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**AN ECONOMIC ETHICS FOR THE ANTHROPOCENE**

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## **Abstract**

Over *Antipode's* 40 years our role as academics has dramatically changed. We have been pushed to adopt the stance of experimental researchers open to what can be learned from current events and to recognize our role in bringing new realities into being. Faced with the daunting prospect of global warming and the apparent stalemate in the formal political sphere, this paper explores how human beings are transformed by, and transformative of, the world in which we find ourselves. We place the hybrid research collective at the center of transformative change. Drawing on the sociology of science we frame research as a process of learning involving a collective of human and more-than-human actants—a process of co-transformation that re/constitutes the world. From this vision of how things change, the paper begins to develop an “economic ethics for the Anthropocene”, documenting ethical practices of economy that involve the being-in-common of humans and the more-than-human world. We hope to stimulate academic interest in expanding and multiplying hybrid research collectives that participate in changing worlds.

### **Keywords:**

Anthropocene, ethics, community economies, hybrid research collective, more-than-human

In 2008, the Geological Society of London announced a new geological epoch, the Anthropocene, in which humankind is foregrounded as a geological force or agent:

The Holocene epoch—the interglacial span of unusually stable climate that has allowed the rapid evolution of agriculture and urban civilization—has ended and...the Earth has entered “a stratigraphic interval without close parallel in the last several million years.” In addition to the buildup of greenhouse gases, the stratigraphers cite human landscape transformation which “now exceeds [annual] natural sediment production by an order of magnitude,” the ominous acidification of the oceans, and the relentless destruction of biota. This new age, they explain, is defined both by the heating trend (whose closest analogue may be the catastrophe known as the Paleocene Eocene Thermal Maximum, 56 million years ago) and by the radical instability expected of future environments...Evolution itself...has been forced into a new trajectory. (Davis 2008)

The end of the Holocene, the coming of the Anthropocene, the displaced trajectory of evolution—these apocalyptic images toss us onto a meta-historical playing field without a clue as to how to play the game (Chakrabarty 2009). Suddenly we are not just billions of individuals and millions of collectivities but a single species alongside other species, one whose survival is threatened by its own behavior. References to millions of years, which used to make our brief lives seem inconsequential, now endow us with gargantuan agency and an almost unbearable level of responsibility—intuitively beyond our capacities for rational or concerted action. Never mind that climate scientists instruct us that such action, undertaken over the next few years, is the only thing that can possibly avert a catastrophe.

In response to scientists' warnings, solutions are being proposed and put in place—cap-and-trade arrangements, experiments in green technology (particularly energy) and development, international treaties, corporate pledges (many already reneged upon), changes in life style and consumption. Efforts to generate political momentum for change are intensifying, including cautions about imminent tipping points and predictions such as Davis's of a "planet of slums, with growing food and energy crises" (2008) punctuated by small climate-protected pockets of the wealthy (Steffan 2008). These attempts at stimulating outrage and action frequently involve naming and blaming capitalist industrialization, in both its systemic and personified forms. The head of NASA's Goddard Institute for Space Studies, for example, recently proposed to a congressional committee that CEOs of fossil energy companies be tried for "high crimes against humanity and nature" (Tom Dispatch 2008).

Frustrated that confronting the world with terrifying "facts" is not enough to galvanize appropriate action, climate scientists have begun to call upon social scientists to come up with new approaches to social change. And here the debate rages over whether technology alone can solve our problems or whether fundamental shifts in values are required (Steffan 2008). Techno-skeptics point to the history of energy efficient innovations that have resulted in cheaper appliances, leading to more widespread appliance use and large overall increases in energy consumption (Hobson 2008). Proponents of values shifts are similarly unconvincing. As Hobson argues, we don't seem to know how to create such shifts, nor do we know that they are effective. Information campaigns don't engender changes in values, and changes in values don't automatically yield changes in behavior (2008:7), which are ultimately what we are seeking—ways of living differently with the earth. Val Plumwood is eloquent and arresting here: "If our species does not survive the ecological crisis, it will

probably be due to our failure...to work out new ways to live with the earth, to rework ourselves....We will go onwards in a different mode of humanity, or not at all” (2007).

From this perspective, responding to the challenges of the Anthropocene is not simply about humans finding a technological or normative fix that will control and restore the earth. It is about human beings being transformed by the world in which we find ourselves—or, to put this in more reciprocal terms, it is about the earth’s future being transformed through a living process of inter-being. But how do we put ourselves (and the earth) in the way of such transformations? How do we get from an abstract ontological revisioning to a glimmer or a whiff of what to do on the ground? No answer arrives when we ponder this question—just a spacious silence and a slowing down.

Silence and slowness are openings, of course, opportunities for the body to shift its stance, to meld a little more with its surroundings; chances for the mind to mull over what floats by on the affective tide, or to swerve from its course as momentum decreases. Undoubtedly these are openings for learning. Not learning in the sense of increasing a store of knowledge but in the sense of becoming other, creating connections and encountering possibilities that render us newly constituted beings in a newly constituted world. Latour along with others has called this “learning to be affected” (2004:205, see also Hinchliffe 2007:2003). Effectively we are created as bodies/beings by the entirety of human and non-human conditions of the world that affect us and from which we learn—if we are open to doing so.<sup>1</sup> Momentous as it may sound and mundane as it may actually be, this learning is a process of co-constitution that produces a new body-world.

So what does this mean for “an economic ethics for the Anthropocene?” We are all familiar with posthumanist ontologies that imagine “an entangled world of living [and non-living] things in which are relaxed the lines marking off the human from the non-human” (Anderson 2007:34, insert

added). If we can read these new ontologies as evidence of “learning to be affected” and thus as part and parcel of a newly sensitized and conditioned world; if we can understand them as Deleuzian philosophy, “a means of going on rather than a cerebral, ivory tower pastime” (Whatmore 2004:1360); if we can treat them as symptoms rather than precursors of change, we may be able to see that an ethics for the Anthropocene has already emerged. And from there it might not be such a stretch to discern an emerging “economic” ethics in the projects and activities of communities worldwide. It would then be our role to theorize this nascent formation and make its practices and promises visible, thereby participating in a new phase of its existence.

It is here that we can finally begin this paper.

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For several decades now, we have been involved in a project of rethinking economy, opening to and being practically affected by the wide diversity of economic activities that offer possibilities of livelihood and well-being, within and beyond the ostensibly global purview of capitalist development. We have also opened to our necessary interdependence with the rest of humanity (Nancy 1991) and to the possibility of building economic communities in which that interdependence is acknowledged and enlarged. Theoretically, as well as through action research in a number of locations, we (alongside others) have experimented with the ethical dynamics of building community economies in the air and on the ground.

