THE NEW CRITICAL IDIOM

SERIES EDITOR: JOHN DRAKAKIS, UNIVERSITY OF STIRLING

The New Critical Idiom is an invaluable series of introductory guides to today's critical terminology. Each book:

- provides a handy, explanatory guide to the use (and abuse) of the term
- offers an original and distinctive overview by a leading literary and cultural critic
- relates the term to the larger field of cultural representation.

With a strong emphasis on clarity, lively debate and the widest possible breadth of examples, *The New Critical Idiom* is an indispensable approach to key topics in literary studies.

Also available in this series:

Autobiography by Linda Anderson

Class by Gary Day

Colonialism/Postcolonialism by Ania Loomba

Culture/Metaculture by Francis Mulhern

Discourse by Sara Mills

Dramatic Monologue by Glennis Byron

Genders by David Glover and Cora Kaplan

Gothic by Fred Botting

Historicism by Paul Hamilton

Humanism by Tony Davies

Ideology by David Hawkes

Interdisciplinarity by Joe Moran

Intertextuality by Graham Allen

Irony by Claire Colebrook

Literature by Peter Widdowson

Metre, Rhythm and Verse Form by Philip Hobsbaum

Modernism by Peter Childs

Myth by Laurence Coupe

Narrative by Paul Cobley

Parody by Simon Dentith

Pastoral by Terry Gifford

Realism by Pam Morris

Romanticism by Aidan Day

Science Fiction by Adam Roberts

Sexuality by Joseph Bristow

Stylistics by Richard Bradford

Subjectivity by Donald E. Hall

The Unconscious by Antony Easthope

ECOCRITICISM

Greg Garrard

Routledge
Taylor & Francis Group
LONDON AND NEW YORK

First published 2004
by Routledge
2 Park Square, Milton Park, Abingdon, Oxfordshire OX14 4RN

Simultaneously published in the USA and Canada
by Routledge
29 West 35th Street, New York, NY 10001

Routledge is an imprint of the Taylor & Francis Group

Typeset in Adobe Garamond and Scala Sans by Keystroke,
Jacaranda Lodge, Wolverhampton
Printed and bound in Great Britain by TJ International Ltd,
Padstow, Cornwall

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library

Library of Congress Cataloging in Publication Data
Garrard, Greg.
Ecocriticism / Greg Garrard.
p. cm. — (New critical idiom)
Includes bibliographical references and index.
1. English literature—History and criticism—Theory, etc.
2. Nature in literature. 3. American literature—History and
criticism—Theory, etc. 4. Conservation of natural resources in
literature. 5. Environmental protection in literature. 6. Philosophy
of nature in literature. 7. Forests and forestry in literature.
8. Wilderness areas in literature. 9. Outdoor life in literature.
10. Criticism—Great Britain. 11. Criticism—United States.
12. Landscape in literature. 13. Ecology in literature.
14. Ecocriticism. I. Title. II. Series.
PR143.G37 2004
820.9'36–dc22 2004003429

ISBN 0–415–19691–4 (hbk)
ISBN 0–415–19692–2 (pbk)

For Holly

difference in the human–nature continuum. We can continue to distinguish reason and emotion, man and woman, human and animal, but without the neurotic obsessiveness of the mainstream philosophical tradition. In doing so, the mastery model that legitimates anthropo- and androcentrism is undermined (see also Plumwood 2001).

Reason, once rescued from its idealisation by androcentric philosophy, can acknowledge and respect 'earth others', afflicted by neither ultra-rationalistic alienation nor animistic assimilation: 'We need to understand and affirm both otherness and our community in the earth' (Plumwood 1993: 137). This position rejects both cornucopian dualism, privileging the rational economic subject above all else, and simplistic ecofeminist and deep ecological monism, in which the distinctive capacities and needs of the human species are in danger of being submerged in an undifferentiated, apolitical ecosphere. Unfortunately, it may nevertheless lead to the position espoused by Caroline Merchant in her influential historical critique of 'mechanistic' science, *The Death of Nature*: a somewhat pious recommendation of 'holistic' or 'vitalist' science based on its moral, rather than its methodological or pragmatic, superiority over 'reductive' conventional science. The place of science in the two major forms of radical ecology, then, remains vexed.

Ecofeminism emphasises environmental justice to a far greater degree than deep ecology. The logic of domination is implicated in discrimination and oppression on grounds of race, sexual orientation and class as well as species and gender. Whereas the *Deep Ecology* anthology contains essays on 'dead white males' such as D.H. Lawrence, John Muir and Henry Thoreau, a recent anthology of *Ecofeminist Literary Criticism* (Gaard and Murphy 1998) includes work on East German, French, Native American, Chicana and other writers, mainly but not exclusively women. This diversity is thought to derive necessarily from ecology, as argued here by Ynestra King:

> A healthy, balanced ecosystem, including human and nonhuman inhabitants, must maintain diversity. Ecologically, environmental simplification is as significant a problem as environmental pollution. Biological simplification, i.e., the wiping out of whole species, corresponds to reducing human diversity into faceless workers, or to the homogenization of taste and culture through mass consumer markets. Social life and natural life are literally simplified to the inorganic for the convenience of market society. Therefore, we need a decentralized global movement that is founded on common interests yet celebrates diversity and opposes all forms of domination and violence. Potentially, ecofeminism is such a movement.
>
> (1989: 20)

We might feel that both biological and cultural diversity are valuable, and ought to be defended, without accepting the move, made without proper explanation, between these very different concepts of 'diversity'. No evidence is given for the similar view of Gaard and Murphy that 'cultural diversity . . . is one dimension that enhances the survival of the human species' (1998: 6). Here, as in some other ecocritical work, the terminology of ecological science is simply appropriated for political ends without any acknowledgment of change in use or qualification of meaning. Moreover, as Chapter 3 shows, the notion of 'balance' in ecosystems is scientifically highly problematic, and ecologists no longer assert that biological diversity is necessarily linked to stability.

Radical ecofeminism clearly functions as an inspiration to many to change their lives, but as a critical philosophy its irrationalism and essentialism are serious limitations. Ecofeminists such as Warren and Plumwood, however, bring to bear social and philosophical insights that give the position far greater depth, scope and rigour. This is reflected in the growing significance of ecofeminist literary and cultural criticism within the ecocritical field, and in the complex analyses ecofeminists can make of, for example, population problems, which greatly exceed in both diagnostic and prescriptive power the crude analyses of deep ecologists (Cuomo 1994). Ecofeminists have also provided sharp critiques of globalisation, free trade and 'international development' that link their project as much to the politically orientated positions associated with social ecology and eco-Marxism as to ethically and spiritually orientated deep ecology (Shiva 1989).

SOCIAL ECOLOGY AND ECO-MARXISM

Like ecofeminism, the positions discussed here do not suggest that environmental problems are caused by anthropocentric attitudes alone,

but follow from systems of domination or exploitation of humans by other humans. Focusing on these intraspecies relationships, they perpetuate, deep ecologists claim, the anthropocentrism that ought to be the target of any earth-centred critique. At the same time, social ecologists and eco-Marxists lament the individualism and pervasive mysticism of deep ecologists, which, they argue, represent a retreat from rational thought and real political engagement. Social ecology and eco-Marxism are explicitly political, and have their origins in nineteenth-century radical thought: the anarchism of Mikhail Bakunin (1814–76) and Pyotr Kropotkin (1842–1921), the communism of Karl Marx (1818–33) and Friedrich Engels (1820–95).

