

**A CRITICAL REVIEW OF ENVIRONMENTAL EDUCATION
AND ITS APPLICATION TO CROSS-CURRICULAR
GREENING IN HIGHER EDUCATION**

MICHAEL JOHN MACLEOD

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Abstract

Environmental education is increasingly looked at as a means of alleviating what is perceived to be a worsening environmental crisis. A recent report (Department for Education and the Welsh Office 1993) recommended that all students in higher education should have an entitlement to some environmental education and that courses should be examined to see if they could be related more to the environment (this is called cross-curricular greening). This thesis is, in part, a response to this call for cross-curricular greening and attempts to develop a strategy for cross-curricular greening at the I.M.Marsh campus of Liverpool John Moores University by: investigating some of the fundamental issues in environmental education and developing a theoretical basis for it; examining the history and practice of environmental education; examining the implications of the campus and University context for cross-curricular greening.

One of the main conclusions is that if environmental education is to play a meaningful role in alleviating the environmental crisis, it needs to encourage debate regarding its purpose and the nature of the crisis. If there is not an active questioning of these issues then there is the possibility that the assumptions underpinning the educational response to the environmental crisis will go undisclosed and unchallenged. This could lead to a failure to address the crisis through the development of misconceived bases for action and could allow hidden agendas to be introduced to environmental education.

Cross-curricular greening at I.M.Marsh should take into account this view of environmental education. There is also a range of changes to the ways in which the campus is used, and the school and university managed, which are required to enable staff and students to enter into the debates surrounding the environmental crisis and maximise the chance of cross-curricular greening being a success.

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1. INTRODUCTION

1.1 Background

There can be few people in Britain today who are not aware of the environment in some way. Anthropogenic changes in the environment impinge on our daily lives, from wearing biodegradable nappies to being buried in sustainably grown hardwood coffins. More accurately, a few people's ideas of how we should react to these changes impinge on our lives, as most of us have no direct knowledge or experience of any but the most localised changes.

When strategies are being devised to deal with these environmental changes a formal educational component is often included. This is because the problems are thought to involve, directly or indirectly, the actions of the population at large and education is seen as a way of reaching them. From the UNESCO/UNEP International Environmental Education Programme to Van Matre's Earth Education (Van Matre 1990), education has been looked to for solutions (Sterling 1992, Smyth 1995).

In this country environmental education has been included as a cross-curricular theme in schools (NCC 1990), although the cross-curricular themes were not referred to in the subsequent Dearing review (SCAA 1994). The role environmental education should play in further and higher education was investigated recently by a government appointed committee (Department for Education and The Welsh Office 1993). Two of the main conclusions of this committee's report (known as the 'Toyne Report') were that:

- Each student should have an entitlement to some education regarding the environment;
- All courses should be examined to see if they could be related more to the environment (this is called cross-curricular greening). (Department for Education and The Welsh Office 1993 ch 6)

It was in response to the need for cross-curricular greening and the belief that education, and in particular teacher education, had a role to play in alleviating environmental problems that this research was initiated.

1.2 Original Mission Statement and Aims

The original mission was to raise the overall level of understanding of, and encourage positive attitudes and behaviour towards, the environment by achieving the following aims:

- (i) developing a model for 'greening' the curriculum at the I.M.Marsh Campus of Liverpool John Moores University (LJMU) and for possible application in the rest of the university;
- (ii) informing the university's Environmental Policy development and implementation;
- (iii) evaluating the potential of the I.M.Marsh campus as a role model for environmental education and practice.

While the aims are still the same in broad terms, the motivation behind the aims and the strategy adopted for achieving them have changed. This is discussed below.

1.3 Rationale for the Approach Adopted

The methodology employed has changed as the project has progressed and as such the research could be described as emergent. The initial approach was characterised by a positivistic research methodology and a view of education based on prediction and control. Environmental education was seen as a means of influencing people's knowledge, attitudes and behaviour in order that they might live their lives in more environmentally friendly ways consistent with the externally derived aims of sustainability. It was decided that one of the main purposes of the research should be to develop a technique for measuring students' attitudes, knowledge and behaviour relating to the environment. This would enable an assessment of the effectiveness of environmental education at I.M.Marsh by measuring student's attitudes, knowledge and behaviour before and after any

initiatives carried out. It was also hoped that this approach would throw light on the complex interplay between these three variables. A questionnaire was subsequently designed, piloted and implemented (see Appendix C) with the above aims in mind and which was also intended to provide general information relevant to cross-curricular greening.

With hindsight it is easy to see why this approach was so readily adopted. All those involved in the research had come from scientific backgrounds and were accustomed to investigating natural phenomena within a hypotheses-testing, positivistic paradigm. We had little experience of investigating social phenomena such as education, and little knowledge of the different epistemologies and methodologies which existed. This lack of knowledge of alternatives meant that the adoption of a positivistic approach based on a realist ontology was inevitable. Our belief that this was the best way to proceed was reinforced by the research published in the *Journal of Environmental Education* - a periodical largely committed to positivistic, behaviouristic research - which influenced our thinking in the early stages. Finally, our perceptions of the causes of the environmental crisis influenced the role that we thought environmental education should play in averting it and the way it should be investigated. Our initial focus was on the importance of the individual's actions in determining our overall effect on the environment. This reflects much environmental education from Friends of the Earth's "Think Global, Act Local" campaign to the Government's exhortations for us to use less energy. If one believes that the actions of individuals are the main cause of our problems then it makes sense to think of environmental education in terms of how it can change people's actions.

