

Industrialism and the Fragmentation of Temporal Structure

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Industrialism's assimilation of the natural world has developed over centuries through complex hierarchies of effects involving ecological, cultural and psychological dimensions. One of the consequences of this assimilation, I argue, is the fragmentation of the temporal structure of the world, and its replacement by a short-term logic that also infects human subjectivity. Because of this fragmentation, the healing of the natural world cannot be realised either simply or directly, and effective action will require us to locate our immediate objectives within a recovered longer-term vision of a healthy natural world.

INDUSTRIALISM'S ASSIMILATION OF THEORY AND PRACTICE

As the industrialist colonisation of the planet grows in grasp and sophistication, so the conceptual and ecological distance between our present situation and the type of world we might consider 'healthy' grows ever greater. Under these circumstances, ecological restitution becomes less a straightforward, one-step process of reintroducing native species, eliminating destructive exotics, and demolishing roads or dams, and more a matter of trying to rematerialise an ecological system whose very form, as well as the current constituents of this form, are disappearing. This being the case, restitution will necessarily involve a long-term strategy involving a number of stages; and the initial, short-term, stages may not be immediately or obviously benign.

However, industrialism does not act only on the world outside us: it also distorts the human psyche, and our subjective sense of time is being appropriated in a way that makes long term planning more difficult. In Christopher Lasch's words, in our own lives as well as in our models of the world, we are losing "the sense of belonging to a succession of generations originating in the past and stretching into the future."¹ Similarly, Richard Terdiman points to the 'memory crisis', involving an "uncertainty of relation with the past", threatening "the very coherence of time and of subjectivity" and causing "the disruption of organic connection with the past."² In this situation, the obliteration of temporal integration in the natural world is accelerated

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¹Christopher Lasch, *The Culture of Narcissism* (New York: Norton, 1979), p. 5.

²Richard Terdiman, *Present Past: Modernity and the Memory Crisis* (Ithaca: Cornell University Press, 1993), pp. 3, 5.

and concealed from us by our own progressive loss of temporal awareness, in a vicious cycle of destruction that Anthony Weston has referred to as 'self-validating reduction'.³ A related notion is captured in Peter Kahn's concept of 'environmental generational amnesia': lacking any more fundamental notion of ecological health, each new generation takes the world as it finds it as 'normal' or 'healthy', and responds critically only to further degradation.⁴

This is a moral as well as an ecological and psychological issue. If life has to do with continuity and integration, and if the defence of life is an ultimate good, then the integration of past, present, and future becomes a moral priority; and equally, their disintegration constitutes a moral collapse. While ecology has emphasised the integration of life in the present, it has been less comfortable in modelling temporal integration; and the central claim of this paper is that our diminishing awareness of temporal structure as an essential ingredient of ecological health is hampering the effectiveness of the environmental movement. This suggests the need for a distinction between long- and short-term aims, incorporated within a vision of a healthy, temporally integrated, world. Short-term ethics, on the one hand, involves what is possible within existing political, ecological, and ideological realities; whereas long-term ethics envisions different realities, so that objectives which may be quite unrealistic in the short-term become reasonable in the long-term. I will illustrate these points with reference to the debate over wilderness preservation.

THE DISSOCIATION OF THE PAST

Our vision is inevitably restricted by the anthropocentric realities of our era; and the natural order, rather than being the transcendent context of human thought and action, has come to be viewed as dependent on human thought and action. Kate Soper, for example, argues that ". . . the human impact on the environment has been so extensive that there is an important sense in which it is correct to speak of 'nature' as itself a cultural product or construction".⁵ This implies that nature is a presently existing state, rather than the evolutionary process which has made this state possible, along with many others not yet realised. While this process, together with the range of possible states it suggests, has indeed been reduced and impoverished by industrialism, views such as Soper's deny the temporal integration and continuity of the natural world, elevating a particular, and arguably pathological, historical situation into a taken-for-granted foundation of theory. To define 'nature' solely by reference to an impoverished present is rather like defining an individual as 'unemployed', 'anaemic', or 'asleep': just as we would protest that we are much more than any of these single conditions, so a more complete awareness of nature will include its history and future potentialities, together with the entire temporal ecology that relates them. A drawing-in of memory and imagination is occurring at the same time as the long-term effects of industrialisation are ever more effectively colonising the future, so that the

³Anthony Weston, "Self-validating reduction: Toward a theory of environmental devaluation". *Environmental Ethics* 18 (1996), 115 - 132.

⁴Peter Kahn, *The Human Relationship with Nature* (Cambridge, Mass.: MIT Press, 1999).

⁵Kate Soper, *What is Nature? Culture, Politics, and the Non-Human* (Oxford: Blackwell, 1995), p. 152.

gap between the temporal reach of theory and the extent of future time affected by industrialism is steadily growing. If theory complacently settles within a specific set of social and environmental conditions, it becomes incapable of recognising either the historical or ideological contexts from which these conditions arose, or the possible alternatives that might develop. Take, for example, Bruce Braun and Noel Castree's assertion that

. . 'first nature' is replaced by an entirely different produced 'natural' landscape. The competitive and accumulative practices of capitalism bring all manner of natural environments and concrete labour processes upon them together in an abstract framework of market exchange which, literally, produces natures(s) anew.⁶

What is repressed here is the continuity between past and present, and the unfolding historical narrative of nature's replacement by the industrial order. A new, capitalist 'nature', supposedly, simply supersedes an outdated one; and the ideological character of this process is ignored. The very word 'past' has taken on the evaluative overtones of obsolescence and outdatedness, as if present structures not only need have no connection with past structures, but in fact should distance themselves from the past. According to Braun and Castree, capitalism has replaced ecology in our understanding of nature, since the latter "has offered only weak understandings of the nature and materiality of transformed environments."⁷ Such capitulations disguised as theoretical advances are only possible through the forgetting of our rootedness as one particular species within larger patterns of natural evolution, and the assimilation of the past and the future to an all-consuming industrialist present. As Alf Hornborg has noted, the consequence is a rejection of any moral demands that the past or the future might make on the present, dissolving

any distinction between the modern and the premodern as a modern fabrication. *Gemeinschaft* is now nothing but a fabrication of *gesellschaft*, and the ecologically sensitive native merely a projection of industrial society. The rather remarkable implication is that, in the course of the emergence of urban-industrial civilisation, no significant changes have been taking place in social relations, knowledge construction, or human-environmental relations. The closely knit kinship group, locally contextualised ecological knowledge, attachment to place, reciprocity, animism: all of it is suddenly dismissed as myth . . . there emerges the new but implicit message that we have always been capitalists.⁸

