemetery in the area during the 1940s and 1950s and the contested (partial) recovery of that cemetery that began in the late 1990s. Through the students' narratives, and classroom observation, I examine how the students engaged with issues of race, colonization, and social and environmental justice, and linked this to their ideas about sustainability. I demonstrate how critical place-based pedagogy was used by students to design and implement their own lesson plan projects. What this research revealed was the important role of *affect* in the students' narratives and the class dialogues, which I argue must be the central focus of critical place-based pedagogy. In particular, I demonstrate how *affect* was engaged with through the use of writing

R. C. Mitchell & S. A. Moore (Eds.), Planetary Praxis & Pedagogy, 107–117.

notebooks and how the use of creative approaches to writing (writing from the non-human perspective) developed a diffractive writing practice that performed critical place-based pedagogy in our post-human times.

PERSPECTIVES

The Sustainability Report (2004), an initiative of the York Centre for Applied Sustainability, describes sustainability as, "living and working in ways that meet and integrate existing environmental, economic and social needs without compromising the well-being of future generations." Yet sustainability has most often been centred in science-based environmental education, both formally in school programming and in non-formal education such as adventure outings (Orr, 1992). Many environmental education programs in the past did not adequately address community development, social justice and citizenship in connection with sustainability. The sustainability crisis is larger than *educating for* environmentally sustainable practices (Orr, 1992), which assumes that given enough information individuals will make rational decisions to act ethically. Implicit in these pedagogies is the privileging of objective, rational, scientific knowledge at the exclusion of people's lived experience as a way of knowing and being (Bowers, 1996; Gough, 1999; Haraway, 1991).

By framing sustainability as "the fit between humanity and its habitat," Orr (1992, p. 83) suggests that ecological literacy is a way for education to address the dilemmas of sustainability. The importance of personal experience with the environment is central to David Orr's *Ecological Literacy: Education and the Transition to the Postmodern World* (1992). For Orr, the intimate connections individuals have to the environment can lead to sustainable ways of interacting in the world that work towards equity and peace. He illustrates how autobiographical writings, such as Thoreau's *Walden* and Leopold's *A Sand County Almanac*, demonstrate a sense of connectedness and the pedagogy of place (Orr, 1992, p. 126). This connectedness that Orr describes involves rethinking the role of education. In particular, he sees the disconnectedness of the curriculum as problematic and suggests integrated learning as necessary for the connectedness he is calling for.

Since Orr's groundbreaking work in the early 1990s, sustainability education (SD), also known as Education for a Sustainable Future (ESF) has advocated a process of lifelong learning (Gough, Walker, & Scott, 2001) that expands the idea of curriculum as it draws on everyday activities and local sites as "places of learning" (Ellsworth, 2005; Gruenewald, 2003; Greenwood, 2010). In particular, Orr's (1992) call for rethinking the curriculum has been addressed by the work of critical pedagogues who have expanded and theorized transdisciplinarity (Giroux & Searls Giroux, 2004; Mitchell, 2010). As Giroux and Searls Giroux state, "transdisciplinary work provides a rationale for challenging how knowledge has been historically produced, hierarchically ordered, and used within disciplines to sanction particular forms of authority and exclusion" (p. 102). The pedagogical approach I have taken

for my education course for pre-service teachers is focused on challenging the ways that disciplinary thinking has disconnected, and limited the questions we ask about sustainability by marginalizing different types of knowledge making. Curriculum theorist Grumet (1995) illustrates that *affect*, our feelings, memories and desires are left out of most of our teaching about the environment when we only give space to scientific knowledge and facts. By engaging a transdisciplinary approach for this course my hope is to encourage "teachers and students to raise new questions and develop models of analysis outside the officially sanctioned boundaries of knowledge and the established disciplines that control them" (Giroux & Searls Giroux, 2004, p. 102). As Canadian geographer, John Robinson (2008) notes, it is not only the working within and between disciplines that is complicated for sustainability research and education, but also the important goal of linking this work to the academy with real-world lived experiences. A transdisciplinary approach stresses "the relational nature of knowledge," (Giroux & Searls Giroux, 2004) and by using this approach to study a local eco-racial conflict, my hope was to allow different questions to be asked in order to bring the creation of identities into discussions of the environment. "Transdisciplinary approaches stress both historical relations and broader social formations, while remaining attentive to new linkages, meanings, and possibilities" (Giroux & Searls Giroux, 2004, p. 102). As a result, sustainability education can focus on how to build more equitable relationships through valuing different ways of knowing the world, which have been marginalized.

There are three major themes emerging from literature on sustainability education: focusing on developing effective ways to include social, environmental, and economic balance; questioning how to move beyond the classroom for community buy-in and collaboration in order to make permanent social change; and using constructivist, problem-posing, and critical consciousness raising education to enable students to become engaged citizens capable of achieving social change in their communities (Hill, 2009; McKeown, 2002; Nolet, 2009; Orr, 2004). This has translated into a focus in sustainability education on social equity and the discussion of topics such as racism and resource distribution, with a community or local dimension (Hill, 2009; McKeown, 2002). The emphasis on local communities is for students to become actively involved in efforts to improve their surroundings, and learn from their community members and leaders (McKeown, 2002). Sustainability literacy is articulated as the "ability and disposition to engage in thinking, problemsolving, decision-making, and actions associated with sustainability" (Nolet, 2009, p. 421). While issues such as race, gender, class, sexual orientation, and age have been traditionally left out of sustainability and environmental education (Hart, Jickling, & Kool, 1999; Russell, Sarick, & Kennelly, 2002) new approaches, such as place-based pedagogy by David Greenwood (formerly Grunewald), have focused on incorporating critical theory through the use of critical pedagogy. Grunewald (2003) argues that by developing a critical pedagogy of place, environmental educators bring together eco-justice

tenets with those of critical theory. Critical pedagogy is a method to incorporate multiple histories (dominant and marginalized) and the *intra*-relatedness of humans with the more than human world. For Greenwood, a critical pedagogy of place begins with the work of Paulo Freire (1970/2010), who stresses problem posing, inquiry based approaches to learning versus the traditional "banking model" of education. Greenwood also acknowledges that, "people must be challenged to reflect on their own concrete situationality in a way that explores the complex interrelationships between cultural and ecological environments" (Freire, 2010, p. 6) He draws on the ways critical pedagogues engage with reading the world, maintaining that "the 'texts' students and teachers should 'decode' are the images of their own concrete, situated experiences with the world" (Freire, 2010, p. 5). Greenwood's focus on texts is broad enough to include experiences both in and out of the classroom.

From this, critical place-based pedagogy develops two important objectives, "decolonization" and "reinhabitation," which are based on challenging ecological racism, changing the ways we interact with the environment, and supporting different cultural ways of engaging with the environment (Furman & Grunewald, 2004). These objectives are engaged through critical pedagogy and are brought together with the eco-justice tenets advocated by Bowers (2001) to form an approach to place that is about connections to each other and the world around us. The tenets of eco-justice include challenging ecological racism, changing the ways we interact with the environment, and supporting different cultural ways of engaging with the environment. Many scholars have identified an individual's own lived experience – "situated knowledges" (Haraway, 1991) – as a starting point to facilitate this dialogue (Ellsworth, 1989) or complicated conversation across difference (Pinar et al., 1995).

This project rethinks environmental education in order for it to more fully engage students in a dialogue that works to restructure our relationships with each other and the places in which we live. Invisible and erased histories play an important role in Canada's history and geography. The Black geographies in Canada are narratives of resilience and erasure that are at once constructions of the past and present (McKittrick, 2002). The aforementioned eco-racial conflicts in Nova Scotia and Ontario illustrate place as a process and not simply a location that is experienced and understood differently (Gregory, 1994; Massey, 1994; McKittrick, 2002).

The invisibility of "white socio spacial epistemologies" has become so normalized within environmental education that when environmental knowledge is shown to be racialized it is often resisted, seen as difficult and shocking or surprising (Farr, 2004; Sullivan & Tuana, 2007; Yancy, 2004). The resilience of the narratives of erasure and the power that they have to interrupt the dominant nationalizing narratives must be included in our teaching about sustainability as they link globalization and the history of colonization to the local. Current scholarship in curriculum theory argues that curriculum is a process of negotiating narratives which opens spaces for the working through of these contingent narratives of the self (Grumet, 1998;

Miller, 2004; Pinar, 2004). Phillip Payne (2000) develops the concept of ecological identity and how bodies, as sites of meaning, need to be the focus of environmental education. Ecological identity is how individuals relate to the more than human world and this cannot be separated from their embodied experiences of race, gender, sexual orientation, ability and class (Payne, 2001). The importance of an ongoing dialogue that reveals how Black geographies and histories are a process and not historic objects to be exoticized and fetishized must be included in environmental education that works for social justice.

The eco-racial conflicts of Africville in Nova Scotia, the reclaimed Black Settler cemetery in Priceville, Ontario, and the controversy over the attempted renaming of "Negro Creek Road" in Grey County, Ontario, all illustrate "the material places of inclusion and exclusion" and these act as "evidence of what is beneath and beyond the landscape" (McKittrick, 2002, p. 29). However, as McKitterick (2002) further states, Black geographies in Canada are not "simply archival pinpoints on a map," place making is a relational process that is multi-vocal and goes beyond geographic boundaries (p. 30). Environmental education can fail to allow students to examine the personal experiences of place-making and how historical distinctions of imperial power continue to inscribe their bodies and lives (Willinsky, 1998). This project addresses the importance of students' own experiences and draws together environmental education, critical pedagogy, and cultural studies with critical whiteness studies and critical race theory.

By studying how my class utilized a local eco-racial controversy, I explore how issues of empire and affect are engaged. From my study I make suggestions for ways to expand critical place-based pedagogy that take into consideration the lived experience of students and the ways that they use local history and controversy to make sense of sustainability issues.

MODES OF INQUIRY

To address my concerns regarding theory and practice, my research asks: How is sustainability taken up by teacher candidates through a local eco-racial controversy? Of particular importance, I also pose this question: What kinds of experiences are needed for people to learn how to perceive, critically analyze, and act on their human and non-human environments and relationships? I am interested in how teacher candidates develop an understanding of sustainability from their environmental education courses that include critical Black Canadian geographies and histories. With this project I am interested in developing both curricular and pedagogical insights from the learning experiences of these students who engage with the material culture of Black history in Ontario as part of place-based environmental education.

In particular, my work looks at teacher candidates, and focuses on how these would-be teachers come to understand sustainability through the local landscape. According to Grunewald, Koppelman, and Elam (2007) place-based pedagogy

"uses the local environment as a context or 'text' to prompt direct experience, inquiry, knowledge and skill development" (p. 234). During my course I begin by problematizing education and include working with *Pedagogy of the Oppressed* (Freire, 1970/2010). With this project I am interested in developing both curricular and pedagogical insights from the experiences of teacher candidates who are faced with the task of implementing the new Environmental Education guidelines across the curriculum.

By using ethnographic research and narrative inquiry to study students in an undergraduate university course of pre-service teacher candidates, I was able to examine how these students engaged with a local eco-racial controversy. In addition, by studying the use of this local event/history, I was able to investigate how an inquiry-based process, often deemed integral to sustainability education, works in terms of students' learning. I explore how students' ideas of sustainability changed throughout the course through a writer's notebook. I also examine students' narratives on their use of archival material (a documentary film, writings, photographs, and digital stories) from the Black Settler community on the Old Durham Road, in Southern Ontario. Through students' narratives and classroom observation, I examine how the students engaged with issues of race, colonization, and social and environmental justice and linked this to their ideas about sustainability. From the students' narratives I examine the aspects of critical place-based pedagogy used by students to design and implement their own lesson plan projects. This research also revealed what was left out of critical place-based pedagogies.

Objects

The data that I collected is in the form of students' written narratives and ethnographic observations. I also draw on the archival materials used by the students, which includes the documentary film *Speakers For The Dead* (Starr, Holness, & Sutherland, 1999), the article "Dig Where You Stand" (Norquay, 2002), photographs, maps, and the digital stories on "Breaking the Chains: Presenting a New Narrative for Canada's Role in the Underground Railroad" (Harriet Tubman Institute, 2010). In particular, I focus on examining students' writing notebooks and the creative writing done by students from the perspective of animals and plants.