However, the focus of the research and the methodology employed have changed as the work has progressed. While many people's views change as they carry out research, indeed it could be argued that this learning process is one of the most important aspects of research, it is not so common to fundamentally alter the scope of a project. One of the main reasons for this is that most research tends to be strictly defined at the outset in terms of a particular delineated problem with expected outcomes. However, the emergent character of this research allowed for a certain amount of adaption in response to the learning process, albeit within the general aims of the initial proposal. Given that the opportunity existed for the research to evolve, there would have been a certain amount of dishonesty and laziness in ignoring what had been learned and adhering to an approach which one did not believe to be justified.

There were three main features of this learning process which altered the course of the research:

- A changing view of the nature of the environmental crisis;
- A changing idea of what the purposes of education in general and environmental education in particular are;
- A change in the ontology and epistemology underpinning the research and consequently a change in the ideas of how social phenomena should be investigated.

As the nature of the environmental crisis was investigated it became apparent that there was more to it than the thoughtless actions of individuals (see section 3 for further discussion of this). To concentrate on individuals while ignoring other aspects, such as the contexts in which people act is to simplify and distort the actual situation. Rather than trying to develop environmental education as an activity which takes for granted the causes of the environmental crisis and seeks to promote obedience and unquestioning acceptance of its edicts, we came to consider environmental education as a subject which should be encouraging people to ask questions of themselves and society. This changing perception of the environmental crisis was mirrored by our changing view of the purpose of education in general from being a means of transmitting the dominant culture and generating national prosperity to being a process of liberating the individual and making society more reflective and democratic. Finally, as the research was carried out it became apparent that there were alternatives to the positivistic paradigm and other paradigms existed with their own philosophical bases (see Robottom and Hart 1993). Obviously, this project is not about to resolve any debates about the relative merits of different epistemologies or methodologies. It is only possible to spend so much time deciding which methodology one believes to be correct before being forced to act by the constraints of time. It would be wrong, therefore, to say that the approach adopted was attempted because it is firmly and consistently believed to be the only way in which the research could be carried out. Rather, after considering the options for the limited time available it was the approach which was favoured at the time when a final decision had to be made. Fortunately the decision has proved to be satisfactory as confidence in the methodology has increased as the research has progressed.

In response to the changes described above the manipulative conception of environmental education held initially was replaced by a more emancipatory view. A critical approach to the research was adopted instead of a positivistic one in response to the above changes and other ideological considerations. It was also intended that adopting a critical approach should help avoid falling into the trap of "reinventing the wheel" by simply providing a resume of other people's work instead of some original suggestions for environmental education. With this in mind it was decided to carry out detailed critiques of a narrow range of ideas with particular relevance to environmental education and teacher education instead of superficial critiques of all the different viewpoints. It was hoped that as well as providing specific critiques of the chosen targets, this process would challenge and bring the author's ideas on environmental education into focus and encourage self-criticism.

The deep ecology movement was chosen for study as it is one of the major radical responses to the environmental crisis. It calls for fundamental changes in humanity's relationship with nature, has far reaching implications for environmental education and was thus thought worthy of close examination. Earth education was chosen because it is "an educational voice in the broad deep ecology movement" (Van Matre 1990 p99) and is also one of the most influential environmental education initiatives. Indeed the Institute for Earth Education has claimed to be "the world's largest group of educators in the environmental field" (Van Matre 1990 p v). It was hoped that by studying the deep ecology movement and earth education it would be possible to gain insight into the assumptions underpinning radical environmentalism and into the way in which some of these ideas are interpreted in terms of environmental education. In addition, earth education and the deep ecology movement are particularly relevant to outdoor education, an important component of the teacher education at I.M.Marsh and a particular interest of the department in which the research was carried out.

The critiques are part of a wider strategy for producing specific recommendations for cross-curricular greening at I.M.Marsh, and more general recommendations for cross-curricular greening in Higher Education. The conclusions from the critiques are combined with the outcomes of chapters two and three to produce a theoretical basis for environmental education. Again this approach was favoured in order to avoid simply reviewing others' ideas and reproducing their assumptions. It is believed that the topics chosen for chapters two and three are of fundamental importance to environmental education and have been somewhat neglected. Instead of being two areas of intense debate, there has been a certain

amount of acceptance of particular worldviews which have formed the basis for a great deal of environmental education. Hungerford and Volk (1990 p17) have stated that:

“Environmental educators overwhelmingly agree that the major aim of EE (environmental education) is to produce individuals who will willingly and responsibly participate in environmental maintenance and remediation”

and have also argued that the time for debating the aims of environmental education has passed (Hungerford et al 1983). Consequently, most research has focused on developing more efficient ways of implementing the accepted aims of environmental education rather than trying to debate them. It is hoped that the approach adopted here will complement the wealth of "how" material that is being produced by going some small way to addressing the lack of "why " material underpinning it.

The theoretical basis for environmental education is followed by a brief history of environmental education and an overview of current practice in environmental education with particular reference to teacher education. Most of this is concerned with an analysis of the role of environmental education in schools after the introduction and revision of the National Curriculum in England and Wales. This is because the National Curriculum is of particular importance to all trainee teachers at I.M.Marsh as it represents the conceptual context in which they will teach their subjects and in some cases engage in environmental education. From a consideration of the theoretical basis for environmental education, of environmental education as it is practised and of the context in which environmental education is practised in schools, it is hoped that a clearer idea of what should be carried out and what could be attempted will emerge.

Finally, the particular circumstances of I.M.Marsh, the School of Education and Community Studies and its relationship with the rest of the University are taken into account in order to develop specific recommendations for cross-curricular greening at I.M.Marsh and for the rest of the university. It is hoped that the approach adopted will result in proposals which are theoretically justified and practically attainable.

