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The Demon-Seed: Bioinvasion as the Unsettling of Environmental Cosmopolitanism

Nigel Clark
Faculty of Social Sciences: Geography
The Open University
Milton Keynes MK7 6AA
n.h.clark@open.ac.uk

Abstract

Spearheaded by Beck and the 'world risk society' thesis, contemporary commentators in search of evidence of political renewal 'from below' have discerned a convergence of environmental and cosmopolitan sensibilities. But through its foregrounding of the destabilization of matter by new technologies, this 'environmental cosmopolitanism' tends to re-enact the conventional binary of passive nature and dynamic culture. It is suggested that this expresses a metropolitan detachment from the everyday experience of working with flows of matter and life. Drawing on the pivotal role of bioinvasion in the European colonization of the temperate periphery, an alternative perspective on ecological globalization is presented which takes account of the 'weedy opportunism' and inherent mobility of biological life. In this way, 'globalization from below' takes on the meaning of an opening of culture to the 'unsettling' influence of biological and geological histories that manifest themselves at global scales'

Keywords: colonization, dissemination, periphery, risk, supplementarity, undelimitable event.

...the pioneers of every colony set in motion machinery beyond their ultimate control; no legislation can regulate the dissemination of seeds. As the sun shines and the rain falls alike on the just and the unjust, so fleets, railroads, and highways convey seeds good and bad to a like common destination (Guthrie-Smith, 1999[1921]: 294).

...the Stranger, threatens....the proper order and healthy movement of goods, the lawful prescription of its controlled, classed, measured, labelled products, rigorously divided into remedies and poisons, seeds of life and seeds of death ... (Derrida, 1981: 167).

'New Zealand Gets Nuked, Too'¹

In a letter published in the *New Zealand Herald* on February 3, 1997, local environmentalist and MP Jeanette Fitzsimons drew attention to a proposal to ship 'recycled' nuclear spent-fuel from Europe to Japan where it was to be stockpiled for use in fast breeder reactors. The voyage was to pass through the Tasman Sea, skirting the west coast of Aotearoa New Zealand. As Fitzsimons pointed out, the concentrated plutonium cargo would be held in containers that had not been designed to withstand 'the maximum credible accident', leaving open the risk of 'collision or fire which could release more radioactivity into the South Pacific ocean than was released by the Chernobyl disaster'.

By a more felicitous accident, Fitzsimon's letter appeared next to one of the *Herald's* daily features, the reprinting of an article published exactly one hundred years ago. The 1897 excerpt tells of 'the ravages of the weasel and stoat' - 'a class of vermin ... which the farmer once looked on as a friend but which is rapidly becoming one of the most serious pests with which he has to cope'. Introduced to New Zealand in the late 19th century, these predators were intended to keep down the numbers of rats and rabbits, but soon turned their attention elsewhere. What the article neglects to mention was that the over-zealously 'naturalising' mustelids were also having a lethal impact on indigenous avifauna. As they continue to do, into our own century.

Evoking a deadly toxicity with a global reach, Fitzsimon's words of warning offer a textbook illustration of Ulrich Beck's world risk society thesis (1999). More than just a question of 'their' ecological undesirables passing through 'here', the nuclear issue speaks of 'reactions' - socio-cultural as well as physico-chemical - whose very dynamic defies containment. For, just as environmental problems are becoming manifest far from their source, or seemingly detaching themselves from specific origins altogether, so too are they being addressed by communities of concerned citizens who have come together from disparate locations. This resonance between the deterritorialization of environmental problems and the transnationalization of activism is providing a new focus for theorists of political culture and social change. That the most dire and fearful forms of globalization should be engendering some of the most promising expressions of 'globalization from below' is being read as a healthy sign by many commentators, fuelling a guarded optimism about a 'cosmopolitan' political and cultural renewal (Beck, 2000a: 12; Urry, 2000a: 203; Held et al, 1999: 412; Yearley, 1996:60; Archibugi, 1995: 169). By contrast with an earlier social scientific concern with environmentalism as a social movement, it is significant that the physicality of hazard figures indispensably in the emerging 'environmental cosmopolitan' conjunction. And what gives these perils their capacity to recontour our experience of modern life is their shocking newness. Beck's by now familiar 'undelimitable event' is characterised by a particular derangement of matter spawned by industrial and post-industrial technics, its 'creeping, galloping and overlapping despoliation' conferring on our era a profile of risk like none before (1995:109). Or as Anthony Giddens states unequivocally: 'Manufactured risk refers to risk situations which we have very little historical experience of confronting' (1999:26).

But who exactly are 'we'? The *Herald's* late-Victorian vermin gnawing at the edge of Empire hint at another type of 'fast-breeder' reaction. The presence at the colonial periphery of weasels, rats and rabbits -along with the victimized sheep - is of profound ecological significance, no less an expression of global interconnectivity than the nuclear issue. Historian Alfred Crosby has collectively described the organisms transplanted from Europe to the 'new worlds' as 'a grunting, lowing, neighing, crowing, chirping, snarling, buzzing, self-replicating and world-altering avalanche' (1986:194). With its epicenters on oceanic islands - at the dawn of the modern European colonial enterprise (Grove, 1995), and later on the temperate periphery, the bio-invasive 'undelimitable event' suggests a very different geography and genealogy of hazard than that proposed by risk society theorists. Yet, like the diffusion of the contemporary 'techno-epidemic', the vicissitudes of biological invasion have taken it to a fully global arena. Today, powered by new velocities of transportation and intensities of global commerce, biotic exchanges are as geographically multilateral as they are taxonomically inclusive. 'There is no longer any single predominating current, nor is there any type of organism that we can say with assurance is exempt from movement', Chris Bright observes. 'Just about anything could be transported anywhere' (1999: 173). Anticipated by ecologist Charles Elton's (1958) warnings about biological invasion causing worldwide dislocations in natural ecosystems, some scientists now claim that invasive species may be joining habitat loss as the planet's prime cause of ecological disintegration. 'As any invasion biologist will tell you', Tim Low argues 'it's a threat more ominous than the greenhouse effect, industrial pollution or ozone depletion (1999:295).

Translocated biological life, then, could figure equally as early warning and late blossoming of the deterritorializing capabilities of globalization. And while it might prompt a revision of the spatial and temporal co-ordinates of the undelimitable hazard, the bioinvasion scenario of irreversible, planet-scaled ecosystemic adulteration seems to resonate strongly with the anti-naturalistic stance which pervades environmental cosmopolitanism. Social and cultural theorists are taking global ecological despoliation as evidence of a general denaturalization that now encompasses the biophysical world in its entirety. They routinely point out that recourse to the 'natural' to support environmentalist positions has been effectively precluded for all time owing to the 'thoroughgoing socialization' of nature (Giddens, 1994: 77), or the fact that we now live in 'a constructed artificial world' (Beck, 1999:145, see also 1992: 81). In a related sense, the shift away from the nation-state as the self-evident spatial enframing of human sociation - as signalled by the cosmopolitan turn - demonstrates that social thought is not excluding its own most cherished object of study from the denaturalising imperative (Urry, 2000b: 188-9). Henceforth, human societies and their cultural life will no longer be viewed as 'somehow rooted in the land, as if they needed the soil' (Kieserling, cited in Beck, 2000b: 80-1).

