

Chapter 3 (pp. 43 – 68 from *Environmental Education: a pathway to sustainability*, John Fien (editor), Deakin University, 1993)

Environmental education and sustainability: A view from critical theory

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Introduction

*Perhaps the [1992] Earth Summit marks a twenty year cycle, and we have ‘arrived where we started’. We know this place, and these crises are familiar, but the feeling is not one of *deja vu*. Things have changed, and these changes call for redoubled learning and exploration of new ethical, political, economic and educational paradigms. We know much better the territory and solutions that have to be explored. But time is short and, it must be said, the calibre and extent of current debate on the interface between environmental survival and the role of education is disappointing. Whether education as a whole can be bold enough to develop an adequate response, on a scale commensurate with the issues that have to be addressed over the next decade, remains a crucial question.* (Sterling 1992, pp. 1—2)

Stephen Sterling wrote these words in an editorial to the 1991—92 edition of the *Annual Review of Environmental Education* which summarises many of the ideas he presents in chapter 4. He reminds those of us old enough to remember 1972 and the Stockholm conference that environmental education is once again being promoted as a vehicle for social change and more sustainable forms of development. He suggests that environmental educators have made limited progress during the past twenty years, and advocates more debate on the interface between education and environmental problems informed by holistic, ethical, political, economic and educational paradigms.

This chapter provides a critical basis for considering the holistic perspective on education for sustainability presented in chapter 4. This chapter elaborates the first imperative of education for sustainability outlined in the conclusion of chapter 2: that it must be grounded upon an appreciation of the root causes of environmental problems in the global economic system. Thus, this chapter outlines a philosophy whereby the interface between education, environmental problems and sustainability can be understood, and examines how the theories which stem from this philosophy have been developed and modified by a number of contemporary social scientists. It anchors environmental problems and education firmly within the changing social structures and processes which shape the combined and uneven development of people, environments and societies around the world. It argues that participatory action research, linked to struggles to

democratise these structures and processes, is the key to both sustainable development and education for sustainability. Such research allows teachers and others to transform themselves, their communities and environments through reflection and action, and takes on a particular significance at the present time when profound changes in the economic, political and cultural order present us with major new opportunities for human liberation.

Realism

Any consideration of environmental education and social change is based on a philosophy or theory of knowledge which explains how the natural and social worlds work and how they interact with one another. Competing theories of knowledge are known as *epistemologies* and are associated with different accounts of what can be known (termed *ontologies*) and different means of acquiring information and knowledge (*methodologies*). Realism is an epistemology which developed as a reaction to idealism or the notion that there is no reality other than that which we perceive. While idealists argue that reality is a wholly mental construct, realists insist that there are structures and processes at work in the world which generate phenomena independent of our powers to experience and access them (Gregory 1986, Sayer 1985).

Realism is based on a three-tiered ontology or stratification of reality which suggests that we can comprehend the natural and social world at three levels:

1 *The level of structures and processes.* The elements which make up the natural and social worlds are arranged or structured in particular ways which make possible certain causal powers or processes. These structures and processes underpin the natural and social worlds at varying levels of abstraction and cannot be apprehended or observed directly. They exist in what is sometimes called the real domain or the ‘underlying structure’.

2 *The level of events* or the actual domain. It is at this level that the workings of the underlying structures and processes are realised or put into operation. They can be observed through events which take place in the natural and social worlds.

3 *The level of experience* or the empirical domain. This is where individuals experience the events in the actual domain which have been caused by processes in the real domain.

In explaining the natural and social worlds, realism seeks to trace the origins of experience through the level of events to the level of structures and processes. The success of the explanation is judged not by how many times an expected event or experience is observed, but by the logic of the links established.

Natural and social scientific realism

The structures and processes which govern the natural world are described by the fundamental laws of physics, chemistry and biology. They cannot be observed directly but exist as theoretical statements that are consistent with the scientist’s observation of the actual and empirical domains. Environmental science is often problematic because it deals with open systems, like the atmosphere and biosphere, where a large number of processes are operating together in changing circumstances. While there are general laws

which govern the outcomes, these are highly complex and are generally the subject of continuing research.

Whereas the structures and processes which govern the natural world are given and unchanging, those which govern the social world are created by people and are continually changed by human action or agency. When these changing processes operate in combination there are no general laws which govern the outcome or events. This is because humans are able to learn and communicate with one another and their changing interpretations of processes, events and experience lead to changing decisions and social behaviour. While social science would seem more problematic than natural science, it does benefit from people having ‘internal access’ to the meaning of many social phenomena and being able to give reasons for most of their actions. These meanings and reasons may be the product of false consciousness, or an incorrect reading of reality, but they are nevertheless insights for which no equivalents exist in the natural sciences. The practices of social and natural science are consequently very different, despite some similarities between them.

Realism is potentially of great value in bringing a common philosophy or approach to the understanding of both natural and social phenomena. Existing knowledge of the structures, processes and tendencies of nature can be integrated with similar knowledge of society in an ordered framework which begins to suggest how the general laws of nature work out in specific historical and geographical circumstances. Figure 3.1 is an attempt to show a realist view of nature, society and environmental education. The solid lines show interaction between the empirical, actual and real domains, while the broken lines show the interpretations or understandings of the natural and social worlds which shape people’s behaviour in society. Comprehensive education for sustainability must address all these interactions and interpretations if it is to address the causes of unsustainability, challenge the predominance of technological modes of sustainability and promote strategies for ecological sustainability.

Clearly events in the evolution of environmental education reflect and shape both social structures and processes, the everyday experiences of teachers and others, as well as our changing interpretations of nature and society and the interactions between them. The interface between education and environmental problems is complex and can only be viewed realistically with the help of different kinds of science.

Jurgen Habermas and critical science

Jurgen Habermas is a philosopher and critical theorist associated with Marxism and the Frankfurt School. He suggests that the conditions which make knowledge possible can be grounded in cognitive or ‘knowledge constitutive’ interests (Craib 1984, Ewert 1991). Habermas argues that any society necessarily involves both social labour, which is organised through a system of instrumental action, and social interaction, which is organised through a system of communicative action. He shows that the first of these involves the realisation of a *technical interest*, because any labour process needs some means of achieving control over its materials and components, while the second involves

the realisation of a *practical interest*, because any communication process needs some means of ensuring that participants understand one another.

These two interests are developed in different social media (see table 3.1) and constitute two different dependent forms of knowledge or science by specifying their domains of study and their associated ontologies and methodologies. The technical interest constitutes the *empirical-analytical sciences* which operate in the empirical domain and generally adopt a positivist philosophy. The *hermeneutic* or *interpretive sciences*, on the other hand, focus on individuals, their actions and the meanings which underpin them, and draw on the philosophy of phenomenology. While the empirical sciences provide us with technical control over the natural and social worlds, the hermeneutic sciences promote mutual understanding and social harmony by aiding our appreciation and awareness of our environment and one another.