In the industrialist world, non-industrialised lifestyles and non-instrumental awareness of nature are relegated to a 'past' that is dissociated from the present; and wilderness areas become what Pierre Nora calls "sites of memory (*lieux de mémoire*)" rather than "real environments of memory (*milieux de mémoire*)".⁹ Nora argues that

⁶Bruce Braun and Noel Castree (eds.), *Remaking Reality: Nature at the Millennium* (London: Routledge, 1998), p. 9.

⁷Braun and Castree, *Remaking Reality*, p.13.

⁸Alf Hornborg, "Ecological embeddedness and personhood: Have we always been capitalists?". In Ellen Messer and Michael Lambek (eds.), *Ecology and the Sacred: Engaging the Anthropology of Roy A. Rappaport* (Ann Arbor: University of Michigan Press, 2001), p. 90.

⁹Pierre Nora, "Between memory and history: les lieux de mémoire." *Representations* 26 (Spring 1989), 7 - 25.

such sites of memory are fundamentally remains, the terminal embodiments of "a memorial consciousness that has barely survived in a historical age that calls out for memory because it has abandoned it."¹⁰ In this vein, much contemporary social science treats the past in much the same way as a taxidermist treats a wild animal, converting it from a living influence to a "myth of an original union with nature ... nostalgia for a better-then-present world, a looking backward to a place and time not spoiled or polluted or industrialised"¹¹, the outcome of an "edenic narrative ... of origins and purity"¹².

This stance can be traced to the Renaissance, when people "came to see the ancient past from a 'fixed historical distance' – just as artists came to see the physical world from a fixed distance."¹³ There is thus a parallel between the development of a spatial detachment from the world – a detachment that is the basis of 'objective' science – and the temporal detachment that makes the past irrelevant to current concerns. The metaphor is an industrialist one of obsolescence and replacement rather than an organic one of rootedness and growth. According to this logic, the past only exists as it is represented in the present. It may be represented as the same; or as alien, 'primitive', incomprehensible; or it may be assimilated into the present as tourist artefact, museum-piece, or raw material. Each of these representations serves the same purpose: to destroy the temporal structure of the natural order that integrates past, present, and future, and so make the industrialist assumptions of the present appear to be the only possible assumptions on which to base human life. Consequently, wilderness areas lose their moral and ecological relevance to our own lives, becoming merely relics of what used to exist, "no longer quite life, not yet death, like shells on the shore when the sea of living memory has receded."¹⁴ Visiting them, we become tourists to the past in the same way that cultural alienations make us tourists to other societies.

As these assumptions colonise environmental writing, a nature previously experienced as partly 'out there', as extending spatially and temporally beyond industrial civilisation, is disappearing from the environmentalist vision, to be replaced by a nature which is itself "remade in the image of the commodity"¹⁵:

Nature has become commodified all the way down. . . . [it is] 'the new box office star' of corporate capital, the subject of new sites and modalities of accumulation.¹⁶

Such an industrialised 'nature' includes almost anything, and so ultimately becomes meaningless. If even wilderness areas are supposedly 'constructed by humans', for example, then it is clear that the natural and humanly fabricated worlds as overlapping

¹⁰Nora, "Between memory and history", p. 12.

¹¹Gretchen Legler, "Body politics in American nature writing: who may contest for what the body of nature will be?". In: Richard Kerridge and Neil Sammells (eds.), *Writing the Environment: Ecocriticism and Literature* (London: Zed Books, 1998), p. 72.

¹²Braun and Castree, *Remaking Reality*, p. 24.

¹³Anthony Grafton and Nancy Siraisi, *Natural Particulars: Nature and the Disciplines in Renaissance Europe*. (Cambridge: MIT Press, 1999), p. 14.

¹⁴Nora, "Between memory and history", p. 12.

¹⁵Braun and Castree, *Remaking Reality*, p. 4.

¹⁶Braun and Castree, *Remaking Reality*, p. 43.

but distinguishable entities have been replaced by a single industrialist order which has "consumed and lost its other"¹⁷.

This conflation of the fabricated and natural realms is also achieved by the superficially different view that industrial processes are inherently 'natural'. If, for example, "man is a natural, a wild, an evolving species not essentially different in this respect from all the others [and therefore] the works of man ... are as natural as those of beavers, or termites, or any of the other species that dramatically modify their habitats"¹⁸, we overlook the entire historical process whereby industrialism has come to oppose and dominate nature. It is characteristic of such claims, which are themselves symptomatic of an industrialist colonisation whose grasp now includes most of academia as well as the commercial world, that they interpret our current situation in terms of a natural evolutionary process that has in fact been profoundly undermined by industrialism. It is the responsibility of the critical environmental theorist to be aware of long-term historical patterns; for without this awareness our understanding of industrialism's assimilation of the natural world remains incomplete and superficial.

Consistently with the redefinition of nature as a product of industrial civilisation, a historical revisionism is occurring which claims that nature was never undomesticated, and that ecosystemic health was always a product of human intervention. It has become commonplace, for example, to argue that "because of human intervention, everything in the world is different from what it naturally would be, and so everything in the world has in a certain sense become an artifact"; and since no forest is "pure wilderness", "the end of nature has always already occurred"¹⁹. But this argument assimilates a continuity of natural differences to the requirements of discursive logic. Beginning with two categories – 'untouched wilderness' and 'human artefacts' – the assumption is that a natural landscape must fall into one category or the other.²⁰ What has happened here is that the nuances of natural reality have taken second place to the cognitive requirement for logical clarity.²¹

¹⁷Ulrich Beck, *Risk Society: Towards a New Modernity* (London: Sage, 1992), p. 10.