Already depicted as 'cosmopolitan' at least half a century ago (see Elton, 1958), the products of biological invasion appear as an obvious addition to this undoing of the natural on a world-wide scale. For Steven Yearley, life uprooted from the ecosystems in which it evolved is a form of 'genetic pollution' - on a par with airborne chemical dispersal or radioactive contamination (1996: 41-2). And while invasive organisms do not feature explicitly in John Urry's discussion of mobile 'inhuman hybrids' which flow and network their way around the globe, (2000b, 194-5; 2000a: 200-2), it is not difficult to picture the complexly implicated relationship between biological life and the technics of transglobal transportation within this conceptual framing. Beck, analogously, only engages with the life's tendency to wander in the case of genetically modified organisms. Again, however, it seems consonant with his argument to consider other forms of technologically-assisted biotic boundary-crossing amongst the volatile '*man-made hybrids*' which, for him, confound the conceptual separation of the world into categories of nature and culture (1999: 145-6 author's italics).

But there are also aspects of the invasive biology issue which hint at an unsettling of the environmental-cosmopolitan paradigm: implications of the mobility of life which are difficult for the emerging consensus to account for. For while the bioinvader is not as conspicuously 'manufactured' as risk theory's exemplary hazardous hybrids, it seems to gain rather lose potential for ecosystemic disturbance on this account. Indeed, transplanted life forms - also termed 'smart pollution' (Bright, 1999: 28) - have an infiltrational expertise that even the most volatile chemicals would envy. While many biotic invaders turn out to be unviable, others take advantage of their distance from familiar competitors, predators and pathogens to proliferate wildly. Actively probing their host environments for new niches and evolutionary opportunities, they tend to become increasingly well adapted over time. As naturalist Herbert Guthrie-Smith observed of the weedy opportunists passing through the New Zealand countryside: 'Each was beyond the direct influence of man, outside his pale, free to select the route of its wanderings, its rate of increase...their goal once attained, fullest liberty awaited them; they were free to pursue a future unshackled by the past (1999: 382).

In contrast to the logic of the progressive 'socialization' or 'artificialization' of the world, then, the invasive organism displays a tendency to 'naturalize' itself wherever it gets a foothold. For all that a technologically-assisted passage may be an aspect of its adventure, biological life's willingness to take advantage of new openings suggests a capacity for mobilism, dispersal and self-transformation that is not reducible to any anthropic principle, let alone any single moment in the development of the technological apparatus. So while the bioinvasion issue might be a cue to further explore culture's global 'traffic in nature' (Franklin et al, 2000: 5), the more perturbing question might be what to make of the traffic

which is nature's own. Today, the 'antinaturalistic' impulses of social and cultural thought converge on the issue of what culture is doing to biology, focusing on its manipulation, dissection, resurrection, reappropriation and soliciting into a range of new networks and configurations. But generally, it is only as an afterthought or supplement to such inquiry, if at all, that biological matter is credited with transformative capabilities of its own.

But why is exactly is it, we might wonder, that there is so much political purchase to be had from the idea of nature's undoing at the hands of culture, and so little currency in considering the things life achieves on its own account? (see Wilson, 1996). And why is it that after all the vexing of the nature/culture binary, we are still so much more comfortable tracking the impact of globalization on the biophysical world than we are with any consideration of a biological or geological contribution to the global contours we now confront? By exploring the processes of biological invasiveness, in its varying historical and geographical contexts, my intention is to rework the environmental-cosmopolitan conjunction from an angle largely passed over in work to date. Taking the now routine insistence on the porosity of the nature/culture binary at its word, I will be proposing that the notion of 'globalization from below' might have new connotations if it can be shown that there is no final cut-off point to this 'below', no guard-rail to restrain us to the realm of the already humanized. The potentials and perils of 'cosmopolitan life', in this sense, might be reimagined not just in terms of an overcoming of the containment of the nation-state, but through a more general opening of global 'culture' to a materiality which is itself mobile, volatile and transformative.

Environmental Cosmopolitanism

Social thought seems to be becoming accustomed to pondering - in the same breath - the once anomalous destinies of culture and matter. 'Money, technologies, commodities, information and toxins' (Beck, 2000a: 20); '... pollutants, drugs, fashions and beliefs' (McGrew, 1992: 66); or 'peoples, objects, images, information, and wastes' (Urry, 2000b: 185) are today the effortless compatriots of common or parallel circuitries. Such recognition of the way a debased materiality joins other artefacts in the criss-crossing of geopolitical borders has helped draw environmental risk into the heart of discourses on globalization. But though the globality of hazard seems to invite a political-cultural response that willingly works the same trans-local terrain, the discursive labour that is going into the melding of environmental and cosmopolitan sensibilities should not be underestimated.

While modern meditations about the interplay of 'Man' and 'Nature' have long tended to be universal in their orientation, most recent environmentalisms have preferred to tap into traditions that privilege groundedness in place, and intimacy with one's immediate surroundings. And though it may be true that the ecologically aware, while acting locally have tried to 'think globally', this gesture has tended to involve a planet-scale projection of qualities of homeliness and rootedness (Robertson, 1990: 56; Robertson and Lechner, 1985: 113). Such sensibilities contrast markedly with those we have come to call 'cosmopolitan'. For cosmopolitans have tended to find virtue in mobility and the changes it rings, their 'taste for the promiscuous and the unstable' (Aragon, 1970:13) usually expressed in a preference for the vibrancy of the metropolis over the 'unspoilt' charms of the countryside or wilderness.