But it took the near simultaneous deaths of the Holocene and eco-feminist Val Plumwood to shock us into a posthumanist project of learning to be affected (Roelvink and Gibson-Graham 2009). (Not that the raw and processed materials for such a project weren’t available all around us, in our discipline, in the academy, and in the world more generally.)<sup>2</sup> In this paper we begin the process of opening our economic thinking and enactments to encompass what Jean-Luc Nancy has called

the “being-in-common” (1991:4) of all being(s), human and non-human, animate and inanimate, processual and fluid as well as categorical and definite in conception (see also Bingham 2006).

The paper unfolds in three sections. The first section explores learning to be affected as an ethical process in which bodies and worlds are co-constituted; we introduce the hybrid research collective as the central character, the body-world that learns. The second section explores the economic ethics that is emerging among hybrid collectives that have learned to be affected by the conditions of the Anthropocene; here an ethics of interdependence embodied in “community economies” comes into view. The third section highlights the role of research collectives in the experimental community economies of rural and outback Australia—noting the role of academics, the proliferation of economic possibilities, and the transformed landscapes and species of a new econo-sociality. We conclude the paper with a call to academic action.

### **Learning to be Affected: An Ethical Practice of Co-transformation**

What is required in order to be ‘a receiver’ of communicative and other kinds of experience and relationship is openness to the other as a communicative being, an openness which is ruled out by allegiance to reductive theories. To view such differences as simply ‘theory choices’ is to overstate the intellectualist and understate the performative aspects involved, which is captured somewhat better in the terminology of posture or stance. Is it to be a posture of openness, of welcoming, of invitation, towards earth others, or is it to be a stance of prejudged superiority, of deafness, of closure? (Plumwood 2002:175-76)

With her reference to an open stance, Val Plumwood brings us to the edge of embodiment. We are at the brink, in this welcoming posture, of recognizing earth others as not-other than ourselves; and

we are just a hair's breadth away from acknowledging our co-constituted being as body-world. Eve Kosofsky Sedgwick (2003) takes us, in her book *Touching Feeling*, to a similar edgy location. Always attuned to the body and its postures, she asks us to reconsider the “paranoid” critical stance so prevalent among social scientists, which tends to confirm what we already know—that the world is full of devastation and oppression, and that transformation is an unlikely if not hopeless project. She suggests instead an open reparative stance that refuses to know too much, that makes space for hope and expands possibility. Unlike the critical stance, which is often suspicious and dismissive, the reparative stance is receptive and hospitable, animated by care for the world and its inhabitants (Gibson-Graham 2006:6).

What Sedgwick is concerned to preserve is the world of possibility that is performatively squelched and narrowed by critical modes of apprehension. In advocating an open “reparative” stance, she implicitly recognizes the (trans)formative potentials of a bodily posture, the way it may promote or allow change, in this case, contribute to a “repaired” or newly cared for world. Unlike the well-defended critical stance, the open reparative posture is conducive to learning, itself a transformative process, and perhaps especially to the kind of bodily learning that Latour calls “learning to be affected” (2004). We have grasped onto this evocative notion for a number of reasons: it provides an accessible place to start—the body—in addressing environmental crisis; it offers a greater field of possibility (and no more uncertainty) than technological and normative approaches; and, most importantly, it distances us from the subject-object dualism that separates humans from a disparaged or discounted non-human world. Performing this dualism has arguably led us into planetary crisis, and “un-performing” it may turn out to be a key practice in an ethics for the Anthropocene.

### ***Starting with the Body: Learning to be Affected***

Drawing on Vinciane Despret's reading of William James, Latour suggests that "to have a body *is to learn to be affected*, meaning 'effectuated,' moved, put into motion by other entities, humans or non-humans" (205, original emphasis). To illustrate this constitutive process of living and learning, he takes us to the perfume industry, focusing on the training sessions through which one acquires a "nose" that can differentiate subtle variations in smell. An odor differentiation kit, consisting of a range of fragrances, is used to train noses, thereby becoming "part of" or "coextensive with the body" (207):

It is not by accident that a person is called 'a nose' as if, through practice, she had *acquired* an organ that defined her ability to detect chemical and other differences.

Through the training sessions, she learned to have a nose that allowed her to inhabit a (richly differentiated odoriferous) world. Thus body parts are progressively acquired at the same time as 'world counter-parts' are being registered in a new way.

Acquiring a body is thus a progressive enterprise that produces at once a sensory medium *and* a sensitive world. (Latour 2004:207, original emphasis)

Latour contrasts the "learning to be affected" vision of body-world co-constitution with the familiar (ingrained) ontology where

...there is a body, meaning a subject; there is a world, meaning objects; and there is an intermediary, meaning a language, that establishes connections between the world and the subject. If we use this model, we will find it very difficult to render the learning by the body dynamic: the subject is 'in there' as a definite essence, and learning is not essential to its becoming; the world is out there, and affecting others is not essential to its existence. As to the intermediaries—language, odour kits—they

disappear once the connection has been established since they do nothing but convey a linkage. (2004:208)

By contrast to this static (dead?) rendering of body/subject and object/world, Latour's perfume industry example depicts a dynamic, changing, living body-world, proliferative and differentiating rather than stable and monolithic. As he introduces other "intermediaries" into the example, including scientific debates between "physiologists about the olfactory and gustatory receptors" (211) and strategies for marketing perfume, Latour argues that the more entities involved the greater the opportunities for registering difference and "the wider [more highly differentiated] the world becomes" (211, insert added). Rather than narrowing down options and inputs, "learning to be affected" embraces multiplicity and diversity as creating more possibilities for registering and enacting the world. Latour refers to this world as "the multiverse", no less singular than a universe (note the definite article) but constituted by beings becoming sensitive to differences (213).