PART A - DEVELOPING A THEORETICAL BASIS FOR ENVIRONMENTAL EDUCATION

2. PROBLEMS IN DEFINING ENVIRONMENTAL EDUCATION

2.1 Formal and informal education

Before attempting to answer the question "what is environmental education?", the meanings of the terms environment and education need to be explored. When people think of education, they often think of the learning that occurs from the nursery, through primary and secondary school, to universities and colleges. This, though, represents only the formal, institutionalised side of education. Much of what we learn about ourselves and the world comes from activities that are independent of these institutions, whether it is talking to friends, reading books or listening to music. Both formal and informal education contribute to one's understanding of the world, to a greater or lesser extent depending on the individual and their circumstances. For example, one person may decide that the thinning of the ozone layer is a significant threat to human health after being taught some atmospheric chemistry at school while others may reach the same or a different conclusion after talking to someone with friends in Australia, reading a novel or hearing a song about the issue.

In addition to the distinction between formal and informal learning is the distinction between planned and unplanned learning. Although planned may seem similar to formal and unplanned to informal, both can occur in formal and informal education. For example, someone may decide to teach themselves guitar (informal and planned) or learn something unexpected by carrying out a chemistry experiment incorrectly (formal and unplanned).

2.2 Nature and environmental issues

Our concept of the environment has been influenced in recent years by environmental issues to the point where it is often inseparable from them. For most people in the West the term conjures up images of bottle banks, road protests and Greenpeace boats. The environment has a positive image and is seen as something which we should be protecting but are irrevocably damaging. 'Environmental' has become a seal of approval for the behaviour of individuals, organisations and

nations, a fact that has not been lost on those in marketing departments. A few years ago one university changed the name of its Public Health Engineering MSc to Environmental Engineering and applications tripled the next year. As Ali Khan (1996 p28) notes, this is not an isolated incident: "some providers are trading on the popularity of environmental learning to attract students, by badging unpopular courses with an environmental prefix". The growing interest in natural and holistic medicines and philosophies seems to represent a rejection of certain Western values and their underlying rationality and, as in the Sixties, there is a call for a return to nature.

The term "environmentalist" is in common usage and is defined in the dictionary as a "person concerned with the protection of the natural environment" (Pocket Oxford Dictionary 1992). The fact that it has entered the language demonstrates how accepted the idea that the environment needs to be protected has become. It is not just the environment but specifically the *natural* environment that seems to require protection.

The distinction between things that are natural and things that are not is important because it is used in deciding what should be protected and what should not. The distinction is often obvious to us as we tend to decide intuitively what is and is not natural: the countryside is and cities are not. However, the form of most of the British countryside is the result of human activity, e.g. through agriculture, forestry and tourism so that the scenery which many people would consider natural is in one sense as artificial as tower blocks.

The dictionary is not very helpful as it defines natural as "existing in or caused by nature" (Thompson 1992). Nature, in turn, is defined as: "**a.** a physical power causing all material phenomena **b.** these phenomena" (Thompson 1992). It is difficult to tell whether this means that only material phenomena caused directly by this power are natural, i.e. a tree or a bird, or if this includes things that are created indirectly through the actions of one of the material phenomena, i.e. a bird's nest. It is unlikely that the former restrictive interpretation is correct and bird's nests are unnatural. Rather, it would make sense that the results of the manipulations of one part of nature by another are natural thus implying that everything that is not supernatural, including space travel and genetic engineering are natural. This is not consistent with our everyday experience where we are able to classify things without much thought.

At a recent conference on Vegetarianism and Health one speaker criticised vitamins as being "hardly natural" (MacLeod 1995). However, it is not clear what natural means in this context, or what constitutes a natural diet. Before the technology was available to cross the Atlantic, potatoes and tomatoes did not form part of the natural diet of this country. All natural means in this context is "as was done before".

Extending this logic the first people to cook meat or to farm animals were doing things that were "hardly natural" at the time. Confusion results when a term which is commonly used as a way of expressing approval, particularly of human activities, is used as if it had an objective meaning. In this case the speaker was trying to demonstrate one of the drawbacks of a vegetarian diet and used natural instead of traditional, presumably because of its positive associations. We often use the term natural in this way to show whether or not some behaviour conforms to what is considered to be normal or desirable in that particular place or time. This is obviously a different definition of natural from the dictionary one. Its meaning is difficult to define because it is changing, subjective and rooted in the values and norms of the society in which it is being used. For example, few people would find the ingestion of tape worms in order to remain slim natural, as Victorian ladies did. There are also obvious differences in current perceptions of cosmetic surgery.

This is all based on the assumption that man is part of nature. However, people tend to distinguish between the ways in which humans and animals manipulate their surroundings which raises the question: in what ways are we fundamentally different from animals and how and when did we become different? The answer to this depends on the individual's cultural background and beliefs. From a Christian perspective man has always been fundamentally different since we, unlike the other creatures, were formed in God's image and given a soul. In contrast, for those who believe we evolved from other species the point at which we diverged is less easy to define. The development of language and the subsequent ability to think of and describe objects in abstract terms, i.e. to call a stick a stick, must have been a vital stage in the development of the communicative abilities and consciousness that makes us unique.

Not everyone would agree that humans should occupy a unique place in nature. There are philosophies and religions which view all life as sacred and equal. For example, Buddhism teaches its followers to respect all life forms and the interdependence of all creatures is signified by a belief in reincarnation. Deep ecology, as distinct from shallow ecology, is characterised by a respect for all parts of nature which are considered to have intrinsic, rather than just instrumental, value and are seen as being equal. Human activity is seen as problematic and harmful to nature because it is based on flawed ideological, economic and technological structures. Emphasis is placed on the importance of values and emotions as genuine sources of knowledge and experience of nature (Naess and Rothenberg 1989 p32). Deep ecology, along with some other schools of environmental thought, has been criticised for mystifying nature (Bookchin 1987) by associating 'magical' powers with it and adopting a reverential tone. Instead of integrating and making us at one with nature as the deep ecologists would wish, this separates and sets us apart.