For social thinkers in search of empowering responses to an intensifying globalization, those environmentalisms firmly grounded in place were always going to be too close for comfort to the troublesome Volkish vision of communities sprung from native soil. For it is precisely the assumption that identity derives from deep-rooted association with territory which has come to be seen as the key pathology of the modern nation-state; the root of its intolerance to foreign bodies (Beck 2000b: 80-1; Bauman, 2000; 184; Rée, 1998: 81). But then neither have the various cosmopolitan lineages been ready-made contenders for reconstituting global politics and culture. Over the last century or so many of the most conspicuous gestures of cosmopolitans have leant more toward the aesthetic than the political or ethical, their

characteristic tolerance of others and openness to new experience apparently better geared to an expansion of personal horizons than to communal betterment (Lash, 1994: 144, see also Robbins, 1998: 254-255). Brought together, however, the two sensibilities seem to offer more promise. If the association with the cosmopolitan lends environmentalism the virtues of openness and tolerance, the implication of cosmopolitanism with mobilizations for ecological sustainability, environmental justice and related causes imbues it with the requisite aura of civic-mindedness and commitment. Hybridized with environmentalism and other movements, cosmopolitanism now seems to offer a possible platform for conversation between spatially separated individuals or groups, contacts which might spawn forms of political representation linking the grassroots and the global (see Archibugi and Held, 1995: 13; Held 1995). In this way, we seem to catch a glimpse of a 'globalization from below' that might counter the institutionally engrained forces of ecological endangerment working 'from above' (Beck, 1999: 37, 47).

If cosmopolitanism and environmentalism are to work together in this way to generate political and cultural possibilities not yet played out in the course of our modernity, then we need to see some strong evidence that their new conjugation is more than the sum of its disparate parts. But if we take the risk society thesis as our focus, there is cause for concern, as well as hope. For, this 'cosmopolitanization that suspends and blurs boundaries' (Beck, 2000b: 98) seems to hinge on a fairly intransigent dichotomy of its own. On the one hand, ecologically undesirable elements are viewed with blatant repulsion. Construed as 'creeping', 'insidious', 'inexorable' and 'explosive', it is their very capacity to produce '*moral outcry*' that is their paradoxical virtue (Beck, 2000a: 71, authors italics). But when it comes to wanderings and displacements on the plane of culture, a rather a different story unfolds. 'Cosmopolitans', Giddens claims, including himself under the rubric, 'welcome and embrace ... cultural complexity (1999:5). Likewise, Beck observes that '*cultural sources have emerged for the joyful and creative taking of risks*', as he proceeds to extol the experimental attitude of aesthetic cosmopolites that makes an 'everyday laboratory of civilization' (2000a:147, authors italics, 149). All of which is clearly distinct from that other sort of experimentation: the 'obscene gamble' of technological modernization (Beck 1999: 78).

Commonsense, perhaps. But as a platform for political and cultural renewal, this is more disconcerting, for what seems to be occurring here is the unraveling of cosmopolitan environmentalism's constitutive strands. Effectively, we are being called on to act as cosmopolitans as we explore the potentialities of culture, but to revert to an older construction of environmentalism when we consider the fate of nature.

Or to put it in another way, as globally-oriented eco-activists, it is our task to exercise our own mobility and interactive capacities in order that we might find new ways to keep nature inactive and at home. Calls for stringent new controls and precautionary principles in the environmental arena indicate that in our capacity as *biological* beings, we have not in the least ceased to be concerned with contamination, nor given up the patrolling of 'natural borders' or abandoned the rituals of purification (see Beck, 2000a: 100; cf. Bauman, 1998: 77; 2000 108-9). It is only once we have reconstrued ourselves as *cultural* beings, that these self-same stratagems can be denounced as intolerant, inhospitable, even symptomatic of fundamentalism (see Giddens, 1999:5).

What seems to underpin the new cosmopolitan environmentalism then, is the premise that left to itself, nature is docile; it maintains its given forms and positions. Culture on the other hand, is seen to be inherently dynamic, both self-transforming and responsible for the mobilization and transmutation of the material world - for better or worse (see Wilson, 1996: 50-1). Western thought's most pervasive dualism, we might be forgiven for thinking, has returned to haunt cosmopolitan risk society. Moreover, the antinaturalism of much of the new cosmopolitanism can itself be seen to rest on a pre-existing nature/culture dualism. While many social theorists seem to accept the argument that a social or techno-cultural offensive has rendered the category of nature obsolete, dissenters have pointed out that the very notion

of 'hybridization' or 'denaturalization' is dependent for its authority on the positing of a previously stable and undefined identity (Kirby 1997:147; Ansell Pearson, 1997:136). The end of nature, in other words, relies on the belief that there once was a nature, just as it presupposes another force – coming by definition from outside of nature - capable of precipitating this change.

It is perhaps surprising that the idea of the denaturalization of nature is being presented as culturally and politically liberating, given the philosophical prominence of efforts to track its ancient lineage. Derrida has gone to great lengths to show the extent to which the suspicion that culture leads us away from an intact nature is an enduring figure of western thought. For him the sense of loss that haunts the celebration of our cultural achievements hinges on a logic of supplementarity. We affirm the capacity of culture to add to nature the qualities we feel it lacks - but at the same time we experience the new world that culture delivers as supplanting this nature and breaking the bond we imagine we once shared with it (Derrida, 1976: 178-80, 1978, 289-90). It is the qualities that culture apparently brings to nature – articulateness, malleability, freedom from determinacy – that have received so much attention in the recent cultural turn in social thought; and this renewed concern with 'intercultural matters' that has framed so much of the recent interest in globalization (see Robertson, 1992: 33). But as Vicki Kirby argues, one of the most profound but least addressed effects of all the talk of mobility and mutability *within* the domain of culture has been the cementing of the sense of an *outside* of culture that is wanting in these very qualities. Far from undoing the logic of supplementarity, she suggests, the cultural turn of the humanities and social sciences has tacitly bolstered western thought's timeworn binary of active, articulate culture and silent, docile nature (1999: 21). Which is precisely the manoeuvre that Pheng Cheah has observed at work in much of the current cosmopolitan resurgence. 'The accounts of linguistic freedom and cultural flux grounding new hybrid cosmopolitanisms, he argues '... rely on the ...anthropologicistic opposition between nature and culture/language insofar as they regard indeterminism as the exclusive feature of social or discursive formations' (1998: 308).

This is not to argue that the cultural exchange, aesthetic experimentation or linguistic play affirmed by the contemporary reassessment of the cosmopolitan disposition is unwelcome. But if the positing of a 'maleficent' denaturalizing scientific-instrumental culture has problematic resonances, so too does the idea of a 'beneficent' aesthetic culture which does not violate or perturb nature. The invoking of a whole domain of cosmopolitan cultural performances which are environmentally innocuous suggests an ideal of autonomy and containment for the sphere of culture, a vision which arguably coheres only so long as we can still imagine a similar identity for nature. It recalls Derrida's depiction of a 'well-computed binarism' coursing through western thought in which the stuff of the world is 'rigorously divided into remedies and poisons, seeds of life and seeds of death, good and bad traces' (1981:167).