We are interested in thinking about learning to be affected as an ethical practice, one that involves developing an awareness of, and in the process being transformed by, co-existence. We are also interested in the ways that an ethics of learning to be affected might be operationalized in a wider arena. In *Disclosing New Worlds*, Spinoza, Flores and Dreyfus (1997) offer fascinating examples of society-wide and even global changes that have been initiated and informed by this sort of learning. One of the most compelling of these concerns Mothers Against Drunk Driving (MADD), a citizen action group that the authors portray as transforming the culture of responsibility in the United States (1997:88-94). MADD was formed by a group of women who had experienced the death or serious injury of a loved one due to drunk driving. They came together to share their pain and anger, which only grew as their collective inquiry identified the profound disconnect between the huge losses they had suffered and the minimal level of responsibility for those losses attributed

to drivers. At the time of MADD's formation, there was considerable social tolerance of drunk driving—in the (modified) words of the public service ad, friends *did* let friends drive drunk. Drinking was often viewed as a form of “earned” relaxation for hard-working Americans, and the injuries and deaths related to drunkenness tended to be seen as horribly unlucky accidents—basically absolving perpetrators of responsibility. MADD drew public attention to the place of drinking in American social life, and to the avoidance of responsibility that accompanied it.

MADD's strategy was to talk to a wide range of citizens, including lawyers, medical professionals, educators and corporate executives (91). The mismatch between the mothers' powerful emotions and the relatively casual treatment of drunkenness created a sensitivity in them that enabled them to differentiate the subtle ways in which drunk driving was differently absolved across many communities (91-92). Most of the medical community, for example, seemed to accept that a few daily drinks would have little impact on health. MADD showed physicians not only that regularly drinking hard liquor was hazardous to your health—a minority view in medicine at the time—but also that mixing drinking and driving could damage another's health. This began a shift among medical professionals toward advocating responsible drinking, since it would save lives in a number of ways (92).

Instead of focusing on a single practice or law, MADD initiated learning to be affected among interdependent others in a “plurality of subworlds that could contribute to their cause” (92). Eventually laws were passed increasing penalties for drunk driving and decreasing acceptable levels of blood alcohol for drivers. Bars and party hosts were held responsible for letting drunks drive and designated drivers became widespread. But Spinoza et al credit MADD with something more far-reaching than simply generating a practice of responsible drinking. They see the group as initiating a society-wide ethic and practice of “full responsibility” (91) that informs safe sex practices, dietary

awareness, smoking behavior, and exercise regimes. The process of learning that began with a small group of mothers deeply affected by loss and lack of accountability became a generalized way of living with ourselves and each other.

From our perspective, we can discern in this example the co-constitution of a new body-world in which alcohol, blood, brain, pathologies and sex differences are connected in new ways with far-reaching manifestations in law, medicine, behavior, and instruments of measurement. Literally we have acquired new bodies in which the breathalyzer is a sense organ, pregnancy and alcohol don't mix, and a range of cancers are associated with moderate rates of alcohol consumption.

### ***Learning Together: The Hybrid Collective***

The activities of MADD remind us that research can play a central role in ethical practices of learning to be affected and “disclosing new [more differentiated] worlds” (Spinoza et al 1997, insert added). In our own action research projects and intellectual communities, we have embraced research as a collective (human) endeavor; we are now being pushed by events and ontological explorations to expand our collective research process to include the non-human entities that make up a world. In Latour's perfume industry example, it is not just the pupil that learns and is thereby created/transformed/differentiated. A hybrid research collective including the professor, an odor kit, the pupil, the laboratory setting, and the “*collective body* of science” (Latour 2004:209, original emphasis) interacts in a process of co-transformation and co-constituted action. It is, as we see in the story of MADD, a hybrid collective that learns.

A hybrid research collective is an assemblage that, through research, increases possibilities for (being in) the world (Callon and Rabearisoa 2003; Roelvink 2008, 2009). The concept was

developed by Callon and Rabeharisoa through their analysis of a muscular dystrophy patient organization in France. The story of this hybrid entity begins with a medical and scientific community that had no interest in muscular dystrophy. To put it bluntly, people with muscular dystrophy were dehumanized – all viewed as the same terminal case. In the late 1950s, families and patients affected by the disease joined together in the Association Française contra les Myopathies (AFM) to undertake research on the disease. They distributed questionnaires, collected testimonies, kept diaries and photographic records, and made films. Through their research AFM differentiated life with muscular dystrophy, showing variation in the effects and development of the disease. The AFM also raised funding for research and, through this funding and their initial research, were able to partner with scientific and medical researchers to undertake further research.

The hybrid collective that emerged went on to conduct many different research projects, rapidly transforming knowledge of the disease:

The more knowledge about...the disease advances, the more complex the picture becomes. The number of actants involved (all kinds of proteins, antibodies, enzymes, etc.) multiplies and causal links proliferate. As a result, differences between individual patients intensify, and the number of specialists that can be mobilized increases. This opens the way for strategic options. (199)

As research projects further differentiated the disease, creating new possibilities for partnership with specialists, “the range of possible therapeutic options [became] broader and more diversified” (199). Patients not only gained from therapeutic options but were transformed through the collective in other ways. Because of the sensitivity to life with muscular dystrophy instilled by MD research—enabling people with the disease to have differentiated bodies (in Latour’s sense of the word)—patients became “personalized” for clinicians and researchers “while gaining depth and complexity”

(199). And as patients interacted with a variety of specialists, scientists, laboratories, prostheses, genetic materials, and even a worm whose genome was used as a model, they were learning to be affected: “Their own understanding of the disease [was]...enriched with an array of new human and non-human entities that they learn[ed] to describe and with which they [became] accustomed to sharing their existence” (199-200). One might go so far as to say (and Callon and Rabeharisoa do) that they learned to think of these entities as “part of themselves” (199).

Among all the human and non-human actants, the gene is singled out by Callon and Rabeharisoa as holding the collective together (at least for many of the MD research projects). The gene, for example, enabled fundraising that could appeal to a number of different disease communities in addition to muscular dystrophy (200). Moreover, the gene enabled patients’ identities to be transformed so that they could be seen as citizens with a small genetic difference: “Genes are not content just to make particular and general interests compatible; they also produce solidarity and compassion. When circulating through various spheres (scientific, political, medical, and economic), they no longer divide; they connect, create interdependency, and produce a common humanity that includes those who tended to be excluded” (200-201).

The increasingly differentiated world brought to life through the hybrid MD collective offers many new possibilities for living and acting. Patients now have a range of experiences open to them and medical scientists have developed new areas of expertise and career paths. Genes are actively implicated in an ever-expanding array of biological and social outcomes: “One researcher will accompany the discovery of a gene by creating an animal model and then testing gene therapy; a second will continue the gene hunt by studying other diseases; a third will concentrate on proteins and their functions; and so on. Each choice can be part of a different set of alliances” (199).

Drawing on Paul Rabinow, Callon and Rabeharisoa describe these co-transformations as yielding a new “bio-sociality” (199).