I began this examination by drawing out themes through coding the student's written reflections with NVivo. Drawing on my work with arts-based or arts-informed inquiry (Cole & Knowles, 2001), poetic transcription (Glesne, 1997), and my experience with ethnographic interviews, I also realized that I needed to be cautious about turning the written responses into "data" that removes the words from the context of a given student's response. What these written responses revealed were emotional engagement with the complex material, and an important goal was to focus on the overall tone and emotional response being developed by the student. Coupling both coding and poetic transcription allowed multiple loci of connection to be made linking many of the students' responses.

RESULTS

From my examination of students' narratives, many stated how they had never thought about the ways race and the environment were linked. As part of their narrative reflections one student said:

> The questions these materials raise is how do we know what the real histories are? So much of the Eurocentric mentalities have distorted the history of the Black Settlers and exaggerated an entitlement to the core of settlement histories. Although, we have managed to unearth the histories of the Black Settlers of some areas like Priceville, how many more histories are still and may always be erased from historical records? It puts our collective history into a more accurate perspective when we include it in Environmental Education.

While these students were very insightful about both of these texts, they also recognized the limitations of the current Ontario curriculum. As one student notes:

> We know, however, from the breaking the chains website and Norquay's "Dig Where You Stand" that Black people were a part of Canadian history and played a role in developing this nation. These two sources aim to uncover those untold, misinterpreted stories. The difficulty here, which is one shared by other environmentally focused curriculum, is that these stories do not feature a great deal in the general curriculum; often only as a themed month and only in schools with a majority of Black students.

An important finding was the linkage of the personal for synthesis of this material. Another student wrote:

> I will begin, just as I began an earlier reflection, by saying that I have had very little education of any kind regarding the presence and experiences of Black Settlers in Canada. The material presented in this course including Naomi Norquay's "Dig Where You Stand": Challenging the Myth of the "White Pioneer" as well as the film "Speakers for the Dead" served, sadly, as an introduction to this poorly documented part of Canadian history. The first thing I learned from this material is how little I know.

They commented that by thinking about the role colonization has played, they were able to see the global linkages that create and maintain our environmental crisis. In addition, many of the students' narratives focused on the emotions they felt and their knowledge that social change only happens if people feel personal responsibility. As one student wrote:

> In the film, "Speakers for the Dead", a gentleman says something to the effect of not wanting to discuss the topic of the cemetery because it will bring bad things to the surface. While the language used is very simple, the idea is very complicated and interwoven into the fabric of society. It continues to echo the notion of burying the parts of history, which will potentially upset, incriminate,

> or enrage citizens. However, aren't these emotional contributions necessary in creating social change? How can we stop burying them?

This attention to affect and the role of emotion in environmental education is a key finding and one of the ways that I see the use of local eco-controversies as a crucial addition to sustainability education.

One of the most striking results from this research can be seen in how a group of seven students created and preformed an in-class activity, where these students developed narratives for human inhabitants (past and present) and the non-human inhabitants of the Black cemetery in Priceville. This group of students began with the performance and then followed up with a discussion of the difficulties of "speaking for" the inhabitants and they made it clear that their activity was a creative exploration that was "incredibly complex, and really emotional." What this project revealed was a deep emotional connection that these students engaged in by asking "what if" – which had been a guiding question throughout the course. These students also revealed the highly complex nature of imagining "into" another's (both human and non-human) experience and that they found using this type of artistic or creative expression to be the best way they could find to explore and communicate what they were feeling.

One student expressed how being engaged in this performance art had allowed him to think much more deeply about his connections to his own history. As this student states:

> Emotions do have a place in environmental education. The empathy that humans spread to "greater-than-human" beings, must also be extended to other humans if we are to begin to dismantle the terrifying an ongoing social issues related to environmental racism.

DISCUSSION

The students' narratives and class discussions indicated the important role of empire in their understanding of sustainability. David Greenwood (2010) has extended his work on critical place-based pedagogy with his article "Nature, Empire and Paradox in Environmental Education." Through this article he argues that empire, as the organization of power, must be deconstructed within practices of critical place-based pedagogies. Greenwood (2010) urges sustainability and environmental educators to "face up to the eco- and genocidal politics of empire, politics we're all complicit with everyday in our cosmopolitan superprivilege. We need to embrace paradox because as heady academics and well-meaning activists, we can easily forget the gift of our own embodied and earthy existence" (p. 10). This paradox, while difficult to discuss because, as Greenwood (2010) points out, we are all implicated in continuing inequitable power relations, is the important linkage of local to global and past to present in teaching about sustainability. As he further states, "nature and empire

are two poles on a continuum that shape the cultural and ecological contexts of life and learning" (p. 10). Greenwood's attention to this continuum of nature and empire signals to me the type of *intra-action* Karen Barad and other critical feminist technoscience scholars and new material feminists, such as Haraway (1991), and Hayles (1999) have developed as posthumanist theory.

The results of this research make the case that sustainability research has much to draw on from the work of new materialist feminists, whose work has grown out of a post-structuralist feminist focus on representation, language, and social constructionist perspectives to a concentration on *affect* and the performance of "material discursive" practices; that is, how bodies and natures are co-constitutive, or how nature and culture *intra-act* in and through each other as active agents (Barad, 2003). By examining my students' narratives we can see how central the concept of linked. The history of colonization and its continued force on bodies and nature, or how bodies and nature are co-constitutive through material discourses is one key aspect that sustainability education can draw from the work of new material feminists.

In terms of affect Madeleine Grumet (1995), in her essay "The Curriculum: What Are the Basics and Are We Teaching Them?" argues that what becomes ignored in the pursuit of the basics in education, such as scientific facts about nature, are feelings, relations, and memories – affect. Through her discussion of teaching seventh graders about black holes, Grumet illustrates how the frightening aspects of nature are ignored and there is never room in the class for how a student feels about black holes and the relation they make with representations of nature that show destruction and horror. As Grumet (1995) suggests, giving students more scientific facts about nature will not address what is left out of our teaching about the environment – our feelings, our memories, and our desires. From my findings, I argue that *affect* must be a focal point within critical place-based pedagogy. In particular, what the students' narratives demonstrate is how *affect* can be engaged with through narrative reflections. Furthermore, the use of creative approaches to writing (writing from the perspective of the non-human) allowed students to develop a diffractive writing practice that performed critical place-based pedagogy and enabled students to engage with their emotional response to curricular objects encountered in the course.

REFERENCES

Barad, K. (2003). Posthumanist performativity: Toward an understanding of how matter comes to matter. *Signs: Journal of Women in Culture and Society*, *28*(3), 801–831.

Bell, D. (2002). Sustainability, peace and security. *Peace Magazine, 19*(1), 6–7.

Bowers, C. A. (1996). The cultural dimensions of ecological literacy. *Journal of Environmental Education, 27*(2), 5–10.

Bowers, C. A. (2001). *Educating for eco-justice and community.* Albany, NY: State University of New York Press.

Choi, B., & Pak, A. (2006). Multidisciplinarity, interdisciplinarity and transdisciplinarity in health research, services, education, and policy. *Clinical & Investigative Medicine, 29*(6), 351–364.

Cole, A. L., & Knowles, J. G. (2001). Qualities of inquiry: Process, form, and function. In L. Neilsen, A. L. Cole, & J. G. Knowles (Eds.), *The art of writing inquiry* (pp. 211–219). Halifax, NS: Backalong Books.

Ellsworth, E. (1989). Why doesn't this feel empowering? Working through the repressive myths of critical pedagogy. *Harvard Educational Review*, *59*(3), 297–325.

Ellsworth, E. (2005). *Places of learning: Media, architecture, pedagogy.* New York, NY: Routledge.

Farr, A. (2004). Whiteness visible: Enlightenment racism and the structure of racialized consciousness. In G. Yancy (Ed.), *What white looks like: African-American philosophers on the whiteness question* (pp. 143–158). New York, NY: Routledge.

Freire, P. (1970/2010). *Pedagogy of the oppressed*. New York, NY: Continuum International Publishing Group.

Furman, G., & Gruenewald, D. (2004). Expanding the landscape of social justice: A critical ecological analysis. *Educational Administration Quarterly, 40*(1), 47–76.

Giroux, H. A. & Searls Giroux, S. (2004). *Take back higher education: Race, youth and the crisis of democracy in the post-civil rights era*. New York, NY: Palgrave Macmillan.

Glesne, C. (1997). That rare feeling: Re-presenting research through poetic transcription. *Qualitative Inquiry, 3*(2), 202–221.

Gough, N. (1999). Rethinking the subject: (De)constructing human agency in environmental education research. *Environmental Education Research, 5*(1), 35–48.

Gough, S., Walker, K., & Scott, W. (2001). Lifelong learning: Towards a practice for formal and non-formal environmental education and training. *Canadian Journal of Environmental Education, 6*, 178–196.

Greenwood, D. A. (formerly Gruenewald). (2010). Nature, empire and paradox in environmental education. *Canadian Journal of Environmental Education*, *15*, 9–24.

Gregory, D. (1994). *Geographical imaginations*. Oxford, UK: Blackwell.

Gruenewald, D. (2003). The best of both worlds: A critical pedagogy of place. *Educational Researcher*, *32*(4), 3–12.

Gruenewald, D., Koppelman, N., & Elam, A. (2007). Our place in history: Inspiring place-based social history in schools and communities. *Journal of Museum Education*, *32*(3), 231–240.

Grumet, M. (1998). Lost places, potential spaces, and possible worlds: Why we read books with other people. *Journal of Curriculum Theorizing, 14*(2), 24–28.

Haraway, D. (1991). *Simians, cyborgs and women: The reinvention of nature*. New York, NY: Routledge.

Harriet Tubman Institute. (2010). *Breaking the chains: Presenting a new narrative for Canada's role in the underground railroad*. Retrieved from http://tubman.info.yorku.ca/educational-resources/breaking-the-chains/about-the-project/

Hart, P., Jickling, B., & Kool, R. (1999). Starting points: Questions of quality in environmental education. *Canadian Journal of Environmental Education*, *4,* 104–124.

Hayles, N. A. (1999). *How we became posthuman: Virtual bodies in cybernetics, literature and informatics.* Chicago, IL: University of Chicago Press.

Hill, K. (2009). A historical analysis of desegregation and racism in a racially polarized region: Implications for the historical construct, a diversity problem, and transforming teacher education toward culturally relevant pedagogy. *Urban Education*, *44*(1), 106–139. Retrieved from ERIC database.

Massey, D. (1994). *Space, place and gender.* Minneapolis, MN: University of Minnesota Press.

McKeown, R. (2002). *Education for sustainable development toolkit*. Knoxville, TN: Center for Geography and Environmental Education, University of Tennessee. Retrieved from www.esdtoolkit.org

McKittrick, K. (2002). Their blood is there, and they can't throw it out: Honoring black Canadian geographies. *Topia: Canadian Journal of Cultural Studies, 7*, 27–37.

Miller, J. I. (2004). *Sounds of silence breaking: Women, autobiography, curriculum*. New York, NY: Peter Lang.

Mitchell, R. C. (2010). Who's afraid now? Reconstructing Canadian citizenship education through transdisciplinarity. *Review of Education, Pedagogy, and Cultural Studies, 32*(1), 37–65.

Nolet, V. (2009). Preparing sustainability-literate teachers. *Teachers College Record, 111*(2), 409–442. Retrieved from ERIC database.

Norquay, N. (2002 , April). Dig where you stand: Challenging the myth of the 'white pioneer'. *Northern Terminus: The African Canadian History Journal*, 1–6.

Orr, D. (1992). *Ecological literacy: Education and the transition to a postmodern world*. New York, NY: State University of New York Press.

Orr, D. (2004). *Earth in mind: On education, environment, and the human prospect.* Washington, DC: Earth Island Press.

Payne, P. (2001). Identity and environmental education. *Environmental Education Research, 7*(1), 67–88.

Pinar, W. (2004). *What is curriculum theory?* Mahwah, NJ: Lawrence Erlbaum.

Pinar, W., Reynolds, W., Slattery, P., & Taubman, P. (1995). *Understanding curriculum: An introduction to the study of historical and contemporary curriculum discourses*. New York, NY: Peter Lang.