¹⁸J. Baird Callicott, "The wilderness idea revisited: The sustainable development alternative." *The Environmental Professional* 13 (1991), p. 241.

¹⁹Steven Vogel, "Environmental philosophy after the end of nature". *Environmental Ethics* 24 No. 1, (2002), p. 24. Other examples of this sort of argument can be found in: William Cronon, "Introduction", In William Cronon (ed.), *Uncommon Ground: Rethinking the Human Place in Nature* (New York: Norton, 1996), p. 69; Arturo Gómez-Pompa and Andrea Kaus, "Taming the wilderness myth". *BioScience* 42, 1992, p. 274.

²⁰This is a specific example of the shortcomings of the more general industrialist attempt to model nature through a cognitive understanding whose rules only partially overlap with those of the natural world. As Eleonor Rosch argues in "Universals and culture specifics in human categorisation" (in R. W. Brislin, S. Bochner, and W. Lonner (eds.), *Cross-Cultural Perspectives on Learning* (New York: Wiley, 1975), p. 178), "the prevailing 'digital' model of categories in terms of logical conjunction of discrete criterial attributes is inadequate and misleading when applied to most natural categories".

²¹See my "Nature's Memory: Restoration and the Triumph of the Cognitive", in Robert France (ed.), *Healing Nature, Repairing Relationships: Landscape Architecture and the Restoration of Ecological Spaces and Consciousness* (MIT Press, forthcoming). Hugh Brody, in *The Other Side of Eden: Hunter-Gatherers, Farmers, and the Shaping of the World* (London: Faber and Faber, 2001), p. 255, also argues that abstract thinking "makes use of analytic categories that are independent of any particular geography", and

But not only do such statements impose our conceptual simplifications onto more complex natural and cultural realities: they also project the destructiveness of industrial lifestyles onto nonindustrialised peoples. Human activity may destroy nature or it may participate in nature, depending on the character of the larger cultural or ideological systems within which the activity is framed. The changes wrought by small-scale slash-and-burn farming, for example, are temporary, readily reversed, and often integrated within existing natural cycles. In contrast, the much more long-lasting changes caused by high levels of atmospheric carbon emission, loss of topsoil due to modern agriculture, or dumping of radioactive waste are more likely to interrupt or obliterate the temporal dynamics of ecosystems; and in this sense they are not 'natural'. The argument that industrial society simply extends natural processes, therefore, rests on the denial of temporal structure.

The results of this denial are apparent in environmental writing. If we are 'freed' from the awareness of how the present has evolved out of the past, or of the history of the technological society that has emerged to consume nature, then it becomes possible to claim that "wilderness . . . is as easily found in the city as in the vast rain forest"²², so that it is a "delusion [to consider] that cities are not part of nature"²³; or that "'nature' has become viewed as that which is outside cities, yet it is everywhere in cities (as parks, electricity, or even automobiles)".²⁴ Freed from its organic connection with the past, the present becomes defined by an unknowable future that we are sucked helplessly towards – a helplessness that is illustrated by the widespread and uncritical acceptance of this future as somehow inevitable.²⁵ There is a vicious circle here; for the problem is not just that we destructively apply our dehistoricised notions to the natural world, but also that a reduced world also depletes our imagination. As Gary Nabhan puts it,

Camps abandoned, wells gone dry, tinajas drained or spoiled by livestock. Sheep populations corralled into smaller and smaller areas, where they are more vulnerable to birth defects rising out of shallow gene pools or to decimation by exotic diseases. And seasonally migratory bands of desert people being corralled as well, told to stay put on reservations or being enslaved to cotton farmers. What is being lost is more than a chunk of desert nature. More than a waning of native culture. What is being lost is a capacity for a long, deep relationship between wild animals and cultural traditions . . . I am worried that as desert sheep slip out of sight, then out of mind, then out of dreams, a vacuum is created not only among desert people but among all people . . .²⁶

that the "law of the excluded middle" does violence to hunter-gatherer and, more widely, natural realities.

²²Wade Sikorski, "Building wilderness"; in Jane Bennett and William Chaloupka, (eds.), *In the Nature of Things* (Minneapolis: University of Minnesota Press, 1993), p. 29.

²³Stephen R. L. Clark, *How to Think about the Earth* (London: Mowbray, 1993), p. 25.

²⁴Roger Keil and John Graham, "Reasserting nature: Constructing urban environments after Fordism". In: Braun and Castree, *Remaking Reality*;, p. 102.

²⁵I owe this idea to Eileen Crist.

²⁶Gary Paul Nabhan, *Cultures of Habitat: On Nature, Culture, and Story* (Washington DC: Counterpoint, 1997), p. 182.

So it is that our imagination shrinks to fit a shrunken world; and what is possible becomes what is possible within industrialism.

TEMPORAL STRUCTURE

We have become used to thinking of the natural world in terms of presently existing states; but its intelligence and purposefulness only become apparent if we recognise the temporal ecology that links past, present, and future. For example, comparing the ethologist Tinbergen's fragmented understanding of stickleback behaviour with Darwin's more empathic account, Eileen Crist remarks that these two accounts embody

different conceptions of the experience of time. Darwin's male stickleback lives in a continuous stream of time ... in which actions merge seamlessly into one another. Within the stream of time no expression is isolated: each moment of action is meaningful in virtue of being part of the larger pattern and of a single feeling. The understanding of the cohesiveness and continuity of time for the stickleback allows the stickleback to emerge as an inhabitant of a meaningful world – a world in which fish can be mad with delight. With Tinbergen's sticklebacks each set of the chain reaction (a set being composed of one male behavioural pattern plus one female behavioural pattern) is complete as a stimulus-response unit, but discontinuous from the previous set and the next set. This discontinuity is equivalent to breaking the stream of time of each fish into separate, isolated segments. The sticklebacks, then, figure as inhabitants of a fragmented world . . . ".²⁷

Furthermore, Crist notes how the destruction of meaning that results from breaking up the continuity of animal life into brief fragments permits the assimilation of behaviour to an economically-inspired paradigm, allowing "the elaboration of a nexus of interconnected economic terms [such as] monopoly, advertising, budgets, efficiency, investment, value, costs, benefits, maximising, minimising, winning, losing . . ." ²⁸ Fragmentation sucks the meaning out of the world, redefining it as 'raw material' for commercial production.