Taking off from this characterization, we could perhaps say that through our own (hybrid) research collectives we have been attempting to produce a new “econo-sociality”. Over the past two decades we have worked with community researchers drawn from all walks of life as well as NGOs, government agencies, small businesses, academic researchers and students in a variety of locations in the US, Australia and the Philippines (Gibson-Graham 2006). Our action research around the world has attempted to reclaim the economy as a site of ethical decision-making and practice. In all our research conversations the economy, rather than being seen as “out there” in the stock markets and corporate headquarters of global cities, has been “domesticated”, brought down to size and made visible as a site of everyday activities and familiar institutions.

A powerful image that has emerged from these conversations is that of an iceberg with formal market transactions, wage labor and capitalist enterprise at the tip, underpinned by a myriad of submerged but sustaining alternative and non-market transactions, alternatively paid and unpaid labor, alternative capitalist and non-capitalist enterprises (see [www.communityeconomies.org](http://www.communityeconomies.org)). We have used this image and the diverse economy diagram in which it is encoded (Gibson-Graham 2006:71) as an inventory kit—not unlike the perfume industry’s odor kit—to produce economic actors attuned to their multiple economic roles. This kit locates *everyone* as contributing to (and part of) the economy in different and multiple ways: the grandmother who gifts her caring labor to mind a grandchild so that the parents can join the paid work force, the corporate executive who volunteers several hours a week at a local food bank, the trash-picker who recycles the rubbish of a city in the majority world, the poor farmer who harvests his neighbor’s rice as part of a time-honored reciprocal labor relationship and the policeman who turns a blind eye to the movement of

illegal drugs within a neighborhood in return for kick-backs. The heightened economic sensibility that arises from using this kit has spun off discussions about the ethical choices that confront people in daily life, as they participate in a diverse economy of interdependent “being-in-common”.

Retrospectively, we can understand our research experience as involving a hybrid research collective learning to be affected by economic diversity. Such learning provokes a questioning of all the inherited givens that see, for example, the unemployed as economically inactive, the household as a dependent site of consumption, minimally capitalized self-employed businesses as unviable, cooperatives as backward-looking, capitalist corporations as unable to care for the environment, and unionized workers as defending collective well-being. The diverse economy catapults multiplicity and economic differentiation to the fore and helps us to counter the ingrained belief that capitalist economic relations are the only driving economic force. Once this one-way street toward development becomes just one among a number of avenues, economic innovation proliferates. New possibilities for enterprise development emerge from discussions around the inventory kit; as these possibilities are pursued, new enterprise forms are created, which lead to greater differentiation of the inventory kit and the possibility of developing new types of enterprises in different locations. In our action research people and agencies have been transformatively affected and new body-worlds (or body-economies) have been created, ones that are dynamic and differentiating rather than stuck and singular. Localities that were defined in terms of deficiency and need have been re-experienced as sites of surplus possibility where alternative pathways to shaping economies are continually opening up.

Taken together, these processes of co-constitution are producing a new econo-sociality (what we have called a community economy) at the core of which is the negotiation of interdependence. The diverse economy inventory kit assists with clarifying the ethical choices

involved. Will a local government continue to grant free access to a closed pre-school building so that a group of volunteers can keep their Santa's workshop open? The kit helps local officials to locate all the economic activities (barter with the corporate sector, volunteer training labor, work-for-the dole, gold coin donations for access to materials, gifts of paints and timber, recycling of waste paint, production for use by local residents, sale of surplus product) that flow through and around the workshop and contribute to the integration and resilience of the local community (Cameron and Gibson 2005). Will a farming community continue to value and engage in the long-standing practice of reciprocal labor exchange? The diverse economy kit helps community researchers recognize this form of labor as a key contributor to livelihoods in the agricultural sector, and to propose that it be drawn upon as a resource for the fledgling phase of social enterprise development (Community Economies Collective and Gibson 2009).

While these examples suggest how close we have come to practicing an economic ethics of human interdependence, they also indicate how distant we still are from an ethics for the Anthropocene. In small and local ways, the human being-in-common of our action research has changed the world, including ourselves and our research collectives; and in more extensive ways, it has changed (that is, contributed to) the world of possibility. But we are just beginning to be affected by the coming of the Anthropocene, and have barely glimpsed the world of economic possibility it carries with it. In the next section we attempt to extend our thinking to the ethics of more-than-human interdependence, seeking out already existing projects that are learning/acting/being *with* a more-than-human world.

### **Ethical Coordinates of Interdependence: Building Community Economies for the Anthropocene?**

In our project of rethinking economy, we hoped to open the eyes of economic activists (and everyone else) to projects and possibilities of non-capitalist development *here and now* (Gibson-Graham 2006, Ch. 7). Rather than pose the time-honored but often paralyzing question of “what is to be done” to produce change, we chose to marshal examples of “what is already being done”, thereby contributing to the credibility and strengthening of alternative economies. In a similar move, here we take a closer look at diverse experiments all around us to see that many hybrid collectives are enacting ethical practices of learning to be affected by the Anthropocene. In these experiments humans already have a sense of their more-than-human lives as works-in-progress. By joining these experimental collectives—in other words, by bringing our perspective and analysis to bear—we hope to increase their legibility as economic projects, engaged in inventing and practicing an econo-sociality that involves the human in relations of mutuality with the more than human.

We have focused our reading of contemporary experiments that are building “community economies” on four ethical coordinates of econo-sociality (see Gibson-Graham 2006, Ch. 4):

- commons (how a commons is produced and sustained),
- consumption (whether and how products and surplus are to be consumed),
- necessity (what is necessary to personal, social and ecological survival), and
- surplus (how surplus is appropriated from and distributed to humans and the more than human).

The ethical coordinates function as a rudimentary language of economy. In what follows we extend our use of these coordinates to survey and sort out the tangled spaces of ethical negotiation in which interdependence between humans and non-humans is being acknowledged and transformed. Some brief examples may help to convey the range (if not the magnitude) of these transformative interactions.

## *Commons*

Anthropologist Stephen Gudeman has taught us that a “community economy makes and shares a commons” (2001:27). Many experiments worldwide are currently extending community beyond the human species. In September 2008, the voters of Ecuador accepted a world-precedent-setting constitution that protects indigenous (and all) peoples’ connection with their more-than-human world. The constitution includes a Bill of Rights that gives

nature the “right to exist, persist, maintain and regenerate its vital cycles, structure, functions and its processes in evolution” and mandates that the government take “precaution and restriction measures in all the activities that can lead to the extinction of species, the destruction of the ecosystems or the permanent alteration of the natural cycles.” (Pena 2008)

This document will guide laws that recognize and validate an indigenous world view in which the duality of “private” and “commons” dissolves. To the extent that the constitution is respected, those economic activities that interfere with nature’s cycles will be banned or regulated and others that promote the diversity and resilience of species, ecosystems and natural cycles will be supported. The Ecuadorian Bill of Rights was co-drafted by the Community Environmental Legal Defense Fund, which has assisted communities in the US to put in place first-in-the-nation laws that treat ecosystems not as property but as rights-bearing entities (CELDF 2008). A movement is underway that could potentially transform what has been seen as “common property” (and well or badly treated as such) into “members of the community” that have rights and a “voice” in ethical economic decision-making.