Table 3.1
Habermas's theory of knowledge constitutive interests: linkages between interest, knowledge, power and science

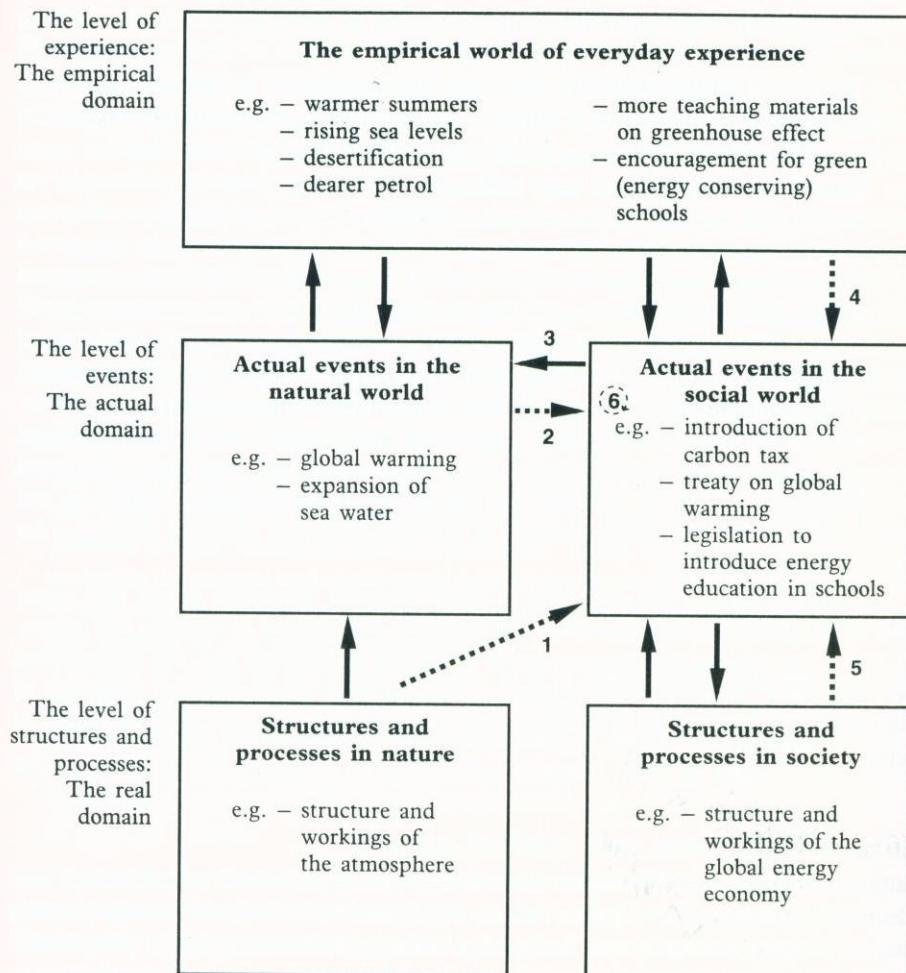
Interest	Knowledge	Medium	Science
Technical	Instrumental (causal explanation)	Work	Empirical – analytic or natural sciences
Practical	Practical (understanding)	Language	Hermeneutic or 'interpretive' sciences
Emancipatory	Emancipatory (reflection)	Power	Critical sciences

Source: Carr & Kemmis (1986, p. 136)

Environmental education programs based on the empirical-analytical sciences and which address technical interests might best be considered examples of *education for environmental management* whereas those which are based upon the interpretive sciences and which address practical interests are examples of *education for environmental awareness and interpretation*.

In addition to technical and practical interests, Habermas recognises a third interest, an *emancipatory interest*, which constitutes *critical science*. If people are to be free from ideological (and material) constraints to their understanding and able to assess all the options available to them in seeking to realise their full potential, then they need a grasp of critical science of theory. This combines study of the real domain with investigations of the actual and empirical domains, and provides both knowledge of how nature and society work and how we can become involved in changing structures and processes through individual and collective action. Together the empirical, hermeneutic and critical sciences facilitate the basic human activities of managing and controlling the environment, interpreting the environment and transforming the environment. This is the basis of *education for sustainability* and, without a contribution from critical science,

Figure 3.1
A realist view of nature, society and environmental education



Key

- Interactions between empirical, actual and real domains
- Human interpretations of the natural and social worlds that shape human action

- 1 Our interpretation of structures and processes in the natural world
- 2 Our interpretation of events in the natural world
- 3 The actual impact of events in the social world on those in the natural world
- 4 Our interpretation of our everyday experience
- 5 Our interpretation of structures and processes in the social world
- 6 Our interpretation of events in the social world

Source: based on Johnston (1989, p. 61).

environmental education is unable to act as an effective vehicle for ecologically sustainable development.

Critical theory, ideology and human agency

In our everyday lives we both reproduce and change the social structures and processes which shape events and experience. Our behaviour is not entirely shaped by prevailing economic, political and cultural realities for we do have some power or agency to interpret and shape our environment in ways which we choose. Critical theorists remind us that our choices may, however, be based on false or distorted interpretations of structures, processes, experience and events (figure 3.1) and that, as a result, they may not have the consequences we intend.

Whereas the empirical and interpretive social sciences seek to describe the world as it is, critical theory tries to understand why the social world is the way it is and, more importantly, through a process of critique, strives to know how it should be. It starts from a critique of ideology or distorted knowledge, believing that self-conscious awareness of knowledge distortion, or enlightenment, is a necessary precondition for individual freedom and self-determination. People become free or emancipated when, on the basis of their enlightenment, they take action that changes the social system in ways which allow the realisation of their unique human potential. Such emancipation is possible through *praxis* or a process of reflection and action.

To reveal the emancipatory potential of education for sustainability we need to consider the critical theories of society and nature offered by modern social scientists working in the Marxist tradition. We will see that those using a modified theory of historical materialism offer a rather different diagnosis and prescription from those employing a comprehensive theory of rationality.

Marx and political economy approaches to society and nature

In the twenty years since the Stockholm conference, the major contributions to a realist or critical account of society and nature have come from geographers and others who have rediscovered and developed Marx's theory of historical materialism (Mandel 1990). The following account draws heavily on the recent work of Peter Dickens (1992), who combines the writings of the young Marx with contributions from modern biology and social psychology to outline a 'green social theory', and that of Richard Peet (1991), who reviews the relevance of Marxist development theory in an era of global capitalism. Dickens helps us to identify the core imperatives of human nature and social reproduction at the abstract level while Peet allows us to consider the ways in which these find expression in a world undergoing profound change from modernity to what some insist is post-modernity (Hall, Held & McGrew 1992). Dickens's starting point is a consideration of Marx's working method and his concept of human nature.

Marx's working method was relational or dialectical. He attempted to specify the potential or latent tendencies within an object (its internal structures and processes) and examine the external or contingent factors which determine whether or not these are

realised. People are constituted by nature with certain powers or tendencies but whether these are realised depends on their dialectical relationship with the rest of the natural and social world.

Marx distinguished clearly between our natural and species being. He suggested that people have certain natural powers and needs in common with other species (labour, eating, sex, companionship) but also have species powers and needs which are distinctively their own. Especially important species powers are self-awareness, conceptualisation and learning, which make possible reflective behaviour and the development of technologies for modifying nature. People's interaction with the natural world goes way beyond mere survival and reproduction. It becomes a way of realising our species powers or our full physical, intellectual, spiritual and aesthetic potential. Human nature is neither fixed nor eternal, but is created under natural and social conditions which are never entirely of our choosing. They change during people's collective struggles to ensure social reproduction.