This destruction of temporal pattern is also apparent over longer periods than individual creatures' lifespans. Consciousness finds it easier to handle states, which can be described in terms of such atemporal concepts as 'biodiversity' or 'climax state'. However, as Donald Worster points out, nature is not well described by such static concepts, since it is constantly changing in ways that only rarely seem to approach any stable 'climax state'.²⁹ Ecological variables such as species population sometimes fluctuate unpredictably, leading some commentators to argue that natural processes are essentially random and lacking in order, and that whatever order nature might embody has to be put there by human intervention. But William Schaffer and others have shown that the behaviour of such variables is not random, but is rather, in Worster's words, "more complex than we ever imagined, [and] some would add, ever

²⁷Eileen Crist, *Images of Animals: Anthropomorphism and the Animal Mind* (Philadelphia: Temple University Press, 1999), p. 170.

²⁸Crist, *Images of Animals*, p. 132.

²⁹Donald Worster, "The ecology of order and chaos". *Environmental History Review* 14 (1990), 1 - 18.

can imagine".³⁰ Although, for example, the population of a species such as the Canadian Lynx may vary greatly and apparently randomly, if we plot population on a three-dimensional 'phase diagram', representing the relations between population levels at certain time intervals, then an unsuspected order sometimes emerges in the form of a 'strange attractor'.³¹ What such findings indicate is that the replacement of the wild world by industrialist monocultures involves the disappearance not only of species, but also of the enormously complex temporal patterns without which ecosystems would be mere collections of creatures.

Tribal peoples, however, seldom adopt the simple and exclusive temporal patterns suggested by concepts such as 'stability' or 'growth', preferring more flexible temporalities that are connected to natural patterns. As Paul Antze and Michael Lambek point out in relation to Australian aboriginal society, "people are the living embodiments of the past, playing out in the public domain the drama of collective memory. Hence even to speak of the 'past' is somewhat misleading. It is the dreamtime of Aboriginal Australia . . . continuously reembodyed, replayed, relived." Similarly, "contemporary Malagasay live not only in the present but in the past. They do not possess memories, rather they are possessed by them . . . time is not fully consecutive; the past is not finished and done with, receding ever further into the distance, but . . . past and present interpenetrate."³² Such notions of time are reminiscent of our own repressed awareness that the past lives on in the present: as Freud pointed out, the unconscious does not suffer from the dissociations of our conscious sense of time, and an event in the past can be as real as one that occurs in the present. This is why our history is, inescapably, part of our present: if our affluent lifestyle is based on the extinction of other species, the exploitation of oppressed peoples, or the theft of land from others, this is not only morally reprehensible, but also psychologically malignant.

Similarly, Robin Ridington shows that for the Dunne-za of northern British Columbia, time is embedded within natural realities that are not simply linear, but also contain a circular component:

Their time is different to ours. The old man and the boy circle around to touch one another, just as the hunter circles around to touch his game. They circle one another as the sun circles around to touch a different place on the horizon with each passing day. During the year, it circles from northern to southern points of rising and setting. It circles like the grouse in their mating dance. It circles like the swans who fly south to a land of flowing water when winter takes the northern forest in its teeth of ice. The sun circles like the mind of a dreamer whose body lies pressed to the earth, head to the east, in anticipation of another day's return. The sun and the dreamer's mind shine on one another. . . .

Historical events happen once and are gone forever. Mythic events return like the swans each spring . . . [They] are true in a way that is essential and eternal.³³

³⁰Worster, "The ecology of order and chaos", p. 14.

³¹William M. Schaffer, "Stretching and folding in lynx fur returns: Evidence for a strange attractor in nature?" *American Naturalist* 124 (1984), No. 6, 798 - 820. William M. Schaffer and M. Kot, "Do strange attractors govern ecological systems?" *BioScience* 35 (1985), No. 6, 342 - 350.

³²Paul Antze and Michael Lambek (eds.), *Tense Past: Cultural Essays in Trauma and Memory* (New York: Routledge, 1996), pp. xxi, 243.

³³Robin Ridington, *Trail to Heaven: Knowledge and Narrative in a Northern Native Community* (Vancouver: Douglas and McIntyre, 1988), p. 70, 72.

Such understandings of nature that embody cyclical components resonate with an important quality of the organic world. For example, Holling and Sanderson point out that in a typical boreal forest, "fresh needles cycle yearly, the crown of foliage cycles with a decadal period, and trees, gaps, and stands cycle at close to a century or longer periods. The result is an ecosystem hierarchy, in which each level has its own distinct spatial and temporal attributes. ... The cycles are all operating concurrently, influencing one another. They are rhythms within rhythms, providing not the static structures of a well-oiled machine shop ... but rather those of a jazz band, building rhythms and riffs around each other, coalescing into both short and long rhythmic structures ...".³⁴ Such insights make it clear that our cognitive preferences for linearity, predictable growth, and a present that unproblematically supersedes the past grossly simplify natural realities.