Robinson, J. (2008). Being undisciplined: Transgressions and intersections in academia and beyond. *Futures, 40*, 70–86.

Russell, C., Sarick, T., & Kennelly, J. (2002). Queering environmental education. *Canadian Journal of Environmental Education, 7*(1), 54–66.

Sandilands, C. (2001). From unnatural passions to queer nature. *Alternatives, 27*(3), 30–35.

Sipos, Y., Battisti, B., & Grimm, K. (2008). Achieving transformative sustainability learning: Engaging head, hands, and heart. *International Journal of Sustainability in Higher Education, 9*(1), 68–86. Retrieved from ERIC database.

Starr, P. (Producer), Holness, J., & Sutherland, D. (Directors). (2006). *Speakers for the dead* [Motion picture]. Canada: National Film Board of Canada.

Sullivan, S., & Tuana, N. (2007). Introduction. In S. Sullivan & N. Tuana (Eds.), *Race and epistemologies of ignorance*. Albany, NY: State University of New York Press.

Sustainability Report. (2004). Retrieved October 10, 2004, from http://www.sustreport.org/home/html

Willinsky, J. (1998). *Learning to divide the world: Education at empire's end*. Minneapolis, MN: University of Minnesota.

Yancy, G. (2004). Fragments of a social ontology of whiteness. In G. Yancy (Ed.), *What white looks like: African-American philosophers on the whiteness question* (pp. 1–24). New York, NY: Routledge.

DAWN R. BAZELY, PATRICIA E. PERKINS, MIRIAM DUAILIBI
AND NICOLE KLENK

7. STRENGTHENING RESILIENCE BY THINKING OF KNOWLEDGE AS A NUTRIENT CONNECTING THE LOCAL PERSON TO GLOBAL THINKING

The Case of Social Technology/Tecnologia Social

INTRODUCTION

In April 2009, we held an international conference at York University in Toronto, Canada, billed as *Ecojustice: How Will Disenfranchised Peoples Adapt to Climate Change*? (Dubreuil, 2009; Klenk, Bazely, & Perkins, 2010). A diverse group of activists and academics that work with NGOs from the Global South and North came together to discuss the challenges of adapting to climate change. Most significantly, the Canadian perspective was entirely represented by First Nations and Inuit, which was, and continues to be unusual at conferences of this kind, held in the southern part of Canada. While we are not aware of literature tracking the presence of Indigenous peoples on conference panels, there is ample research drawing upon data on the (under)representation of minorities and women at Social Sciences and Science, Technology, Engineering and Mathematics (STEM) conferences (e.g., Killian & Hardy, 1998; Eisen, 2012; Schroeder et al., 2013).

Our conference was very interdisciplinary (Dubreuil, 2009; Klenk et al., 2010). It triggered and reinforced a cascade of diverse activities and research that have followed many intertwining pathways that diverged, crossed and reconnected over the intervening five years. Several key factors emerged from both the field experiences shared by conference participants, and subsequent research, indicating that the adaptive capacity of disenfranchised peoples in Brazil, India, South Africa, Canada and beyond, is enhanced by diverse kinds of shared knowledge. This shared knowledge essentially creates new kinds of insights and ideas, some of which are transdisciplinary (*sensu* Lélé & Norgaard, 2005) in nature (Klenk et al., 2010), prompting a STEM academic (co-author Bazely), familiar only with the IPCC's (Intergovernmental Panel on Climate Change) work on climate change, to obtain observer status for York University at the United Nations Framework Convention on Climate Change (UNFCCC), which is the policy-political arena for climate change.

In this chapter, we describe the *Knowledge as a Nutrient* framework that emerged from these conversations. We describe how it relates to the *Tecnologia Social* policy

R. C. Mitchell & S. A. Moore (Eds.), Planetary Praxis & Pedagogy, 119–132.

approach to sustainability, developed in Brazil (Dagnino et al., 2004; Fundação Banco do Brasil, 2009; Costa, 2013), which is not well known in the anglophone world. *Tecnologia Social* was both inspired by and rooted in Paulo Freire's (1970/2010) pedagogical thinking (Klix, 2014). We show how this framework has the potential to increase community resilience and adaptive capacity, not only for communities that face and must adapt to climate change but for all communities in the throes of complex social, ecological, economic and political transitions.

CIVIL SOCIETY AT THE UNITED NATIONS: OBSERVER STATUS FOR YORK UNIVERSITY AT UNFCCC

The UNFCCC allows civil society, including universities, to apply for observer status at its various Conferences of the Parties (COPs). One Ecojustice conference suggestion was that IRIS (Institute for Research and Innovation in Sustainability), York University, seek observer status, as a means to allow diverse members of the York community – students, staff and faculty – to attend COP 15 (Klenk et al., 2010; UNFCCC, 2014). Since Copenhagen 2009, many student, staff and faculty delegates have attended annual UNFCCC meetings in Cancún (Mexico), Durban (South Africa), Doha (Qatar) and Warsaw (Poland). These and other explicitly interdisciplinary international meetings such as *Climate, Sustainability & Development in Semi-arid regions: ICID+18*, in Fortaleza, Brazil (IISD, 2010), and *Adaptation Futures: Third International Climate Change Adaptation Conference*, also in Fortaleza (United Nations Environment Programme [UNEP], 2014), have been spaces for the further interdisciplinary connections and conversations, that have informed our research (e.g., Perkins, 2013; Bazely, Christensen, Tanentzap, & Hoogensen, 2014).

BRINGING AN ECOLOGICAL PERSPECTIVE TO THE TRANSDISCIPLINARY TABLE

Our ongoing interdisciplinary conversations and collaborations have led us to conceptualize *Knowledge as a Nutrient*. In a popular Biology Department seminar presentation, "Ecologists (and scientists, in general) – why don't we get more respect?" Dawn Bazely outlines what ecologists can bring to the interdisciplinary table (Figure 1).

Questions about how nutrient cycles and networks drive ecosystem functioning while influencing stability, diversity and resilience have been asked in ecology for decades (e.g., Holling, 1973; Gunderson, 2000; Chapin et al., 2000; Elmqvist et al., 2003). Additionally, the adoption of the ecological concept of resilience in the social sciences, and its evolution (reviewed by Janssen, Schoon, Ke, & Börner, 2006), has also led to its uptake in the climate adaptation field (Adger, 2006).

When we reflected upon how ecological theory may further contribute to solutions for diverse sustainability issues, including how human communities (particularly those with disenfranchised peoples) may be empowered as they are forced to adapt

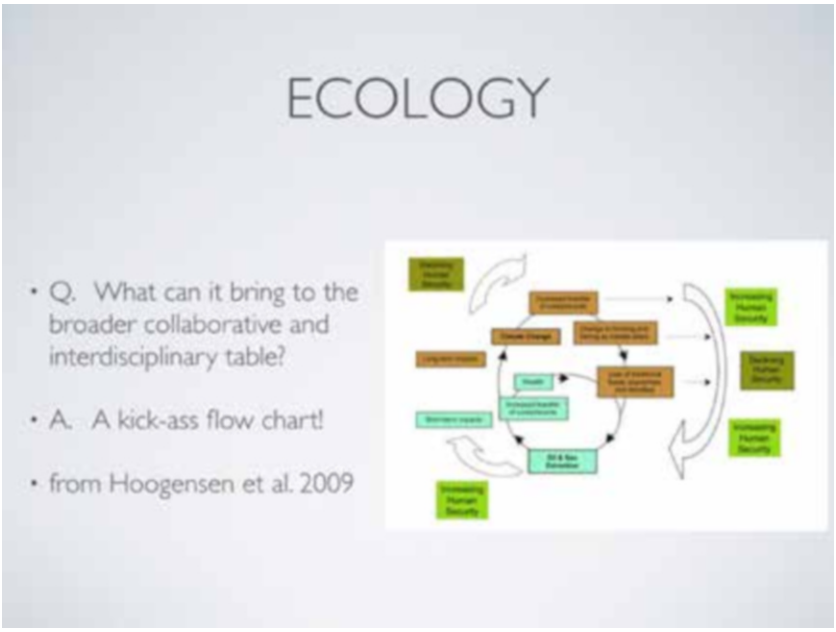

Figure 1. Slide from Bazely seminar, given at 4 biology departments, 2011–2014

to climate change, we were struck by the many references to the importance of knowledge sharing (e.g., Klenk et al., 2010). This led us to think about how different kinds of climate adaptation and mitigation might link with ecology, and to ask "if energy, nitrogen, phosphorus, carbon, etc. are so important in determining ecosystem structure and function, why not also think of *knowledge* in the same way?" Too little of it will limit the diversity of efforts aimed at finding ways of adapting to ecological and environmental stressors. More of it should increase the diversity of options at the individual, community, national and international scales.

We present the *Knowledge as a Nutrient* concept in the standard ecology format of nutrient flow charts that are found in all biology texts (Figure 2). A basic chart has been adapted to illustrate that, through increased flows and connections, indicated by the size and strength of arrows, more knowledge may be brought into the public sphere, and also be prevented from disappearing. Scientists and academics in general, commonly point to barriers to knowledge mobilization and the consequence for policy and politics (e.g., Bazely et al., 2014).

We considered knowledge to be most similar to energy influxes from the sun. The boxes on the left represent the biotic or living components of the ecosystem. The boxes at right represent the abiotic components of ecosystems. The two boxes in the middle, represent new knowledge, similar to incoming solar radiation, which can also be lost from the earth when it is re-radiated and not captured in photosynthesis.

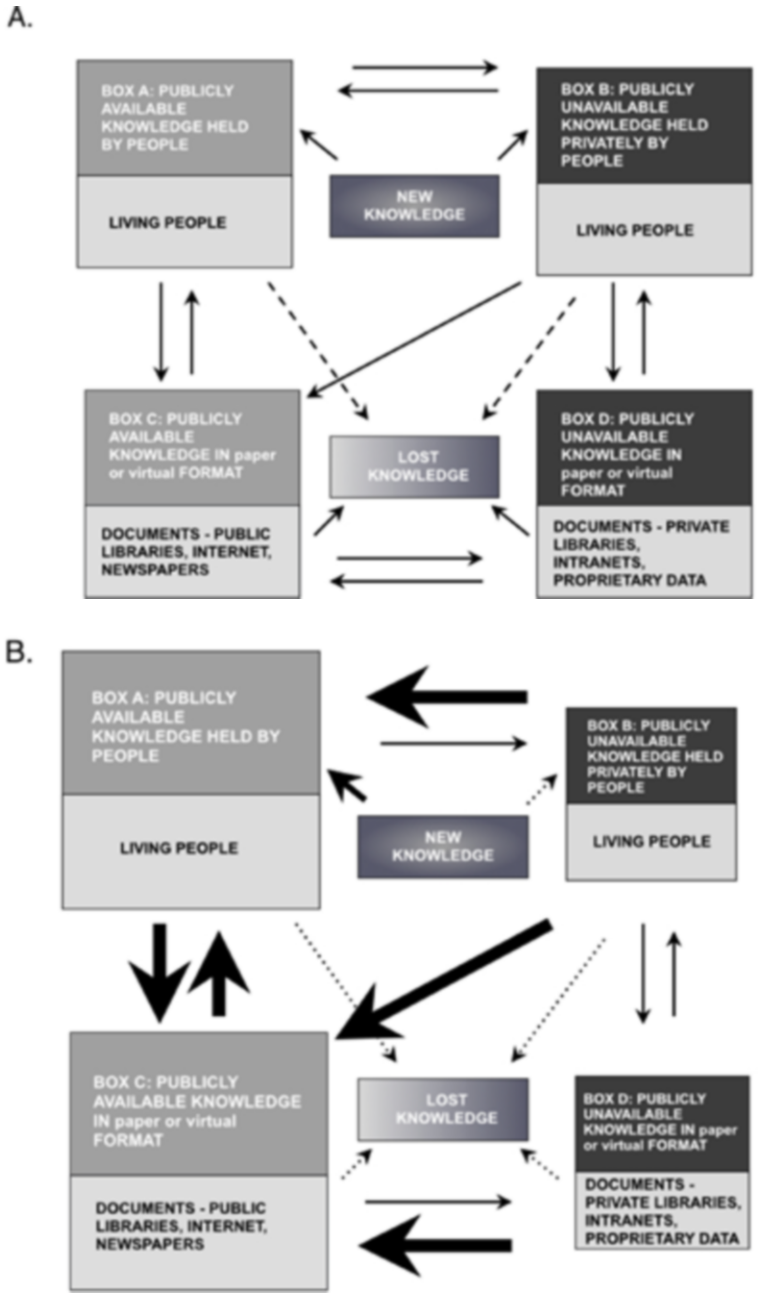

Figure 2. Adapted generalized nutrient cycle chart found in undergraduate biology textbooks (e.g., Campbell et al., 2008)

Through this increased knowledge flow, resilience and capacity for adaptation should increase. Also, the flow and circulation of knowledge will be strengthened by increased network connections and connectivity. Our underlying assumptions are: 1. That all relevant knowledge systems are included in decision-making (which significantly differs from, but is related to the principle of including all affected in decision-making); and 2. Knowledge storage must be reliable and be a function of knowledge mobilization, that is, not a barrier to knowledge mobilization.