Social reproduction

Marx's theory of historical materialism is both science and politics. It provides a realist explanation of the structures and processes which prevent people from realising their potential in the past and sets out a program whereby they could transform society and so realise their potential in the future. Marx concentrated his attention on the social organisation and transformation of economic production, but modern Marxists, such as Richard Peet, have widened their horizons to focus on the more general process of reproduction. This includes the total set of practices and relations through which humans make and remake their existence and gives more attention to the role of ecological limits in social development.

Figure 3.2 suggests that eight transhistorical elements can be seen in the reproduction of all societies. Throughout history, people have organised themselves into dynamic modes of reproduction with different forms of social relations or structures shaping social practices including their metabolism with nature. Modes of reproduction reflect the natural regions or territory in which they are based and their impacts on nature act back upon society to shape its continued reproduction or development. This is primarily the result of changing social relations, which may allow developments in the forces of production or a society's capacity to transform the natural world.

Marxists maintain that the level of development of a society's productive forces limits and directs (rather than determines) its political and cultural development or its entire mode of existence. Once control of these forces passes to an elite, it seeks to use them in its own interests by further enhancing cooperation in the collective labour effort and using new technology to raise productivity and overcome limits imposed by nature. The exploitation of labour and nature then become arenas of struggle in which an increasingly 'socialised' and dominated majority seeks greater control of the forces and relations of reproduction and the elite uses social regulation to maintain its control of surplus production through its control of economic, political and cultural power. Since social relations are multi-faceted, struggle generally takes place in numerous sites. It includes

Figure 3.2

Transhistorical elements in the reproduction of society

1 A territorial base

All societies are located in earth-space. They must survive or make their living within a particular environment which reflects the impact of past and present human activity.

2 Necessary activity

All societies must engage in activities of a material and practical kind in order to survive and develop. These activities include the production and distribution of goods and services, the possible generation of surplus, procreation, and production of new ideas and technologies. Such activity will be more or less sustainable in terms of its impact on natural resources and services.

3 Forces of production

All societies must make use of natural resources, human labour and technology to secure a livelihood. Technology may be more or less appropriate in terms of its impact on natural resources and services.

4 Conditions of production

All societies depend on natural resources and services (e.g. soil fertility, water purification, climate stabilisation), rural and urban space (e.g. freedom from congestion and pollution) and human health and welfare (e.g. fit and suitable educated young workers). These conditions of production must be reproduced if development is to be sustainable.

5 Social relations

All societies must organise people to produce the goods and services they need (social relations of production), to reproduce people (gender relations), and to reproduce the conditions of production. Social relations include the relations between the individual and society, between groups within society and between societies over space. Democratic relations mean that people are more likely to realise their common interest in sustainable development.

6 Social regulation

All societies require some means of maintaining social order or regulation of the mode of reproduction. In modern societies the state plays the key role and is able to regulate people's relations with one with one another and society's relations with nature. The state may be able to shift society to more sustainable forms of development, using such instruments as legislation, taxes and environmental education, but such a policy is likely to be strongly guided and limited by other imperatives of the state.

7 Geographical articulation

All societies have links with other societies regionally and globally. These links between individuals, groups and whole societies may foster or impede progress towards sustainable development.

8 Human consciousness

All people develop an awareness and understanding of themselves and their world in a social context. Human thought or consciousness is both a reflection on and of reality and is a means of realising partial liberation from natural constraints. It often takes ideological forms which conceal the true nature of social relations.

Source: based on Peet (1991, p. 179).

conflict over the ownership and use of the forces of production (including natural resources and technology) and conflict over the reproduction of the conditions of production which include the natural resources and services on which future production depends. Much of this conflict is focused on the state.

An exploitative society in which economic surplus is expropriated by a minority must develop institutions which ensure elite domination or the reproduction of class and gender relations. Many of the necessary reproductive or regulatory functions are concentrated in the state and are governed by an appropriate form of politics. The state has a monopoly on violence, rationalises inequality and guarantees the continued reproduction of the social order. Its 'apparatus' includes education, which serves to socialise the young and unify understanding of society through the transmission of ideology. Such apparatus is structurally connected to the economic base of society and, while this limits and directs the kind of educational system and state which comes into existence, it is people living in specific times and places who create their more exact forms.

While modern Marxists look to changing modes of reproduction to explain social development, they insist that it is necessary to consider the articulation of modes in time and space if the complexity of the structures of necessary activity and relations shaping social mechanisms or practices is to be perceived. The remnants of past modes and features of emergent modes connect with the present mode to shape a particular social formation and these constituent modes interact with others across geographical space. The articulation of modes of production and reproduction helps us to explain uneven development within and between social formations. This is structured by the reproductive requirements of the dominant mode and the level and types of resistance offered by subordinate modes.

It is the variety of articulations and the related multiplicity of structures, mechanisms, contradictions and struggles within any social formation which make it difficult for the social scientist to predict the course of social development. Critical realists and structural Marxists emphasise the role of agency within structural constraints with human activity making and sometimes breaking reproductive patterns. They recognise common themes in outcomes but do not see structures and processes determining social phenomena and development in the narrow sense. Participatory action research provides them with a way of improving their understanding of the complex links between structures, processes, events and experience, or consciousness, actions and outcomes (Fals-Borda & Rahman 1991).

The capitalist mode of reproduction

While pre-capitalist elites or ruling classes often sought to regulate economic activity, and sometimes to stimulate it, they did not attempt to 'save' and reinvest the surplus product to develop the productive capacities of society in any generalised and systematic way, that is, by continuously expanding the scale and efficiency of production. This process of accumulation made its historic appearance with the emergence of capitalist society and its unique set of social relations. These included the separation of the

producers from the means of production, the formation of labour power (or capacity to work) as a commodity, and the generalisation of commodity production or production for the market. Capitalist social relations produce two basic classes: the capitalist class which owns property in the means of production and the working class which, lacking means of production to produce its own subsistence, has to sell its labour power to the capitalist class in exchange for wages.

Under capitalism the elements of production, which include the labour power of the producers and natural resources, become commodities to be incorporated into a process of generalised commodity production for profit. The purpose of transforming natural resources into commodities for sale in the market is to achieve profit and this process brings capitalists into competition with one another to produce commodities as cheaply as possible. In seeking greater 'efficiency' or lower unit costs of production, they attempt to minimise labour costs, maximise labour productivity, keep raw material costs as low as possible, and use the environment as a free source of such services as water purification and waste disposal. This enhances profits, some of which are re-invested or accumulated in even more 'efficient' ways of exploiting both workers and nature. The drive for capital accumulation results in the rapid development of the forces of production and society's productive capacity. However, capitalist development faces the central contradictions that the accumulation which drives the system leads to the impoverishment of workers, whose purchases are needed to maintain accumulation, and to the neglect of the conditions of production, such as natural resources and services, on which it also depends.

Alienation and commodity fetishism

Under capitalism people are unable to realise their species powers because they do not control their interactions with nature and others in the process of social reproduction. Commodity production for profit means that they experience nature and other people in limited and limiting ways. Few work directly with natural materials in ways which develop their physical, mental and aesthetic powers, and few work cooperatively with others in ways which meet their real needs for community and sociability. We work and live in environments which are increasingly detached from nature and are encouraged to behave more and more as competitive individuals with little regard for the collective good.