The lack of a sense of temporal structure causes us to be unaware not only of natural patterns, but also of the changes conveyed through the development of industrialism. Although we consciously recognise the short-term effects of our actions, we are blind to their more indirect effects. We do not drive our cars in order to cause global warming, or go shopping in order to perpetuate capitalism; but these are nevertheless indirect effects of our actions.³⁵ The notion that we are in control of the direction of industrial society, therefore, is a suspect one; and a more realistic interpretation might be that we are the unwitting agents of the industrial virus, responsible for spreading it throughout the globe. Furthermore, it is quite likely that once we have served our colonising purpose, we will become altogether dispensable to the technological order that emerges. Bill Joy, Chief Scientist for Sun Microsystems, has expressed unease over the likelihood that within the next two or three decades we will be able to build nanotechnological systems that are not only orders of magnitude more intelligent than ourselves, but also self-reproducing.³⁶ The consequences for the human race, not to mention the rest of the natural order, are starkly obvious.

A less apocalyptic scenario, although one that is ultimately no less terminal, is that humanity's progressive assimilation by the industrial order may occur more gradually, in a way that is even more imperceptible to conscious awareness. Social theorists from Freud onwards have commented on the emerging dominance of the intellect and the corresponding atrophy of other faculties. The narcissistic focus on our own lifetimes makes us unaware of the rapid changes in subjectivity that have accompanied the growth of technology; and the term 'human', like the term 'nature', has come to be defined largely by reference to present social conditions, repressing both the memory of what we have been in the past and the imagination for what we might be in the future. The destruction of nature, then, is experienced as something external to ourselves, rather than as part of a process that includes ourselves.

³⁴C. S. Holling and Steven Sanderson, "Dynamics of (dis)harmony in ecological and social systems." In Susan Hanna, Carl Folke, and Karl-Göran Mäler (eds.), *Rights to Nature: Ecological, Economic, and Political Principles of Institutions for the Environment* (Washington DC: Island Press, 1996), p. 63.

³⁵Compare Roy Bhaskar's similar argument in *Critical Realism: Essential Readings* (London: Routledge, 1998), p. xvi.

³⁶Bill Joy, "Why the future doesn't need us". *Wired Magazine*, April 2000, <http://www.wired.com/wired/archive/8.04/joy.html>

Consequently, an industrially-defined self theorises about an industrially-defined nature within an industrially-defined world; and such a self has little capacity to recognise the deeper currents in which both nature and itself are suspended.

THE TAMING OF ENVIRONMENTAL THEORY

One of the most obvious (and one of the most potentially disastrous) examples of technological society's colonisation of the future is that of nuclear waste. Although those of us who are alive in the present (and, in fact, a small minority even of this group) reap the benefits of nuclear power generation, the period during which the resulting waste will remain dangerous is at least comparable with the entire history of *homo sapiens* up to the present.

However, it seems that the theory which should be able to comment on and critique this colonisation of the future has itself succumbed to the same trends. Just as history is being revised to fit the present, so the future, too, seems to be experiencing the same fate. Claims for the 'triumph of capitalism' and the 'end of ideology' have led to the idea that no alternative order is conceivable; and many environmental writers are now arguing that our solutions necessarily have to be found within the overall context of global capitalism. Industrialism's 'short-termism' leads to the loss of any sense of human activity as occurring within longer-term processes and structures that are not humanly determined. If we as environmentalists base our ethic on what is possible within current realities rather than on a vision of wholeness, of what could be, then we have abandoned any sense of perfection, of goals to strive towards. This impoverishment of ethical structures is the mark of a decadent society, and it is invariably fatal in the long run.³⁷

What is being lost here is any sense of a temporal ecology; that is, the temporal organisation of the natural order through which later eras develop, heal, and transcend earlier ones. As we lose this awareness of temporal structure, so we give up our capacity to work toward any objective that is 'unrealistic' in the short-term. For example, J. Baird Callicott argues that "... faced with the harsh realities of the coming century, the wilderness idea ... is too little too late." But these 'harsh realities' are part of the overall problem that environmental theory should be addressing, not the assumed context within which theory and practice develop. Similarly, Daniel Botkin, assuming precisely what needs to be challenged, states that "nature in the twenty-first Century will be a nature that we make".³⁸ Environmental theory should be capable of transcending such 'realities' and obstinately envisioning other, potentially healthier possibilities that are beyond the sphere of capitalist industrialism. Theory should be the critic of current assumptions, not their collaborator or servant; and to accept that the objective of a healthy world is in principle 'unrealistic' is to inflate the status of these assumptions from historically relative constraints to reified natural conditions.

³⁷Joseph A. Tainter, *The Collapse of Complex Societies*. (Cambridge: Cambridge University Press, 1988).

³⁸Daniel Botkin, *Discordant Harmonies: A New Ecology for the Twenty-First Century* (New York: Oxford University Press, 1990), p. 193.

We need to recognise the productive tension between existing and ideal conditions, and work toward transforming the former in the direction of the latter.

It is difficult to overrate the importance of the difference between these two ethical stances. If we take as given a domesticated, overpopulated world, then environmental ethics becomes a matter of ameliorating the effects of these basic problems while accepting them as 'natural' and inevitable. We will take care to recycle materials where possible, to conserve 'natural resources', and to avoid littering the park; but the concept, as well as the reality, of wild nature will have been entirely replaced by a nature that is either extensively domesticated or even entirely fabricated. Ultimately, ethics and values will be defined in economic terms such as 'efficiency', as the commodification and private ownership of nature become global. Environmental theorists, like those social scientists who adapted their work to the needs of the Nazi regime during the Second World War,³⁹ will take current reality to be the only conceivable reality; and imagination will shrink to fit the confines of fashionable ideologies.