Social ecology and eco-Marxism share the crucial insight with the cornucopian economists, whom they diametrically oppose politically, that the notion of ecological 'limits' is a kind of mystification. The fear of 'overshoot' of the capacities of natural systems to provide resources and absorb waste informs both deep ecology and environmentalism, but this analysis obscures the way scarcity is created by capitalistic forms of production that depend on the manipulation of the dynamic of supply and demand. Furthermore, technology modifies the dynamic, both by initiating new demands, and, through changed extraction or production processes, offsetting or exacerbating scarcity. In other words, 'scarcity' is not simply an objective fact about the natural world, but a function of the will and means of capital: the purposes that guide production, and the technologies that facilitate it. Change the political structure of society so that production to meet real needs replaces production for the accumulation of wealth, it is argued, and the ecological problem of limits produced by capital's structural need for perpetual growth will disappear. It is worth noting that, whilst this argument is persuasive in relation to mineral resources, it is far less so when applied to non-substitutable and economically invisible resources such as freshwater aquifers or biodiversity.

Social ecologists, most of whom recognise political philosopher Murray Bookchin as their intellectual guru, share with eco-Marxists a distinctive view of the place of humans in nature. They claim the ecocentric monism enjoined by deep ecologists is disingenuous because, although humans are supposed to be 'part of nature', many of the things humans do are still portrayed as 'unnatural', thereby reintroducing the

dualism they were trying to overcome. Opposing this false monism is a dialectical perspective that envisages the evolution of human culture, or 'second nature', from 'first nature', in an ongoing process in which each defines and transforms the other:

> Marx . . . recognised the priorness [*sic*] of an 'external' or 'first' nature, that gave birth to humankind. But humans then worked on this 'first' nature to produce a 'second' nature: the material creations of society plus its institutions, ideas and values. This process, as Bookchin . . . stresses, is part of a process of *natural* evolution of society.
>
> (Pepper 1993: 108)

Eco-Marxists and social ecologists are therefore neither monists nor dualists. One of the consequences of this view is that environmental problems cannot be clearly divorced from things more usually defined as social problems such as poor housing or lack of clean water. It gives these positions a clear affinity with environmental justice movements that protest the common association of acute environmental degradation and pollution with poverty.

In line with traditional Marxist thought, eco-Marxists argue that there is a structural conflict between workers and the owners of the means of production, in which the latter cream off the surplus value created by the labour of the proletariat. This objective exploitation is at the heart of all other forms of exploitation and oppression, as Pepper argues: 'The true, post-revolutionary, communist society will be classless, and when it is attained the state, environmental disruption, economic exploitation, war and patriarchy will all wither away, being no longer necessary' (1993: 207–8). Against this vision of a planned economy based on need rather than greed, social ecology promotes a decentralised society of non-hierarchical affiliations avowedly derived from an anarchistic political tradition:

> A fundamental unit will be the *commune*, a closely knit, small community based on love, friendship, shared values, and commitment to a common life. . . . cooperative institutions in all areas of social life will be formed: mutualistic associations for child care and education, for production and distribution, for cultural creation, for play and

> enjoyment, for reflection and spiritual renewal. Organization will be based not on the demands of *power*, but rather on the *self-realization of persons* as free social beings.
>
> (Clark 1990: 9)

If eco-Marxists identify class conflict as the key political issue, social ecologists oppose the power relations and hierarchy they see as afflicting all kinds of societies, be they capitalistic or centrally planned socialist. In place of a workers' revolution, social ecologists promote exemplary lifestyles and communities that prefigure a more general social transformation and give people practice in sustainable living and participatory democracy.

Eco-Marxism seems at present to be a marginal force in the green politics of rich nations, although its role in Third World environmental justice movements may be more significant. However, it suffers from association with the environmental horrors perpetrated by the former Soviet Union and its Eastern European satellites. On the other hand, social ecology and anarchism more generally, seem to be experiencing a resurgence in the anti-globalisation and bioregional movements. Anarchism has the advantage of not requiring an elusive revolutionary proletariat for its realisation, and is clearly amenable to a range of counter-cultural movements. Nevertheless, Marxists are right to emphasise the pervasive power and reach of global capital, and the probable futility of rebellious actions by individuals or small, loosely affiliated groups against a handful of its symbols but none of its essential structures. Despite these differences, in what follows, holders of both these positions will be called 'social ecologists'.

HEIDEGGERIAN ECOPHILOSOPHY

Whilst it is undoubtedly marginal to green political thought, the philosophy of Martin Heidegger (1889–1976) has inspired a number of ecocritics. It is apparently impenetrable to the beginner, but some critics argue that Heidegger's thought is among the most profound critiques of industrial modernity because it combines a poetic awe before the Earth's being with a savage deconstruction of the death-denying project of world mastery that we are taught to call 'progress' (see Foltz 1995; Garrard 1998; Zimmerman 1990 and 1993).

Heidegger's starting point is the fundamental difference between mere material existence and a revelation of 'being', or the thing-ness of things. To 'be' is not just to exist, but to 'show up' or be disclosed, which requires human consciousness as the space, or 'clearing' (*Lichtung*), in and through which it is disclosed: 'At bottom, the ordinary is not ordinary; it is extraordinary' (Heidegger 1993: 179). Once again, the problem of dualism is not so much resolved as displaced, as being only 'is' through this clearing, and human being is in turn properly realised in the letting be of beings in its 'space' of consciousness. The clearing and what shines forth there have a mutual need for one another, as the sheltering Earth provides the entities from which human being founds a world: 'A stone is worldless. Plant and animal likewise have no world; but they belong to the covert throng of a surrounding into which they are linked. The peasant woman, on the other hand, has a world because she dwells in the overtness of beings' (p. 170).

The relationship of being and clearing, or Earth and world, is not a simple one, however, because the responsiveness or attunement between them may be more or less responsible, and beings may or may not be 'let be' (i.e. be disclosed, show up, emerge). Thus responsible humans have an implicit duty to let things disclose themselves in their own inimitable way, rather than forcing them into meanings and identities that suit their own instrumental values. One of the crucial modes of proper letting be or unhindered disclosure of being is poetry: language, especially archaic or oblique poetic language, rightly understood discloses to us the act of disclosure itself. It enables showing-up itself to show up. On the other hand, Heidegger was dismissive of everyday chatter because it discloses both language and beings to us as mere instruments of our will; disposable words correspond to a world of disposable stuff. Worse still, things may emerge as mere resources on call for our use when required, so that a living forest may show up as merely a 'standing reserve' of timber (*Bestand*), no longer trees even but just lumber-in-waiting, and even the mighty Rhine may be disclosed as just a source of hydroelectric power. In meditation upon the poetic word, however, we discover that 'language is the house of Being in which man ek-sists by dwelling' (Heidegger 1993: 237), and Heidegger claims that the essence of beings, their autonomy and resistance to our purposes, is disclosed by a similarly resistant language. Through poetry, then, we learn that 'Man is not the lord of beings. Man

8

FUTURES: THE EARTH

Jonathan Bate concludes *The Song of the Earth* with a Wallace Stevens poem called 'The Planet on the Table' and a request to the reader:

> As you read the poem, hold in your mind's eye a photograph of the earth taken from space: green and blue, smudged with the motion of cloud . . . so small in the surrounding darkness that you could imagine cupping it with your hands. A planet that is fragile, a planet of which we are a part but which we do not possess.
>
> (2000: 282)

As Stephen Yearley points out, 'The photographic portrayal of the globe viewed from an orbiting spacecraft has been used repeatedly to evoke the Earth's isolation in space, its fragility and wonder, and the sense that the beings on it share a restricted living space surrounded by an unwelcoming void' (1996: 65). Media analyst John Hannigan, like Bate, takes the meaning of the image for granted when he cites evidence that 'the single most effective environmental message of the century was totally inadvertent: the 1969 view from the moon of a fragile, finite "Spaceship Earth"' (1995: 62). Somehow this image, without commentary or design, seems unambiguously to communicate a powerful message.