At the same time that nations and localities are extending rights to the more than human, collectives around the world are taking action to share, replenish, and live *with* a commons:

“We in our conventional lives today export all our harms to a Commons we don’t ever see. WestWyck brings the Commons to your front doorstep and you can’t avoid the fact that your actions have a direct impact on your water supply and the quality of your soil.” Michael Cann, resident of a Melbourne inner city eco-village in which organic and human waste is treated on-site, grey water is recycled, rain water caught and used and solar power captured for heating and power. (Dolan 2008:58)

The eco-village experiment is international in scope. Each village explores the limits of their ability to live sustainably under vastly different local conditions. In drought-prone Australia, Michael Cann and his co-residents are learning to live and garden with water and solar power in ways that respect the seasonal rhythms and variable quantities of the former and the daily rhythms and unboundedness of the latter. While producing novel options for urban design, WestWyck is also producing a new human body—one that turns on the tap and experiences connection to reservoirs, the hydrologic cycle, and the needs of neighbors and more-than-human others. As a complex assemblage of worms, water, waste, bacteria, energy, space, tanks, sunshine, children, vegetable growers, plants and, no doubt, unaccounted for guests like possums and cockroaches, WestWyck is a (hybrid) neighborhood community economy that is producing a new local commons while participating in an international experiment to invent a new econo-sociality.

### ***Consumption***

Many communities are making individual and social consumption the focus of concerted action and in doing so are reconfiguring felt responsibilities and connections between humans and the more

than human. In a poor urban neighborhood of Metro Manila some 200 workers, mainly women, are members of a cooperative that collects plastic juice containers from streets and garbage cans, cleans them and sews them into colorful and stylish carry-alls that are sold in fair trade outlets around the world (Milgram 2005). In a rural Philippine municipality in Mindanao, a social enterprise has been established to make coconut coir into matting for erosion control, fiber for mattresses, plant hangers, and furniture. The primary raw material of the enterprise is waste coconut husk that once clogged waterways and destroyed marine habitats (Community Economies Collective and Gibson 2009). In 1996 the Australian Capital Territory became the first government in the world to set a goal of no waste going to land fill. The commitment to zero waste by 2010 has just been revised, but in 2005 residents were already recycling or reusing 75 percent of what was once thrown away (Australian Bureau of Statistics 2007). In the recycling and reuse sectors a diverse range of enterprises have sprung up—not-for-profit charitable enterprises, volunteer organizations, social enterprises, capitalist firms, cooperatives, child can collectors and barter networks.

The relatively new attachment to recycling is evidence of a shift toward living *with* that has occurred as the degraded earth and its inundated creatures have imprinted themselves on our 21<sup>st</sup> century bodies and psyches, in large part due to the efforts of the environmental movement. Around an emerging ethic of consumption with its technologies, bodily habits, moralities and waste possibilities, economic communities are formed, new commons emerge, and economic possibilities proliferate.

### ***Necessity***

What do humans, other species and ecosystems *need* in order to survive with some kind of dignity? This (anthropomorphic?) question increasingly intrudes upon what were formerly purely

“economic” deliberations. The needs of animals, plants, soils and water sources, for example, have become a matter of concern that is reorganizing the food production industry. Reorganization has been moved along by rogue infectious agents such as the prions that cause mad cow disease (Whatmore 2002) and the algae that grow in stagnant water holes but also by the environmental and animal liberation movements. The need for chickens to scratch the earth, move about, take dust baths, nest at night and lay eggs in comfort is acknowledged and accommodated in the growing organic free range poultry industry. While the price of the eggs and poultry meat from this sector cannot compete with that of mainstream producers, the presence of this niche has put pressure on the mainstream to improve the living conditions of its birds.

Gerardo Ramos of Holyoke, Massachusetts has initiated a small business around more-than-human needs, responding to the plight of dying coral reefs by focusing his education and livelihood on them. Though he never completed high school, Ramos has taught himself to read the English-language textbooks and articles that have made him an expert on coral reef habitats. His business, Marine Reef Habitat, supplies institutions, individuals and businesses with fresh and saltwater tanks, fish and corals. Eventually, with the stock of corals generated through coral farming, and his savings supplemented by donations, Ramos intends to restore the coral reefs of his native Puerto Rico, where he used to swim and fish as a child before the reefs were decimated by pollution.

### ***Surplus***

Traditionally Marxists and labor advocates have been militantly concerned about the exploitative capitalist class process in which surplus (value) is appropriated by non-producers from the workers who produce it. What if we added to our concern about the exploitative interdependence between producers and non-producers a concern for the unaccounted-for exploitation of the non-human

world? Because the contribution of the more than human is not taken into account, in practice it ends up in the residual we identify as surplus. This is true for exploitative and non-exploitative enterprises alike—capitalist firms, worker cooperatives, independent producers, etc. To recognize and account for the needs of the non-human world would be to raise the social allocation to “necessity” and reduce the social surplus generated and finally appropriated.<sup>3</sup> It would mean the growth of activities focused on regeneration and maintenance of the environmental commons and the dignity of animal life as an integral part of production. It would mean a fundamental change in the nature of business thinking and practice. Indeed, with a smaller surplus available for investment, the whole economics of growth might be called into question, and an opening created for a new “economics” focused on sustenance and interdependence.

Such a shift seems impossible when posed in macro terms, but the beginnings of a change are clearly visible at the firm and industry levels. A New Hampshire electronics firm, for example, was at first resistant to regulation by the US Environmental Protection Agency and only reluctantly allocated a distribution of surplus to comply with clean air and water regulations. Ten years later the picture had entirely changed: the department that was initially assigned the task of compliance had become the center of innovation and cost-saving in the firm, and also the area where employees were most desirous of working. New people with environmentalist values had joined the company and older personnel had left or been influenced to change (James Hamm, personal communication). While the impact on surplus was probably positive, the example reminds us that new distributions of surplus are always taking place (if often toward executive compensation) and such distributions are increasingly targeted to meeting the needs of the more than human (see, for example, Gibson-Graham and O’Neill 2001).