There would also seem to be a misanthropic undercurrent to much contemporary environmental thought, including deep ecology. Humans are viewed as being too successful in colonising the planet for our own good, or that of any other species. Consequently, we need to reduce our numbers and learn to 'live lightly'. We are basically perceived as a spreading, destructive force which is out of control, destroying delicately balanced ecosystems wherever our influence reaches without any consideration of the consequences. The measures which some environmentalists are prepared to take, such as tree spiking, demonstrates how highly valued some areas of countryside are, particularly those areas that have an untouched, undeveloped appearance. They echo the sentiments expressed by Robert Burns 200 years ago in his famous poem "To a mouse" which he wrote after ploughing up a field mouse's home:

"I'm truly sorry Man's dominion
Has broken nature's social union".

To what extent is nature a social union? A passing fox would, no doubt, waste little time being sociable with Burns' mouse before eating it. Animals do, of course, cooperate with each other as well as compete but the notion of existing in a harmonious social union seems reserved for humans and the creatures in Disney films.

Our anthropomorphic view of other creatures, demonstrated by our treatment of pets and cartoon characters may tell us more about the state of our own society than that of the animal kingdom. It may be that we retreat from the problems of modern life, such as poverty, crime and homelessness, then idealise nature and previous ways of life, projecting what we wished existed onto them. It then becomes apparent to us that what we have to do is to go back to nature or past ways of living. Unfortunately this process tends to be rather selective and ignores the reality of the situation. Country life for those that have to make a living from the countryside (as opposed to those who merely live in rural areas and commute to work in towns) can be harsh. Farm work is characterised by hard work, long hours, low pay and high levels of accidents and suicides - hardly the pastoral idyll of Constable's landscapes. Similarly, the concept of nature is imbued with positive imagery and has transcendent, harmonious associations while man-made or artificial often has less favourable associations. However disease, predation and starvation are as natural as wild flowers and beautiful sunsets, while art, science and philosophy are as artificial as nuclear power stations and motorways. The natural equals good and synthetic equals bad association is over-simplistic.

Nature has not always been so highly valued as it is today and our idea of what constitutes beautiful countryside has changed a great deal. In the 17th century

mountains were frequently considered to be barren, ugly and sterile. Thomas (1983) has noted that:

“The cultivation of soil was a symbol of civilization, whereas ‘wild and vacant lands’ ‘encumbered with bushes [and] briars’ were ‘like a deformed chaos’. An uncultivated common, thought Timothy Nourse in 1700, was ‘the very abstract of degenerated nature.’” (p255)

and

“...in 1697 Ralph Thorasby found both the Border country and the Lake District full of horrors; dreadful fells, hideous wastes, horrid waterfalls, terrible rocks and ghastly precipices. In the same spirit Dr Johnson wrote of the Scottish Highlands that ‘an eye accustomed to flowery pastures and waving harvests is astonished and repelled by this wide extent of hopeless sterility” (p258).

This is obviously different from the way in which most people see the countryside today. Remote areas are prized and sometimes officially protected by being designated National Parks. Outdoor pursuits such as hill walking and climbing are increasingly popular. There are several possible reasons for the “historically transient aesthetic tastes” (Rodman 1995 p247) which have led to us valuing wilderness areas more highly. For one thing, increased population and human influence means that remote areas, particularly in England, have become less common. Where there were once towns separated by large tracts of countryside there are now areas of countryside, such as the National Parks, separated by large areas of developed land. As Rodman (1995 p254) puts it:

“I am aware that my preference for diverse, complex, and stable systems occurs in a time that I perceive as marked by unprecedentedly high rates of species extinction and ecosystem simplification. In this situation, diversity has scarcity value in addition to its intrinsic value...”

We are also more insulated from the negative aspects of nature such as crop failures, food shortages and harsh weather. The ills that affect our lives now tend to be more man-made, such as poverty and crime, so it is hardly surprising that people nowadays have more desire to "get away from it all". The more insulated from nature's ill-effects we become the easier it is for us to idealise it and wish to get back to it. The way in which people think we should relate to nature has also changed. The post-enlightenment ideas of the 17th century were based on a belief in the power of

human rationality and scientific method. This same rationality has been criticised more recently as being one of the underlying causes of the environmental crisis (see section 3) and disenchantment with it has been expressed by the increasing interest in alternative medicines and new age philosophies.

Attitudes to wilderness had changed by the early 19th century in response to poetry, landscape painting and the increased accessibility of remote areas. The Romantic Movement played an important role in forming this new view which is still influential today. The Romantics had a broadly similar attitude to their environment (Prickett 1981 p5), finding it a source of great pleasure and even, for Wordsworth at least, "a means of spiritual exaltation" (Blaumires 1984 p61). Mountains now inspired poetry instead of loathing. The ideals of the French Revolution and the ideas of Rousseau, that man was fundamentally good and should therefore be free, were important in forming the Romantics' view of nature which was also a reaction to some of the negative aspects of the industrial revolution such as the squalor and exploitation of the new urban masses. For the Romantics, in common with many modern environmentalists, nature had inherent beauty and worth regardless of its usefulness to man.