The history of the Earth image, however, does not sustain the notion

that it has a single meaning. Repeating Bate's experiment, we must acknowledge that the same act of imagination could grasp the earth as either a fragile totality 'of which we are a part but which we do not possess', or else a biological system for producing unlimited non-monetary wealth given fully rational management, and that both inflections might fairly claim to be ecological. The concept of 'Spaceship Earth' was in fact proposed by architect, inventor and cosmologist R. Buckminster Fuller (1895–1983), who took the Earth image as a figure for the possibility of the total, cornucopian management of the planet in human interests (see Fuller 1969).

Andrew Ross, one of the few ecocritics working on popular rather than literary culture, counts a photograph of the Earth taken by Apollo astronauts, amongst his 'images of ecology':

> In recent years, we have become accustomed to seeing images of a dying planet, variously exhibited in grisly poses of ecological depletion and circulated by all sectors of the image industry, often in spots reserved for the exploitation fare of genocidal atrocities. The clichés of the standard environmental image are known to us all: on the one hand, belching smokestacks, seabirds mired in petrochemical sludge, fish floating belly-up, traffic jams in Los Angeles and Mexico City, and clearcut forests; on the other hand, the redeeming repertoire of pastoral imagery, pristine, green, and unspoiled by human habitation, crowned by the ultimate global spectacle, the fragile, vulnerable ball of spaceship earth.
>
> (Ross 1994: 171)

We seem here to return to pastoral on an almost cosmic scale. Yet as Ross demonstrates, it is also crucial to consider the 'ecology of images': 'the social and industrial organization of images' and the 'ecological arguments to be made about those processes' (p. 172). The astronauts' pictures of the planet were won at considerable cost to it, not only in terms of the $25 billion space programme, or the £5.6 million of fuel on each Saturn 5 rocket, but also the interrelations between the Apollo programme and the Cold War military-industrial complex. As Ross shows, the US military has historically evaded environmental legislation, while preparing for wars that wreak extraordinary ecological damage upon foreign lands.

So the Earth image is contested and, arguably, compromised by the institutions and practices that made it possible. It is, moreover, a false perspective that allows us to see what only a handful of US astronauts have actually seen, a 'god's eye view' that promises a kind of transcendental power that we, as individuals or as a species, do not possess (see Legler 2000: 245). Nevertheless, it is essential for ecocritics to give greater consideration than they have thus far to the transformation in the dominant meaning of the word 'earth': from the most immediate ground of existence, the soil, to life's largest relevant context, the biosphere. The need not only to 'think globally' but to think about the globe demands a politicised reading practice more akin to social ecology and Cultural Studies than to deep ecology and traditional literary studies. Such a practice would consider constructions of the Earth provided by economics, politics and biology, as well as literature, TV and film. This chapter will examine two key inflections of the Earth, in order then to suggest possible futures for ecocriticism, beyond the problematic tropes of pastoral and wilderness, place and locale. The first inflection stems from the key concern of postmodern social thought, globalisation, and gives us the Earth as a technologically and economically enframed globe. The second is Gaia, which inflects the Earth as a living thing.

GLOBE

The Apollo photographs are just one means by which people all over the world are now able to apprehend its form. This globalisation of the imagination is powerfully reinforced by counterparts that operate, according to Yearley, in finance, communications, culture, business and politics. Transnational financial organisations demonstrated that they could marshal greater resources than national governments on several occasions during the 1990s: 'As capital markets become global, the fate of whole countries' economies can fall prey to the fears and imaginings of investors in the international money markets' (Yearley 1996: 4). These activities are made possible by global satellite-based communications, including the Internet, which eliminate traditional considerations of physical distance from transactions involving the communication of information. The local communities beloved of anti-modern ecocritics are being supplanted by 'virtual' communities brought together by shared

interests, including environmental concerns. The globalisation of culture is both a cause and an effect of this process, as transnational cultural icons provide transnational talking points within and across these communities.

Globalisation, for some, represents homogenisation in which diverse local cultures are supplanted by 'monocultures of the mind' promoted and sustained by transnational culture industries based mainly in North America, Japan and Western Europe. The aspect of globalisation most often targeted by environmentalist critics is the growth of companies with turnover exceeding that of many nations and who possess a commensurate political power. While many industries remain necessarily locally or nationally based, the omnipresence of brand-based companies such as Nike or Coca-Cola seems to produce, sustain and rely on a homogenous global market. Cornucopian enthusiasts for globalisation argue that this presents an opportunity for poverty-stricken countries to develop economically, following the example of some Asian and South American nations. They claim that deregulation of markets and the elimination of trade barriers will encourage international investment, give Third World countries access to foreign markets and liberate domestic entrepreneurial capital, leading to a circle of wealth creation and the kind of social and environmental progress seen mainly in rich countries. At the same time, 'structural adjustment' policies imposed on Third World countries by international financial institutions such as the World Bank can have crippling effects on existing social and environmental programmes, forcing governments to end price controls on basic goods, cut public spending and privatise nationalised industries. Even then, the economic benefits of free-market solutions may not accrue because of adverse domestic conditions or because transnational corporations realise most of the profits from liberalised trade. This has led to vigorous anti-globalisation resistance in both First and Third World countries. While the proportion of people in the world enduring absolute poverty is declining, population growth means that total numbers are continuing to increase, and power remains unevenly distributed. The statistics lessen neither the misery of the poor nor the scandal of First World wealth. As ecocritics interpret the meaning of the Earth, they will increasingly have to engage with globalised political conflicts.

The inflection of the globe as market place requires institutions to

promote and enforce it. The most powerful of these are the World Bank, the International Monetary Fund (IMF) and the recently formed World Trade Organisation (WTO). All three are explicitly dedicated to the promotion of international capitalism, although the World Bank in particular incorporates questions of social development and environmental protection into negotiations with Third World countries. Some environmental organisations such as the World Wide Fund for Nature, Friends of the Earth and Greenpeace International have become substantial global actors, reflecting the scale and scope of the issues they address. The planet is developing a meaningful, though fragmented, political identity, in which a range of distinctively globalised social and environmental issues are contested.

As discussed earlier, it was a global political meeting, the Rio Earth Summit in 1992, that redefined the local or national problem of nature conservation as the globalised issue of 'biodiversity'. Yet the affirmation of a common interest in the future of the world's herring or rainforests conceals considerable differences of interpretation and conflicts of interest. Not only are there variations between countries in terms of method and extent of data collection, but as J.A. Hannigan's 1995 study shows, the biodiversity agenda had to overcome several major problems before it could become a 'successful' issue: accurate claims about extinctions are difficult to sustain, there are no obvious villains or simple solutions and few First World environmentalists would be affected directly by the losses. Third World countries that are biologically rich but economically impoverished can easily see the costs of preservation but, wildlife tourism aside, may not be able to see substantial benefits (Hannigan 1995: 146–61). Moreover, the universalising scientific and moral discourse of biodiversity is seen by some critics as a cover for First World pharmaceutical and agricultural corporations seeking to expropriate Third World biological wealth.