Having alienated us from nature and society, capitalism's trick is to compensate us for our loss by developing or sanctioning processes which restore some sense of community and contact with the natural world. Religion, liberal democratic politics, consumerism and environmental pressure groups are all examples of forms of association which re-establish links with other people and nature while at the same time emphasising the apparent equality of individuals. Money, consumerism and the market are particularly important in this respect for, having separated ourselves from others and nature for money, we are compelled to use it again in an attempt to re-establish lost connections. The market obliges by further commodifying nature and selling it to us as health foods, holidays to 'natural' locations, and 'environmentally friendly' products of all kinds. Like other products these appear to have a life of their own. They appear not as a set of social relations, complete with a full account of the social and environmental costs entailed in

their production, use and disposal, but as cult objects to be admired and possessed. Under consumer capitalism, nature and community are reconstructed in commodified and fetishised form while social life revolves around the market and the acquisition of reified inanimate objects rather than the realisation of our true species being (Seabrook 1990).

Global capitalism

Capitalism is now a global economic system with flows of trade, investment, labour, technology and aid linking national economies around the world (Wallace 1990). Virtually the whole of earth-space has become the territorial base for commodity production of one kind or another and the imperatives of capital accumulation, reflected in global markets, shape the 'necessary' activity and environments of most societies. Global capitalism's social relations or global division of labour have been shaped by centuries of colonialism and imperialism and, as structures of economic, political and cultural power, they are now maintained by transnational companies and financial institutions, the governments of the richest and most powerful nation states, and the global information and entertainment industries. These structures shape geographical articulation, regionally and internationally, allowing a continued process or mechanism of unequal exchange between core and periphery or the rich societies of the North and the poor societies of the South and East. They also shape the ways in which nation states regulate social reproduction within their borders, including the ways in which they develop their education systems.

Global capitalism is both a crisis-ridden and a crisis-dependent system. No single body acts to coordinate its development, and accumulation periodically grows ahead of the capacity of markets to consume the resulting production. Short-term economic cycles take place within longer waves of boom and slump which reflect the growth and decline of regimes of accumulation based on different products, technologies and labour processes. According to the regulation school, regimes of accumulation refer to the stabilisation over long periods of the allocation of the net social product between consumption and accumulation. They imply some correspondence between the transformation of both the conditions of production and the reproduction of wage earners and some linkage or articulation between capitalism and other modes of production. As we have seen the state is the key agent of regulation, establishing a mode of regulation, or body of norms, habits, laws and regulatory networks, which ensures that people's behaviour and expectations are consistent with a regime of accumulation. Education is one of the principal instruments used to meet this goal.

A feature of global capitalism is the increased geographical separation of consumers from the natural systems which sustain their lives. For many people, increased alienation from nature is heightened by global communications which bring distant environment and development issues onto their television screens. Together with the increased insecurity and powerlessness generated in the social world, it may result in a quasi-religious identification with nature which is perceived to be a benevolent source of power and wisdom (Lovelock 1989). Some utopian strands of modern environmentalism reflect such a reactionary ideology of nature and serve to deflect attention from the need to transform social structures if alienation and insecurity are to be reduced.

The recent history of global capitalism

The ‘long boom’ or fourth wave of accumulation in the world economy from 1950 to the mid-1970s was an unprecedented era of sustained growth for the major capitalist economies of the world. High rates of profit, growth and investment were realised against a background of enabling material and institutional conditions. Whole economies and societies had to be reconstructed as a result of war damage and there were reserves of labour, cheap raw materials and technological innovation to draw upon. The Bretton Woods conference established international institutions to control the financing of aid, trade and development while the application of Keynesian ideas, nationally and internationally, served to sustain growth and bring significant improvements in living standards throughout much of the world. While the arms race diverted increasing resources away from still greater improvement, military-industrial complexes, East and West, served to further stabilise economies and delay the return of global recession.

The fourth wave was the product of Fordism — an intensive regime of accumulation based on mass production and consumption. Henry Ford pioneered and developed a labour process based on the semi-automatic assembly line and the standard eight-hour working day. Fordist modes of regulation were designed to discipline a largely immigrant workforce, counteract radical unionism, and produce a new type of Americanised worker committed to conventional morality and the family. They allowed the development of an accelerating ‘treadmill of mass production and consumption’ (Schnaiberg 1980) which benefited capital (increased profits), governments (increased tax revenues) and workers (increased living standards). Fordist patterns of mass consumption involve the individual ownership by the working class of consumer durables which permit their more effective recuperation from physical and nervous fatigue in a compact space of time within the day and at a single place. A consumer society facilitates the reproduction of workers and citizens while sustaining capital’s profits and involves the social control of consumption through marketing and advertising.

Social democracy, Keynesian demand management, rising living standards and meritocratic forms of education were key elements of the modes of regulation or politics which accompanied Fordism in the core states of the world economy. However, while Fordism brought significant improvements in *material* living standards, it represented an exploitative environmental and social settlement. Production was generally energy and resource intensive and the accelerating treadmill required an even greater scale of exchange between society and nature (Commoner 1990, North 1986). Such products as motor cars, plastics, artificial fertilisers and nuclear power entailed high environmental costs in their production, use and disposal while the treadmill’s wasteful appetite drew upon more and more of the world’s reserves of natural resources. Migrant and women workers in the core states received a much lower share of the benefits whilst even their relative consumer affluence was sustained by the continuing exploitation of workers in the South (Shiva 1989). There was sufficient redistribution of wealth, internally and externally, to sustain the treadmill but it was nowhere near enough to abolish poverty.

By the late 1960s, the reserves of labour power, raw materials and technology which had facilitated the rise of Fordism were becoming exhausted. The limits to the intensification of labour were being reached and it was more difficult to contain class struggle or worker militancy at the point of production. Rates of productivity growth and profitability were falling and this prompted capital to look for new investment opportunities in the countries of the South on the periphery of the world economy. Around the same time developing countries were encouraged to borrow the surplus capital made available by a steep rise in oil prices and use it to establish export-orientated industry along Fordist lines. Some 'newly industrialising countries' showed that development through capitalist industrialisation was possible in the South but the costs for their workers and environments were often high. Most who did borrow were faced with rising debts as the world economy went into recession, markets for their exports declined and interest rates rose.

The global debt crisis is now the principal form taken by the first of the core contradictions of capitalism which were outlined above (George 1988). In the 1970s governments in the North borrowed to sustain growth, welfare spending and the arms race, while those in the South borrowed to cling onto the prospect of development. The fourth wave of accumulation was now in decline and the fifth wave could not be born without significant new investment. In the 1980s New Right governments won power in most of the world's core states and set about establishing new modes of regulation designed to generate and attract this investment. They dismantled the old certainties of full employment, social welfare and rising living standards, used high interest rates to maintain the value of their currencies and tackle inflation, and deregulated markets and the environment in an attempt to restore competitiveness. Such policies had limited success because high levels of debt, high interest rates and the resultant lack of demand continued to discourage investment. A deepening recession triggered trade wars and threats of protectionism, while rising poverty and unemployment raised levels of political conflict (Green & Sutcliffe 1987).