We are not the first people to conceptualize knowledge as an ecological concept, but we are the first, as far as we know, to conceptualize knowledge as a nutrient in the ecosystem. Other authors' discussions of knowledge ecosystems and its movement are conceptually very different from ours. Michaels, Goucher, and McCarthy (2006) consider the steps that transform data to knowledge. Their concept is complementary to ours, and speaks to the finer scale of process. In contrast, Papaioannou, David Wield, and Chataway's (2009) critical evaluation of the legitimacy of the knowledge ecology concept and the theory of the innovation ecosystem, is less complementary. They considered it as a reductionistic STEM-grounded approach and evaluated its validity, ultimately concluding that it has substantial theoretical issues because it is not appropriately grounded in historical processes of the social division of labour. Papaioannou et al. (2009) defined ecology as having a different meaning from ecosystem, which is, indeed, the case. However, their distinction is highly problematic because it conflates the different meanings with different scales of approach taken in ecological research: from the individual to the population, to the community and the ecosystem. Papaioannou et al.'s definition of ecology, which is that it poses questions about an *individual*'s interactions with the environment, is, in fact, only one area of ecology. Ecology usually asks questions about how organisms interact with their environment at multiple spatial and temporal scales, simultaneously. Furthermore, in contrast to Papaioannou et al.'s assertion regarding history and context, they are very important in ecology: for example, evolution, legacy effects, or paleolimnology.

Thus, as with our consideration of the historical and current usages and definitions of the terms *Social Technology*/*Tecnologia Social*, in the interdisciplinary space it is vital to explore diverse meanings of language and terms used, in a process that engages diverse scholars and many voices.

THE *TECNOLOGIA SOCIAL* APPROACH: *KNOWLEDGE AS A NUTRIENT* IN ACTION

The term, *Social Technology,* has a history of usage in recent anglophone literature that is startlingly different from what its translation, *Tecnologia Social*, means in Brazil (Dagnino, 1976; Dagnino et al., 2004; Fundação Banco do Brasil, 2009; Costa, 2013). We believe that it is worthwhile to explore the different use and meaning of this term, in order to increase awareness of the fully realized Brazilian *social technology* framework, for researchers in sustainability, human development,

and climate change adaptation and resilience. We avoid the longer history of the *Social Technology* concept, which dates back several centuries, and highlight the current significance of this concept for adaptation and development efforts in Brazil. Furthermore, we note that some Brazilian-Portuguese speakers may not be aware of the anglophone political and historical connotations that arise in the translation of *Tecnologia Social*: in progressive English-speaking circles, there remains vestigial resistance to the use of the term for reasons summarized here. Therefore, we discuss both the Brazilian and (various) anglophone meanings of the concept.

What is Tecnologia Social in Brazil?

- *Social Technology* is considered to be every product, method, technique or process designed to solve some kind of social problem and meet the principles of simplicity, low cost, easy applicability and proven social impact.
- Social technologies can be born within a community or academic environment. They can also combine popular knowledge and technical-scientific knowledge. Essentially, the effectiveness of these technologies multiplies, allowing development to scale-up (Dagnino et al., 2004; Fundação Banco do Brasil, 2009; Costa, 2013).

Social technologies are key to economic, social and environmental sustainability. The four dimensions are: understanding science and technology; participation, citizenship and democracy; education; and social relevance. Social technologies facilitate inclusion and improve quality of life (Dagnino et al., 2004; Costa, 2013). The *Tecnologia Social* framework addresses the needs of the most vulnerable communities that are most intensely affected by climate change (J. Malheiros, personal communication). Local communities identify their needs and embark on an organized, collaborative, knowledge-sharing process, to develop the appropriate social technologies, for example, those needed for climate change adaptation.

Not the Same Thing: 20th Century Usage in the Anglophone World

Most recently, the term *social technology* has been associated with Internet-based social networking systems. Research often discusses how and why businesses should interact with YouTube, Twitter and Facebook (Li & Bernoff, 2008), or the usefulness of podcasting as a *social technology* for blended learning (Lau et al., 2010). Rice (2005) documented the increasing research into Internet-related topics, and Kraut et al. (1998) examined the downside of this *social technology*: namely, how increased Internet usage intensified loneliness and depression.

To track the usage of the term in anglophone 20th century academic literature, we conducted a bibliometric search of peer-reviewed journal articles in all accessible databases of the ISI Web of Science, using “social technology” in the topic area. This returned a total of 104 papers. Prior to 1967, when reviews of the book *Social*

Technology (Helmer, Brown, & Gordon, 1966) first appeared in the peer-reviewed literature, there were five papers employing the term. None of them have been cited in academic journals. The first paper was published in 1901 (Henderson, 1901), followed by four in the next 66 years (Henderson, 1912; Bushnell, 1936; Giles, 1953).

Helmer et al. (1966) envisioned *social technology* as a practical means of bringing the social sciences closer to the "hard" (natural and physical) sciences (Aligica & Herritt, 2009). Echoing Condorcet's 18th century view of the social sciences, Helmer et al. (1966) viewed the imprecision of social sciences with respect to their apparent lack of exactitude, and their frequent failure to garner reproducible results, as being not so very different from the hard sciences. When a scientist conducts research outside of controlled laboratory conditions, the results often become messier and less clear-cut. Social technologies are intended to be the practical applications of lessons learned in the social sciences. They can help humanity to deal with emerging and future issues (Aligica & Herritt, 2009), such as today's *wicked problems* of climate change and poverty (Durant & Legge, 2006).

Social Technology (Helmer et al., 1966) aims to shift methodological approaches in the social sciences and implement the insights through operational model-building and predictive exercises such as the Delphi method, which relies on expert opinion (Michael, 1967). Predictive expert-based methodologies, immediately differentiate the Helmer et al. (1966) concept of *social technology* from its Brazilian counterpart, which values bottom-up participatory methodologies and local knowledge. Even if Helmer and colleagues' version of *social technology* aims to create "a more humane world for tomorrow" (Michael, 1967), it appears to be imposed from the top down.

In the almost five decades since Helmer et al., the concept of *social technology* has been used by anglophone researchers in diverse ways. The 96 articles published from 1970 to 2010 span 56 subject areas, including sociology (16 articles), management (10), business (7), economics (7), planning and development (7), psychology (7), multidisciplinary topics (7), and the history and philosophy of science (6). While the term cuts across this very broad range of subject areas, its usage is rare within most of them, generally occurring only once or twice. Some of the 96 articles do not provide a specific definition of *social technology*, and use the term only once or twice, either in passing or in the title (e.g., Bastalich, 2009).

Whether *social technology* is developed and implemented by university researchers or governments, there is often a suspicion of activities occurring under this rubric – see, for example, Suedfeld's (1973) review of Varela's book, *Psychological Solutions to Social Problems: An Introduction to Social Technology* (1971). This may relate, in part, to the RAND Corporation, where Helmer worked for 22 years (Aligica & Herritt, 2009), being involved in secret research for the United States military (Campbell, 2004). Another reason for this caution is related to the strong association between the terms *technology* and *engineering*. For many English speakers, *social engineering* calls to mind eugenics, engendering an instinctive negative reaction (Schwartz, 1992; Koch, 2006; Gerodetti, 2006).

Is there an overlap between the Brazilian Tecnologia Social *and a more progressive anglophone understanding of* social technology*?* A number of English-language articles align themselves to varying degrees with the Brazilian perspective of *social technology*, with respect to enhancing societal well-being (Bloom et al., 2001; Szto, 2007). Elsewhere, critical links have been made between *social technology* and *human rights* (Knopff, 1989), the role of universities as institutions of *social technology* (Fuller, 2003), and the often-overlooked contribution of human skills to wealth creation (Patel, 1992).

A much earlier paper, written after the Great Depression, overlaps strongly with the Brazilian *Tecnologia Social*. Indeed, Bushnell (1936) wrote that "the challenge comes home to the sociologists today … the social technology required by the present social emergency calls for a comprehensive social-planning" that will address a slew of issues that resonate today:

> Vast technological unemployment; disgraceful housing for half our population; sweeping foreclosures of home mortgages; glaring contrasts of poverty and wealth; general insecurity; the paradox of scarcity in the presence of possible abundance; business waiting for markets while withholding from labor adequate buying power; the holding back of inventions; the stinting of education, recreation and art; the waste and maldistribution of resources… all indicate a lack of planned cooperative control that cannot long continue without general, public disaster. (p. 423)

However, recent anglophone usage of *social technology* is generally not in alignment with the comprehensive Brazilian framework speaking to democracy, activism, and collective human ingenuity (Dagnino, 1976; Dagnino et al., 2004). *Tecnologia Social* is intended to provide a practical pathway for building capacity in local communities that will lead to greater empowerment, security, resilience and sustainability (Rodrigues & Barbieri, 2008). In addition to goals of eradicating poverty and environmental stewardship, it promotes *deliberative citizenship*, the central aspect of the political dimension of how *Tecnologia Social* views development (Rodrigues & Barbieri, 2008). With its local-global dialectic framework (MacLellan, 2010), collaborative knowledge production and normative aims of improving social conditions, in our view Brazilian *Tecnologia Social* merits much greater global attention and debate as an example of connecting diverse community members.

THE OPEN ACCESS MOVEMENT, INSTITUTIONAL REPOSITORIES AND DIGITAL ARCHIVES: WHERE SOCIAL TECHNOLOGY AND *TECNOLOGIA SOCIAL* INTERSECT

How can the *Tecnologia Social* programmes developed and implemented in Brazil, gain wider attention? The Internet and *Social Technology* (in its current, predominant anglophone sense) is one obvious means of communicating the experiences and

knowledge generated by this inclusive Brazilian approach. As well, the *Knowledge as a Nutrient* concept adds a useful illustrative dimension to efforts aimed at increasing access to diverse kinds of knowledge, from peer-reviewed research to local knowledge rooted in peoples around the world. The flow charts (Figure 2) provide an illustration of hypotheses about how accelerating community adaptation to climate change may be achieved through expanded knowledge sharing and publicly available information.

We propose the Open Access movement (Willinsky, 2006), spearheaded and supported by university Institutional Repositories (Lynch, 2003), as a pathway for accelerating knowledge movement and mobilization. Additionally, putting information that may normally be difficult to access into Open Access Institutional Repositories and tracking its uptake provides a means of testing these predictions about the empowering effects of access to knowledge.

Institutional Repositories are self-archiving open access collections from a university's entire community (Lynch, 2003). For example, the Churchill Community of Knowledge Digital Archive is one of many collections in YorkSpace, York University's Institutional Repository:

http://yorkspace.library.yorku.ca/xmlui/handle/10315/8089

It comprises digitized media from the diverse long-term ecological research at Churchill, Manitoba, Canada. The public can easily access such repositories via Google searches, which provide legal means of circumventing paywalls.

Dawn Bazely and colleagues have built the Open Access Churchill, Manitoba digital archive to document long-term (>40 years) of ecological research, including studies on climate change. Impacts Analytics data tell us that it is widely used (Untershats et al., 2014). We are undertaking research to track this activity more formally. Another example of implementation of *Tecnologia Social* that uses Social Technology, is provided by Paulo Cunha, a speaker at the 2009 conference (Klenk et al., 2010). He has developed a sustainability education programme based in Rio de Janeiro, Brazil (Cunha, 2014). His approach emphasizes the importance of personal reflection and transformation, that is very much rooted in Freire's thinking.