From the fifteenth century onwards, new territories discovered by European explorers were granted to national governments and their agents by charters, patents and Papal Bulls, with little concern for the rights of indigenous peoples. Vandana Shiva claims in *Biopiracy* (1998) that this colonial appropriation of land by means of legal instruments, which led to the domination, enslavement or extermination of non-Europeans in the populated continents, has a modern counterpart in the

patents on genetically engineered organisms granted by courts in the developed world and assiduously protected by the WTO. Trade Related Intellectual Property Rights (TRIPs) are demanded by biotechnology companies to protect their investments in research and development, but Shiva claims that they represent a neo-colonial appropriation of the traditional biological knowledge of indigenous peoples and the 'inner spaces' of DNA, in processes that can be likened to 'the second coming of Columbus' (Shiva 1998: 11). She argues that genetic modification is misrepresented as a predictable, deterministic process of 'engineering' that creates organisms worthy of patent protection. On the contrary, this mere 'tinkering' with DNA, as she calls it, involves both processes and products that rely on nature's own capacity for self-organisation and reproduction, so that a patent effectively appropriates for biotechnology companies the inherent creativity of nature. If, as Shiva believes, the latter deserves reverence in itself, patenting even hybrid seed varieties would be a form of blasphemy. She makes a strong case for the legal protection of indigenous knowledge, albeit without explanation of how it differs from biotechnology as an appropriation of nature. Shiva also shows that the WTO and the Biodiversity Convention, which seem to represent opposite poles of exploitation and protection, may not be quite so antagonistic. The latter may lead to the identification and protection of Third World biological resources in the name of ecology that the former then allows First World companies to appropriate in the name of profit. Thus the comforting Planet Earth of ecologists may collude with the exploitative globe of transnational capital.

We have already observed that globalisation requires sophisticated communications technologies, which in turn require satellites in space. The various space programmes have not only supported commercial and military ends, however: meteorological and hydrological satellites supply vital information to scientists about global and local environmental issues, from ozone thinning to soil erosion. This process arguably represents a fresh inflection of the Earth as the object of new regimes of environmental surveillance and disciplinary design. This rather paranoid-sounding view derives from ecocritic Tim Luke's critique of the influential environmentalist organisation, the Worldwatch Institute, which is loosely based upon the work of philosopher Michel Foucault. Worldwatch collects environmental data from a vast array of sources, produces computer

models and develops alternative future scenarios that are extrapolated from various possible starting points. Each year they publish a comprehensive report on the *State of the World*, including 'bioeconomic' information on natural resources, biodiversity, water supplies, population and so on.

Luke does not deny that Worldwatch is an effective environmental organisation. Rather, he criticises the inflection of the planet implied by Worldwatch's quest for sustainable modernisation: no longer a wild, mysterious Earth, but rather 'an ensemble of ecological systems, requiring human managerial oversight, administrative intervention, and organizational containment' (1997: 90). Lukes points out that Worldwatch reports identify bioeconomic inefficiencies that can be rectified, and individual or state policies that might be modified, but do not critique global capitalism as such. In the process, the science of ecology is reduced to a managerial or disciplinary role in the mitigation of environmental problems. Luke argues that the Earth is thereby inflected as an errant subject requiring techno-scientific correction, or 'environmentalization': 'As biological life is refracted through economic, political and technological existence, "the facts of life" pass into fields of control for disciplines of ecoknowledge and spheres of intervention for their management as geopower at various institutional sites' (1997: 91) From the social ecological perspective of Luke's analysis, world-watching leaves in place the 'basic logic of commodification and exchange that causes ecological destruction' (1997: 93). Because it fails to challenge the wealth of the First World, world-watching ensures that the burden of attaining sustainability will fall disproportionately on the Third World.

One of the most striking successes for world-watching was the 1987 Montreal Protocol that introduced global controls on ozone-depleting chloro-fluoro-carbons (CFCs). This agreement is often cited as evidence of the role science can play in addressing an emerging environmental problem decisively and effectively. As one US negotiator put it:

> The Montreal Protocol was the result of research at the frontiers of science combined with a unique collaboration between scientists and policymakers. Unlike any previous diplomatic endeavor, it was based on continually evolving theories, on state-of-the-art computer models, simulating the results of intricate chemical and physical reactions for decades into the future, and on satellite-, land-, and rocket-based monitoring of remote gases measured in parts per trillion.
>
> (cited in Yearley 1996: 107)

The protocol and later amendments achieved a complete phased elimination of CFCs and related compounds in response to evidence that they were destroying the ozone layer over Antarctica. Ozone is a relatively rare form of elemental oxygen in which three atoms are present rather than the more usual two. At low altitudes, ozone is a corrosive component of smog and a greenhouse gas, but in the upper atmosphere it forms a 'layer' that filters out ultraviolet radiation that would otherwise be extremely damaging to animals and plants. In the 1970s it was claimed that CFCs, chemicals used in aerosol sprays and refrigeration, were capable of destroying atmospheric ozone. This claim was confirmed when scientists in the Antarctic found that the ozone above them was severely depleted during the spring, as a combination of atmospheric conditions unique to the region led to rapid destruction of stratospheric ozone.

This account makes it clear that the ozone problem is an objective, scientific phenomenon of global import that was successfully addressed by scientifically informed global political action. Kate Soper in *What is Nature?* assumes and propagates this view when she comments that 'it is not language that has a hole in its ozone layer' (151). This neat, memorable phrase has been cited by a number of critics to exemplify the emphasis on literal truth, rather than social construction, that marks ecocriticism out from other literary critical schools (Barry 2002: 252; Rigby 2002: 154). Ironically, Soper may have picked the wrong example to make her point. The 'hole in the ozone layer' is actually a good example of the scientific and cultural construction of global environmental problems, since the terms 'hole' and 'layer' are strictly metaphorical in this context. The latter is an area of increased concentration of ozone, which is actually present throughout the atmosphere. As Hannigan observes, images of the ozone hole are really simulated graphic maps:

> The NASA satellite pictures of the ozone hole . . . transformed continuous gradations in real ozone concentration into an ordinal scale that is colour-coded, conveying the erroneous impression that a discrete,

> identifiable hole could actually be located in the atmosphere over the South Pole.
>
> (1995: 45)

These images raise the question of access to the means of representation and policy formation. It was the rich nations that drove forward the Montreal negotiations, demanding cuts in their own emissions and those of Third World countries, even though the latter were much smaller and had started more recently. Deploying science allowed developed countries to claim to speak for the whole world, a process called 'scientification': '*The conviction that science speaks objectively and disinterestedly means that one need have no qualms about excluding other people from decision-making since they would, in any event, have arrived at the same conclusions as oneself*' (Yearley 1996: 118; italics in original). The image of the ozone hole suggests the possibility of undemocratic and even neo-colonial environmental scientification. Ecocriticism demands attention to literal and irreducibly material problems such as ozone depletion, but it also depends upon the insight that scientific problems are never fully separable from cultural and political ones. The ozone problem is real, but it is mediated by a popularising metaphor, and framed within international political discourses that are not scientific, but ideological. Such an insight is congruent with the *critical realism* elaborated by Soper in her analysis as a whole.

The problem is therefore to establish the role of simulation for an ecocritical perspective on the globe. For the poetics of authenticity, it is the unmediated encounter with the real world that rescues the subject from the corrupt modern world of representation and simulation. In *The Age of Missing Information* (1992) Bill McKibben, one of the most persuasive of the proponents of this view, contrasts the insights provided by 24 hours on top of a mountain in the Adirondacks with the torrent of programming recorded from 100 cable TV channels in the same period. The latter, McKibben concedes, provides occasional doses of knowledge and a fair bit of entertainment, but at the same time fatally narrows our range of perception and response. Far from an Information Age, he claims, we live in a period of 'Unenlightenment', cut off from in the lessons taught by nature: 'Subversive ideas about how much you need, or what comfort is, or beauty, or time, that you can learn from the one great logoless channel and not the hundred noisy ones or even the pay-per-view' (McKibben 1992: 23). McKibben argues that TV promotes a violently compressed sense of time, and that it substitutes a bland, minimal comfort for the strife of exertion, discomfort, relaxation and sensuality that makes real happiness possible. Putting on warm, dry clothes after a hike in the rain is a pleasure fundamentally antithetical to immersion in the flickering glow of the TV set, not least because it involves senses of touch and smell that the latter simply does not address. Nonetheless, for ecocritics alert to the implications of postmodernity, his dualistic view of TV versus nature is unsustainable. The ozone hole is real and simulated, literal and metaphorical; global warming is a phenomenon generated by complex computerised climate models.