The Turbulence of the Periphery

Floating fluorocarbons, seeping toxins and drifting radionuclides: these are the demon-seeds of the late modern bestiary. What I am taking issue with here is not the act of ascribing malevolence to certain substances, or the corresponding call for precaution. My difficulty is with the way that such decisions, instead of announcing their own institution of a new binary, quietly take their license from a familiar one. Widening the scope of environmental hazards under consideration, however, does not simply deliver us from western thought's default setting, as Bright's verdict on bioinvasion indicates. 'We want a world in which people are as free as possible to travel and to exchange goods and ideas', he declares. 'But at the same time, we *need* a world in which most other living things stay put' (1999:200). Indeed, the distribution of life is an archetype for distinguishing beneficence from maleficence, as Derrida's seminal tropes recall. And it is one which Bauman has deployed to get to the very heart of the modern.

As we have seen, the assumption of territorial and cultural congruence that has underpinned the modern nation-state has as its corollary the need to sort those who belong from those who don't: a process Bauman likens to gardening (1990: 154). But the problem with maintaining gardens, he reminds us, is the inevitable outbreak of weeds: 'the uninvited, unplanned, self-controlled plants' that are ever ready to subvert the established order (1987:51). There is a rich vein of symbolic association of social diaspora and cosmopolitanism with bad seeds, weeds and vermin that could be mined here.² But rather than pursuing such displacements and slippages across the terrain of the cultural, I want to follow Bauman's lead, by fleshing out the metaphor. For in this way, we begin to see how the socio-cultural dimensions of the globalization process depend on, and cannot be severed from, a non-human 'outside'. As Bauman suggests, the figure of gardening arose out of a specific set of transformations in the European metabolism with the physical environment: an intensification of cultivation entailing a new degree of control over vegetable and animal lives. He concludes of this process, that '...by the beginning of the nineteenth century it had by and large been completed in the Western tip of the European peninsula. Thanks to its success there, it also became the pattern to be coveted by, or to be forced upon, the rest of the world' (1987: 51).

Besides being figures of resistance to the ordering process, then, Bauman's weeds are living vegetation, at once biologically autonomous and stimulated by a social technics. But though they may be an undesirable consequence of technological intervention, self-propagating and self-dispersing plant-life has not featured in genealogies of risk, to date. Outbreaks of weeds, it seems, do not present themselves aggressively enough in Europe to qualify as the 'manufactured uncertainty' of agricultural intensification. The role of cultivation's weedy Others, however, begins to take on a different cast if we consider the global ambitions of Europe's 'gardeners'. Bauman has observed how the construction of a 'frontier' city like Brasilia from scratch gave urban architects a chance to instantiate modern criteria of design on a scale that Old World planners could only dream about (1998: 43-5). But the *tabula rasa* that Europeans and their descendants projected onto the lands they claimed abroad went far beyond the spaces cleared for city building. In the temperate settlement zones, colonists set out to reconstruct nature itself from 'the ground up'. As has been said of the New Zealand context, it was the aim of settlers to 'carry with them everything of England but the soil and the climate' (Lamb, 1999: 81). And it is under these circumstances that the relationship between orderly improvement and its unforeseen consequences - as central to the risk society theorists as it is to Bauman - starts to take some interesting and contrary turns.

Through the early experience of colonizing the eastern Atlantic archipelagos- the Canaries, Azores, and Madeiras, Europeans learned that their own plants and animals could thrive in novel environments. And having successfully 'seeded' numerous remote islands with livestock, they also gleaned that 'meat on the hoof' could proliferate without further assistance (Crosby, 1989: 100,175-6). If imposing a new 'order' was the master plan of colonization, at ground level, it appears, a rather different logic was taking shape. In temperate latitudes across the oceans, European colonists found landmasses that seemed to be climatically preconditioned for the flora and fauna they carried with them: so conducive in fact that in much of Australasia and the Americas livestock or semi-domesticates could be turned out to fend for themselves. Which many did, multiplying with an exuberance surpassing even the settler's wild expectations. One eighteenth century estimate put the head of feral cattle in the South American pampa at 48 million, for example, while an approximation of the rabbit population of a single Australian farm in the late nineteenth century stands at 36 million (Crosby, 1986: ch 8; Rolls, 1969: 53-4).

Crosby is unequivocal: such runaway, self-perpetuating irruptions of life remain unmatched in impact by any of the more obviously 'manufactured' transformations wrought by industrial technics:

If the Europeans had arrived in the New World and Australasia with twentieth-century technology in hand, but no animals, they would not have made a greater change as they did by arriving with horses, cattle, pigs, goats, sheep, asses, chickens, cats, and so forth. Because these animals are self-replicators, the efficiency and speed with which they can alter environments, even continental environments, are superior to those for any machine we have thus far devised' (1986:173).

Evidence suggests that temperate colonization would have been much less of an economic success for settlers and even more of an environmental catastrophe had it not been for an unexpected synergy of the invasive complex. Ironically, it is the surprise arrival of weeds - the supposed nemesis of cultivation in Europe - which emerges as the savior of agriculture at the periphery. When Europe set about transplanting its 'superior' cultural and biological forms to the new worlds abroad, the expectation was that its biotic 'lowlife' would not be eligible. But like the rats that so successfully surfed the maritime networks, the seeds of numerous Old World weedy plants hitched their way to the colonies, nestled amongst the licit traffic of empire (Guthrie-Smith, 1999: 246-251).

In a similar way that the contagious micro-organisms endemic to Europeans so often broke the resistance of the 'epidemiologically naïve' populations they encountered, so too did the opportunistic plants of the Eurasian landmass sweep into new lands, establishing themselves at the expense of indigenous flora. As Manuel De Landa observes 'the weed "colonization front" raced ahead of the human wave, as if preparing the ground for it' (1997:153-4). Utterly unadapted to the hoofed grazers and browsers they now encountered in ever-increasing numbers, the indigenous plants of much of the Americas and Australasia were trampled and uprooted, leaving behind them swathes of bare, churned earth. But Eurasian weeds, co-evolved with livestock over many millennia, were used to this sort of turbulence. So too were they often adapted to the particularly aggressive regimes of tree-felling and burning that many settlers embarked upon to create pasture where forests stood. Blanketing the traumatised topsoil, the uninvited Old World weeds at once prevented further erosion and provided fodder for the escalating heads of stock (Crosby, 1986: 288-291, Bright 1999:35-6).