Whether or not a part of nature can be said to be objectively beautiful is open to question as factors such as the individual's background and historical knowledge of the area inevitably influence their perceptions. For instance, the Scottish Highlands are considered beautiful by many who appreciate the solitude and space that can be found there. However, according to some interpretations of the history of the area its emptiness may be perceived as more desolate than beautiful - for instance if one realises that in the aftermath of the Jacobite Rebellions the Highlands, well populated up until then, were forcibly cleared in order to destroy Highland society and make way for sheep farming. So, while one person may admire the empty expanses of the Highlands, another may look at the same landscape and think of the culture that might have been. It has been argued that the tourists/outside view of landscape is inevitably different from that of "existential insiders" (Bourassa 1991 p6-7): "landscape for all its appeal, cannot mediate the experience of the active insider and the passive outsider" (Cosgrove 1984 p270).

The aesthetic appeal of landscape, which contains elements of nature, art and artefact, would seem to be an important part of the way in which we value different places. There are different theories of the way our aesthetic judgement is formed, i.e. how we decide what is and is not beautiful. These can be grouped into theories which are based on: a. the importance of biological laws resulting from our evolution; b. cultural rules with historical roots; c. personal strategies based on our individual development (Bourassa 1991 p xiii). An example of a theory stressing biological laws would be Appleton's prospect-refuge theory (Appleton 1990), in which the aesthetic

appeal of a landscape depends on the way it symbolises features important to survival: prospects, refuges and hazards. Put simply, we prefer scenes that allow us to see without being seen. Costonis (1989) proposed a theory based on cultural identity and stability. Our feelings for the landscape are not determined by its form (formalism) but by what it symbolises and how our identities are tied up with the control we have over the environment. There are fundamental differences between these different theories which have important implications for understanding the way we relate to our surroundings - whether you think that art influences the way we perceive nature or nature influences the way we perceive art depends on what you think our aesthetics are based on.

The development of science and technology has meant that our power to alter nature for our own benefit has increased at a faster rate than our understanding of the possible consequences of the changes we make. This lag, it is argued, will lead inevitably to irreparable damage to the planet, the 'end of nature' (McKibben 1990) and the downfall of humanity. Alternatively, the way in which we interact with nature can be viewed as a form of experimentation through which we learn more about it. For instance, the use of CFCs as refrigerants and their subsequent release into the atmosphere led, through the discovery of ozone depletion, to new knowledge of atmospheric chemistry. This is not to suggest that the Earth should be treated as a big science lab, as those who point to the role of the dominant positivist rationality as the source of our environmental problems say we do (see section 3), but merely to point out that uncertainty and the way we respond to consequences of our actions have been an integral part of our changing relationship with nature (see for example Lash et al 1996). As society has evolved, we have altered nature which, in turn, has influenced our development. In the next section, some of the reasons put forward for why our evolving relationship with nature has led to increasing environmental damage are examined.

3. PERCEIVED CAUSES OF THE ENVIRONMENTAL CRISIS

3.1 Introduction

The concept of "the environment" in the West is one which has seeped increasingly into the public consciousness over the last 10 to 15 years and in the process its meaning seems to have altered. For many, it has changed from being merely that which surrounds us to having an association with specific issues which manifest themselves in everyday life as bottle banks, ozone-friendly aerosols and road protests. This perception of the environment as a series of problems in need of solutions seems to be an integral part of our late twentieth century milieu. A wide variety of events seem to be linked in people's minds for little reason other than that they are identified as environmental in some way. This is not surprising given the sort of images that are commonly conveyed in the media, education and everyday experience. However, it would be unwise to accept this view, with its implications for education, without examining it more closely.

Often concern about the environment seems to be based on indefinite or inaccurate assumptions. For instance, although global warming may well result from increased emissions of greenhouse gases it is still not the unquestioned certainty that many consider it to be and the effects of any warming are unpredictable (Pearce 1997). Despite this it has been used by the UK government as dubious justification for subsidising the nuclear industry and adding VAT to domestic fuel bills. Another example is the commonly held belief that increased air pollution is a cause of asthma, particularly in children, even though there is a lack of empirical evidence to support this.

It is hardly surprising that such misconceptions exist when many individuals and organisations apply the 'precautionary principle', assuming that if something may be happening, then we should react as if it is. This may be a sensible approach when faced with the uncertainties and disastrous potential of global warming, but could act as an unnecessarily limiting influence on human activity if applied too readily. Some would go further and dismiss environmentalists as Jeremiahs whose ideas "muddy the pure waters of free market economics" (Kent Jeffreys in Vidal 1995).

Misinformation and the misinterpretation of environmental issues can result from the issues being manipulated to suit particular purposes. For example businesses

may be keen to have tougher environmental legislation introduced in order to squeeze out weaker competitors. Environmental policies may be used as elements in corporate marketing strategies. Green organisations have to persuade us to support them with our limited time and money to justify their existence whilst the media needs items which will interest people but not necessarily inform them. These and other motivating factors combine to produce a nebulous perception of what the environment is and make it important that people are able to put events in context and ask questions when actions are made in the name of saving the planet.

In addition to criticism that environmental issues are often misconceived, rather than based on reality, is the view that even when the changing physical processes are well understood they are often symptoms of different, often multiple causes. Viewing them as single, environmental, issues can divert attention from the actual causes. For instance, it is easy to blame the pollution, congestion, and ill health caused by road traffic on the selfishness of individual motorists but this fails to recognise the range of factors which influence choice of transport. These include the need for freedom of movement and a lack of suitable alternative to the car; the desire to control one's immediate surroundings or the need for a status symbol. Consideration of factors such as these leads us to question why public transport may be deficient, or why people feel the need to use a car as a way of identifying with a particular lifestyle. Many issues which may at first seem quite straightforward often have complex dimensions on closer analysis.