The concept of cryptocurrencies and the development of Bitcoin (Nakamoto, 2008; Elias, 2011; Reid & Harrigan, 2013) is another intersection between Social Technology and *Tecnologial Social*. The recent launch of Permacredits (Hofman, 2014; Poupard, 2014) is perhaps the natural evolution that occurs when business people give up the consumer lifestyle for one that practices sustainability principles, from the permaculture perspective (Mollison, 1988).

CONCLUSION

The opportunities for reflection, learning and transdisciplinary thinking provided by the inherent inclusivity, interdisciplinarity and collaborative thinking of the sustainability space, led us to develop a new use for standard ecological nutrient

pathway models that considers *knowledge as a nutrient* (Figure 2). Furthermore, our thinking about improved governance, community resilience and adaptation to climate change resulted in an exploration of the diverse history of terminology usage: specifically, the differences and connections between the Brazilian *Tecnologia Social* approach to sustainability, and the current anglophone definition of *social technology*. In doing this, we now propose that together, they provide mechanisms and processes for testing the *Knowledge as a Nutrient* concept.

Finally, some key points discussed at the *Ecojustice* 2009 conference have emerged as principles that we believe reinforce the *Knowledge as a Nutrient* concept in ways that expand community resilience and adaptive capacity:

- relevant information must be widely and freely available;
- decision processes must be transparent and inclusive of all affected by the decisions;
- communication across disciplines must be recognized as equally important as knowledge-generation within disciplines;
- collaborative, equitable knowledge-sharing processes must be built, fostered, moderated and protected;
- transparency, diversity, and creativity must be paramount virtues;
- tendencies for private profit from knowledge production, barriers to knowledge-sharing, and technology development that benefits a few at the expense of many must be resisted;
- integration of public citizenship, lifelong education, social diversity, communication, and social-political-ecological responsibility must be recognized as the path to development.

The diverse calls for improved knowledge mobilization and transparency, as well as the caveats that characterize discussions about access to knowledge, and the *Tecnologia Social* concept, emphasize their strong grounding in an ethics framework as well as their transdisciplinarity:

> [Technical models of the effects of climate change] offer us value judgements obscured by a cloak of objective detachment, when what is needed for climate justice is value transparency, clear attention to all the impacts, and a science that cultivates a sentiment of responsibility and care instead of objective detachment. (Tuana, 2013, p. 24)

> Developing inclusive, deliberative processes is the fastest, most effective way to address climate change, because it draws on local, place-based knowledge and identifies the needs of people most affected, thereby reducing inefficiencies that might result from top-down approaches. (McAllister, Magee, & Hale, 2014, p. 10)

ACKNOWLEDGEMENTS

We thank João Otavio Malheiros (AMAVIDA Associação Civil, Brazil), Gerson Guimarães (ITS, Brazil), Stepan Wood, Patty Figueiredo and Sabreena Delhon (York University), and Aaron Ellison (Harvard Forest) for discussion, comments and translations. Parks Canada, International Polar Year, IDRC, NSERC, York University, Environment Canada and a Bullard Fellowship from Harvard University, have all provided funding support over the years during which we have worked on these ideas and concepts.

REFERENCES

Adger, W. N. (2006). Vulnerability. *Global Environmental Change, 16*(3), 268–281. doi:10.1016/j.gloenvcha.2006.02.006

Aligica, P. D., & Herritt, R. (2009). Epistemology, social technology, and expert judgment: Olaf Helmer's contribution to futures research. *Futures, 41*(5), 253–259. doi:10.1016/j.futures.2008.11.010

Bastalich, W. (2009). Reading Foucault: Genealogy and social science research methodology and ethics. *Sociological Research Online*, *14*(2), 3. doi:10.5153/sro.1905

Bazely, D. R., Christensen, J., Tanentzap, A. J., & Hoogensen Gjørv, G. (2014). Bridging the GAPS between ecology and human security. In G. Hoogensen Gjørv, D. Bazely, M. Goloviznina, & A. Tanentzap (Eds.), *Environmental and human security in the Arctic* (pp. 129–150). London, UK: Routledge Earthscan.

Bloom, D. E., River Path Associates, & Fang, K. (2001). *Social technology and human health.* Concept Paper for the Human Development Report, United Nations Development Programme (UNDP). New York, NY: Oxford University Press. Retrieved August 21, 2014, from http://hdr.undp.org/en/reports/global/hdr2001/papers/dbloom_healthandtechnology-1.pdf

Bushnell, C. J. (1936). Social technology in relation to social planning. *Social Forces*, *14*(3), 423–427.

Campbell, N. A., Reece, J. B., Urry, L. A., Cain, M. L., Wasserman, S. A., Minorsky, P. V., & Jackson, R. B. (2008). *Biology* (9th ed.). New York, NY: Pearson Benjamin Cummings.

Campbell, V. (2004). How RAND invented the postwar world. *Invention and Technology*, *20*(1), 50–59.

Chapin, F. S., Zavaleta, E. S., Eviner, V. T., Naylor, R. L., Vitousek, P. M., Reynolds, H. L., … Díaz, S. (2000). Consequences of changing biodiversity. *Nature, 405*(6783), 234–242. doi:10.1038/35012241

Costa, A. B. (Ed.). (2013). *Tecnologia Social e Políticas Públicas.* São Paulo, Brazil: Instituto Pólis, Fundação Banco do Brasil, Brasília. Retrieved July 15, 2014, from http://www.fbb.org.br/tecnologiasocial/

Cunha, P. 2014. *Cultura para sustentabilidade*. Retrieved May 6, 2014, from http://www.comculturaparasustentabilidade.com/

Dagnino, R., (1976). *Tecnologia apropriada: Uma alternativa?* Dissertação (mestrado) – UnB, Departamento de Economia, Brasília, Brazil.

Dagnino, R., Brandão, F. C., & Novaes, H. N. (2004). Sobre o marco analítico-conceitual da Tecnologia Social. In A. E. Lassance Jr., C. J. Mello, E. J. Siqueira Barbosa, F. Alves Jardim, F. Cruvinel Brandão, H. Tahan Novaes, … S. M. Portella Kruppa, (Eds.), *Tecnologia Social: uma estratégia para o desenvolvimento* (pp. 15–64). Rio de Janeiro, Brazil: Fundação Banco do Brasil. Retrieved July 15, 2014, from http://www.fbb.org.br/tecnologiasocial/

Dubreuil, A. (2009, April). *Ecojustice: How will disenfranchised peoples adapt to climate change?* Conference proceedings, York University, Toronto, Canada. Retrieved August 20, 2014, from http://iris.info.yorku.ca/events/ecojustice-conference/

Durant, R. F., & Legge, J. S. (2006). Wicked problems, public policy, and administrative theory: Lessons from the GM food regulatory arena. *Administration and Society*, *38*(3), 309–334. doi:10.1177/0095399706289713

Eisen, J. (2012). *Bring your surfboard & your Y chromosome b/c they don't take a XX*. First annual winter Q-Bio meeting: Quantitative Biology on the Hawaiian Islands, February 18–21, 2014. Retrieved August 20, 2014, from http://phylogenomics.blogspot.ie/2012/09/q-bio-conference-in-hawaii-bring-your.html

Elias, M. (2011). Bitcoin: Tempering the digital ring of gyges or implausible pecuniary privacy. *Social Sciences Research Network*. Retrieved August 24, 2014, from http://ssrn.com/abstract=1937769 or http://dx.doi.org/10.2139/ssrn.1937769

Elmqvist, T., Folke, C., Nyström, M., Peterson, G., Bengtsson, J., Walker, B., & Norberg, J. (2003). Response diversity, ecosystem change, and resilience. *Frontiers in Ecology and the Environment, 1*(9), 488–494.

Freire, P. (1970/2010). *Pedagogy of the oppressed* (M. Bergman, Trans.). New York, NY: Continuum International Publishing Group.

Fuller, S. (2003). The university: A social technology for producing universal knowledge. *Technology in Society*, *25*, 217–234. doi:10.1016/S0160-791X(03)00023-X

Fundação Banco do Brasil. (2009). *Tecnologia social na fundação Banco do Brasil: Soluções para o desenvolvimento sustentável*. Rio de Janeiro, Brazil: Author. Retrieved July 15, 2014, from http://www.fbb.org.br/tecnologiasocial/

Gerodetti, N. (2006). From science to social technology: Eugenics and politics in twentieth-century Switzerland. *Social Politics*, *13*(1), 59–88. doi:10.1093/sp/jxj001

Giles, H. H. (1953). Conflict episode analysis – A tool for education in social technology. *Journal of Educational Sociology*, *26*(9), 418–433.

Gunderson, L. H. (2000). Ecological resilience – In theory and application. *Annual Review of Ecology and Systematics, 31*, 425–439. doi:http://www.jstor.org/stable/221739

Helmer, O., Brown, B., & Gordon, T. (1966). *Social technology*. New York, NY: Basic Books.

Henderson, C. R. (1901). The scope of social technology. *American Journal of Sociology*, *6*(4), 465–486.

Henderson, C. R. (1912). Applied sociology (or social technology). *American Journal of Sociology*, *18*(2), 215–221.

Hofman, A. (2014, April 8). Are permacredits the future of sustainable living? *Bitcoin Magazine*. Retrieved August 24, 2014, from http://bitcoinmagazine.com/12115/permacredits-future-sustainable-living/

Holling, C. S. (1973). Resilience and stability of ecological systems. *Annual Review of Ecology and Systematics*, *4*, 1–23. doi:http://www.jstor.org/stable/2096802

IISD. (2010). *Second international conference on climate, sustainability and development in semi-arid regions (ICID 2010)*. Retrieved August 22, 2014, from http://www.iisd.ca/ymb/climate/icid2010/17aug.html

Janssen, M. A., Schoon, M. L., Ke, W., & Börner, K. (2006). Scholarly networks on resilience, vulnerability and adaptation within the human dimensions of global environmental change. *Global Environmental Change*, *16*(3), 240–252.

Killian, K. D., & Hardy, K. V. (1998). Commitment to minority inclusion: A study of AAMFT conference program content and members' perceptions. *Journal of Marital and Family Therapy, 24*(2), 207–223. doi:10.1111/j.1752-0606.1998.tb01077.x

Klenk, N., Bazely, D. R., & Perkins, P. E. (2010). *How will disenfranchised peoples adapt to climate change? Strengthening the ecojustice movement*. Report of the first international ecojustice conference. Retrieved from http://yorkspace.library.yorku.ca/xmlui/handle/10315/6351

Klix, T. (2014, February 1). Paulo Freire, the simplicity that still innovates. *Jornal do Brasil*. Retrieved August 22, 2014, from http://m.jb.com.br/ciencia-e-tecnologia/noticias/2014/01/02/paulo-freire-a-simplicidade-que-ainda-inova/

Knopff, R. (1989). *Human rights and social technology: The new war on discrimination*. Ottawa, Canada: Carleton University Press.

Koch, L. (2006). Past futures: On the conceptual history of eugenics – A social technology of the past. *Technology Analysis & Strategic Management*, *18*(3/4), 329–344. doi:10.1080=09537320600777085

Kraut, R., Patterson, M., Lundmark, V., Kiesler, S., Mukopadhyay, T., & Sherlis, W. (1998). Internet paradox: A social technology that reduces social involvement and psychological well-being? *American Psychologist*, *53*, 1017–1031.

Lau, R. Y. K., Ip, R. K. F., Chan, M. T., Kwok, R. C., Wong, S. W. M., & So, J. C. F. (2010). Podcasting: An internet-based social technology for blended learning. *IEEE Internet Computing*, *14*(3), 33–41. doi:10.1109/MIC.2010.74

Lélé, S., & Norgaard, R. B. (2005). Practicing interdisciplinarity. *BioScience, 55*(11), 967–975.

Li, C., & Bernoff, J. (2008). *Groundswell: Winning in a world transformed by social technologies*. Boston, MA: Harvard Business Press.

Lynch, C. A. (2003). Institutional repositories: Essential infrastructure of scholarship in the digital age. *Libraries and the Academy*, *3*(2), 327–336. doi:10.1353/pla.2003.0039

MacLellan, J. I. (2010). Brokering the local/global dialectic. In A. Fenech & J. I. MacLellan (Eds.), *Linking climate and impact models to decision and policy making* (pp. 63–70). Toronto, Canada: Environment Canada.