If, on the other hand, environmental ethics is to take a stance that places it outside industrialism, so that we are prepared to think critically about and offer alternatives to it, then it becomes possible to maintain the idea of a healthy nature as separate from and inconsistent with the industrial order. If we are to adopt this latter stance, then we can't assume that we will 'continue to transform' nature, although this may well be so in the short term. Just as the dreams of a Gandhi or a Martin Luther King have to some extent been realised today, so dreams of an ecologically healthy world can give direction to short-term actions. Even if the wilderness idea were unrealistic today – which I do not accept – it would be entirely possible that it would become realistic at some point in the future. The existence of wilderness should be evaluated not simply according to the role it might play in today's world, but also on the basis of its possible role in a world that is recovering from the damage caused by the industrial era. If we accept that "[l]egitimate human demands for culture cannot be satisfied without the sacrifice of nature. That is the sad truth"⁴⁰, we take the overpopulated 'realities' of industrialised 'culture' as immutable facts and extrapolate them into universal truths. There is much in today's world that appears destructive because of this overcrowding – cutting trees, picking wildflowers, fishing, for example – but these activities might well be perfectly acceptable in an ecologically healthy context. The anthropological literature makes it clear that the relation between culture and nature is not necessarily the zero-sum game that is its industrialist form, but that this relation can be mutually supportive; and an adequate ethical system will transcend such 'realities' and recognise alternative long-term possibilities.

In the short-term, we clearly have to work within existing political realities; and pretending otherwise simply substitutes fantasy for reality. However, short-term aims should not be ends in themselves, but rather should be integrated within longer-term objectives. If this is not so, then the longer-term effects of our actions will, by default, be tacitly consistent with those of industrialism. If the temporal reach of industrialism is greater than that of ethical theory and practice, then the latter will always be

³⁹Ulfried Geuter, *The Professionalisation of Psychology in Nazi Germany* (Cambridge: Cambridge University Press, 1992).

⁴⁰Holmes Rolston III, *Conserving Natural Value* (New York: Columbia University Press, 1994), p. 86.

integrated within the former. By analogy, growing beans requires that we plant seeds rather than eating them; and manuring our vegetable patch may be necessary before planting. In other words, although short-term behaviour may offer no immediate rewards, and may even involve short-term reversals, it should be designed to contribute to longer-term aims. It is especially in this relation between short- and long-term aims, which has been extensively forgotten, that theory and practice need to remember the temporal structure of the natural world. If we allow even our long-term aims to be defined by current conditions, then we lose the possibility of any other world than the industrial; and when the vision even of the critics of industrialism is constrained within an industrialist sphere, then the hegemony of industrialism is complete.

Given the widespread influence of industrialist assumptions, together with the continuing destruction of the natural world, fidelity to the natural order becomes not only a task of preserving the diminishing areas of natural landscape (although this is still a vital one), but, increasingly, one of envisioning a healthier future world. Such a vision was born with Aldo Leopold's conversion from the short-term rationality which holds that "fewer wolves meant more deer" to a longer term awareness that destruction of wolves leads, inevitably, to a situation in which "the starved bones of the hoped-for deer herd, dead of its own too-much, bleach with the bones of the dead sage . . .".⁴¹ "Thinking like a mountain", then, since it deals in complex systems containing nonlinear variables, is more like planning a chess strategy than building a wall. Like the deer of the Kaibab plateau, natural entities sometimes depend on processes that initially appear hostile to them, but which are nevertheless essential to the long-term health of the natural world. And conversely, apparently positive interventions may be disastrous in the longer term, as illustrated by the 'paradox of enrichment':

Suppose the death rate of an important prey species is attributable both to predation and to a shortage of resources. Now a well-meaning manager supplies an abundance of the limiting resources. Instead of helping matters, this might actually send predator and victim into an unstable, high-amplitude oscillation from which neither will recover. The paradox is that feeding a population that is starving can actually exterminate it, if it is under predatory regulation.⁴²

Present destruction, therefore, has an indeterminate relation to the underlying but less visible destruction of temporal pattern. It is characteristic of our object-laden world and noun-laden language⁴³ that we focus on preserving things rather than

⁴¹Aldo Leopold, *A Sand County Almanac* (New York: Ballantine, 1966), 138, 139 - 140.

⁴²Michael L. Rosenzweig, "Restoration ecology: a tool to study population interactions?". In: William R. Jordan III, Michael E. Gilpin, and John D. Aber (eds.), *Restoration Ecology: A Synthetic Approach to Ecological Research* (Cambridge: Cambridge University Press, 1987), p. 196.

⁴³But this interpretation of the world as consisting primarily of 'things' is not an inescapable property of language. Daniel Nettle and Suzanne Romaine report in *Vanishing Voices* (Oxford: Oxford University Press, 2000) that "In the Native American language Micmac, trees are named for the sound the wind makes when it blows through them during Autumn, about an hour after sunset when the wind always comes from a certain direction. Moreover, the names are not fixed but change as the sound changes." (p. 16). It is not coincidental, as Nettle and Romaine argue, that such languages are becoming extinct, since the "extinction of languages is part of the larger picture of worldwide near total ecosystem collapse."

patterns, and states rather than processes. The death of natural entities in the service of other natural entities may, sometimes, be a healthy part of the natural world – a point often lost sight of in our idolatry of individual lives. What is more fundamentally destructive is the stilling of the temporal patterns within which life and death occur, which is itself a more profound kind of death; and it is characteristic of our current ignorance of these patterns that we have the utmost difficulty distinguishing between natural and destructive changes.

Memory is the temporal communication of ecosystems. Geese migrate to the same area each season, just as salmon return to the same river, which itself follows the same path through the landscape. Wild fish, unlike their less intelligent domesticated counterparts, return to the same streams after flash floods. And creatures such as *chirocephalus salinus*, a desert shrimp, can exist in anhydrobiotic form for decades in the desert sands, springing into life when conditions are right.⁴⁴ Even where there are dramatic fluctuations and changes in natural systems, these changes are likely to follow patterns that recur. And in human life, too, we are not just what we are in the present: we incorporate the historical narratives of our lives and our cultures, so that our identities are grounded in and given meaning by these narratives. The future, too – in terms of our hopes and dreams and purposes – is alive in the present, giving it direction and meaning. A meaningful life, then, is one that participates in temporal structures that are essential aspects of ecological pattern. Industrialism is the denial of this meaning: in reducing a person to an assembly-line worker or consumer, or a forest to a 'timber reserve', it identifies their use-value in the present as their sole and defining meaning. The atrophy of temporal structure destroys the patterns which intelligently relate eras, so that the only possible relation to the past, other than its rejection, is its simplistic reproduction. But both these choices – going 'back to nature', on the one hand, or moving 'forward' along a technological path, on the other – embody the underlying pathology of temporal fragmentation, concealing the possibility that the future can differ from the past while being organically related to it through intelligent patterns of temporal integration.