## ***Reflections***

The community economy coordinates focus attention on ethical practices that produce economic connection and change. Distinct but interrelated, the coordinates prompt us, for example, to trace the ways that attending to the *needs* of the more than human reallocates *surplus*, shifts patterns of *consumption*, and replenishes a *commons* (or not). They constitute rudimentary elements of an economic theory—categories that separate out points of analytical interest (these could be called entry points) while at the same time enabling us to map and differentiate the ethical space of an economy. They help to distance us from the structural dynamics that have plagued economic theorizing, allowing us to represent an economy as a space of negotiated interdependence rather than a functional (or dysfunctional) growth machine. They also offer a tool for discerning an emerging economic order and participating in its performative consolidation (Callon 2007).<sup>4</sup>

We have collated and displayed here just a few among the multitude of ethical projects that are arguably and even demonstrably bringing a more-than-simply-human economy into being. At the same time, in this paper and elsewhere, we've been engaged in a number of related activities, including bringing an experimental (learning) rather than critical (judging) stance to ethical projects; amplifying and integrating small projects and disparate processes (via the community economy concept, for example); coming up with schematics and categorizations (like the coordinates and the inventory kit) that can orient research and proliferate economic possibilities; interpreting and disseminating key ideas and innovations; translating and making connections between different knowledge systems and communities; developing a pedagogy and protocols for “listening” to what was previously inarticulate; extending the collective to students, colleagues and other communities; transforming the collective's concerns into tangible and transportable objects of public policy; fostering credibility and working against inevitable attempts to discount the viability and significance

of collective achievements (Santos 2004). We see these activities as an academic contribution to hybrid research collectives that are building community economies. In what follows we track several such collectives that are engaged in co-creating a community economy for the Anthropocene.

### **Emergent Hybrid Research Collectives in Rural and Outback Australia**

Deborah Bird Rose is an academic anthropologist who works with Indigenous Australians in what we see as a hybrid research collective that is teaching us how we might be nourished in our world while participating in nourishing earth others:

My work with Aboriginal people indicates an alternative. Rather than humans deciding autonomously to act in the world, humans are called into action by the world. The result is that country, or nature, far from being an object to be acted upon, is a self-organising system that brings people and other living things into being, into action, into sentience itself. (Rose 2005:303)

Rose's research in Northern Australia with Aboriginal people reveals intricate practices of mutual life-giving whereby the needs of humans, animals and country are attended to simultaneously. She documents practices that have hitherto been recorded in Dreamtime stories and traditional Law. In our terms, she codifies key ethical negotiations of an active community economy. Consider, for example, the principle of mutual benefit whereby benefits ramify beyond immediate use—the river fig provides firewood for humans and fruit for birds, ants, fish and turtles. When harvesting bush tucker some food is left behind or distributed to others because it is “food for everyone”, and this action returns benefit (297). As one of Rose's teachers, Riley Young Winpilin, explains,

...when you go fishing and the [river] figs are ripe, you can eat some for yourself, and then throw some into the water to attract the attention of turtles. One reason

you would want to attract the attention of turtles is that the time when the figs are fruiting is also the time when turtles are becoming fat, hence especially good to eat.

(296, insert added)

Rose draws on the many stories related by her Aboriginal co-researchers to demonstrate the place-based and ecosystem-bounded aspects of a communication system that connects humans and earth others. “Country tells what is happening; it announces its own patterned eventfulness and invites engagement” (298):

The country tells you when and where to burn. To carry out this task you must know your country. You wouldn’t, you just would not attempt to burn someone else’s country. One of the reasons for burning is saving country. If we don’t burn our country every year, we are not looking after our country. (April Bright, quoted in Rose 2002:78-82)

Firestick farming, or mosaic burning of grassland, helps animals and insects to thrive, gives good hunting for humans, and sustains biodiversity. But how to burn one’s country is an embodied knowledge relevant only to that particular interconnection of earth and species. Outside one’s country the body’s sensory and practical capacities are underdeveloped:

One of the floodplain people describes the experience of coming home in this way:

“You see the birds [referring to a totemic species], you see the country, and your senses come back to you. You know what to do and where to go.” (Rose 2005:299)

Listening to country, observing its interconnected changes and being called into action to produce mutual benefit—these are ethical practices of a more-than-human community economy. The hybrid research collective that includes Rose is bringing this economy to our attention, recognizing the ethics of interdependence that, despite colonial settlement, is still active in the landscape.

Economic anthropologist Jon Altman works in a hybrid research collective with biological scientists, ecologists and Aboriginal people in remote Arnhem Land, also in the north of Australia. Altman has explored the economic, social and ecological benefits of Aboriginal reoccupation and harvesting of traditional lands and suggests that Aboriginal methods of farming can be understood as maintaining a biodiverse commons (2003). Increased recognition of the diversity of Aboriginal land management techniques has generated new economic possibilities. Altman argues, for example, that Aboriginal land management could be resourced in the same way that national park management is resourced and the discourse of welfare dependency could be supplanted with a recognition of the important public roles played by Aboriginal communities. He notes that at present “smoke inhalation in Darwin associated with late dry season wildfires generates significant health costs” (76-77). Employing Aboriginal firestick farmers to manage the land around Darwin could “be supported as a preventative health measure that may be more cost effective than later health interventions” (76-77). Here the principle of mutual benefit practiced by Aboriginal people would be extended to urban dwellers while wild life habitats would be maintained and the transfer of traditional knowledge between Aboriginal generations would be ensured. In this more-than-human community economy Altman imagines the replacement of state income support with on-country income security that fuels the proliferation of community enterprise. Supporting people to stay on the land might ensure the sustainability of an indigenous art industry in which art is “produced on country”. And land-based livelihoods remunerated in kind could be supplemented by new jobs in wild life management, wild life harvesting and pest eradication (2003:75).