However, it is not only because climate change and ozone depletion are simulated crises that the world of simulations cannot simply be counterposed to the real world of nature. As we have seen, our encounters with the natural world are inflected by metaphors and every perception is, to some extent, a simulation. Conversely, as Katherine Hayles shows in 'Simulated Nature and Natural Simulations', the functionality of 'virtual reality' (VR) programmes and other simulations depends on an intimate fit between technology and nature, which implies a critique of the poetics of authenticity:

> If nature can be separated from simulation in a clear-cut way, then we risk believing that nature is natural because it is unmediated, whereas simulation is artificial because it is constructed. But there is an important sense in which nature is constructed . . . and simulation is natural . . . Only because simulation technologies employ precise and detailed knowledge about human perceptual transformations can they create simulations that strike us as compelling and realistic. A VR simulation appears three-dimensional to us because the images are offset, simulating the "natural" spacing of our eyes.
>
> (1996: 418)

Yet even as Hayles argues that the real and the simulated are not simply opposed and incommensurable categories, she takes for granted the validity of the distinction between them. French philosopher Jean Baudrillard claims in his influential 'Simulacra and Simulations' (1981)

that communications technologies, capable of infinite replication and wide dissemination of information, have initiated a world of simulation, that now functions to supplant the real world. Modernity was characterised by growth in forms of representation, such as writing or the map, in which the real thing and its representation could always be clearly distinguished. In the postmodern world, however, mass-reproduced representations lose their origins so that now 'it is the map that engenders the territory' (2001: 169), and the real is scarcely discernible. Baudrillard identifies four 'phases of the image':

> 1 It is the reflection of a basic reality.
> 2 It masks and perverts a basic reality.
> 3 It masks the *absence* of a basic reality.
> 4 It bears no relation to any reality whatever: it is its own pure simulacrum.
>
> (2001: 169)

Disneyland exemplifies all four of these orders; it represents pirates, and Main St USA (1), and also, obviously, misrepresents them (2). But it also embodies a more subtle misrepresentation: 'Disneyland is there to conceal the fact that it is the "real" country, all of "real" America, which *is* Disneyland' (p. 175). In this third phase of the image, the unreality of Disneyland obscures the more ominous unreality of America, although the 'unreality' in both cases is due to a surplus of representations rather than a lack of substance. Both Disneyland and America, then, are not less than real, but 'hyperreal', since the distinction between the real and simulated has collapsed, and what is left is a hall of mirrors of 'simulacra' (4). Michael Branch's essay 'Cosmology in the Casino' (1999) exemplifies this notion by examining the 2-hour cycle of day and night projected inside the dome of the Silver Legacy Resort Casino in Reno, Nevada, and expresses concern that this simulacrum may feed a desire for the hyperreal as a satisfactory substitute for the real. Baudrillard's scepticism towards the 'real' diametrically opposes him, and his theoretical conception of postmodernity, to most ecocritics.

Don DeLillo's novel *White Noise*, discussed earlier, explores the relationship between a postmodern world of simulations and environmental crisis. For example, during the toxic airborne event, officials appear from a state emergency preparedness organisation, SIMUVAC, that simulates catastrophes. For them, this actual emergency is an opportunity to rehearse, although the real can disappoint, as one official remarks: 'There's a probability excess. . . . You have to make allowances for the fact that everything we see tonight is real' (1986: 139). Jack's exposure to the toxic cloud leaves him adrift in uncertainty, as the SIMUVAC computer attempts to calculate a projected risk to his health. The official's reassurance is indistinguishable from threat:

> "It's what we call a massive data-base tally. Gladney, J.A.K. I punch in the name, the substance, the exposure time and then I tap into your computer history. . . . It comes back pulsing stars. This doesn't mean anything is going to happen to you as such, at least not today or tomorrow. It just means you are the sum total of your data. No man escapes that."

Such a projected or simulated death seems somehow superior to the subject's own living reality. Jack reflects, 'It makes you feel like a stranger in your own dying' (p. 142). Death and environmental disaster, which might seem to exemplify the real, are subordinated to the order of simulation in which every narrative of threat and resolution is hackneyed and insincere. As Richard Kerridge argues:

> *White Noise* positions its reader outside all the available narratives which could process environmental disaster and stabilise it, leaving an impasse, a condition of passive waiting. This novel dramatizes, more unsparingly than any other I know, the impasse between environmental consciousness and the inability of a culture to change.
>
> (1998: 139)

Postmodernist theories of representation may provide accurate diagnoses of environmental crises in the media, but they simultaneously disable the possibility of activism. Baudrillard's notion of simulation, as represented in *White Noise*, tends towards a kind of hyperbolic paranoia, or as he calls it, a 'vertigo of interpretation' (p. 178). Such implacable scepticism towards stable truth claims must be antithetical to an ecocriticism that

attends to problems of representation, but is founded ultimately in the assumption of real environmental problems. We must distinguish between an enervating scepticism towards truth in general, as typified by Baudrillard's postmodernist theory, and a revitalising scepticism towards certain supposed 'truths' of popular ecological discourse, exemplified by postmodern ecology.

Crucially, both Baudrillard's enthusiasm for a simulated Earth and deep ecological despair remain entranced by the failed promise of authenticity. Orientated toward practical problems of responsibility, we need not accept the dichotomy between backpacking in the Adirondacks and a cyborg existence on a simulated Earth. The Baudrillardian perspective implies the implosion of meaning in contexts of postmodern ecological risk, but Ulrich Beck's engagement with the same problem yields a quite different conclusion:

> Global ecological dangers, far from intensifying a general lack of meaning in the modern world, create a meaning-filled horizon of avoidance, protection and assistance, a moral climate that grows sharper with the scale of the perceived danger, and in which a new political significance attaches to the roles of hero and villain.
>
> (1999: 45)

The operative myth is not necessarily paranoid apocalypticism, but more like the boy David's pragmatism faced with the giant Goliath. As Beck points out, inflecting the planet through global risk generates new political strategies as well as actors, such as the 'judo politics' of Greenpeace, 'designed to mobilize the superior strength of environmental sinners against themselves'. Such politics, moreover, can mobilise their own virtual inflections of the Earth.

GAIA

It was the novelist William Golding who suggested the name 'Gaia', the ancient Greek Earth-goddess, for the inflection of the Earth developed by his friend James Lovelock (see Chapter 5). It is now used by deep ecologists and ecofeminists to counter the inflection of the Earth as a technologically and economically enframed globe. Lovelock's work began

in the science of planetary ecology. His hypothesis was that the Earth could be described as a self-regulating system, analogous to a living organism. It has been known since the discovery of plant photosynthesis that living organisms produce the atmosphere they need to inhabit, but Lovelock took the argument a stage further, asserting that the planet has been so thoroughly altered physically and chemically by living things that the Earth itself has to be seen as kind of super-organism. Rather than merely being a rock in space with life clinging to it, the non-living parts of the planet are as much a part of the whole as the non-living heartwood of a living tree.