McAllister, L., Magee, A., & Hale, B. (2014). Women, e-waste, and technological solutions to climate change. *Health and Human Rights Journal*, *16*(1). Retrieved August 25, 2014, from http://www.hhrjournal.org/2014/07/01/women-e-waste-and-technological-solutions-to-climate-change/

Michael, D. N. (1967). Review of social technology by Olaf Helmer et al. *American Sociological Review*, *32*(5), 829–830.

Michaels, S., Goucher, N. P., & McCarthy, D. (2006). Considering knowledge uptake within a cycle of transforming data, information, and knowledge. *Review of Policy Research*, *23*, 267–279.

Mollison, B. (1988). *Permaculture: A designer's manual.* Washington, DC: Island Press.

Nakamoto, S. (2008). *Bitcoin: A peer-to-peer electronic cash system.* Retrieved August 24, 2014, from http://nakamotoinstitute.org/bitcoin/

Papaioannou, T., David Wield, D., & Chataway, J. (2009). Knowledge ecologies and ecosystems? An empirically grounded reflection on recent developments in innovation systems theory. *Environment and Planning C: Government and Policy*, *27*(2), 319–339. doi:10.1068/c0832

Patel, S. J. (1992). Social technology: A new factor in development. *Economic and Political Weekly*, *27*(35), 1871–1873, 1875.

Perkins, P. E. (Ed.). (2013). *Water and climate change in Africa*. New York, NY: Routledge.

Poupard, F. (2014, June 1). Digital currency and sustainability. *Bitcoin Vox*. Retrieved August 24, 2014, from http://bitcoinvox.com/article/718/digital-currency-and-sustainability

Reid, F., & Harrigan, M. (2013). An analysis of anonymity in the bitcoin system. In Y. Altshuler, Y. Elovici, A. B. Cremers, N. Aharony, & A. Pentland (Eds.), *Security and privacy in social networks* (pp. 197–223). New York, NY: Springer.

Rice, R. E. (2005). New media/internet research topics of the association of Internet researchers. *The Information Society*, *21*(4), 285–299. doi:10.1080/01972240500189232

Rodrigues, I., & Barbieri, J. C. (2008). A emergência da tecnologia social: Revisitando o movimento da tecnologia apropriada como estratégia de desenvolvimento sustentável. *Revista de Administração Pública – Rio de Janeiro*, *42*(6), 1069–1094. doi:10.1590/S0034-76122008000600003

Schroeder, J., Dugdale, H. L., Radersma, R., Hinsch, M., Buehler, D. M., Saul, J., … Horrocks, N. P. C. (2013). Fewer invited talks by women in evolutionary biology symposia. *Journal of Evolutionary Biology*, *26*(9), 2063–2069. doi:10.1111/jeb.12198

Schwartz, M. (1992). Eugenics and population-policy – Recent literature on the history of a problematic social technology. *Archiv fur Sozialgeschichte*, *32*, 426–444.

Suedfeld, P. (1973). Review of Jacobo A. Varela, *Psychological solutions to social problems: An introduction to social technology*. New York, NY: Academic Press, 1971. *Behavior Therapy*, *4*(2), 301–302. doi:10.1016/S0005-7894(73)80046-2

Szto, P. P. (2007). Cultural context and social technology transfer: The case of Canton, China. *International Journal of Social Welfare*, *16*, 55–64. doi:10.1111/j.1468-2397.2006.00416.x

Tuana, N. (2013). Gendering climate knowledge for justice: Catalyzing a new research agenda. In M. Alston & K. Whittenbury (Eds.), *Research, action and policy: Addressing the gendered impacts of climate change* (pp. 17–31). Dordrecht, The Netherland and Berlin, Germany: Springer.

United Nations Environment Programme (UNEP). (2014, May). *Adaptation futures.* Third international climate change adaptation conference, Fortaleza, Brazil. Retrieved August 20, 2014, from http://www.unep.org/provia/ADAPTATIONCONFERENCE/tabid/55292/Default.aspx

United Nations Framework Convention on Climate Change (UNFCCC). (2014). *Civil society and the climate change process.* Retrieved August 20, 2014, from http://unfccc.int/parties_and_observers/ngo/items/3667.php

Untershats, N., Kosavic, A., Cooke, F., Jefferies, S., Sivakumaran, J., Bekit, N. Z., & Bazely, D. (2014). *The Churchill community of knowledge: An open access digital archive.* Retrievd from Yorkspace website: http://yorkspace.library.yorku.ca/xmlui/

Willinsky, J. (2006). *The access principle: The case for open access to research and scholarship*. Cambridge, MA: MIT Press. Retrieved August 22, 2014, from http://hdl.handle.net/10150/106529

PATRICIA E. PERKINS

8. BUILDING COMMONS GOVERNANCE FOR A GREENER ECONOMY

Much recent work in ecological economics and political ecology, including calls for 'de-growth' in the transition towards more sustainable economies, focuses on commons as a promising paradigm for sustainable governance institutions. The vision involves people who depend on or have an interest in a resource or asset, working together cooperatively to use that asset for production, service provision, and exchange which creates value and well-being while integrating ecological care, justice, and long-term planning to the best of diverse communities' abilities. This includes institutions such as co-ops, land trusts, and non-market or beyond-market collective ways of organizing production, distribution, consumption, and waste or materials management.

Commons are seen as better and more sustainable than private property and markets for a whole range of reasons: markets can create strong incentives to over-exploit resources, exclude some users whose needs must then be met in other ways, generate pollution, ignore ecosystem services and long-term impacts, and otherwise "externalize" crucially-important costs of resource use while undercutting society's ability to address those costs and manage human development sustainably. Commons, on the other hand, allocate assets while also incorporating governance systems to limit overexploitation of resources and negative production impacts. Building effective forms of commons governance combines political economy, psychology, community development, gender/equity awareness, education, global and local policy, and ecological care with economics in ways that span and integrate many traditional disciplines and areas of human endeavour. In times of global climate change, this interdisciplinary challenge takes on a grave imperative.

Preventing the 'tragedy' of commons, by controlling open access and exhaustion of resources for private profit through strong social, political and economic institutions, requires a high level of general civic consciousness, co-operation, the ability to listen and mediate differing goals, conflict resolution, flexibility, trust, and good will throughout society, especially in the context of social dynamism and diversity. As Elinor Ostrom said in her 2009 Nobel Economics Prize acceptance speech, "a core goal of public policy should be to facilitate the development of institutions that bring out the best in humans. We need to ask how diverse polycentric institutions help or hinder the innovativeness, learning, adapting, trustworthiness, levels of cooperation of participants, and the achievement of more effective, equitable, and

R. C. Mitchell & S. A. Moore (Eds.), Planetary Praxis & Pedagogy, 133–145.

sustainable outcomes at multiple scales." Ostrom and others have demonstrated through meticulous research that this does not always happen, but it is possible.

Paulo Freire's concept of participatory communal work is an expression of the spirit behind commons. In *Pedagogy of the City*, Freire stated, "Participation, or cooperation, for example through the so-called *mutirões* (state-community improvement initiatives where the community provides the manpower), are used to repair school buildings and child-care facilities, to clean streets and parks. Without denying the importance of this kind of cooperation, for us participation should go further. For us participation involves a more active presence of the subordinate classes in history, instead of their mere representation. It involves the political participation of the popular classes, through their representations, on the decision-making level, not just to carry out pre-planned projects. The authoritarian understanding of participation obviously reduces it to a presence of the popular classes in the administration conceded only at certain moments.… Popular participation, for us, is not a slogan, but the expression of the city's accomplishment of democracy and the way to it. The more firmly we consolidate the democratic practice of participation, the further away we will be moving, on the one hand, from antidemocratic, elitist practices and, on the other, from the no less antidemocratic grass-roots practices. I realize it is not easy to implement projects or experience community and grassroots participation as a government program and as a political ideal. Above all, it is not easy on account of authoritarian traditions, which we need to overcome…" (Freire, 1993: 70).

This chapter summarizes and illustrates definitions and typologies of commons, citing some Canadian examples and theoretical contributions, and suggests some ways that education, policy and grassroots change may foster their (re)growth. It also outlines some ways that those working in policy, activism, and academia can foster commons growth and regrowth.

Aboriginal traditions of hospitality, sharing, potlatch (or giving away material wealth as a sign of moral and community standing), humility, and reverence for the earth and its creatures and life systems are good examples of locally appropriate commons governance processes. Many First Nations also had hierarchically nested governance systems that, in my view, correspond with what Elinor Ostrom has cited as successful ways to govern large-scale commons.

The interdisciplinary International Association for the Study of the Commons was formed in 1989, building on the Common Property Network, formed in 1984. IASC now has over 1,000 institutional members and has sponsored 12 international conferences, with the most recent in Japan in June 2013 and another planned for May 2015 in Alberta. There are regional meetings, an online digest, a digital library and bibliographies, and discussion groups (www.iasc-commons.org). New books on commons appear frequently now, and the idea that commons governance represents something fundamentally different from "the Market" or "the State" is becoming well known and widely accepted.

DEFINITIONS AND TYPOLOGIES OF COMMONS

So what exactly is a commons? The word is a somewhat odd collective noun, pluralized but singular – how do we understand and use this idea? There is a risk, noted already in the literature, that 'commons' will become the latest glom-on term, co-opted and vague, obscuring more than it conveys. However, 'commons' starts out more overtly oppositional to capitalism than other terms like 'sustainability' or 'development', focusing as it does on ownership and property, land, resources, and assets that are explicitly NOT privately owned.

Commons take a big step towards internalizing externalities, to use neoclassical terminology – and towards discourse-based valuation of ecological and social goods and services, bringing politics together with economics, in the best alternative or heterodox traditions of political ecology and feminist ecological economics.

Ideas on common goods and their governance have a long history. The Justinian Code of CE 534 divided things into "*res privatae, res publicae, res communes, res nullius, and res sacra. Res comunes* included earth, water, air, sky, flora and fauna and navigable waterways" (Ricoveri, 2013: 37). In Europe and elsewhere, common land was long maintained for agricultural use, including hunting, foraging, and pasturing animals (Thompson, 1993). Worker and housing cooperatives, guilds, community barn-raisings, "mutual aid", and repeated examples worldwide of crises bringing out altruism, solidarity, generosity and courage in stricken communities are indications that people's desire to act communally is ever-present (Cato, 1993: 9–12; Ricoveri, 2013: 63).

A recent book on commons and ecological governance says, "the commons is a term that applies to the resources utilized, owned or shared by multiple individuals on a group basis," (Suga, 2013: 4) "…The traditional commons had to do with the management of resources on a local, not global, level. Those resources were not comprehensible if removed from the micro-societal context in which they existed… (C)urrent-day, widespread use has diluted the formerly rigorous definition of the term 'commons,'…and fostered a vast expansion in the scope of those resources now considered worthy of research within a commons-related context" (Ibid.: 6). The book's editors state, "This volume rests on the perspective that modern society is composed of three elements: a public sector, common sector and private sector… If humanity were a society driven by the profit motive alone, it would be a society of disparities highlighted by unbearable levels of inequality. That is why society demands the existence of a public sector committed to the redistribution or balancing of income and assets through the power of taxation. Modern societies also incorporate a common sector that is neither public nor private… that operates independently of the profit motive or the interest in upholding public authority. Structures or communities of this nature are typically composed of households, various cooperatives or non-profit organizations… (and) international volunteer associations… Cooperation and/or coordination are the driving principles on which these organizations operate" (Murota & Takeshita, 2013: xxii).

Elinor Ostrom and Charlotte Hess, long-time commons researchers, define the term as follows (2007): "Commons is a general term that refers to a resource shared by a group of people. In a commons, the resource can be small and serve a tiny group (the family refrigerator), it can be community-level (sidewalks, playgrounds, libraries, and so on), or it can extend to international and global levels (deep seas, the atmosphere, the Internet, and scientific knowledge). The commons can be well founded (a community park or library); trans-boundary (the Danube River, migrating wildlife, the Internet); or without clear boundaries (knowledge, the ozone layer)" (Hess & Ostrom, 2007: 4–5).