We can see parallel hybrid research collectives forming around some adventurous Australian farmers who have allowed country to speak to them and have been called to buck mainstream agricultural science and experiment with radically different ways of working with the land. European

settlers brought their knowledge of green pastures and flowing brooks to the dry island continent and proceeded to clear the land and manage the water ways to reproduce a version of the country they knew. Horse breeder and farmer Peter Andrews learned at an early age to be affected by the effects of these practices on his father's outback farm near Broken Hill. After witnessing the devastation caused by dust storms he realized that

...without the scrub that had always protected it, the land was exposed to the weather. The winds could now rip and tear at the earth. It was my first lesson in how, within a decade or two, people could drastically affect a landscape that had been operating successfully for tens of thousands of years. (Andrews 2006:16)

Andrews later conducted archival research into pre-colonial landscapes, noting that while the journals of early European explorers "are filled with descriptions of swamps and marshes...,today ninety per cent of wetlands have disappeared"(6). He became increasingly alarmed that practices of clearing water ways and grazing animals along stream banks had deepened stream incisions and increased the flow of water through the landscape, stripping the land of nutrients and causing erosion and salinity problems. Over many years he experimented with slowing the water flow on his property, becoming a self-taught agricultural scientist:

As far as I could tell there was no body of scientific knowledge I could turn to that threw any light on what I was doing....Tarwyn Park, with its paddocks, creeks, weeds and salinity problems, became my laboratory. (Andrews 2006:33)

Eventually he devised a system of farming known as Natural Sequence Farming (NSF) which involves impeding water flow with plants and other barriers and increasing water retention in the landscape (Andrews 2001). Former CSIRO head John Williams speaks for Andrews about the simplicity and obvious benefits of this system:

...what Peter's saying is, well, instead of letting the water run down the stream into the dam and then we pump it back and irrigate, why don't we, as a society, hold the water in the landscape and use it where it is? (2005)

NSF is not dependent on expensive new technology but on a new way (for most Australian farmers) of being *with* the land:

The investment required is in training for the landholder to interpret the natural processes of the landscape and time spent by the farmer in "reading the country" and applying the NSF principles to the particular property and landscape features of their region. (Newell and Reynolds 2005)

Switching to a farming practice that attends first and foremost to the needs of the land for water, plants for nutrient and soil for cover, but that doesn't lose sight of the needs of introduced animals for pasture and farmers for income, may actually reduce the consumption of industrial inputs (Hudson 2005:244). In the case of NSF, Newell and Reynolds argue that the system simply requires "intelligent redistribution" of on-site resources with small amounts of outside inputs targeted to redress occasional imbalances. Moreover, "where neighbouring landholders in a sub-catchment adopt NSF, even more rapid progress to increased profitability and environmental sustainability can be achieved, as NSF adopts a whole-of-catchment approach to farming"(2005).

Despite his evident success, Peter Andrews suffered years of resistance from the agricultural science and land management communities. Land ecologist David Goldney recalls first traveling to meet him with a group of bureaucrats "who laughed about Peter all the way there and...derided him all the way back":

But I saw something there that just kept drawing me back. And then I had to try and fit this stuff in to my existing scientific understanding. That took me 10 years to do

it. Now I think we can explain the process, you know in half an hour or less, ten minutes given the right sort of video help. (Goldney 2005)

Academic scientists have now recognized that Andrews' learning and experimentation has resulted in an increasingly differentiated landscape of greater bio- and ecological diversity which is more resilient to drought (Williams 2005). John Williams co-organized an international workshop on thermodynamics (or energy flows) to explore Andrews' ideas, noting that after three weeks discussion and debate among participating scientists there was a strong consensus supporting Andrews' activities on ecological grounds (2005). A hybrid research collective has now formed around Andrews' farm (Williams 2005, Wentworth Group of Concerned Scientists 2009).

Through Andrews and his unconventional ways, scientists, bureaucrats and business people are learning to be affected by the Australian environment. The Wentworth Group of Concerned Scientists, an independent organization interested in innovation and sustainability, has proposed five key changes based on Andrews' work that the Federal and State governments can implement immediately:

- Clarify water property rights and the obligations associated with those rights to give farmers some certainty and to enable water to be recovered for the environment;
- Restore environmental flows to stressed rivers, such as the River Murray and its tributaries;
- Immediately end broad scale land clearing of remnant native vegetation and assist rural communities with adjustment;
- Pay farmers for environmental services (clean water, fresh air, healthy soils)...on behalf of the rest of Australia; and
- Incorporate into the cost of food, fibre and water the hidden subsidies currently borne by the environment. (2009)

The first two recommendations are currently being acted upon with the Federal government spending \$50 million in 2007-8 to purchase water allocations from farmers that will amount to 35 billion extra litres of water for the Murray Darling Basin rivers (Wong 2008).<sup>5</sup>

John Weatherstone is another farmer who has learned to listen to country and discovered a new economy of working *with* the land. From the 1960s, his merino sheep stud, Lyndfield Park, was an exemplar of state-of-the-art farming, enjoying high stock carrying capacity and productive cash cropping. As Weatherstone remembers, “the whole focus of scientific research and government policy was production-oriented” (2003:6). Australian farmers were exhorted to make their land work harder to produce more food and fiber for the “starving millions of the world waiting to be fed and clothed” (6).

For Weatherstone, the long-term impacts on the land of following mainstream agricultural practice were devastating. During the 1982-83 drought Lyndfield Park was transformed to dust and he was faced with the horrible task of killing new born lambs as there was no way to meet their needs for food and water. Standing at the edge of his property he watched the remaining soil and organic matter blow away, while only a few feet from his fence the weedy overgrown border of a nearby highway gave evidence of adequate soil and moisture retention. He pinpoints this moment as when he resolved to radically change his farming practices and, in the face of much criticism, begin “repairing the country”.

Weatherstone’s program of repair involved creating a diversified community economy in which the land and a variety of species live together in recognized interdependence. He reduced stocking rates, planted a range of tree species (not all native) chosen to ensure flowers at all parts of the year, improved pastures with perennial grasses, decreased cultivation, switched from ploughing to seed drilling, and reduced use of toxic chemicals. Key to the farm’s survival has been species and

economic diversification and a focus on mutually benefiting activities, such as planting honey locust trees that reduce fire risk, offer foliage for fodder and shade, help maintain fertile soils, provide timber and honey, and enhance the beauty of the landscape (Weatherstone 2003:10). The farm currently generates income from beef cattle, forestry and a seed business. It has become a native habitat for over 51 species of native birds. The scientific community has taken notice and Lyndfield Park is now a leading example of farming innovation. In 2001-2002, Weatherstone was awarded a Land and Water Australia community fellowship to tell his story. He works with scientists and other visitors to evaluate the farm and generate new ideas for experimentation (Weatherstone 2003:17). In the process, he has gained a diversified identity that extends well beyond his original role of feeding the nation and world.