According to Lovelock, the sun has been getting hotter as life on Earth has evolved, but our planet has stayed cool to the point of experiencing ice ages. This shows that Gaia has maintained a fairly stable global surface temperature throughout its history. Solar radiation passes through the Earth's atmosphere just as it passes through glass, and warms the surface. The heat produced would be lost to outer space but for the atmospheric gases that absorb it on the way out, trapping it as though under a blanket. Allowing light in, but stopping heat from getting out, is called the greenhouse effect. It is enhanced by high proportions of carbon dioxide. For Gaia to support life, the greenhouse effect must be regulated, since either too much or too little would be lethal. 'Global warming' involves an unacceptable degree of *anthropogenic* greenhouse effect, in addition to what the biosphere naturally provides.

Lovelock pointed out that marine organisms use some of the carbon dioxide dissolved in seawater to make their shells, which are then laid down in vast numbers in sedimentary rocks such as limestone. Some carbon dioxide is removed when dead plants decompose incompletely, forming coal, oil and other sediments. By these means, living things regulate atmospheric carbon dioxide in order to maintain a congenial surface temperature. Michael Allaby's *Guide to Gaia* (1990) explains how analogous mechanisms sustain water, sulphur and iodine cycles, regulate the salinity of the oceans and, perhaps, even affect continental drift. A benign and wholly unconscious conspiracy of millions of species keeps Gaia alive and stable, although the specific organisms and processes have changed considerably during its history and may be expected to continue to do so. Gaia is dynamic and unpredictable, not static and harmonious, although the hypothesis claims that it tends towards a geophysiological

balance of energy and chemical elements analogous to the physiological balance of an organism.

Since Lovelock put forward the hypothesis, it has been strongly disputed by other scientists (see Schneider and Boston 1993). Brewer calls it a mere 'charming metaphor' (1994: 372). The debate may be difficult to follow in detail, but the key issues are not forbidding for non-scientists. Gaia has been attractive to deep ecologists and eco-spiritualists as well as climatologists, hydrologists and philosophers of science. Ascribing organismic unity to the planet and giving it the name of an Earth-goddess allows Gaia to be appropriated as the object of global environmental consciousness, and perhaps veneration too. But as Ernest Callenbach asserts: 'Gaia is not a conscious entity with a purpose or special concern for humans. Those who think of it as a stand-in for a Supreme Being or God are misinformed' (1998: 62). Kate Rawles argues that the ethical consequences of Gaia are not at all clear-cut. For example, it has been assumed that Gaia proves our interdependent 'oneness' with the biosphere, and should therefore promote care of it, but Rawles observes that 'while we are indeed inclined to look after ourselves up to a point, we are also notorious for risking long-term damage to our own health for short-term gains, or when the causal mechanisms of the damage are abstract or obscure' (1996: 318).

There are also political disputes concerning Gaia. Ecofeminist critic Patrick Murphy has criticised Lovelock for 'sex-typing the planet'. He acknowledges that 'Gaia has become an immediately recognized, acceptable term for Earth' and that the scientific hypothesis 'works well for changing consciousness' (Murphy 1995: 61, 68), but he nevertheless criticises Lovelock for remaining bound by patriarchal habits of language and thought. Murphy argues that, by adopting a feminine stereotype, Lovelock, in common with radical and Goddess-worshipping ecofeminists (see Chapter 2), 'reinscribes . . . patriarchal sex-typing' because 'the conception of the fertile female as enchanting, sacred, and mysterious is a perception that hinders the very healing they seek' (pp. 62–3). Like Plumwood, Murphy enjoins a non-hierarchical, or 'heterarchical', differentiation of gender that accepts biological differences without forcing them into hierarchical valuations. Gaia, he argues, elevates a specific valuation of the female to a planetary level. Nevertheless, while Murphy subjects Lovelock's hypothesis to ecofeminist critique, his own normative rhetoric remains conspicuously resistant to critique from a truly ecological perspective. He repeatedly measures writers against a yardstick of commitment to 'balance' and 'harmony' that, as we have seen, has little to do with modern ecology, and asserts wrongly (citing a theologian rather than an ecologist) a 'basic ecological principle that diversity is a key component of systemic health' (p. 67). Murphy is an important figure in ecocriticism, having fostered ASLE, ecofeminism, internationalism and greater literary theoretical sophistication, but his basic ecological vocabulary is increasingly anachronistic.

Gaia is, in any case, not simply identical with the Earth. It is a hypothetical construct of Lovelock's theory, a simile for the planet grasped 'as if' it were an organism. As the theory is refined, Gaia ought to come increasingly to resemble the Earth that we know and inhabit, but it will remain indefinitely open to falsification by scientists. One way to test Gaia is to try various computer models of its regulatory mechanisms, such as Lovelock's own Daisyworld simulation, versions of which are available on the Internet (e.g. DaisyBall is at <http://www.gingerbooth.com/courseware/daisy.html>). Simulations can show how Gaia works if it works at all, but on their own they cannot prove its worth as a theory. By comparison with Baudrillard's hyperbolic paranoia, such sensible pragmatism will seem dull, but understanding the responsible use of ecological modelling is essential for understanding the nature of scientific 'prediction' in the age of global ecology. Moreover, although I have analysed only its scientific formulation, Gaian simulation might also provide a basis for attempts to imagine the whole Earth in the literary and other media more usually addressed by ecocritics.

THE FUTURE OF ECOCRITICISM: BETWEEN TWO SIMULATIONS OF EARTH

This book has moved from the ancient trope of pastoral to the contemporary contestation of the figure of the Earth, from Romanticism to postmodernism. The Bible and Graeco-Roman narratives were important sources for the earlier tropes, and we saw that the notion of a pristine original space lost by human misdemeanour runs through pastoral, wilderness and some versions of dwelling, while the hope or fear of some final destination for human struggles with nature saturates apocalyptic

visions. However, Christian tropes are problematic for ecocritics, originating in an other-worldly religion that legitimises environmental destruction. The underlying narrative structure of Christian mythology claims a coherence for the history of Creation that is utterly at odds with evolutionary and ecological processes. Such ancient tropes, as adapted by environmental discourse, have the advantage of deep roots in our culture, but the liability of anachronism in the postmodern era. Only the relatively novel constructions of the human animal and the whole Earth, both profoundly shaped by scientific thought, seem to offer metaphors adequate to the novelty of our predicament, and even these may be inflected quite differently in different contexts.

Much ecocriticism has taken for granted that its task is to overcome anthropocentrism, just as feminism seeks to overcome androcentrism. The metaphysical argument for biocentrism is meant to sustain moral claims about the intrinsic value of the natural world, which will in turn affect our attitudes and behaviour towards nature. Wilderness experiences, or apocalyptic threats, or Native American ways of life, are supposed to provide the impetus or the example by which individuals come to an authentic selfhood orientated toward right environmental action. Whilst the importance of changing the minds and lives of individuals is undeniable, this book has aimed to show the political dimension that this moralistic emphasis may occlude. However, the politicisation of ecocriticism does pose its own problems. Dwelling on the troubling example of Heidegger (Chapter 6), who espoused both Nazism and a kind of deep ecology, Jonathan Bate asserts in *The Song of the Earth* that 'The dilemma of Green reading is that it must, yet it cannot, separate ecopoetics from ecopolitics' (2000: 266). Environmentalism is compatible with most political positions, and while we have seen possible dangers inherent in this, it might also give us a clear argument for better, not less, political attunement in ecocriticism. Bate rightly points out that poets are not the engineers of the world, and that literature cannot provide specific solutions, which means that ecocriticism must continue to adopt and adapt theories from feminist and Marxist traditions, enabling positive engagement in cultural politics.