One consequence of the economic restructuring of the 1980s was a mounting global environmental crisis. Materials and energy conservation were often sought within factories but other improvements in productivity and profitability were often obtained at the expense of the conditions of production worldwide (O'Conner 1988). Environmental deregulation and industrial relocation meant that less attention was paid to pollution, resource depletion, habitat destruction and workers' health and safety. At the same time increased debt and poverty, much of it related to the austerity programs demanded by such bodies as the IMF and World Bank, caused the governments and peoples of the South and eastern Europe to further exploit their environment. The feminisation of poverty played a key role in this ecological destruction because women are often responsible for securing livelihood from the land. By the early 1990s the world's scientific establishment was warning of severe risks to human survival and there were renewed attempts by the United Nations and other agencies to tackle global capitalism's linked economic and environmental crises.

Global capitalism's fifth wave of accumulation is based on such leading sectors as information technology and biotechnology, and employs automated control systems which introduce new levels of flexibility into the production process (Allen 1992, Hall & Jacques 1989). The application of computers and robotics means that mass production gives way to mass customisation with small batches of diversified products being made for more segmented and specialised markets. Labour hierarchies change to less stratified networks but new social divisions appear between highly skilled core workers and semi-skilled or unskilled peripheral workers. New products and services are aimed at increasingly segmented consumer markets and the politics of lifestyle or consumption become more salient than those of the workplace or production. The old mass parties lose their appeal and new social movements, such as environmentalism, appear to many to be more in tune with the spirit of the times. Post-Fordist modes of regulation tend to mask a strong totalitarian tendency under the ideological cover of liberalism and entail a conservative restructuring of education designed to tighten its correspondence with new labour processes and social and cultural realities. Such restructuring shapes the evolution of environmental education.

Environmentalism and the red-green debate

In rediscovering, updating and extending Marx's ideas about the role of nature and environmental issues in social development, social scientists working in the Marxist tradition have paid much attention to environmental politics (Frankel 1987, Gorz 1980, Johnston 1989, Stretton 1976) and the rise of environmentalism as a new social movement (Pepper 1984, Sandbach 1980). Increased difficulties in reproducing the conditions of production (urban and rural space, human health and safety, natural resources and services, and an adequately educated labour power) have prompted a range of new social movements which include the women's movement, urban community movements and the environmental movement. The modern environmental movement emerged in the late 1960s and early 1970s, declined with the recession of the late 1970s and early 1980s and, as we have seen, re-emerged in the mid 1980s. Environmentalists subscribe to a range of ideologies and utopias (O'Riordan 1981, Schnaiberg 1980, Yearley 1991) which can be linked to their socialisation and material position in society (Cotgrove 1982). While the majority seeks reforms of market capitalism, often designed to protect the immediate environments and quality of life of the already privileged, a minority seeks more radical social change to ensure that we use natural resources and services in more sustainable ways. This radical ecocentric (O'Riordan 1981) or ecologic (Yearley 1991) minority contains individuals supporting a range of diagnoses and prescriptions including many who are idealistic or utopian in their thoughts and actions. Much green political thought (Dobson 1990) fails to relate environment and development issues to social structures and processes in the manner suggested by historical materialism, preferring instead to offer such 'explanations' as inappropriate technology, inappropriate values, over-consumption and over-population.

The politics of sustainability

The deepening environmental crisis of the 1980s prompted a revival of environmental politics, a new wave of modern environmentalism, and renewed attention to

environmental economics and politics from governments, the business community and academic researchers. Increasing interest in the concept of sustainable development is a reflection of this attention. Like liberty, justice and democracy, sustainable development is a contested concept open to competing interpretations. As explained in chapter 2, the concept of sustainable development can be understood and implemented in different ways and the competing interpretations can best be understood in terms of the contradictions between sustainable growth, or the greening of capitalism, and sustainable development, or the greening of socialism. Sustainable growth is a reformist concept based upon 'business as usual' but with greater attention to reproducing the conditions of production. On the other hand, real or ecologically sustainable development is a revolutionary concept which requires constraints on market forces and the democratic planning of production to ensure a secure livelihood for all the world's people both now and in the future. Ben Jackson captures the difference admirably in his distinction between development which puts the economy first and that which puts people first (Jackson 1991).

The owners and managers of capital and their allies in government, who seek the greening of capitalism, adopt a technocentric approach which seeks to sustain economic growth via new 'environmentally friendlier' products, technologies and institutions. Green capitalists (Elkington 1987) maintain that there is no inevitable conflict between capital accumulation and 'environmental excellence' and suggest that such emerging sectors as biotechnology offer major possibilities for environmental protection. They generate wealth with less energy and materials, are generally cleaner, and so lay the foundations for future 'green growth'.

Green capitalists also advocate environmental economics as a way of making the market more sensitive to its neglect of environmental costs. According to David Pearce and others, the environment is too often perceived and used as freely available resources and services (Pearce, Markandya & Barbier 1989). By putting a price on these and then using the prices to guide economic decision-making, demands on the environment can be kept within sustainable limits. Conventional environmental economics assumes that all legitimate demands on the environment are expressed through markets by households and firms, that the preferences expressed are self-interested and rational, and that the tastes and desires on which the preferences are based are determined outside the economic process. It uses a range of instruments such as prices, taxes, subsidies and legislation to engineer an 'optimal' use of the environment and it claims that its methods maximise the benefits which present and future generations obtain from the current use of nature in the most efficient way possible.

Socialist economists, such as Michael Jacobs (1991), suggest that conventional environmental economics has its uses but is seriously flawed. Its apparent or claimed ethical neutrality is misleading since environmental decisions affect those with no stake in the market (people and species distant in space and time) while those with a stake have grossly unequal purchasing power. The outcome of a market modified by environmental pricing is not necessarily 'optimal' for it is an ethical choice and the ethics of conventional environmental economics need to be more explicit. Such economics

operates on the basis of personal preferences expressed in markets. However, people also have public preferences, for example for public goods such as clean air, which may be more appropriately expressed through the political process. People are not always as self-interested and rationally calculating as the conventional economist assumes and the sources of their preferences are largely shaped by the nature of the economy in which they live. Therefore, economic behaviour needs to be viewed in a wider political and cultural context which recognises that we are citizens as well as consumers. Consumer preferences in a modified market are unlikely to be sufficient to guarantee sustainability, and the logical way to proceed is for the state to specify sustainability as a policy objective, or constraint on the economy, prior to giving consumers choice.

The greening of socialism (Dunkley 1992, Ryle 1988) entails planning for sustainability in a two-stage process. First, targets are set for key environmental indicators which define the level at which environmental capacity is to be protected. Second, a wide range of instruments are used to influence economic activity in such a way that it does not damage or erode this capacity. A wide range of indicators are used to measure environmental stocks and flows and determine capacity thresholds. The economy is then constrained within these by using taxes, prices, regulations, government expenditure and other instruments which shape the behaviour of firms and households. Planning for sustainability determines the macroeconomic outcomes of production but does not determine or plan the micro-economic methods whereby they are realised. Democratic government decides the economy's overall environmental impact while consumer choice in modified markets plays a key role in determining how limited environmental resources and services are used. Sustainability planning allows people to express and realise a common interest in sustainable development which they cannot realise through individual behaviour in modified markets alone.