In October 2006, in the midst of continuing drought, one of us visited Lyndfield Park from nearby Canberra and found a green and pleasant oasis—paddocks of trees with cattle grazing on the lush grass, flowering trees full of birds, and many interested visitors gathered in the converted shearing shed to hear how Weatherstone and his wife achieved this turnaround. All around were the barren, drought-stricken paddocks of neighboring farms. That night on the TV news, hundreds of farmers pressured the Federal government for larger handouts to weather the current “once in a 100 year drought”.<sup>6</sup>

The hybrid research collectives involving Deborah Bird Rose, Jon Altman, their Aboriginal co-researchers, Peter Andrews, John Weatherstone, their scientific and business co-researchers, and many others are showing us that there is a way to live *with* earth others even in the dry conditions of the Australian Anthropocene. In these collectives academic researchers are learning to listen to country and to non-academic researchers and being called to translate, inventory, codify, formalize, formulate policy, communicate to ever wider publics, extend the boundaries of collectives, and make

connections between them. All these collectives are constituting a new econo-sociality in which the *needs* of the more than human are valued and prioritized. *Surplus* is directed toward more-than-human needs, *consumption* habits are modified with respect to these needs, and the *commons* shared by all species is replenished and renewed. These practices can be seen as the elements of an economic ethics for the Anthropocene.

## **Conclusion**

As we celebrate the 40<sup>th</sup> anniversary of the birth of *Antipode*, it is inspiring and heartening to note the theoretical and political distances that radical geographers (and others on the left) have traversed in the past 40 years. Even a brief inventory yields a sense of dramatic shifts in how we are able to think about things. Perhaps most notably, we have loosened the hold of structural visions that channel transformative change into narrow openings and scarce opportunities; we have gained a sense of power as distributed and ramified rather than as (always) concentrated and monolithic; we have rethought scale beyond nested hierarchies in which the global generally prevails; and we have opened to the being-in-common of humans and the more-than-human world.

There are also many new ways to think about how things change. We have a broader notion of (political) agency, no longer restricted to a mass collective subject and potentially involving variously sized collectives of human and non-human actants. Small actions and networks can be seen to have sweeping global effects, and rapid large scale change can emerge from diffuse local transformations. Theory has taken on a new relation to action—to understand the world *is* to change it. As a performative practice, academic research *is* activism; it participates in bringing new realities into being. Our role as academics has thus dramatically changed. We are less required to function as critics who excavate and assess what has already occurred, and more and more pushed to

adopt the stance of experimental researchers, opening to what can be learned from what is happening on the ground. To put this in the form of a mandate, we are being called to read the potentially positive futures barely visible in the present order of things, and to imagine how to strengthen and move them along.

Faced with the daunting prospect of global warming and the apparent stalemate in the formal political sphere, this paper has put the hybrid research collective at the center of change. Research here is framed as a process of learning involving a collective of human and more-than-human actants—a process of co-transformation that re/constitutes the world. Starting with Latour’s “body” to give a sense of this differentiating, co-creating process, we moved to the MADD collective to convey the rapid and far-reaching changes (now codified in law) that can arise from a small group of learners. We moved next to the muscular dystrophy story of Callon and Rabeharisoa, which provides a striking example of the proliferation of actions and identities that a hybrid research collective can engender in a brief period of time.

It is this vision of how things change that grounds our “economic ethics for the Anthropocene”. What we can see all around us, if we put on the 3-D glasses provided here, are ethical practices of economy that involve the being-in-common of humans and the more-than-human world. Each of these practices is involved in building a community economy, in which sustenance and interdependence are key values and ethical negotiations center on the interrelated issues of necessity, surplus, consumption and commons. Each is more or less embedded in a hybrid research collective, which is more or less effectively learning to be affected, and more or less successful at proliferating alliances and avenues of action. What we would hope to stimulate is an academic interest in expanding and multiplying these hybrid research collectives, and thereby participating in a world-changing process.

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## Endnotes

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<sup>1</sup> According to Latour, such learning is not optional: “If you are not engaged in this learning you become insensitive, dumb, you drop dead” (205). Our hope is to make such learning more intentional.

<sup>2</sup> In geography Harvey (1974,1996) and Smith (1984) pioneered the “production of nature” thesis based on an historical geographical materialism which posits a relational ontology of nature and society in dialectical connection. Placing human labor *within* nature they went a long way towards collapsing the dualism that has structured so much economic and ecological thinking and action. Writing more recently, Braun (2006) and Castree (2002), among others, have voiced concerns about the remnant privilege accorded to logics of capitalist determination in this formulation and have moved towards a new materialism of immanent causality which sees capitalism as performatively constituted through hybrid assemblages of human and non-human actants. We bring our own critique of capitalocentrism to our interactions with this rich tradition of scholarship.

<sup>3</sup> We are accustomed to thinking about surplus (value) as the basis of capitalist profits. The term “social surplus” has been proposed as a way of thinking about the aggregate surplus labor produced within all the different class processes making up an economy (capitalist, communal, independent, feudal, slave, household-based, etc.) (Chakrabarti and Cullenberg 2003; DeMartino 2003; Gibson-Graham 2006). DeMartino defines social surplus as “the residual that arises from the fact that those who perform the labor necessary to provision society produce more than they themselves consume” (2003:8). We assume that he is referring here to multiple class processes as earlier he writes that “antiessentialist Marxism refuses to acknowledge the (ontological) dominance of any particular class process. It encourages us to expect that each and every economy (no matter its self-designation) will

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comprise of diverse class forms and that these will be articulated in various and unpredictable ways (rather than just merely in a structure of dominance)” (2003:7).

<sup>4</sup> The coordinates can be seen as having multiple potential functions, not unlike the gene in the muscular dystrophy example above (Callon and Rabeharisoa 2003:200-201). Tracing ethical negotiations around the coordinates can connect activist communities; foster acknowledged interdependency and solidarity; proliferate economic possibility; create new identities; and prompt new research questions and the formation of hybrid research collectives.

<sup>5</sup> Geographer Jessica Weir is concerned, however, that rivers continue to be viewed as flows, an image that perpetuates a plumbing system mentality and ignores the Aboriginal and ecological communities supported by water (2008). Weir has conducted research with the Murray Lower Darling River Indigenous National Alliance to formulate a different understanding of river systems, one that can be used by Aboriginal communities in their negotiations with government authorities and environmental groups about an Indigenous water allocation (Weir and Ross 2007:187).

<sup>6</sup> Writing in February of this year as the country burns, eco-philosopher Freya Mathews asks us to learn to be affected by our environment and to “stop using the word ‘drought’, with its implication that dry weather is the exception. The desiccation of the landscape here is the new reality. It is now our climate” (2009).