HOW THE COGNITIVE AND THE NATURAL DIVERGE

Operational thought, according to cognitive theorists such as Piaget, is reversible; so a mistake in thought can be reversed simply by back-tracking and trying a different direction. For example, if I multiply instead of dividing, I can simply go back a stage and then carry out the correct operation. Ecological structures, however, invariably build on the past rather than replace it; so nature is not reversible in this way. If, for example, a tree has blown down, nature doesn't reverse this process by righting it: rather, saplings will grow in the space vacated by the old tree, whose rotting provides nutrients and shelter for the younger trees. As Schaffer's work on natural populations clearly shows, even if a natural system appears to return to an earlier state, there are likely to be small but highly significant differences between present and past states; and these small differences are often the basis of dramatic

⁴⁴Craig Childs, *The Secret Knowledge of Water* (Boston: Little, Brown, and Co., 2000), p. 66.

divergences in future states.⁴⁵ Ecological relations, in other words, embody a temporal dimension that is as significant as that which we normally term 'ecological'; and healing often incorporates rather than reverses previous states. Forgetting this, we attempt to reverse environmental problems rather than participating in their evolutionary solution.

In order to clarify the significance of these distinctions between the cognitive and natural realms, consider Callicott's suggestion that the concept of wilderness "perpetuates the pre-Darwinian Western metaphysical dichotomy between 'man' and nature", and "pits ... human economic interests against the interests of nature"⁴⁶. Callicott argues for a "sustainable development alternative" which "does not compromise ecological integrity seriously." We can, he argues, "work out our own, postmodern, technologically-sophisticated, scientifically-informed, sustainable civilisation . . .".⁴⁷

Such remarks confuse a conceptual bifurcation with the real and extensively materialised divergence between the natural and industrial orders. The same ideology which is responsible for our dualistic conceptions has also been at work physically and ecologically restructuring the world for many centuries; and we need to distinguish between the dualistic interpretation of phenomena which are not intrinsically dualistic (such as the human-animal distinction), on the one hand, and the sedimented effects of centuries of dualistic thought on the ecological and cultural realities of our times, on the other. 'Human economic interests' are already pitted 'against nature', since the aim of the industrial system is the expansion of capital through the hostile assimilation of nature and its conversion into commodities; and so the roots of this problem lie in the real-world conflict between these two incompatible systems, and not simply in a dualistic style of thinking that interprets what is happening in this way. This has important implications for the ways we set about solving such problems. Given our long-standing tradition in industrial society of distancing ourselves from nature and exploiting it for our material benefit – a tradition that has become materialised in our technologies, our lifestyles, and our ways of thinking over many centuries – it is simply not possible to recover a 'symbiotic relationship with nature' in any simple or rapid way. Just as an epidemic is not controlled through 'symbiosis' between healthy and unhealthy creatures, the spread of industrialism will not be controlled through any kind of immediate accommodation between the natural and industrial systems. Consequently, the answer to Callicott's rhetorical question that if indigenous peoples can "live in peace and harmony with their organic environment, can't a civilised, technological society also live, not merely in peaceful coexistence, but in benevolent symbiosis with nature?"⁴⁸ must be: "Not yet; and only through a probably lengthy process of psychological, cultural, and technological evolution."

To argue that wilderness preservation "pits ... human economic interests against the interests of nature" is therefore to confuse the cognitive realm, in which a present situation can instantaneously be altered or reversed, with the ecological realm, in which it can only be creatively integrated into a future which incorporates it as part of

⁴⁵In chaos theory, this is known as 'stretching'. See note 30.

⁴⁶ Callicott, "The wilderness idea revisited", pp. 240, 239.

⁴⁷Callicott, "The wilderness idea revisited", p. 243.

⁴⁸Callicott, "The wilderness idea revisited", p. 245.

its material/historical structure. For example, if our fallen tree allows a row of saplings to grow, the pattern they form will incorporate the original situation in a structure that is simultaneously temporal and material. Such a simultaneity exemplifies a genuine integration of the past within the present. Industrialism, in contrast, annuls history. For example, a plastic bottle will contain few traces of its origins in the oil-rich strata of a particular landscape, and no relation to the ecological structures from which its 'raw materials' were extracted. Similarly, industrial production assimilates humans into its patterns without regard for our own particular histories, memories, or mythologies, employing those faculties which play a role in production while relegating the rest to our personal lives and leisure pursuits.

Consequently, Callicott's claim that wilderness preservation denies "homo sapiens the opportunity to establish a positive symbiotic relationship with other species and a positive role in the unfolding of evolutionary processes"⁴⁹ ignores the entire historical structure of technological development. Solutions to this sort of issue can't be achieved at a stroke, and the minimal requirements for a 'symbiotic relationship' with nature include a lower population and an ecologically consistent cultural frame. Blurring the boundary between nature and cognition seduces us into an imagined reconciliation between industrialism and nature which denies the extent of the divide between them: "Precisely because the works of man are largely cultural, they are capable of being reformed rapidly".⁵⁰ This amounts to a wish-fulfilling technological fantasy that projects the cognitive capacity of reversibility into the ecological and cultural realms and entices us toward 'reconciliations' with nature which would, in fact, complete its assimilation to industrialism.