I would argue that the promise of ecofeminist literary and cultural theory has yet to be realised. With important exceptions such as Haraway, Armbruster, Westling and Murphy, such criticism has been held back by

the overstated anti-rationalism and gynocentric dualism of radical ecofeminism. The work of Australian philosopher Val Plumwood offers ecofeminism a sound basis for a much-needed critique of the dynamics of domination as they operate in a range of cultural contexts. A monolithically conceived root cause of environmental destruction, be it labelled anthropocentrism or androcentrism is bound to misrepresent the complexity of causation in the real world. Ecofeminism, modified by dialogue with social ecological positions, can provide insight into the cultural operations of environmental injustice. In this way, the fusion of environmental and social development agendas that has occurred so strikingly within and between global NGOs might come to ecocriticism; *Beyond Nature Writing* (2001), edited by Karla Armbruster and Kathleen Wallace, includes several essays in this emergent field of enquiry.

Ecocritics therefore continue to experiment with hybridised reading practices, drawing on various philosophical and literary theoretical sources. Bennett and Teague's *The Nature of Cities* (1999) reveals a new emphasis on bringing cultural theorists such as Cronon, Ross, Luke and Haraway into dialogue with literary ecocritics, thereby consolidating the field around a critical encounter between genres, perspectives and politics. The work of Richard Kerridge is exemplary in this respect: he writes with as much insight about postmodern risk as he does about Thomas Hardy. Harrison's eclectic *Forests* (1993), which ranges from Grimm fairy tales to the architecture of Frank Lloyd Wright, fosters the making of connections between disparate cultural phenomena without eliminating their peculiarities. Bate and Buell first published books that identified a single 'environmental tradition' in Britain and the USA, stemming from Wordsworth and Thoreau respectively. In later works, however, they favour an explicitly dialectical approach. In *The Song of the Earth*, Wordsworth's piety is leavened with Byron's wit, and Heidegger's portentousness gets a learned sneer from Theodor Adorno. For Buell, *Writing for an Endangered World* involves juxtaposing urbanites like Theodor Dreiser and Gwendolyn Brooks with the more obvious candidates for ecocritical treatment, Jeffers and Berry. Drawing upon such diverse resources of hope enables ecocriticism to connect with the urban and suburban places in which most of us will continue to live, and will add depth to the ecological critique of modernity; material and economic progress is no more the root of all evils than it is an unalloyed benefit to

people or the natural world. By such means the risk of fostering reactionary politics might be minimised.

There are two key challenges for the future. One is the relationship between globalisation and ecocriticism, which has barely been broached. Sustained attention to the idea of place as locale has provided us with no sense of the place of the whole Earth in contemporary culture. The second is the difficulty of developing constructive relations between the green humanities and the environmental sciences. This is especially problematic in the light of developments in ecology that expose the rhetoric of balance and harmony as, in effect, versions of pastoral. This notion of nature's wisdom is so deeply ingrained in environmentalist discourse and ecocriticism that only sustained research at the borders of the humanities and the new postmodern biological sciences can disentangle it from our systems of basic presuppositions. As Daniel Botkin observes:

> As long as we could believe that nature undisturbed was constant, we were provided with a simple standard against which to judge our actions, a reflection from a windless pond in which our place was both apparent and fixed, providing us with a sense of continuity and permanence that was comforting. Abandoning these beliefs leaves us on an extreme existential position: we are like small boats leaves us on an extreme existential position: we are like small boats without anchors in a sea of time; how we long for a safe harbor on a shore.
>
> (1992: 188–9)

Gaia, for example, implies unpredictability and dynamism rather than predetermined harmony, but also comfortingly reasserts the tendency of life to maintain equilibrium or balance. Botkin's ecology places rather less faith in the harmonious regulatory functions of living organisms. In both cases, the inflection of Earth as a static, fixed image is shown to be terribly misleading. The Earth is perhaps better seen as a process rather than an object.

Postmodern ecology neither returns us to the ancient myth of the Earth Mother, whose loss some ecocritics lament, nor supplies us with evidence that 'nature knows best'. The irony is that a future Earth-orientated system of values and tropes will have to acknowledge contingency and indeterminacy at a fundamental level, but this only

increases the scope and extent of our liability as the most powerful species on the planet. The poetics of authenticity assumes, against the evidence of ecology, that there is a fixed external standard we ought to try and meet. The poetics of responsibility recognises that every inflection of Earth is our inflection, every standard our standard, and we should not disguise political decisions about the kind of world we want in either the discredited objectivity of natural order nor the subjective mystification of spiritual intuition. Ecocriticism is essentially about the demarcation between nature and culture, its construction and reconstruction. The ultimate logic of pastoral would be the hope that culture might be subsumed within nature, but we have seen the limitations of such idealism. The opposite extreme would be the technological sublimity of simulation, in which nature is no more than a cultural construct, but this world of pervasive representation is a misrepresentation. Ecocriticism, I would argue, will have to work with the shifting, pragmatic sense of the relationship of culture and nature suggested in this book.

Ecophilosophers often criticise the arrogance of anthropocentrism, sometimes using the Ancient Greek term 'hubris' for this fatal flaw of overweening self-righteousness and wilful misuse of power. The history of the world in the last 200 years, and especially the history of the developed world in the last 50 years, supplies ample evidence of such hubris. Yet the solution need not be, as deep ecologists would have it, self-abnegating humility and submission to the presumed natural order. The Ancient Greeks proposed a virtue that combined the proper pride of a clever, resourceful animal with reasonable acceptance of the human place in a world we can neither wholly predict nor control. They called it 'megalopsuche', which translates roughly as 'greatness of soul', and I would suggest this as a worthy aspiration. We can understand the distinction by contrasting two attempts to simulate planetary ecology.

In September 1991, eight people, called 'bionauts', were sealed into an enormous structure in the Arizona desert. For the next two years, they attempted to live and work in 'Biosphere 2', a simulation of the Earth's environment, the original Biosphere. Architecturally, Biosphere 2 is dominated by two stepped tetrahedral pyramids, reminiscent of Meso-American ruins, but built out of steel and glass like corporate buildings. Inside these and associated buildings, there are seven biomes that bring selected plants and animals from around the world together into a

supposedly integrated, self-sustaining, total environment. Five 'natural' biomes – ocean, savannah, desert, tropical rainforest and marsh – sustain two 'artificial' ones, including a microcity for the human bionauts and an area for intensive agriculture. Outside the Biosphere itself, the site includes control rooms, conference facilities, exhibition spaces, gift shops and tourist conveniences. The initiative was supposed to provide a functioning model of 'Spaceship Earth' that might not only serve as a testbed for environmental engineering technologies, but also as an example of the eco-simulation technologies we might need for eventual space exploration beyond the limits of food, energy and oxygen supplies brought from Earth.