If any text captures this experience of biotic invasion in all its ambivalence, it would be Herbert's Guthrie-Smith's *Tutira* (1999 [1921]): an account of the transformations of a block of pastoral farmland (a 'station' or 'run') in north-eastern New Zealand over the late 19th and early 20th centuries. Considered locally to be not only a preeminent work of environmental history but a literary classic, a metropolitan audience might be bemused to find that the author devotes most of the book's 450-odd pages to tracking the progress of weedy plants across his acreage. 'The annals of Tutira can be read in its weeds', Guthrie-Smith claims (1999: 239), going on to ponder that 'no fresh human addition to station interests and enjoyments can occur without a corresponding movement in plant life, without the influx of a more or less specialized host of uninvited vegetative aliens (1999: 296). Recognizing many of the introductions - both floral and faunal, deliberate and unintentional - as unmitigated disasters, he also acknowledges the occasionally vital role played by opportunistic plants, as in the case of Suckling (*Trifolium dubium*) which established itself in the erosion-prone soil of the East Coast region: 'I never look on this insignificant weed without thankfulness' Guthrie-Smith writes: 'to it I owe my continued ownership of the station; it has produced more wool and saved the lives of more hoggets than any single fodder-plant on the run' (1999: 276)

What makes *Tutira* such an important document of peripheral modernity is the way that it plies the binary between human technics and the forces of the biophysical world. Guthrie-Smith is keen to disabuse us of the idea that our own inscriptions on the landscape constitute a unique event. 'The highway of man is after all but a track better graded and more evenly trodden than that of the sheep, the penguin, the kiwi, the petrel, or the pig', the farmer-naturalist observes (1999: 347), proceeding to give a detailed first-hand account of the many

ways that human path-building and land-marking in the new colony follows the trails and traces left by other creatures (1999: Ch XXII). But so too does he work the nature-culture dichotomy from the other direction, chronicling the way that each human techno-cultural intervention, intentionally or unintentionally, offers new opportunities for other organisms. The 'migration routes' we provide for our convenience are soon appropriated: 'man builds roads and wise animals use them (1999: 346). Each weed finds its own mode of transportation, Guthrie-Smith notes, such as *Setaria verticillata* - which appears where drays and lorries are unloaded, and *Amaranthus deflexus* - which turns out to thrive in the 'soupcon of grease' left by locomotives and other machinery (199:307-8).³ No less than in the case of today's 'techno-epidemics', then, the uncontrollable events that afflict the peripheral hinterland are triggered and broadcast by the human technological apparatus. But Guthrie-Smith never forgets that biological life pursues its own agenda and that it is the interplay of biophysical and socio-technical agencies which afford the biotic runaway event its peculiar potency. And indeed, as far as outcomes are concerned any firm divide between nature and artifice is meaningless. As he concludes: 'to the animals themselves, and indeed in the final result., the sails of a ship are no more than a prolonged gale, the deck of a steamer no more than a drifting timber mass' (1999: 381).

The Archaeology of Mobilism

For Guthrie-Smith, the European settlement of New Zealand is 'an experiment that cannot be repeated' (1999: 382). The evidence of multidirectional traffic he accumulates from the wave-front of colonization militates against any sense of a monolithic or unilinear 'denaturing' of nature, and ultimately seems to compromise even his own distinction between 'seeds good and bad'. But do the biotic runaway events of the temperate periphery, like the even earlier ecological invasions of tropical islands, simply draw back the onset of world risk society by a few centuries? Or do they pose a more profound challenge to current attempts to think globalization 'from below'? Certainly, the hazards of transplanting life provide plentiful evidence to support the normative notion of 'nature' staying put. At the same time, however, the often-observed exuberance of the acclimatized arrival in its host environment gives us cause to ponder its own specific qualities. To put it simply, if it is in the 'nature' of life to hue to its home turf, why exactly are there species from all across the taxonomic spectrum that seem so eager and so well-disposed for relocation?

Any reconceptualizing of the role of weedy opportunists needs to be contextualised within the broader rethinking of life's interplay with its physical environment. Recent decades have seen a shift in the discipline of ecology away from the idea that ecosystems naturally succeed to stable 'climax' communities, toward a more 'discordant' vision in which repeated disturbance is considered to be at least as vital in the shaping of life as is the settling down process (Botkin, 1990; White and Pickett, 1985). By taking into account the impact of periodic natural upheavals at various scales - such as fire, storm, disease, vulcanism, and seismic activity - it is now argued that most 'climactic' communities are actually a fairly heterogeneous mix of relatively mature and more recently perturbed patches. 'Equilibrium landscapes would therefore seem to be the exception, rather than the rule', as White and Pickett conclude (1985:5).

This shift in ecological thinking affords a new prominence to those plants, animals and microorganisms that play the colonizing role after local or large-scale upheavals. Those that arrive on the scene first tend to be 'generalist' species rather than fine-tuned specialists, they are species that can tolerate a broad range of habitats and thus switch niches with relative speed. These are 'weeds' in the biological sense: the opportunistic organisms that snaffle the resources made available by topographical upheaval and the destruction of rival life. Dispersing rapidly, maturing quickly, and breeding prolifically, they reclaim traumatized land, only to be displaced later by more specialized species (Low, 1999: 201-2; Bright, 1999: 24). Or alternatively, the opportunists themselves begin to evolve into more sedentary forms,

at least until they are rebooted into mobilist mode by the next disturbance event (Croizat, 1962: 228-9).

It is 'disaster', then, that stimulates the pressures of selection, at once testing life's tolerance and galvanizing its creativity (White and Pickett, 1985: 8; Margulis, 1998: 151). At least, that is, until it reaches a certain frequency or intensity. Disaster opens up new ecological spaces, and it is the invasion of these spaces, as the biologist Jacques Monod observed, that constitute 'the important turning points in evolution' (1972: 121). 'Weedy' organisms - the hardier, least specialized members of the various classes of life - are the ones most primed to make these evolutionary moves. Botanical weeds in particular evolve rapidly and are the most likely plants to hybridize with near relatives, and to engage in rare - but in evolutionary terms, very important - exchanges of genetic material with organisms which are taxonomically widely separated (Cronk, 1995: 8-9, cf Deleuze and Guattari, 1987: 10-11).

Weeds', in this light, are '...a very respectable and very important part of life' (Croizat, 1962:225). Their lesson, if we might be permitted to learn from biological 'lowlife', is that life shapes itself through mobility. Or that 'nature', in Derrida's formulation, has 'always already escaped' (1976:159). So deeply engrained is life's own capacity for 'border-crossing' that weed scientists are often faced with a serious dilemma when it comes to deciding what constitutes an exotic invader:

The reviews of paleoecological data remind us that invasion by NI (non-indigenous) species is not qualitatively different from the progressive assembly and migration of IN (indigenous) plants, which are constantly in flux...invasions have occurred constantly through evolutionary and ecological time; it is only the rate that has been altered by human action. Invasion is a natural biological process (Huenneke, 1997: 102).