It is because of the common misconceptions about environmental issues and the fact that they often have hidden complexity that it is important for us all to avoid accepting unchallenged assumptions and become better informed and thus more able to analyse conventional wisdom. To discover how we can do this and the role that education could play we first need to take a closer look at what may be causing the alleged problems. Although different problems often have different causes, this has not prevented people from looking for common causes for what is often thought of as the 'environmental crisis'¹.

¹ The use of the term 'environmental crisis' does not necessarily imply that what is happening is considered an environmental crisis by the author. Rather it is used to illustrate the widespread perception that there is such a crisis.

3.2 Perceived causes of the environmental crisis

3.2.1 The role of economic and political systems

There is a popular view that the current laissez-faire, free market ideology, although responsible for some damage, can be made to work for the environment through the imposition of green measures (see for example Cairncross 1991, Pearce et al 1989). In Pearce et al (1989), environmental problems are explained as being the result of the absence of markets leading to commodities being priced at zero and of the inevitable result of common property with global open access, e.g. the atmosphere:

"One of the central themes of environmental economics, and central to sustainable development thinking also, is the need to place proper values on the services provided by natural environments. The central problem is that many of these services are provided 'free'. They have a zero price simply because no market place exists in which their true values can be revealed through the acts of buying and selling" (Pearce et al 1989 p5).

By tuning the markets with green standards, taxes and appraisal techniques, such as cost-benefit analysis, it should be possible to make being 'environmentally friendly' also profitable. This approach has several problems, not least of which are the difficulties of valuing and regulating and the unfairness of allowing those who can afford to damage the environment to do so. There are also wider questions of whether a society based on competition and wealth creation and their associated values can ever put the longer term interests of nature before the short-term need to make profits.

While capitalism is often defended as being natural by comparing economic competition with Darwin's ideas of natural selection and survival of the fittest, this ignores two important points:

- i. co-operation is a feature of nature as well as competition, e.g. bees pollinate plants and receive nectar, pilot fish swim with sharks and wolves hunt in packs
- ii. the comparison between nature and human society is largely irrelevant anyway because the two are fundamentally different.

Marxists, in contrast, do not tend to view environmental problems as the results of badly adjusted markets and natural limits but rather as the inevitable consequence of organising society around the guiding principle of making profits. Instead they believe that society should be organised to meet human needs. But what if these needs are unsustainable, such as our current consumption of petrol? Then they would argue that we should try to solve the problem by developing more efficient engines or new fuels instead of avoiding it by limiting our consumption. They point to history to show that human advancement is a process of creating and solving problems as they arise rather than one of avoiding them. The crucial assumption is that our ingenuity will be sufficient to overcome any problem we create through our own advancement so we should not limit ourselves by worrying about what the negative, i.e. environmental, consequences may be. This may seem harsh on the rest of nature, and it is indeed an anthropocentric view. However, Marxists see nature as inseparable from, as opposed to apart from and untouched by, society: "the relationship of the individual to nature is mediated through society" (Richards 1989a p20). The big uncertainty in this view of nature is how do we know we will be able to solve future problems just because we have in the past. It seems like a risky extrapolation to make.

The work of Schumacher has influenced many green thinkers over the years and in his book "Small is Beautiful" (1973) he suggested that we are heading for disaster by mistakenly believing that the 'problem of production' has been solved (Schumacher 1973 ch. 1). By this he meant that we have created the illusion of sustainable production by consuming the Earth's capital resources instead of living off its income (renewable) resources. The non-renewable resources we are using up quickest fall into three categories:

- (i) fossil fuels
- (ii) the tolerance margins of nature
- (iii) the human substance.

Schumacher suggested that the reason we have developed such a destructive economic system lies in the Western mindset which determines the way we see our relationship with nature. In this respect there is common ground between Schumacher

and other writers, e.g. Orr (1992, 1994a) or Bowers (1993), who see the roots of the environmental problems as cultural. In order to solve these Schumacher suggested that we need to change our values and thus our economic system to make improved quality of life central.

3.2.2 The role of individuals

A commonly cited cause of environmental damage is the impact of the behaviour of individuals. Whether it is a piece of litter dropped in the street, the increase in CO₂ emissions resulting from the high level of car use or the need to use nuclear power to meet our increasing domestic energy demands the problems, and hence the solutions, depend on the actions of individuals. It follows that if the problems are caused by human behaviour, then we must find out what factors control behaviour and try to change them through education, persuasion and coercion. However, if we consider the wider influences on behaviour other than individual differences it becomes apparent that blaming things on the individual can be misleading and obscure other factors. For instance, at one level our transport problems are the result of people choosing to use cars a lot. While this is undeniably true, one has to look at the reasons behind the popularity of the car:

- (i) the desire for personal freedom linked with lack of alternatives to the car;
- (ii) the desire to identify with images portrayed in car advertising (sex, fun, style and occasionally safety);
- (iii) the desire for control of one's immediate surroundings thus avoiding having to put up with "dreadful human beings sitting alongside you" (comment by Stephen Norris, then Transport Minister, widely quoted in the media in early 1995).

As the first two of these are largely outside the control of the individual and linked to the economics of the automobile industry, it would seem unfair to lay the bulk of the blame for our transport problems with the individual. Perhaps this is why governments and some institutions are keen to emphasise the role of the public - it removes the burden of responsibility from them. This may explain why certain companies which have been seen as environmentally damaging e.g. BP, ICI, BNFL

produce a lot of environmental education packs. By doing so they change the relationship of polluted and polluter to one where the implication is that the company is a source of greater understanding and is therefore less culpable than those the materials are aimed at.