The original Biosphere 2 mission failed dramatically. Technical problems caused crop failures and elevated levels of carbon dioxide that would have killed the bionauts were it not for external intervention. Few worthwhile scientific results were achieved, and it largely failed as an advertisement or laboratory for self-sustaining life support systems. The second mission in 1994 was cut short, and Biosphere 2 has since had a new lease of life without bionauts or extravagant 'missions' as a research and educational facility of Columbia University. In its original incarnation, Biosphere 2 seems a good example of tragic hubris, occasionally bordering farce. Its 3.2 acres, whilst impressive in terms of large glasshouses, were a ludicrously small compass for such grandiose ambitions. Moreover, as Luke observes, the very basis of the project was disingenuous; while human life and its 'technosphere' depends on the sustaining 'ecosphere' out here in Biosphere 1, the simulated Earth reverses this priority. Underneath the great structures, complex, hidden mechanisms are needed to regulate environmental factors such as temperature or air composition. The ecosphere, in other words, comes to depend upon the technosphere. The biomes themselves are composed of entirely artificial associations of plants loosely associated with particular nations or regions, with a tiny selection of insects and animals included. This makes Biosphere 2 an excellent example of an ecological simulacrum:

> Here, 'Nature' is not Nature, but rather something that has been digitally sampled, botanically colorized, zoologically compressed, and ecologically scanned into a biospheric simulation of itself that could not and would not exist without the engineering needed to stage this odd ecological experiment.
>
> (Luke 1997: 102)

On 15 May 2000, the world's largest greenhouses opened to the public in Cornwall. The Eden Project, as it is called, is presently striving to cope with its own extraordinary success as a tourist attraction. Superficially, the Project resembles Biosphere 2: it incorporates two gigantic indoor biomes, simulating humid tropic and warm temperate conditions with regional botanical zones. It is brilliantly designed as a tourist attraction, seeming to hide at the bottom of its enormous claypit until the paying customer emerges onto the first viewing platform for an impressive panorama of its eight geodesic domes surrounded by landscaped parkland, outdoor crops and tourist services. The merchandise is of high quality, the Eden Project brand name is everywhere and the designers have clearly learned a lot from theme parks and similar leisure facilities.

Tim Smit, author of *Eden* (2001) and prime mover in the Project, is candid about its commercial needs but deplores the theme park analogy. He traces the laborious construction process, and explains that the philosophy behind it was not to simulate ecosystems in the sense of pretending to recreate them, but 'to represent and interpret climate zones which exhibited the maximum impact of man on the environment, thus providing a canvas on which to explore the widest range of issues' (Smit 2001: 129). Its ambition is not intergalactic and technophilic, but resolutely terrestrial and educational, emphasising human dependence on plants for aesthetic and spiritual sustenance as well as food, medicine and industrial processes. Sculptures litter the inner and outer spaces, and the site is patrolled by both scientists and performing artists. Technosphere and ecosphere are constantly and explicitly interrelated, with service pipes externally mounted on the domes, while within the biomes both creative and destructive interrelations between culture and nature are explored:

> Eden would be dedicated to inspiring people to reflect on the vital role of plants and come to understand the need for balance between, on the one hand, husbandry – growing them for our use – and, on the other, stewardship – taking care of them on behalf of all living things.
>
> (2001: 174)

Perhaps ironically, then, the 'Eden' Project is anything but an exercise in pastoral nostalgia, or a dualistic projection of humans in opposition to, or exile from, the Earth. It is an experiment in imaginary human ecology that flirts with utopianism, but ultimately epitomises something like global georgic:

> Eden isn't about the environment; that's like saying life is about air. It is concerned, in partnership with others, with exploring development in the fullest sense of the word: the sustainable development of human potential and the achievement of the optimum quality of life for all, across economic, social and cultural boundaries.
>
> (2001: 302)

It ought not to be too pious, or too implausible, to associate the ecocriticism of the future with Eden's inflection of the Earth: attuned to environmental justice, but not dismissive of the claims of commerce and technology; shaped by knowledge of long-term environmental problems, but wary of apocalypticism; informed by artistic as well as scientific ecological insight; and committed to the preservation of the biological diversity of the planet for all its inhabitants. It is a long way from the pastoral we started with, and it is a great-souled vision with its feet planted solidly on the ground.

GLOSSARY

Androcentric system of beliefs and practices that favours men over women.

Animism belief that natural objects and phenomena have spirits.

Anthropocentrism system of beliefs and practices that favours humans over other organisms.

Anthropogenic caused by humans.

Carrying capacity maximum number of organisms of a certain kind that an ecosystem can support. Sometimes dubiously applied to human populations, e.g. Callenbach 1998: 22–5.

Constructionism belief that apparently natural phenomena, such as gender characteristics, are mainly or wholly enculturated or 'socially constructed'.

Cyborg hybrid organism incorporating biological and electro-mechanical elements.

Dialectic analysis pursued by means of incorporation of opposed arguments or perspectives.

Dualism explanation of the world in terms of two opposed terms, e.g. mind vs. matter, nature vs. culture.

Ecocide destruction of entire habitats, rather than just individual organisms or species.

Instrumental value possessing value only in relation to human interests, usually narrowly economic.

Intraspecies operating within, rather than between, species.

Intrinsic value possessing value in its own right, without reference to human interests.

Jeremiad a discourse of warning or discouragement, often prophetic in tone.

Matrifocal social system centred on mothers as possessors of wisdom and creativity. Compatible with some forms of patriarchy.

Mechanism belief that the world is explicable in terms of mechanical physical laws.

Monism explanation of the world using a single, all-encompassing term.

Normative proposing or maintaining a standard or norm.

Prolepsis narratological term for anticipation of future events.

Reductionism belief that phenomena can be explained in simple, or (by implication) simplistic, terms.

Speciesism prejudice in favour of one's own species.

Synecdoche figure of speech in which a part stands for the whole, e.g. 'hand' instead of 'worker', or 'hungry mouth' instead of 'poor person'.

Therianthropic representation of humans and animals in a single image, usually as a form of caricature.

Theriomorphic representation of humans as animals, usually with satirical purpose.

Theriophobia irrational fear of animals.

Trope any figure of speech, e.g. metaphor, metonymy, irony. Used in this book to name large-scale, underlying cultural metaphors of nature.

Vitalism largely discredited scientific belief that phenomena possess a vital spirit over and above qualities that may be described mechanistically.

Further Reading

The ASLE website is an excellent, growing source of theoretical, bibliographic and pedagogical material, with an especially interesting section that includes twelve different definitions of 'ecocriticism': <http://www.asle.umn.edu/conf/other_conf/wla/1994.html>. This would be a good starting point for further research, as are the following:

K. Armbruster and K.R. Wallace (eds) (2001) *Beyond Nature Writing: Expanding the Boundaries of Ecocriticism*, London: University Press of Virginia. Examines a wide variety of authors and periods, with a broadly social ecological and ecofeminist perspective.

J. Bate (2000) *The Song of the Earth*, London: Picador. A dialectical reading of canonical literature, mainly British, using Heideggerean concepts.

M. Bennett and D.W. Teague (eds) (1999) *The Nature of Cities: Ecocriticism and Urban Environments*, Tucson, AZ: University of Arizona Press. Not only a new terrain for ecocriticism, but also a politically progressive theoretical framework.

D. Botkin (1992) *Discordant Harmonies: a New Ecology for the Twenty-First Century*, Oxford: Oxford University Press. An accessible and thought-provoking introduction to recent ecological theory that recognises the importance of tropes.

L. Buell (2001) *Writing for an Endangered World: Literature, Culture, and Environment in the U.S. and Beyond*, London: Belknap Press. Together with Buell's earlier Thoreau book, constitutes a thorough basis for American ecocriticism.

W. Cronon (ed.) (1996) *Uncommon Ground: Rethinking the Human Place in Nature*, London: Norton. An excellent collection of work by writers from a variety of disciplinary backgrounds.

C. Glotfelty and H. Fromm (eds) (1996) *The Ecocriticism Reader: Landmarks in Literary Ecology*, London: University of Georgia Press. Canonical anthology with a broadly deep ecological approach and exclusively American focus.

R. Kerridge and N. Sammells (eds) (1998) *Writing the Environment*, London: Zed Books. Important anthology containing essays on children's