A consideration of the historical dimensions of the human role in the dispersal of other species only makes the dilemma more profound. Ecologically speaking, the reason why Bauman's 'uninvited, unplanned, self-controlled plants' quickly follow any attempt at cultivating order is because the physical effects of cultivation itself - disturbance of the soil and radical simplification of the life it supports - reproduce the very conditions that weedy, opportunistic organisms thrive on (Low, 1999:202-3). But arable farming is far from our first major insertion into the regimes of ecological perturbation. Fire is one of the most widespread and significant of disruptive forces, and evidence for its earliest deliberate use draws us back some 1 to 1-6 million years to the era of *Homo erectus* (Pyne, 1997a: 3, 25). Paralleling the reassessment of disturbance in the shaping of ecological communities, then, is a growing appreciation of the extent to which all human social formations - historically and geographically - have modified the landscapes in which they dwell (Cronon, 1993: iix-ix).

In contrast to theorists of risk society, who persist in depicting pre-industrial people as passive and superstitious victims of 'natural' disasters (see for example Beck, 1995: 77-8 and Giddens, 1990: 30), environmental historians and paleoecologists note the prevalence of extensive ecosystem management. Stephen Pyne goes so far as to claim that at the time of 'first contact' many of the landscapes of the Americas and Australia 'were as fully anthropogenic as any found in Europe' (1997b: 26). Like the distinction between indigenous and introduced species, the ubiquity of intervention renders the dividing line between social impact and non-human perturbations a blurry one. In many cases, 'distinguishing between these two forms of disturbance is difficult, and moreover, may be unimportant due to similarities between the effects of natural and human induced disturbance events' (Adair, 1995: 189; see also Pickett and McDonnell, 1993: 313).

The point, then, is not to push back the historical location of the 'end' of nature, but to recognize that disturbance, like mobilism, invasion, and hybridization, is endemic to the

living world. Which is one way to problematize an environmental cosmopolitanism that would weave a political culture around the moment of nature's final demise, and around the particular technics charged with the precipitation of this moment. 'Our epoch has taken progress so far that a minimal exertion may relieve everyone of further exertions', Beck claims: 'Ours is the age of the smallest possible cause for the greatest possible destruction' (1995:4). But other eras and other places, from a mid-Pleistocene Africa inhabited by fire-wielding hominids onwards, have witnessed their own versions of the runaway, self-propagating 'disaster', for better or worse. Far from 'negating' nature, such events are possible only because the physical world is itself, in part, constituted by non-linear events; by upheavals, outbreaks and contagions. And this means, as the settlers of the colonial periphery (re)discovered, a relatively minor intervention could quickly irrupt into a 'catastrophic' change of state, one which could be generative or destructive depending on circumstances (see Deleuze and Guattari, 1987: 503, De Landa, 1997: 14).

Those people who have inhabited regions over much longer time-scales – who we term 'indigenous' or 'traditional' – are no less reliant on 'flows of grass, water, herds... or matters in movement', as Deleuze and Guattari have noted (1987: 410). It is not that these cultures simply preserve ecological 'equilibrium', but that they have learned to work with the volatility of material life. Having accrued over many generations the sort of tacit knowledge which enables critical transition points to be recognized, they have increased their own likelihood of tapping into, channelling or unleashing flows without triggering catastrophe (see Deleuze and Guattari, 1987: 404-14; cf Wynne, 1996; 70-72, Dickens, 1996: 116-121). And many of these flows, like wind and water currents, or the migration of fish and birds, have always been global in scale.

But what of the globally resounding transition in Western Europe that Bauman described: the shift away from working with and through the complex mobilities of matter and life and into a whole new level of control of the biophysical flux? (1987: 51-3, see also Urry, 2000b: 186). It is certainly an interesting irony that a new insistence on containment and regulation should ultimately set in motion a novel world-altering proliferation of human/non-human hybrids. But is the implication here that it is a mutation *internal* to the realm of culture, within this particular region, that transforms the metabolism with the physical environment? For, if this were the case, then the assumption would seem to be that the blurring of the nature/culture binary has worked in one direction only - a movement issuing from culture and taking nature as its object. This, of course, sets up the currently observed impact of a 'debased' materiality on social life as a new and profound shift, one in which 'our relation to reality has been fundamentally transformed' (Beck, 1987: 155), even as it perpetuates the idea that the new efficacy of matter is itself culture's doing.

But the question this begs is whether the novelty of the current moment is being inflated through a discounting of all previous feedback effects between the social and the biophysical. What is suggested by the events of the temperate periphery, and by the longer history of the social interchange with mobile, opportunistic biological matter is the porosity of the nature/culture binary 'from below' as it were: the always-already pervious character of every socio-cultural formation to biophysical differences and transmutations. So in this sense, as well as pondering the impacts of the European imperium on the stuff of the rest of the world, we need to consider how the materiality of the temperate northwest inscribed itself into the dynamics of the cultures it hosted.

Materiality and the Metropolis

Once tarnished by racism, the idea that biology – or rather, the spatio-temporal unevenness of the biophysical – might have contributed to the early European success in the globalization process is again receiving serious consideration. Where Darwin speculated that the more specialized or 'higher' life-forms of the North had a competitive advantage over those of the

South (1996: 272), later ecologists have taken a different tack, partially inverting Darwin's thesis to draw attention to the unusually under-specialized character of European biological life. With regard to its biota, 'Europe suffered far the greatest catastrophe and impoverishment' in the last phase of glaciation, Elton has pointed out (1958:44). Not surprisingly, the plants, animals and microorganisms that rushed in to colonize the nutrient rich post-glacial terrain – some 10,000 years ago, were a weedy, opportunistic lot. But whereas this 'riotous swarm' might be expected, in large patches at least, to have given way to more sedentary and specialized ensembles, one particular arrival turned out to play a vital role. Very early on, *Homo sapiens* joined the biotic influx (Pyne, 1997a: 19-20). Because of this timing, and in particular because the inflowing hominids came equipped with agricultural technologies, they were able to have an impact on Europe's subsequent ecological development unmatched on any other landmass. 'Humans' as Pyne puts it 'were seizers of disturbed sites who had the capacity to further disturb' (1997a: 20). Burning, tilling, digging, and trampling the ground with their accompanying fauna, they kept the region in a state of sustained trauma, selecting constantly in favour of the most tenacious, disturbance-loving biota, and against more vulnerable, specialized forms.

In this way, a uniquely co-evolved and interdependent collection of plants, animals, microorganisms and human technics established itself in post-glacial Europe (Pyne, 1997a: 34-9; Flannery, 1994: 304).

And it is the characteristics of this weedy assemblage - notably its resilience and disturbance-centeredness - that enabled both the domestic intensification of cultivation that Bauman noted, and its phenomenally successful export to other temperate regions. Moreover, as Pyne notes, Europe's lack of a definite fire season allowed an unusually high degree of control over burning, which was an important precondition for the substitution of the 'contained fire' of industrial fossil-fuel for the energy formerly made available through free-burning fire. In this way, the industrializing societies emerged as the first major exception to the multi-hued tradition of the torching of living biomass by the human species (Pyne, 1997a: 4, 29). In other words, while neither the endogenous transformation of Europe, nor its overseas expansion can be reduced to biophysical determinants, there is none the less a vital conditioning role played by biomaterial specificities of the European peninsula.