Related to the idea that human (mis)behaviour is at the root of our environmental problems is the popular notion that population growth represents the greatest threat to our survival. The influential Jonathan Porrit, echoing the ideas of Malthus almost 200 years before him, compared the Earth to a cake of set size and warned that "if the number of people involved exceeds the cake's capacity, then people die" (Porrit 1990 p23). In his book 'The Population Bomb', Ehrlich (1971) pointed out the dangers of over-population, recommending measures such as taxes to discourage child bearing and limiting food aid to poor countries. This deterministic sort of outlook is summarised in the statement "...like every other species, we are still constrained by certain fundamental laws of nature" (Porrit 1990 p23). This statement is only partially true. Firstly, on a practical level, humans, unlike other species, have overcome some of nature's laws and limits by, for example, developing language, storing knowledge, developing agriculture and travelling in space. What may at first seem like an insurmountable limit can be transformed by the human imagination: "To a primitive people the sea is a barrier; to a more developed society the same stretch of water offers a means of transport and exploration" (Richards 1989a p20). It could be argued that there are several limitations imposed on us by nature. Human intelligence for example, however we have invented computers to extend our mental capabilities. The ability of nature to tolerate pollution is a potential limit but we can develop more efficient, less polluting industry and lifestyles. Inadequate food supply is often cited but reorganised, sustainable global agriculture could feed many times more people than there are at present (see, for example, Warnock 1987 p301). Malnutrition and famine are more the result of global finance structures and inadequate food distribution than reaching any food production ceiling. Our mineral and metal supplies could be recycled much more efficiently, other planets and satellites could be colonised and mined. The key factor in all of this is obtaining sustainable energy supplies. Our fossil fuels and uranium are very limited but even if the problems of nuclear fusion are not solved the fact remains that the energy received from the sun is about several orders of magnitude greater than the amount we use (Allen 1992). Obviously a lot of this is received where there are not many people - oceans and deserts - but it changes the main technological challenges to those of energy storage and transportation rather than generation.

While doubts have been expressed as to whether or not development based on increasing reliance on science and technology is ecologically sustainable, some have questioned whether such development is culturally sustainable and argued that we should not necessarily develop more sophisticated technology just because we can. We need to look at the sort of future we are heading for and ask if it is what we want.

Milbrath (1989) considers the choice between the current Dominant Social Paradigm (DSP) and the New Environmental Paradigm (NEP). He concludes that we run the risk of losing a lot more than we could gain by continuing with the DSP: "Why risk everything for the dubious gain of spreading riches and thrills to more and more people?" (p351). The same idea is expressed in terms of a pay-off matrix in Pearce (1989 p11). Unfortunately these comparisons simplify the complex decisions facing us to the point where they are meaningless. They presume to know the future and view it as a fixed-stake gamble with a set dividend of "riches and thrills". It is rather dismissive to describe some of the beneficial results of the DSP, such as sanitation and quantum theory, as mere "riches and thrills". This is not to say that 'progress' in the Western, industrial sense is necessary for human fulfilment. It is difficult to tell if we would be a happier healthier society if we had a more spiritual relationship with nature. However, there is no way of knowing for certain that scientific progress and human happiness and fulfilment are incompatible. In the same way that we are morally obliged, as tenants, to preserve the Earth for future generations it could be argued that we are obliged not to halt scientific progress. It could be difficult explaining to people in 100 years time why they have been denied the 'thrill' of a cure for cancer.

3.2.3 Science and Technology

Science and technology are often cited as being contributory factors to our environmental problems in the West, either because of our perceived over reliance on resource hungry technology or because of the way in which scientific thought has dominated our outlook since the Enlightenment. Some would defend them as being essentially neutral and point to the way in which they are used as being problematic, not the knowledge in itself. Advances in nuclear physics and the development of the technology to split atoms did not compel anyone to invent nuclear weapons - the motivation for that was provided by political instability and insecurity. The technology was, however, a source of political power and in this respect it is not

really neutral and value-free. Science does not exist in a vacuum but in the real world where funding is provided by governments and industries with a view to getting some sort of useful return on their investments. It has also been argued that because science rejects values in favour of objective facts that this decision in itself represents a value (Harvey 1974). Further, according to Kuhn, the way in which science develops is through 'revolutions' involving social and cultural factors not pure objectivity (in Carr and Kemmis 1986 p72). Finally, the way in which science is interpreted and understood depends on the readers' cultural perspectives as well as what has been written and also the way in which science is taught and learned. From this perspective it would seem that the context and paradigmatic content are both important in determining whether or not science damages the environment.

Others have examined the cultural implications of making science, rather than philosophy or religion, the focus of our efforts to understand existence. Bowers (1993) traces the origins of the ecological crisis to the neglect of the role of living tradition in favour of scientific rationality and the dualism of Descartes which separated man from nature and viewed the latter as having instrumental value only. The hidden assumptions of this anthropocentric mindset, e.g. that change is good and progressive per se and the past is irrelevant, has led to a state of perpetual cultural experimentation without careful consideration of the social consequences. Descartes' rational philosophy considered the Universe in mechanistic rather than organic or divine terms and was heavily influenced by the work of Galileo and Newton.

The science-based, mechanistic view of the Earth is criticised by ecofeminists such as Merchant (1980) and Shiva (1991). They see the change from thinking of the Earth in organic, feminine terms (as mother nature) to thinking of it as a machine as instrumental in justifying the subjugation of nature and women (who they associate with nature, presumably because of their fertility). Science is seen as inherently patriarchal:

"The reductionist mind superimposes the roles and forms of power of western male-oriented concepts on women, all non-western peoples and even on nature, rendering all three "deficient" and in need of development" (Shiva 1991 p5).