In a recent book on commons, David Bollier and Burns H. Weston use the following definition: "A commons is a regime for managing common-pool resources that eschews individual property rights and State control. It relies instead on common property arrangements that tend to be self-organized and enforced in complex, idiosyncratic ways" (Bollier & Weston, 2012: 347).

Italian commons activist Giovanna Ricoveri's definition is: "The commons are goods or means of subsistence which are not commodities, and therefore they constitute a social arrangement that is the complete opposite of the one created by the market economy" (Ricoveri, 2013: 31)… The commons are local systems that can be managed effectively only by those who have a precise and detailed knowledge of the area and who know its history, language, culture, vegetation, mountains and other physical attributes (ibid.: 34)…. Thus there does not exist, nor can there exist, a general law that is valid for all systems of the commons for the very reason – contrary to what is generally believed – that they are open local systems, receptive and adaptable to the local 'whims' such as climate, the different attributes of the localities in terms of natural resources, the knowledge of the inhabitants, their professionalism – all elements that cannot be defined in law (ibid.: 36).

Elinor Ostrom too has emphasized the importance of locally constructed governance processes, local monitoring and enforcement of environmental quality and access to the resource. This makes monitoring more efficient, cost-effective, and accurate (Ostrom, 2012: 83).

To add some detail and ground these definitions, let's now examine several Canadian and international examples of commons. Following a bit of history to set the context, the next section discusses these examples at increasing scales from local to global.

EXAMPLES OF COMMONS

Co-Operatives and Credit Unions

There is a long history in Canada of communities developing creative ways of securing social livelihood and building community resilience through cooperation. Canada still has the highest per-capita credit union membership in the world: 35% of Canadians are credit union members. According to the Canadian Co-operative

Association (CCA, 2013), there are approximately 9,000 co-operatives and credit unions in Canada which provide products and services to 18 million members in all economic sectors – agriculture, retail, financial services, housing, child care, renewable energy, etc. Co-ops have more than $370 billion in member-owned assets, employ 150,000 people, and have strong links with their local communities via volunteerism, community donations and sponsorships. Their survival rate is higher than that of traditional businesses (62% are still operating after 5 years, compared with 35% for traditional businesses; after 10 years the figures are 44% and 20% respectively.)

In Canada, mutual insurance companies were founded in the 1840s; dairy producer co-operatives in central and Atlantic Canada in the mid-1800s; the first known consumer co-operative in Stellarton, Nova Scotia, in 1864; a co-operative bank at Rustico, Prince Edward Island, also in 1864; and worker co-operatives connected with the Knights of Labour in the 1880s. Says University of Victoria emeritus history professor Ian MacPherson, who has recently written a history of the Canadian co-operative movement, "It should be noted that all these beginnings took place before there was specific, enabling co-operative legislation; before there was any general acceptance of international co-operative principles; and before regulators had any significant understanding about the nature of co-operative enterprise. In short, the early experiments were just that – experiments undertaken by groups working within flexible and developing company law to create institutions to meet their needs and likings; in some instances at least, though, they were attempting to imitate European precedents…. A significant issue in thinking particularly about beginnings, but also about the sustained ongoing strength of co-operatives, is the association with traditional co-operation (e.g., the ritual co-operation typically found in most rural areas at the time of planting and harvesting) and spontaneous co-operation (when groups, perceiving opportunities, collaborate for joint purchase of supplies or the sale of produce). Much of this kind of co-operation is informal, but it is important for the beginnings and the subsequent development of formal co-operative institutions. It provides context, networks, and bonds of association without which many co-operatives would not have succeeded, particularly in their formative and stabilizing phases. In that sense, it is misleading to think that an institutional approach to understanding co-operative movements is fully satisfactory. The "movement" has a life beyond institutions, often stretching deeply into cultural, community, kinship, and class relationships. The movement is not easily measured" (MacPherson, n.d.: 2–3).

More recently, MacPherson states, "During the last two decades there has been a steadily widening and deepening interest in the development of different kinds of co-ops. Perhaps the most common area of interest has been in co-ops that provide "slow food", food produced locally as much as possible, preferably organic, so as to lessen dependence on food produced elsewhere and brought to Canada in ways that seriously impact the environment. Across the country, too, there is a significant rise in transportation co-ops (e.g., car share co-ops, bike co-ops) and energy

co-ops based on wind power or the production of biodiesel fuels. Many young people have found it useful to develop worker co-ops in the high tech industries or to seek alternative forms of housing. Communities facing health issues because of declining support of governments and aging populations have organized different kinds of health or service co-ops. These co-ops are similar to the new co-ops found around the world, a modern rebirth…" (ibid., 18–19).

Local Commons in Toronto, Ontario

Here are a few examples of organizations and projects in my home city which are building local commons. Similar examples exist in most Canadian communities, and in local areas around the world.

Not Far From The Tree (which was started by Laura Reinsborough in 2008) puts Toronto-grown fruit to good use by picking and sharing it locally. Fruit trees planted long ago in the city are still producing lots of apples, pears, cherries, berries, and other fruit. According to the organization's website, "When a homeowner can't keep up with the abundant harvest produced by their tree, they let us know and we mobilize our volunteers to pick the bounty. The harvest is split three ways: 1/3 is offered to the tree owner, 1/3 is shared among the volunteers, and 1/3 is delivered by bicycle to be donated to food banks, shelters, and community kitchens in the neighbourhood so that we're putting this existing source of fresh fruit to good use. It's a win-win-win situation! This simple act has profound impact. With an incredible crew of volunteers, we're making good use of healthy food, addressing climate change with hands-on community action, and building community by sharing the urban abundance" (*Not Far from the Tree* website, 2013).

The Yes in My Backyard program similarly links volunteers and landowners to grow vegetables in Toronto. "Many people would like to garden but live in apartment buildings or do not have access to yard space suitable for growing food. And yet others have access to a yard but do not have the time, interest, or the physical ability to maintain a vegetable garden. Some just like the idea of co-operating with others to create a garden together. Whatever the motivation for participating, YIMBY is working to build community and strengthen relationships between people who might not have otherwise met" (*Yes in My Backyard* website, 2013).

Located on 8 acres of city-owned conservation floodplain land in North Toronto, and coordinated by an award-winning food and agriculture education and advocacy organization, the Black Creek Community Farm helps build community food security and food justice by producing healthy vegetables which are sold locally through harvest shares, farmer's markets and volunteer programs. Its mission is "to engage, educate and empower diverse communities through the growing and sharing of food" (Black Creek Community Farm website, 2013).

Community supported agriculture farms exist across Canada and in many other countries around the world. Food consumers purchase a share of each year's mixed vegetable crop at the beginning of the growing season, providing cash up-front

for farmers and spreading the risks and rewards of agriculture. In some CSAs, consumers also help out in the fields. An Ontario website provides a directory of CSA farms across the province so that potential customers can find one in their area (Community Supported Agriculture website, 2013).

Also in Toronto, the Anarres Worker Co-operative, formed in 2003, provides affordable technology services and online communications tools for the non-profit social sector, including website development, hosting and IT support. Their website says, "We … believe computer technology and the web should primarily be tools for community building. We are passionate about using open source software for reasons of both utility and ethics. We believe in its affordability, flexibility and effectiveness…. We are activists and social advocates in our own right, and we strive to bring this aspect of ourselves to our work as much as we do our technical competence and experience (Anarres, 2013).

The Co-operative Housing Federation of Toronto represents more than 45,000 people living in more than 160 non-profit housing co-operatives. Since 1975 it has provided development assistance for new housing co-ops, as well as education and services, a bulk-buying program for its members, information for the public in 8 languages, diversity education, and policy support (Coop Housing Federation, 2013).

Regional and International Commons

The 885-km Bruce Trail extends from Queenston, near Niagara Falls, to Tobermory, on Lake Huron in central Ontario. It was built and is maintained by nine regional clubs of the Bruce Trail Conservancy, which maintain a conservation corridor and public footpath along the Niagara Escarpment – a UNESCO World Biosphere Reserve – through the "kind permission" of private landowners, coordination with public lands and roadways, and the gradual purchase of land through a charitable preservation fund (Shimada, 2010). The regional clubs also organize volunteer-led nature walks, hikes and excursions, including a series of hikes where participants meet at Toronto subway stations and go by bus to the hike site.

The Great Lakes Commons Initiative, begun in 2010, is "a cross-border grassroots effort to establish the Great Lakes as a commons and legally protected bioregion" (Great Lakes Commons, 2013). One of its projects is the participatory development of an online map of the Great Lakes linking stories and crowd-sourced information, creating a shared space for dialogue and exploration (Great Lakes Commons Map, 2013). The Great Lakes Commons Initiative is a collaborative, incubated project of On the Commons, a commons movement strategy centre founded in 2001 which publishes a magazine and online newsletter, and hosts a resource centre and network of commons 'animateurs' (On the Commons, 2013).

The non-profit Marine Conservation Institute brings together scientists, local conservation groups and activists, and governments to advocate for trans-boundary protection of oceans, and is working with government officials, activists and

conservation organizations to publicize and begin organizing a "Baja to Bering" ocean conservation corridor, including important offshore biological diversity conservation sites from Alaska and British Columbia to southern California in the eastern Pacific (Marine Conservation Institute, 2013).

Global Commons

The Sky Trust is a proposal to establish a governance structure to control and charge polluters for their atmospheric emissions. Proceeds would accrue to the Trust, which would use them for clean energy investments or dividends. "Sky Trust … would encourage less pollution because it would reward the commons owners – all of us – for tough emission limits… For decades we have been told that there are only two choices for the management of scarce resources: corporate self-seeking or the bureaucracy of the state. But there is another way. Commons management has worked for centuries and is still working today. It can be adapted to the most pressing global problems, such as climate change. A new phrase is about to enter the policy realm. To "market-based" and "command-and-control" we can now add "commons-based" (Rowe, 2008, unpaged).

Creative Commons is a non-profit organization based in Massachusetts that helps to distribute and manage shared creativity and knowledge. Says their website, "The idea of universal access to research, education, and culture is made possible by the Internet, but our legal and social systems don't always allow that idea to be realized. Copyright was created long before the emergence of the Internet, and can make it hard to legally perform actions we take for granted on the network: copy, paste, edit source, and post to the Web. The default setting of copyright law requires all of these actions to have explicit permission, granted in advance, whether you're an artist, teacher, scientist, librarian, policymaker, or just a regular user. To achieve the vision of universal access, someone needed to provide a free, public, and standardized infrastructure that creates a balance between the reality of the Internet and the reality of copyright laws. That someone is Creative Commons" (Creative Commons, 2013).

These very brief examples indicate, at different scales, how commons can be assembled, managed, enjoyed and governed by groups of people using a combination of NGO, government, and private structures, rules, and incentives. Each is different; each has its own constituency and provides distinct services or generates value for its members or "commoners." When considered broadly, these benefits extend beyond the commoners to others in society, which is partly what motivates the commons' development and existence, and also shows why commons fill important gaps in state or private/market forms of governance.

The next section explores some ideas, partly drawn from these examples, regarding the skills and social education which are needed to help commons grow and flourish.

EDUCATION AND SKILLS NEEDED FOR COMMONS

Elinor Ostrom's research has demonstrated that successful commons governance institutions share several characteristics:

- They face uncertain and complex environments
- The local population is stable over long periods of time; people care about their reputations and expect their descendants to inherit the land
- Norms have evolved which allow individuals to live in close interdependence with each other and the community is not severely divided
- The resource systems and institutions have persisted over time; they are robust and sustainable.

Ostrom developed a set of "design principles" that help to account for the success of those commons governance institutions that have proven to work well:

1. Clearly defined boundaries for the commons
2. Congruence between appropriation and provision rules and local conditions (local appropriateness)
3. Collective-choice arrangements (individuals can participate in modifying the rules)
4. Monitoring of the rules by members takes place
5. There are graduated sanctions for violations of rules
6. Rapid, low-cost conflict-resolution mechanisms exist
7. Rights to organize are recognized, at least minimally (outside authorities do not challenge the rights of members to devise their own institutions) and, for larger systems
8. There are multiple layers of nested enterprises which perform governance functions (Ostrom, 1990: 89–90).