Such a greening of socialism affords the state a key role in establishing a radically new mode of social regulation. Only the state can ensure that the economy develops in appropriate directions with sustainable production for use gradually replacing non-sustainable production for profit. We have already seen that nation states are unlikely to take such action alone, but the type of international programs outlined by Dunkley (1992) and Jackson (1991) could lead them to a coordinated adoption of planning for sustainability. Joint action by local, regional, national and international governments is clearly necessary and, in deciding at what level planning should operate, the principles of maximising democracy and equality should be taken into account.

There are numerous local communities around the world whose struggles for sustainable livelihood development (Chambers 1986) can only be successful once there is change from above (Ekins 1992). Such development regards meeting people's basic needs as its fundamental objective; employs sustainable resource use as a means of meeting those needs; makes use of appropriate technology and encourages selfreliance; and is sensitive to the contexts (location/culture) within which it takes place.

Participatory action research is a proven means of fostering such community development in the South (Fals-Borda & Rahman 1991) and finds echoes in those forms of

popular planning and community politics adopted by local socialists in the North (Blunkett & Jackson 1987, Huckle 1990, Wainwright 1987). Such research empowers local people to democratise social structures and is the route to forms of socialism which operate in ways which maximise rather than limit democracy (Albert & Hahnel 1991, Devine 1988, Hodgson 1984). The state and democracy have been key issues in the debates between socialists and greens but it is difficult to see how sustainable societies can be created in the real world other than by collective political choice and the assistance of an enabling state.

For green socialists then, sustainability is an ethical principle of commitment to inter-generational equity which can be realised through an extension of economic and political democracy or popular control of the mode of reproduction. It implies that people living in the future should have the opportunity to experience the same level of well-being from the use of nature as the present generation and is a logical extension of socialists' existing commitment to equity within the current generation. While discounting one's own future may be acceptable, discounting the lives of other people is not. Reports such as *Our Common Future* (World Commission on Environment and Development 1987) and *Caring for the Earth* (IUCN, UNEP & WWF 1991) share green socialism's concern to integrate the environment and economics and their commitment to equity and democracy, although they are understandably more guarded in their approach to market forces and the need for planning. A UNESCO report (UNESCO 1991) highlights the tensions between growth and development in *Our Common Future* but again fails to suggest that 'patterns of development without throughput growth' may not be compatible with capitalist social relations.

Discursive democracy and the ecologically rational society

The attention given by greens and green socialists to intra- and inter-generational equity and a new world ethic for sustainable living, links them to an alternative body of critical social theory in the Marxist tradition developed by Jurgen Habermas. The main contrasts between the theories of Marx and Habermas are outlined in table 3.2 and these remind us that, like earlier members of the Frankfurt School, Habermas emphasises the role of instrumental reason. Such instrumental reason can be traced back to the Enlightenment and both Pepper (1984) and Atkinson (1991) provide detailed accounts of its impact on our ideologies and use of nature.

In examining the nexus of dominant institutions which now characterise the United States of America, the United Kingdom and Australia, John Dryzek finds that capitalism, liberal democracy and the administrative state are largely controlled by instrumental logic and, so, are seriously flawed as vehicles for a transition to ecologically sustainable development (Dryzek 1992). As we have seen, market capitalism requires economic growth to maintain capital accumulation and political stability. It has an inbuilt tendency to discount future costs and benefits, and has no mechanisms for dealing with common property resources or the 'tragedy of the commons' (Hardin 1968). It passes on its environmental problems to be handled by liberal democracy. However, the outcomes of environmental politics are flawed by social processes such as an uneven distribution of power which generally favours business interests, the disaggregation of problems which

Table 3.2**Main emphases in the critical theories of Marx and Habermas**

Marx	Habermas
Historical materialism	Comprehensive theory of rationality
Economy	Language, political administration
Labour	Interaction
Modes of production (reproduction)	Ethical systems
Transformation of nature to realise higher states of social development	Transformation of communicative action to realise higher states of moral development
Emancipation through socialising the means of production (reproduction)	Emancipation through extending the realm of discursive democracy
Contradictions between the forces and relations of production (conditions and relations of reproduction)	Contradictions between steering crises and existing morality/politics
Economic crises	Legitimation crises
Class struggle	New social movements

prevents coherent environmental action, and a short time horizon which reflects the electoral cycle. Like capitalism, liberal democracy has a strong interest in economic growth which can serve to ameliorate conflict over inequality. But, like wealth redistribution, environmental policy is usually one of the first victims of economic downturn or recession.

While liberal democracy is governed by a political and interactive logic, the administrative state displays an instrumental logic. Its claim to be a vehicle for sustainable development rests on the truth of its claims to embody the common purpose, employ neutral expertise and cope rationally with complexity. However, these claims are seriously suspect because the state is highly constrained in its responses to complex environmental problems. Departmentalism and bureaucracy limit its actions as do administrative rationality and obstructions to the free flow of information associated with hierarchical systems. The problems are compounded when capitalism, liberal democracy and the administrative state operate together as it is generally capitalism's need for accumulation which constrains the other two. Reformers suggest a greater role for environmental economics and the market, more powers for central state bodies, and more public participation and consultation in decision-making. However, an increasing number of environmentalists and others in new social movements have lost faith in 'the system' and focus their attention and political action on the alternative public sphere of civil society beyond the triangular nexus of dominant institutions.

Dryzek suggests that the contemporary problems of liberal democracy and the administrative state amount to a crisis of rationality and legitimization. As the state's role in social regulation grows, it is unable to sustain levels of public spending and public faith in its ability to manage social affairs. Its increasingly corporatist nature serves to compound its problems as do such new demands as environmental protection and conservation. Those who control the state sanction such new instruments as environmental impact assessment, public inquiries and a Citizen's Charter, but these

incipient discursive designs are poor substitutes for the genuine discursive and consensual decision-making which new social movements demand. Their agenda seeks a truly plural and non-hierarchical society in which democracy is based on an autonomous public sphere: ‘. . . the space in which individuals enter into discourse which involves mutual respect, openness, scrutiny of their relations with one another, the creation of truly public opinion and, crucially, confrontation with state power’ (Dryzek 1992, p. 30).

By offering incipient discursive designs, the state seeks to pacify and co-opt social movements. However, this risks further highlighting the contradictions between genuine discourse or communicative rationality and its instrumental rationality. Dryzek maintains that radical environmentalists should exploit these contradictions by working to extend democracy within the state, at its boundaries where it seeks legitimisation through new incipient discursive designs, and in civil society. Like Murray Bookchin (Bookchin 1986), he believes discursive democracy to be the key to the reconstruction of political economy on ecologically rational lines. This is because it is sensitive to voices calling attention to disequilibrium in society—nature relations which are undistorted by ideology. It can also accommodate a limitless number and variety of such voices and thereby acknowledge the complexity of ecological problems without placing limits on the kinds of interests and values considered. The common interest in sustainable development is likely to prevail and rational discourse, guided by critical theory, is likely to prove a most effective medium for social and environmental education.