What seems to be crucial, is that at the time of transition to the 'modern' intensification of the metabolism with the physical environment Europe is able to carve out 'a colonial outfield to the metropolitan infield' (Pyne, 1997b: 23). At the same time as they tighten up the channelling of matter-energy on the home front, Europeans engage in a massive loosening or rending open of analogous flows in distant regions. Already cushioned by their exceptionally resilient biota and stable agricultural ensemble, metropolitan Europe buffers itself still more securely from the risks that attend the metabolism with living matter, as its expansion abroad at once dramatically increases the likelihood of catastrophic ecosystemic disturbances on the periphery. Beck, Giddens and others may be correct, in this sense, about a certain circumscribing of risk in classical industrial (and energy-intensive agricultural) society, but there is little evidence that they are sensitive to the global-scale trade-off through which this reprieve was bought.

While the export of the European agricultural ensemble may have played havoc with overseas ecosystems and the indigenous regimes that managed them, there were lessons to be learned from living in the midst of 'manufactured uncertainty' on such a scale. As Richard Grove observes: '(t)he environmental attitudes of Europeans at the temperate metropolises and those settled at the periphery of expansion underwent considerable and divergent transition' (1995: 24). As the European metropolises ballooned on globally pilfered flesh and fuel, their populations grew ever more distant from the flux and the volatility of the biophysical world. It was in this context, as Pyne notes, that urban intellectuals came to view all free-ranging fire as 'an atavism, as disorder and destruction', resulting in widespread suppression of the surviving vernacular regimes of fallow-burning (Pyne, 1997a: 4). But an almost inverse

experience characterized the temperate periphery, where it was difficult for anyone to fully detach themselves from the 'flows of grass, water, herds' and other biomaterial elements. And where, amidst the trial and error of the colonization process, any opportunity to work *with* runaway, self-propagating events was seized upon.

The European metropolis was also host to increasingly heterogeneous flows of commodities, ideas and peoples. Most city dwellers developed a working knowledge of the ebb and flow of cultural materials around them, and learned through experience and experiment how to make a variety of more or less adept intercessions in these movements. Those we have come to term 'cosmopolitan' were simply the most reflexive about this process, the most acknowledging of the various 'uses of disorder' (see Sennett, 1996). But, in what became the template for urban life throughout much of the world, the productive use of the city's cultural turbulence and 'combinatorial richness' (see De Landa, 1997: 98) came to be viewed entirely apart from the daily interventions into the flux of organic and inorganic 'life' that were played out beyond the city (and indeed, less visibly within urban space itself).⁴ Those who celebrated their own artfulness in negotiating cultural-linguistic flows, in other words, generally failed to see any resonance between their skills and the 'arts' of those managers of ecosystems throughout the planet's hinterlands who also monitored and channelled complex flows.

This division, as I have intimated, survives intact in the current environmental cosmopolitan synthesis. That is, both its constitutive strands - the environmentalist belief in a nature which 'stays put' and the cosmopolitan celebration of culture free of groundedness and material responsibilities - can be seen as derivatives of the same metropolitan detachment from the daily dynamics of bio-materiality. And it is in this sense that the experience of the colonial periphery might offer an alternative, though not necessarily 'safer' articulation; one which draws together recognition of the material implications of the cosmopolitan with a feeling for the mobilities that inhere in the ecological. While I suggested above that all 'traditional' ecosystem management involves working with material flows and sedimentations - some of which are spatially far-reaching, we have also seen how the imposition of new settler regimes brought an unprecedented globality to this material flux. In this light, we might imagine a variant of the 'cosmopolitan' particular to the colonial periphery. No less than metropolitans, peripheral populations confronted 'the daily metamorphosis of external things' (Baudelaire, 1964: 4): but these things included at once the forms and expressions we gather under the rubric of 'culture' (both imported and local), geological elements (frequently destabilized) and a volatile blend of life forms (recent arrivals and longer term inhabitants). And while the cities of the centre may have presented vistas pulsing with 'the ephemeral, the fugitive, the contingent', the settler formation could offer entire landmasses convulsing with the shock of the new. As one naturalist noted of late 19th century New Zealand, the island's ecosystem 'had reached a point at which, like a house built of incoherent materials, a blow struck anywhere shakes and damages the whole fabric' (W. T. L Travers, cited in Crosby, 1986: 267).⁵

Environmental Cosmopolitanism 'From Below'

Perhaps, of the new arrivals at the periphery, it is Guthrie-Smith - the chronicler of the weed - who comes closest to developing a cosmopolitan environmentalism with contemporary relevance.⁶ Consonant with his attempt to move away from a rigid nature/culture dichotomy, he is able to combine an informed concern about the ecological impact of introduced species on local wildlife, with an abiding fascination with whatever 'turns up'. 'Each ride beyond the run contained the element of anticipation, of hope, the possibility of the discovery of a new wayfaring alien' Guthrie-Smith writes, demonstrating an openness that on occasion extends beyond tolerance to a considerable empathy for the non-human organism which struggles to accommodate itself to a new environment (1999: 278, see also 297,351). For today's cosmopolitans, his keen awareness that all social activities - cultural pursuits as well as

economic interventions - potentially contributed to the dissemination of life is a salutary one (see 1999: 240).

But the same lesson can be learned in a more dramatic way if we take into consideration the events which helped produce the capricious biology of the temperate periphery. For it was not simply the ordering drive that brought new life to the colonies: throughout the European settler colonies local organizations and government bodies colluded in projects of acclimatization that moved well beyond the 'functionality' of the European agricultural ensemble (Low, 1999: ch 5; Bright, 1999: ch 6; McDowall, 1994). From around the mid 19th century, the largely unidirectional traffic of familiar European biota ceded to multi-lateral exchanges that criss-crossed the tropical and temperate zones: 'English acclimatizers wanted wombats, wonga pigeons and Murray cod, ' Low reports, 'New Zealanders imported possums, parrots and prawns, and India received wallabies, cockatoos and swans' (1999:33). As antipodean enthusiasts for the empire-wide exchange of 'Animals, Birds, Fishes, Insects, and Vegetables' concluded in their memorandum of 1863: 'unlimited scope is afforded for almost any variety of experiment' (cited in McDowall, 1994:12). Never much more than a marginal and eccentric endeavour in the metropolis (see Lever, 1992), acclimatization at the temperate periphery effectively commandeered entire continents for these experiments: Australian biologist Tim Low concluding rather despairingly that 'the acclimatizers were true internationalists with the whole world in their sights' (1999:32).