If the failure to perceive temporal structure brings with it a blindness to the historical divergence between the natural and industrial systems, it also makes us incapable of imagining any future that is not a linear extrapolation of present trends. For example, one writer in this journal argues that "Environmental ethics will have to address the problems of the 21st century *and beyond* in a world with few areas of wilderness, with billions of people living in towns and increasingly in cities, and in the context of rapid technological change". Later in the same paper, we are urged to consider "how we ought to live in a world that continues to be transformed by humans".⁵¹ While it is realistic to accept that a healthy world is unattainable in the short term, however, it is an ethical and, ultimately, a natural disaster to make the same assumption for the long term; and the result of this shrivelling of our imagination will be a nature that is merely a cosmetic adjunct to an unchallenged industrialism.

CONCLUSION: DISTINGUISHING LONG- AND SHORT-TERM AIMS.

Distinguishing between long and short term aims is necessary for several reasons.

⁴⁹Callicott, "The wilderness idea revisited", p. 240.

⁵⁰Callicott, "The wilderness idea revisited", p. 241.

⁵¹Alastair Gunn, "Rethinking communities: Environmental ethics in an urbanised world". *Environmental Ethics* 20 (1998), 343, 355. My italics.

Firstly, behaviour is seldom intrinsically 'ethical' or 'unethical', but also derives its ethical status from its cultural, ecological, and temporal contexts. In Toni Morrison's *Beloved*, Sethe kills her child, so freeing her from the suffering of slavery – a morally complex act the ramifications of which reverberate throughout the novel. Death, we believe, is to be avoided; and defending life is right. And so it often is; but reifying such principles, as I suggested above, results in a deeper form of death. Behaviour that is ethical in a healthy world may not be so in a degraded one; and our actions need to embody a wider recognition of their likely consequences and effectiveness. An awareness of temporal structure is therefore necessary ethically as well as epistemologically; and taking refuge on an island of temporal ignorance that absolves us of any environmental responsibility beyond recycling our wine bottles is as lacking in integrity as the political myopia that allows us to ignore our dependence on cheap labour beyond our national boundaries.

Tim Luke, for example, argues that green consumerism and recycling, "rather than leading to the elimination of massive consumption and material waste, instead revalorises the basic premises of material consumption and material waste", and by "providing the symbolic and substantive means to rationalise resource use and cloak consumption in the appearance of ecological activism . . . [these activities remain] structurally invested in thoroughly consumerist forms of economy and culture".⁵² Simply to refer to such actions as 'ineffective' misses the point: by assuming that they are 'good' whatever their context, we ignore their assimilation to the industrialist system within which they occur, so ultimately reinforcing that system and undermining the challenge to it.

Similarly, the more efficient use of petroleum is usually promoted within a context that assumes the survival of massively energy-dependent lifestyles into the indefinite future. If this is so, then 'efficient' use of energy becomes a way of perpetuating and legitimating this context, and so ultimately colludes in the assimilation of nature to industrialism. On the other hand, the reduction of petroleum consumption can be part of a longer-term programme of phasing out the capitalist assimilation of nature and developing a form of human life that once again participates in natural processes. Each of these approaches starts with the same steps; but their long-term objectives are entirely different. Economising on petroleum use, therefore, is not an end in itself. It may benefit the survival of the natural world; or it may work against this survival. Which of these outcomes is realised depends on the long-term vision within which our actions take place, not on the intrinsic character of the actions themselves. If our actions are simply assumed to be intrinsically beneficial and to need no further justification, then by default they will be assimilated to the social system that dominates our lives, namely industrialism.

Secondly, behaviour that is guided only by short term aims has effects which are mystifying and demoralising, since its evident inability to prevent accelerating ecological damage quickly becomes apparent, leading to feelings of powerlessness and acceptance of industrialist 'realities' as somehow inevitable. Restricting ourselves to a short-term frame is psychologically disintegrative, since it domesticates subjectivity and transforms us into agents of industrialism. Recognising that we may not be able to

⁵²Tim Luke, "Green consumerism: Ecology and the Ruse of Recycling". In Bennett and Chaloupka, *In the Nature of Things*.

achieve a healthy world within a short time or by taking a few simple actions need not lead to such demoralisation or disintegration if we view such actions as stages within a larger strategy.

Thirdly, and complementarily, an awareness of temporal structure allows us to retain, nourish and work toward long-term aims even while recognising that these aims are unachievable in the short term. Since industrialist assumptions, activities, and physical realities have become so deeply sedimented into the world, effective action will necessarily be indirect and not immediately beneficial.

Fourthly, an exclusively short term focus perpetuates our illusion of control over the world while disguising our long term lack of control. Since we can, in the short term, successfully predict the way ecological systems will react to our interventions, this reinforces the 'technological fix' mentality and conceals our ignorance of the long-term consequences of such 'fixes'. Hence 'natural disasters' such as storms and floods appear unconnected with our activities rather than as challenges to our ways of understanding.

Recognising these four points can be the basis of a productive reassessment of environmental activity. Actions that seem benign in the short term, but which are consistent with industrial growth, damage the natural order; and those which are constructive in the long term may sometimes, although not necessarily, appear destructive in the short term. Consider an oil-spill such as that involving the Exxon Valdez, which produced a large amount of immediate ecological damage. Its longer term effects, however, since they raise public awareness of the risks of crude oil transport, may be more ambiguous. The growth of global industrialism requires that the short-term effects of consumption be superficially positive for the consumer, and that the negative effects be concealed by geographical distance, the passage of time, ideological manipulation, or the powerlessness of those negatively affected. Any action that blows open these veils of concealment and brings to consciousness the real costs of industrialism will have some benign long term effects. The presumption that industrial growth can be made consistent with ecological and human needs is probably the most damaging single belief that is widely held today; and challenging such beliefs may ultimately be more valuable than trying to moderate the destruction that accompanies industrial processes. Ecological integrity resides in our allegiance to a frame that is both larger and more closely allied to the natural order than the industrialist system; and this frame has temporal and psychological dimensions as well as 'ecological' ones in the narrow sense. Aligning our actions with this larger frame is essential if we are to contribute effectively to the well-being of the natural order.