The critical theories of Jurgen Habermas

Dryzek’s arguments linking the transition to sustainable development to the spread of discursive forms of politics characterised by communicative rationality draw on the ideas of Jurgen Habermas, whose theory of knowledge-constitutive interests was introduced at the beginning of this chapter. Like earlier members of the Frankfurt School, Habermas seeks to counter the positivism and economic determinism of Marx’s later writing and thus allow a greater role for capable, reasoning actors in social development. While Marx regarded the struggle to control or transform nature as providing the key to social development, Habermas switches the focus to language and morals (see table 3.2). He believes that the evolution and institutionalisation of more advanced normative standards occurs because of their capacity to overcome the ‘steering crises’ which threaten the continued stability of social systems. These are the result of the type of rationality crisis which Dryzek describes: a crisis compounded by association legitimisation and motivational crisis which threaten both social integration and the ‘steering’ or regulatory mechanisms which bind people and institutions together. As people’s motivation to participate in mainstream society is undermined, new social movements gain new recruits.

The linked crises of environment and development currently facing the world accentuate steering crises, threaten modes of regulation, and can only be solved by extending the realm of social affairs governed by universal moral principles. Green socialists and others therefore highlight our divided moral and political loyalties and urge us to put our rights and duties as global citizens before our rights and duties as citizens of nation states. Our global environmental predicament calls for a higher state of morality but Habermas’s theory of communicative action suggests that this is *currently* blocked by forms of

language use and communication which lead to false consensus shaped by tradition, power, domination and ideology.

Habermas suggests that the possibility of universal moral consensus is inherent *in the nature* and use of human language. All human communication presumes an ‘*~t~\ ~ptec*’ situation’ in which all participants have equal power to defend their *conthbz2tk>ns* as meaningful, true, justified and sincere. Discursive democracy exposes *claims* to truth and justification to public scrutiny and allows a rational consensus based on open argument to undermine the false consensus which is at the heart of the rationality crisis. As new social movements rejuvenate civil society and encourage the development of communicative competence through discursive dialogue, the technical, moral and political principles and strategies necessary for a transition to more sustainable forms of development will slowly emerge.

Discursive dialogue is a central feature of praxis, participatory action research and education for sustainability. It focuses on what can, might and should be done in different situations and requires the use of all three forms of science with their distinctive methodologies and tests for truth. The empirical and hermeneutic sciences can aid clarification of what can and might be done, or what is technically possible and culturally acceptable. However, only the critical sciences can reveal whether or not proposed actions are genuinely emancipatory and will enable us to better realise our species powers.

Environmental education

The application of critical theory to education (Ewert 1991, Gibson 1986) has rejuvenated radical-left discourse in such fields as curriculum theory (Grundy 1987, Smith & Lovat 1991), educational research (Carr & Kemmis 1986, Kincheloe 1991) and teacher education (Giroux 1988). Several writers have encouraged environmental educators to engage in this discourse and have used it to illuminate curriculum theorising and practice (Fien 1993, Greenall Gough & Robottom 1993) and research (Robottom 1987, Robottom & Hart 1993) in environmental education. It remains for this chapter to suggest how environmental education can contribute to ecological sustainability through the greening of socialism as outlined above.

Table 3.3 reminds us that environmental education exists in three forms. These are:

- *education for environmental management and control*, which predominantly serves the technical human interest, is based upon empirical-analytical science, and coheres most closely with the notion of education *about* the environment;
- *education for environmental awareness and interpretation*, which predominantly serves the practical human interest, is based upon hermeneutic or interpretive science, and coheres most closely with the notion of education *through* the environment; and
- *education for sustainability*, which predominantly serves the critical human interest, is based upon critical science, and coheres most closely with the notion of education *for* the environment (Fien 1993, Huckle 1983).

Table 3.3
Three philosophies of environmental education

Type of science	Human interests served	Related ideologies	Environmental education
Empirical sciences Empirical science operates in the realm of experience and generally adopts a positivist philosophy. Knowledge of the world is gained by observation and is critically examined and classified to find regularities or general laws which are then used to predict future events.	Successful empirical science allows for <i>technical control</i> . Because it can forecast the effects of human intervention in the natural and social worlds, it allows for the control of both the environment and society. The empirical sciences enjoy high status and support. They are widely used in the management and control of environmental and social problems. Faith in empirical science underpins technocentric environmentalism.	Empirical sciences, especially empirical social sciences, are associated with conservative ideology which takes the current structure and function of society as given, and seeks to manipulate and engineer its trends.	Environmental education aims to provide the environmental professionals/managers of the future and young citizens who will be supportive of their work. Its curriculum supports the greening of society as currently organised or structured and is built largely on empirical or technical knowledge of the environment and education. It might be termed <i>education for environmental management and control</i> .
Hermeneutic sciences Hermeneutic sciences focus on individuals in society, their actions and the meanings which underpin them. The goal of hermeneutic science is to appreciate people and what they do.	Hermeneutic sciences advance <i>mutual understanding and inter-personal accommodation</i> , enriching society by making individuals better aware of both each other, their environment and themselves. Some ecocentric environmentalism draws on hermeneutic science.	Hermeneutic sciences are conservative in that they are not necessarily linked to any program of social change. They are also liberal in that they canvass individual freedom, in full appreciation of all others exercising their freedoms.	Environmental education aims to increase people's understanding of their behaviour within the environment. It helps them to examine and share the beliefs, attitudes and values which contribute to non-sustainable ways of living with nature and to promote alternatives. Such education draws heavily on hermeneutic knowledge of the environment and education, and can be termed <i>education for environmental awareness and interpretation</i> .
Critical sciences The critical sciences seek to explain the empirical world in terms of underlying structures and mechanisms and the events that set them in motion. This requires not only empirical analysis and hermeneutic understanding, but also theoretical accounts of the mechanisms. It is the development of valid theories of the 'abstract real' and their use in explaining concrete events and experiences which are the fundamental tasks of critical science.	The goal of critical science is <i>emancipation</i> , freeing people from the ideological (and material) constraints to their understanding. Self-determination or the full development of human potential requires knowledge, not only of the empirical and hermeneutic kind – valuable though this is – but also of the critical sciences. These aim to expose people to exactly how and why their society operates, thereby allowing them to become fully involved in its transformation to the sort of society that they want.	The critical sciences are fundamentally radical. They oppose the domination of the empirical sciences in a capitalist society, for example, because these do not tackle, and so implicitly promote, the basic inequalities on which such societies are built. They fault the hermeneutic sciences because they present a false ideology of human self-determination.	Environmental education aims to empower people so that they can become agents of social change and sustainable development. It enables them to reflect and act on the structures and mechanisms which shape the social use of nature in ways which prefigure a future democratic and sustainable society. Such education draws heavily on critical knowledge of the environment and education, and can be termed <i>education for sustainability</i> .

While varying combinations of these are found in different schools and classrooms, there is an overwhelming predominance of 'education for environmental management'. The role of green socialist teachers is to expose the limitations and ideological functions of this and of 'education for environmental awareness and interpretation', when taught with no reference to critical science, and to promote 'education for sustainability' as a more rational and democratic alternative. It inevitably incorporates elements of the other two forms of environmental education, but critical inquiry and discourse ensures that these meet emancipatory ends.