While the 'official' era of acclimatization is all but over, the 'escape' of exotic garden plants, aquaria organisms and other pets has a profound and growing impact on ecosystems throughout the world. Low points out that garden plants already dominate his country's 'worst weeds' lists, as he presents a case that 'gardening is harming Australia's environment more than mining' (1999: 296, 72-3). In this way, as evidence from many other regions corroborates, the 'cosmopolitan' taste for the exotic and experimental has been, and remains, as much of an environmental threat as many of the most intrusive instrumental interventions. So while the current wave of bioinvasions supports the environmental –cosmopolitan claim that ecological hazards and other artifacts share the same networks, it profoundly challenges the assumptions that 'good seeds' and 'bad seeds' can be distinguished on account of the degree of instrumental intent or level of technological manipulation involved. As it raises fundamental questions about any positing of the 'aesthetic' as the crux of a salvational 'other modernity'.

If the experience of the colonial periphery offers the lesson that not every aesthetic intervention is innocuous, so too does it offer reminders that not all self-catalysing, non-linear events are catastrophic. For all the obvious attraction of new modes of environmental political organization 'from below', the metropolitan bias of both activists and commentators is revealed in the overwhelming emphasis on '*decelerating* action' (Beck, 2000c: 217) at the expense of those interventions which trigger, or work through the unbinding of flows. Beck's own example of shipping insurance as the paradigm of an earlier 'calculable risk' (1995: 107-8) has a revealing counter-side. The calculations of the metropolitan insurance company offered little succour to the mariner on the 'frontline', prompting explorers, pirates, sealers and whalers to engage in the more substantive life-insurance of seeding remote islands with edible animals – as we have seen (see Crosby, 1986: 175-6). A practice which, in the light of the more general ecology of colonization, is perhaps equally paradigmatic. More often, for those committed to a subpolitics of subsistence, fire has been the preferred agent of freeing up sedimented matter-energy. In early modernizing Europe, and subsequently all around the colonial periphery, metropolitan-based sanctions against free-burning were met with outbreaks of fire-setting by local or indigenous people intent on reestablishing their own means of managing bio-energetic flows (Pyne 1997b: 26; 1997a 490). And still, on the old temperate periphery, unbinding bio-material fluxes surfaces from time to time as a subpolitical act by those who believe they know the local terrain well enough to work with its volatile aspects. This has included, in the New Zealand case, both the intentional spreading of

gorse seed by environmentalists to take erosion-prone farmland out of production, and the recent ill-fated release of calicivirus by farmers wishing to control rabbit populations on their land (Clark, 1999).

From mustelid introduction to mistimed releases of myxamatoxis, many of the periphery's attempts to counter the runaway event with a further unfettering bear out Bauman's claim that 'catastrophes most horrid are born - or likely to be born out of the war against catastrophes' (1992: 25, cf Low, 1999: 270). This may speak more of inadequate tacit knowledge or a failure to learn from experience, however, than of total strategic misdirection.⁷ Certainly, there are many cases of technologically-induced material-energetic 'deterritorialization' that call for restraint – particularly in cases where latency or invisibility inhibits vernacular understanding, as Beck has rightly insisted (1992: 21-3, 53-5). But only a political constituency that has become impervious to the quotidian wanderings and convulsions of material life would extrapolate from these events to materiality in general. What the consideration of biological matter's own mutability and mobilism suggests is the corresponding need to unleash flows and promote viscosity where excessive regulation or containment now reigns (see De Landa, 1992: 155-61). As Pyne has shown, 'the demonization of fire', to give one example, has greatly contributed to our physical insecurity (1997a: 546) to the point that many nature-loving inhabitants of the leafy urban fringe now have far more to fear from forest fire than from nuclear conflagration. In this regard, the recent questioning of the idea of 'pristine' and imperturbable wilderness areas, and the tentative return to free-burning and other traditional modes of ecosystem management in certain parts of former periphery (see Pyne, 1997b: 25, 1997a: 536-43) seem to offer intimations of alternatives to metropolitan-dominated environmentalism.

Perhaps, then, a more fully cosmopolitan environmentalism might be closer to Baudrillard's notion of a 'a malificent ecology - one which treats evil with evil' (1994: 79); if evil is the term we give to those transformational processes that we will never entirely control. In this sense, the liberation of socio-cultural life from the hold of 'native soil' is not enough, if in the process it conceptually condemns soil and all the life implicated with it to some sort of unspoken extra-cultural indifference and political irrelevance. At the same time, any attempt to redeem the political purchase of material life's own opportunism that simply imports a measure of biophysical agency to cover for a perceived lack in existing environmentalist programs leaves the logic of supplementarity unperturbed. For, as Kirby argues, biology and geology are no more culture's missing additive than culture is theirs (2001: 62-3). What we need to consider, at once is the mutability and articulateness inherent in material life and the material-energetic implications of all cultural flux. In this light, there is no rigid boundary separating *our* 'cosmopolitan dispositions' from the proclivity to wander, the tolerance of disturbance, or the experimentalism proper to biophysical materiality – thus opening 'globalization from below' into a literally bottomless deferral. If there are lessons that we can draw here from those moments of colonial history that highlight the volatility of material life and the potential 'uses of disorder' in the context of the current environmental predicament, we should also heed Paul Carter's words. 'Living in a new country is not an eccentricity' he writes; 'it is the contemporary condition' (1992:8).

Notes

¹ Chapter title from Douglas Coupland's novel *Generation X* (1991).

² See for example Elton, who compares the invasive organism to the immigrant (1958:117), or Guthrie-Smith who makes the comparison between the oppression of Jews and the control of weeds (1953:297).

³ cf Deleuze and Guattari: '...cultural or technical phenomena provid(e) a fertile soil, a good soup, for the development of insects, bacteria, germs, or even particles' (1987: 69).

⁴ For a complementary paper to this one that explores the biophysical dimensions of urban life, see Clark (2000).

⁵ Although it does not preclude the redemptive reading of certain moments of peripheral experience that I am proposing here, a more dichotomous view of 'unnatural' aliens versus native species, which is much more reminiscent of the metropolitan culture/nature binary, has subsequently established itself amongst the settler cultures of the temperate periphery (see Morton and Smith, 1999).

⁶ The response of the longer-established or 'indigenous' peoples of the periphery to the ecosystemic disturbances triggered by European colonisers raises issues too complex to be addressed here. For an intriguing introduction to Aboriginal attitudes toward 'invasive' species, see Nick Smith (2000: ch 6).

⁷ While far from a cure-all, 'biocontrol' - the use of natural predators to counter invasive species - has had many successes. Wider use of pathogenic micro-organisms, including genetically-modified organisms, to control invasive species is an important area of research in invasive biology (see Bright, 1999: 218-24).

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