Tiered and nested organizational layers exist in many co-operative federations and credit unions, as Jack Quarter et al. note in their study of the social economy in Canada. "The tiering arrangement represents a type of functional integration in which co-operatives with common needs co-operate with each other through an apex organization that helps them with their service provision. Often apex organizations serve as the voice of the sector (its members) to government, seeking to represent their needs. Sometimes they provide practical services to member organizations such as assistance with loans, loan guarantees, and information… (or as) brokers for national and international markets… (and) business associations" (Quarter et al., 2009: 67). This shows how commons management is qualitatively different from both state/government organization and market rationality.[1]

What are the attributes and skills required in the general populace for commons to be managed well, and for this paradigm and framework to spread? It should be obvious by now that we are not talking about a wholesale, sudden substitution of

commons-type goods and service provision for everything done by the market; rather this is a slow progression where commons of various kinds gradually expand in the interstices and to meet the many gaps in the global and local economy, whenever (and exactly because) commons meet some needs better than any other system. It's possible to envision a nearly-infinite overlapping set of communications and governance structures covering all kinds of commons and groups of people, from watersheds, air-sheds, agricultural areas, and political jurisdictions to epistemic commons, information commons, groups of music lovers such as the "beehive" of Beyoncé fans or the "little monsters" who listen to Lady Gaga, "Out of the Cold" shelter networks, community-shared agriculture and food box groups, arts and culture groups of all kinds, and all the networks which create social, political, ecological and economic communities. This addresses social and psychological needs for belonging which may be as important as material needs in keeping a socio-economy running well, and is a topic that is related to the question of how to reduce material throughput while maintaining health and well-being.

Thus, interesting ideas about skills generation and transmission for commons come from a range of fields including Community Development, Systems Theory, Whole Psychology, Philosophy, Eco-feminism, and many other fields.

Ken Conca, in writing on how to nurture improved institutions for global water governance, states, "Scholarship on the effective sustained management of common-property resources has shown the importance of institutions as second-order public goods that help to provide the underprovided good of social co-operation. One obvious area in which such second-order public goods would facilitate the nurturing of institutions is resolution of environmental disputes…. The dispute-resolution approach could also be linked to growing interest in the idea of environmental peacemaking…. processes such as cooperative knowledge ventures and the emergence of regional-scale identities might help to transform situations of conflict and insecurity using environmental relationships as catalysts, with non-state channels as important venues" (Conca, 2006: 384–385).

Bollier and Weston speak of innovations in law and policy being needed in three areas, to foster commons governance: General internal governance principles and policies for commons, building on the work of Elinor Ostrom and the Indiana University Workshop in Political Theory and Policy Analysis where she carried out much of her research; Macro-principles and policies that the State/Market can embrace to develop commons and "peer governance" and Catalytic legal strategies to validate, protect and support commons (Bollier & Weston, 2012: 349). As examples, they cite conceptualizing commons as equal and legitimate partners with the state and the private sector – a triarchy of State/Market/Commons for governance options; adapting private contract and property law to protect commons, as in the GPL or General Property License which copyright owners can attach to software to assure that the code and any future modifications to it will be forever accessible to anyone to use, and the Global Innovation Commons, a huge international database of lapsed

patents; "stakeholder trusts" to manage and lease ecological resources on behalf of common groups and distribute revenues to them, such as the Alaska Permanent Fund or a Sky Trust; re-localization and "transition towns" movements; Community Supported Agriculture and Slow Food movements assisted by government policies; expansion of the public trust doctrine of environmental law to include atmosphere and water; wikis and crowd-sourced platforms to include citizen experts in policymaking and enforcement, participatory environmental monitoring of water quality and biodiversity, etc. (Bollier & Weston, 2012: 351).

Computer technologies, online organizing and communications now allow people to create participatory global, regional, and epistemic communities and commons of many new kinds. According to legal scholar Beth S. Noveck, these forms of collective action are potentially vibrant and efficient, and should be recognized and encouraged in law by allowing legitimate, decentralized self-governance (Noveck, 2005).

CONCLUSION

"Big History" scholar David Christian has identified a key human characteristic which has made it possible for our species to dominate earth's ecosystems: our ability to communicate and share knowledge over space and time, which he calls "collective learning" (Christian, n.d.) Addressing the challenges we humans have created, especially global climate change, will require us to use this collaborative facility more successfully than ever before. Besides naming, describing, and prioritizing transformative educational praxis, we will need to seek creative ways of establishing and fostering commons for democratic and engaged governance at all levels and stages of human endeavour.

In Paulo Freire's words, "In truth, one of our political tasks that we need to assume is to make viable the dreams that appear impossible. In other words, we need to diminish the distance between the dream and its realization… (T)he transformation of the world is an educational task in itself. We know that education cannot accomplish all, but it can achieve some things… It behoves us to put the power of education at the service of our dreams" (Freire, 1993: 123).

> Democracy doesn't start from the presupposition that we are all equal, but that we are different. When we want to transform this multiplicity of interests into one collective interest guided by human rights, social movements and parties are fundamental. By means of communication, we represent and imagine the desirable, that is, we construct the imaginary, we make and represent the things that we want from the world and from ourselves. One of the characteristics of poverty is symbolic exclusion from communication systems. The Third Sector should, therefore, succeed in making minorities' or poor peoples' ways of seeing, feeling, working and expressing themselves an equal part of the symbolic universe which circulates in society. (Toro, 2005: 55–60)

NOTE

[1] Quarter et.al also discuss the growth in Canada of multi-stakeholder co-operatives or "solidarity cooperatives" which involve workers, consumers, and other community organizations in co-op governance. In 1990 the Co-operators Group insurance company proposed to the Ontario government that it would create a non-profit auto insurer with three sets of members, each with defined rights: drivers, employees, and government representatives. The proposal was not accepted, but it led to new initiatives in Quebec and internationally. By 2004 there were 121 multi-stakeholder co-ops in Quebec, most providing homecare to seniors and others in need. "Having a worker co-operative as part of a broader organization – as in a multi-stakeholder or a worker-shareholder co-operative – reduces the financial load for employees and the inordinate risk of a worker co-operative" (Quarter et al., 2009: 66). Some social economy businesses combine for-profit and non-profit arms, link businesses with membership organizations, include government agencies as partners, supplement paid services with volunteers, or combine commercial and charitable services (Quarter et al., 2009: 71–74).

REFERENCES

Anarres. (2013). Retrieved July 17, 2014, from http://anarres.ca/

Bakker, K. (2007). The 'commons' versus the 'commodity': Alter-globalization, anti-privatization and the human right to water in the Global South. *Antipode*, *39*(3), 430–455.

Black Creek Community Farm. (2013). Retrieved July 17, 2014, from http://everdale.org/blackcreek/ http://www.cbc.ca/news/canada/toronto/urban-farm-near-jane-and-finch-to-receive-400-000-grant-1.2074258 http://www.thestar.com/news/gta/2013/10/16/janefinch_farm_rakes_in_first_harvest.html

Bollier, D., & Helfich, S. (Eds.). (2012). *The wealth of the commons: A world beyond market and state*. Amherst, MA: The Commons Strategies Group / Levellers Press.

Bond, P. (2010). *South Africa's 'rights culture' of water consumption: Breaking out of the liberal box and into the commons?* Retrieved from July 17, 2014, http://ccs.ukzn.ac.za/files/Bond%20culture%20of%20water%20rights%20final.pdf

Canadian Co-operative Association. (2013). *Co-op facts and figures*. Retrieved July 17, 2014, from CCA website: http://coopscanada.coop/en/international_dev/about/facts http://www.planetfriendly.net/coop.html http://www.coopscanada.coop/assets/firefly/files/files/Ethnocultural_co-ops_report_final.pdf

Cato, M. S. (2004). *The earth is our mother – What are the economic implications?* Retrieved July 17, 2014, from http://www.gaianeconomics.org/pdf/ecofem.pdf

Christian, D. (n.d.). *Big history project*. Retrieved July 17, 2014, from https://www.bighistoryproject.com/thresholds/6

Community Supported Agriculture. (2013). Retrieved July 17, 2014, from http://csafarms.ca/ http://www.davidsuzuki.org/what-you-can-do/queen-of-green/faqs/food/what-are-community-supported-agriculture-farms/?gclid=CND3mIaO6rsCFdE-Mgodp04Amw

Co-operative Housing Federation of Toronto. (2013). Retrieved July 17, 2014, from http://www.coophousing.com/

Creative Commons. (2013). Retrieved July 17, 2014, from http://creativecommons.org/about

Freire, P. (1993). *Pedagogy of the city*. New York, NY: Continuum.

Great Lakes Commons Map. (2013). Retrieved July 17, 2014, from http://greatlakescommonsmap.org/main

Great Lakes Commons. (2013). Retrieved July 17, 2014, from http://www.greatlakescommons.org/

Hess, C., & Ostrom, E. (2007). *Understanding knowledge as commons: From theory to practice*. Cambridge, MA: MIT Press.

Hyde, L. (2010). *Common as air: Revolution, art and ownership*. New York, NY: Farrar, Straus & Girous.

MacPherson, I. (n.d.). *The history of the Canadian co-operative movement: A summary, a little historiography, and some issues*. Retrieved July 17, 2014, from http://socialeconomyhub.ca/content/telelearning-session-19-long-view-social-economy

Marine Conservation Institute. (2013). Retrieved July 17, 2014, from http://www.marine-conservation.org/what-we-do/program-areas/mpas/baja2bering/#sthash.0erSPrqb.dpuf

Mellor, M. (2012). Cooperative principles for a green economy. *Capitalism Nature Socialism*, *23*(2), 108–110. Retrieved July 17, 2014, from http://www.tandfonline.com/doi/abs/10.1080/10455752.2012.675237?journalCode=rcns20#.U8g9jI1dVOQ

Murota, T., & Takeshita, K. (2013). *Local commons and democratic environmental governance*. Tokyo, Japan/New York, NY/ Paris, France: United Nations University Press.

Not Far from the Tree. (2013). Retrieved July 17, 2014, from http://www.notfarfromthetree.org/about/what-we-do

Noveck, B. S. (2005, November). A democracy of groups. *First Monday*, *10*(11), 7. Retrieved July 17, 2014, from http://firstmonday.org/ojs/index.php/fm/article/view/1289/1209

On the Commons (published monthly). Retrieved July 17, 2014, from http://onthecommons.org/

Ostrom, E. (1990). *Governing the commons: The evolution of institutions for collective action*. New York, NY: Cambridge University Press.

Ostrom, E. (2009). *Beyond markets and states: Polycentric governance of complex economic systems*. Nobel Economics Prize lecture, December 8, 2009. Retrieved July 17, 2014, from http://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/2009/ostrom_lecture.pdf

Ostrom, E. (2012). *The future of the commons: Beyond market failure and government regulation*. London, UK: Institute of Economic Affairs.

Quarter, J., Armstrong, A., & Mook, L. (Eds.). (2009). *Understanding the social economy: A Canadian perspective*. Toronto, Canada: University of Toronto Press.

Ricoveri, G. (2013). *Nature for sale: The commons versus commodities*. London, UK: Pluto Press.

Rowe, J. (2008). *The parallel economy of the commons: State of the world report 2008*. Retrieved July 17, 2014, from http://jonathanrowe.org/the-parallel-economy-of-the-commons

Shimada, D. (2010). *How can societies create common access to nature? The roots and development process of the Bruce Trail, a Canadian case study*. Post-doctoral research paper, York University, Faculty of Environmental Studies. Retrieved July 17, 2014, from http://dlc.dlib.indiana.edu/dlc/bitstream/handle/10535/7369/356.pdf?sequence=1

Suga, Y. (2013). The tragedy of the conceptual expansion of the commons. In T. Murota & K. Takeshita (Eds.), *Local commons and democratic environmental governance* (pp. 3–18). Tokyo, Japan/New York, NY/Paris, France: United Nations University Press.

The Ecologist. (1992, July/August). Special issue: Whose common future? *22*(4).

Thompson, E. P. (1993). *Customs in common*. New York, NY: The New Press.

Toro, J. B. (2005). *A construção do público: cidadania, democracia e participação*. Rio de Janeiro, Brazil: SENAC.

Yes in My Back Yard. (2013). Retrieved July 17, 2014, from http://thestop.org/yes-in-my-back-yard

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