The *What We Consume* module of WWF-UK's Global Environmental Education Program (Huckle 1988) is an attempt to develop a curriculum in 'education for sustainability' which draws on many of the ideas outlined in this chapter. The *Teachers Handbook* and the ten curriculum units in the module illustrate how these ideas can find expression in practice (see figure 3.3). The activities encourage discursive dialogue in classrooms and attempt to strike a balance between empirical, hermeneutic and critical sciences. The materials have not been adopted widely by schools and teachers in Britain and, while this is partly due to limited publicity and a lack of associated courses of professional development for teachers, it is also the product of the general educational and political climate which marginalises initiatives in environmental education that seek to incorporate critical as well as empirical and hermeneutic perspectives.

The reality for most teachers in Australia and Britain, and most other places in the world, is that 'education for sustainability' is not a priority. The restructuring of education in both countries seeks to ensure that environmental education, predominantly in the form of 'education for environmental management', plays its part in the greening of capitalism. The controlled restructuring of environmental education is consistent with the more general process whereby education and schooling are being 'conformed' in the interest of hegemonising the prevailing 'cornmonsense' ideology of the dominant class. The all-pervasive influence of 'education for environmental management' is very obvious in the National Curriculum for England, where environmental education is relegated to a cross-curricular theme and the associated guidance document reveals no real awareness of 'education for sustainability' as described in this book. Geography has the major responsibility for delivering environmental education, yet the then Minister of Education ensured that all references to issues, politics and learning through inquiry were removed from the National Curriculum for Geography's programs of study and attainment targets (Morris 1992). The same processes of control are also operating in Australia given the tortured history of the development of the National Statement for Studies of Society and the Environment in this country. The original team commissioned to write the consultation draft of this Statement was dismissed because of its perceived insistence on incorporating critical perspectives as well as those informed by empirical and hermeneutic science — even though all three were prescribed in their writing brief (see Gilbert et al. 1992). The National Curriculum for England still contains aims and content which can be used to promote 'education for sustainability'. However, the reality is that many teachers will not recognise these opportunities and that the national testing of pupils is likely to reinforce further their conservative interpretations of what the curriculum requires.

The chances of teachers ‘subverting’ the National Curriculum in England are further reduced by changes in teacher education. The British government seeks forms of teacher training which amount to packages of subject-based knowledge and classroom-control skills divorced from issues of morality, politics and the macro- context (Hill 1992). Pre-service and in-service courses which prompt critical inquiry

Figure 3.3

An overview of the *What We Consume* curriculum project (Huckle 1988)

What We Consume provides a curriculum framework and classroom activities for teachers wishing to explore issues of environment and development with their pupils. One hundred original activities, in ten units, link pupils as consumers to economies and societies around the world. They enable them to study different forms of development and underdevelopment, recognise the impact these have on nature and the environment, and consider alternatives which are more ecologically sustainable. In doing so, pupils learn of the part which they and others play in such issues as acid rain, desertification and the destruction of tropical moist forests. They develop their understanding of the economic and political roots of environmental issues and consider social alternatives which may allow more harmonious relations between people and between people and nature. In this way, *What We Consume* introduces some of the central themes of the world and UK conservation strategies and educates young people for the roles they might play in the transition to ecologically sustainable development.

What We Consume consists of a teachers’ handbook and ten curriculum units:

- 1 Society and Nature
- 2 The Rise of Industrial Society
- 3 Our Consumer Society
- 4 The United Kingdom: Farming and Wetland Drainage
- 5 Brazil: Cattle Ranching and Rainforest Destruction in Rondonia
- 6 Ethiopia: War, Famine and Desertification
- 7 The USSR: Lake Baikal—Management of Water resources
- 8 China: Beijing—A Livable City?
- 9 Multi-lateral Action on the Environment
- 10 The Environment and Democracy.

Unit 1 contains introductory activities on Society and Nature. It is followed by two units that explore the use of nature in our own society—in the recent past and at present. Units 4—8 relate a range of environmental issues to the development policies of five nation states variously located within the world economy. While Unit 9 looks at attempts to resolve environmental issues through multilateral action from above, Unit 10 focuses on movements seeking greater democracy and environmental welfare by change from below. Unit 9 examines EEC action on acid rain and UN negotiations over Antarctica, while Unit 10 deals with the Chipko movement in the Himalayas, the environmental movement in Poland and initiatives by trade unions and local councils in Britain.

are increasingly hard to find. Teachers are also being proletarianised and de-professionalised by changes in work practices and management consistent with post-Fordism. The result is that an increasing number have neither the time nor the inclination to engage in the type of professional development which 'education for sustainability' requires. However, it is these very forms of professional development, which Robottom (1987) describes as based upon participatory action research and informed by critical science, which can contribute to the type of sustainable community development which is associated with the greening of socialism.

As transformative and organic intellectuals, capable of assisting the community in its transition to sustainable development, teachers of 'education for sustainability' need to be capable of the three levels of reflection identified by Zeichner and Liston (1987). In addition to reflection which serves technical and practical interests, they need to be able to think about teaching and learning in ways which are informed by critical theory and guided by concerns about justice, democracy and sustainability.

They need to find support from others in the community who support their transformative aims and together they need to recognise that there is a rich body of theory and practice relating to community education and development on which they can draw.

The work of environment and development NGOs throughout the world supports the claim of critical theorists that participatory action research is the key to exposing ideology, generating socially useful knowledge, and enabling people to reconstruct their own lives and environments (Fals-Borda & Rahman 1991). Development workers as 'external animators' or agents of change, work with 'internal animators' or community leaders, and the resulting knowledge combines elements of academic and popular knowledge in new ways. Collective research, the critical recovery of history, re-assessment of folk culture, and the use of new media for education, all combine in praxis, or reflection and action, with the result that education becomes genuinely empowering rather than a form of social control. Such community education and development can be coopted by the state as part of incipient discursive designs, and 'sponsorship' of this and other kinds raises many dilemmas for the agencies and people involved.

Alan Dyson applies the lessons of appropriate technology and community development to strategies for implementing change in schools (Dyson 1991). Curriculum development to encourage education for sustainability should be the product of action research with teachers which acknowledges the distinctive cultural, technological and organisational context of the school. It should involve an assessment of needs and wants which considers the wider social context and should balance security and challenge, foster self-help, and recognise and develop people's talents. Control of change and innovation should remain with the teachers themselves and should empower them to interpret such directives as the English National Curriculum and the Australian National Curriculum Statements in ways which are consistent with their chosen values. Curriculum models such as *What We Consume* can hint at what education for sustainability might involve, but the ideal is for local teachers to design their own appropriate technology or

curriculum as part of their community's transition to more socially useful and sustainable forms of economic and cultural production.

The next twenty years

The links between environmental education and social change are reasonably clear. Education is not the solution to our environmental predicament (Huckle 1991, Pepper 1984) but appropriate forms of education informed by critical theory can assist the political struggle to adopt more sustainable forms of development. Some of us are less idealistic and naive than we were in 1972 and, who knows, by 2012 environmental education may really have made a difference. The challenge now is to test our critical theory of environmental education in action. As environmental educators we still have much to learn, little to lose and everything to gain.

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