Shiva (1991 p4) suggests that "A stable and clean river is not a productive resource in this view: it needs to be 'developed' with dams in order to become so." However it is true that a river requires a dam in order to produce the electricity which could free people (mainly women) from the labour of collecting firewood.

While development often happens for the wrong reasons, to assume that it is always misguided to try to alter nature - that nature is somehow perfect and cannot be improved upon - would seem to be based on a negative view of human potential. Taken to its logical conclusion, this view implies that it was a mistake to use fire or to pick up a stick and use it as a tool. Our ability to manipulate our environment - i.e. to develop nature - is one of the activities (along with social organisation and language) that makes us human. Shiva (1991 pp34-36) proposes the adoption of "ethno-science" instead of science in a similar way to Bower's (1993) ideas of the use of tradition as a sort of learned culture. Orr (1994b) also looks to Western cultural development and locates the cause of our environmental problems in the way that education and community have been separated: "Our culture has taken education and research *out* of community and broken the vessel" (p13). He thus views "the ecological emergency as, in fact, a crisis of mind and of education" (p27).

Science is also considered by some to be responsible for the lack of spirituality that has resulted in the diminishing of humanity and the destruction of the environment. According to Skolimowski (1993) we need to regain spirituality and think of the Earth as a sanctuary in order to escape from our nihilistic, materialistic state of mind and the mechanistic, scientific conception of nature that has encouraged us to exploit the planet. "Without it (spirituality) the human condition cannot be truly human" Skolimowski (1993 p1). While there may be some debate about whether science and spirituality are mutually exclusive, Appleyard(1992) certainly thinks they are and suggests that:

"It is, therefore, idle to pretend, as many do, that there is no contradiction between religion and science. Science contradicts religion as surely as Judaism contradicts Islam - they are absolutely and irresolvably conflicting views."(p85)

However, it is debatable whether a return to spirituality represents a move to a better way of life rather than just a reaction to the present problems with our science-based culture.

While science is seen as a cause of problems by some, others take the opposite view and look to it as a means of solving them. Whether or not this 'technocentric' view is valid, it is true that regardless of the role that science plays in causing the problems, its usefulness in highlighting them is obvious, from attempts to understand climate change to measuring roadside lead concentrations. The role that science plays as an instrument of economic growth and the morality of the industrialisation

process have been widely criticised. In their estimation the benefits of industrialisation are outweighed by the ills they associate with it: e.g. increasing mental illness, stress, cancer and social problems. In order to relieve these and create a sustainable society we need to get back to nature in some way. We need to live with the harmony and reverence that comes from the holistic view of man and nature that the North American Indians, for instance, had. Whether this sort of de-industrialisation is desirable or even possible is open to question. According to Young (1990 p26) the indigenous people of Oceania and Australia had not been living in static harmony with their environment:

"In fact, Oceania and Australia had been civilised in accordance with the cultural values and with the technology available to the inhabitants, and the environment had been greatly modified".

Part of the cultural values involved a greater acceptance of ill effects such as conflict, death, disease and infant mortality as a necessary part of the cycle of renewal.

Whether it is possible for a society to change its values, reject the benefits of modern technology and endure the hardships which our ancestors did, is open to question. It may be possible so long as there is a safety net in case things become unbearable. When romanticising palaeotechnic cultures it should be borne in mind that these cultures often embrace certain aspects of neotechnic life once they are made available to them.

3.3 Conclusions

There is probably some truth in many of the views discussed above depending on the particular environmental problem and its context. It may not be possible to think of all the problems that we face as a coherent whole with a single cause. To do so may be to oversimplify the situation and make things worse. Being too prescriptive or dogmatic about the cause of environmental problems is liable to make matters worse as it substitutes genuine understanding of each individual issue with a false basis for action on all issues. Although many are related and frameworks for analysis are useful, each should be approached with an open, critical mind. Often the apparently different ideas of the causes of the environmental problems represent different emphases rather than fundamentally different views and these are coloured

by our own worldviews and backgrounds. In the next section, the views of one major response to the environmental crisis are examined in greater detail and the implications for environmental education discussed.

4. THE DEEP ECOLOGY MOVEMENT AND EARTH EDUCATION

4.1 The deep ecology movement

4.1.1 Introduction

The term "deep ecology movement" was introduced in 1973 by Arne Naess (Drengson and Inoue 1995) in an attempt to distinguish between what he saw as two distinct movements: shallow ecology and deep ecology. Although the term is recent, many of the ideas it embraces can be traced back to writers such as Leopold, Thoreau and Muir in America, the Romantic movement in Europe, and certain Eastern religions such as Buddhism and Taoism. Among Western philosophers, Spinoza has been identified as having the most influence:

"Arne and I also independently shared the conviction that Spinoza, more than any of the other major Western philosophers, provided a good model and inspiration for contemporary ecological philosophy" (Sessions 1995 p54).

Along with Naess, the two other people who have most developed and popularised deep ecology are George Sessions and Bill Devall. Their book "Deep Ecology" (Devall and Sessions 1985) has been described as "the first major book on the deep ecology movement by writers other than Naess. It played a significant role in popularising the ideas of the movement" (Drengson and Inoue 1995 p xviii). Consequently, this discussion is largely based on the work of Naess, Devall and Sessions, and in particular the 1985 book by Devall and Sessions.

4.1.2 Background

When Naess wrote his summary of the shallow and deep ecology movements in 1973 he started off by characterising the shallow ecology movement in the following way: "Fight against pollution and resource depletion. Central objective: the health and affluence of people in the developed countries" (Naess 1973). Given that he went on to spend three pages defining the deep ecology movement, it seems more accurate to describe his treatment of the shallow ecology movement as a summary

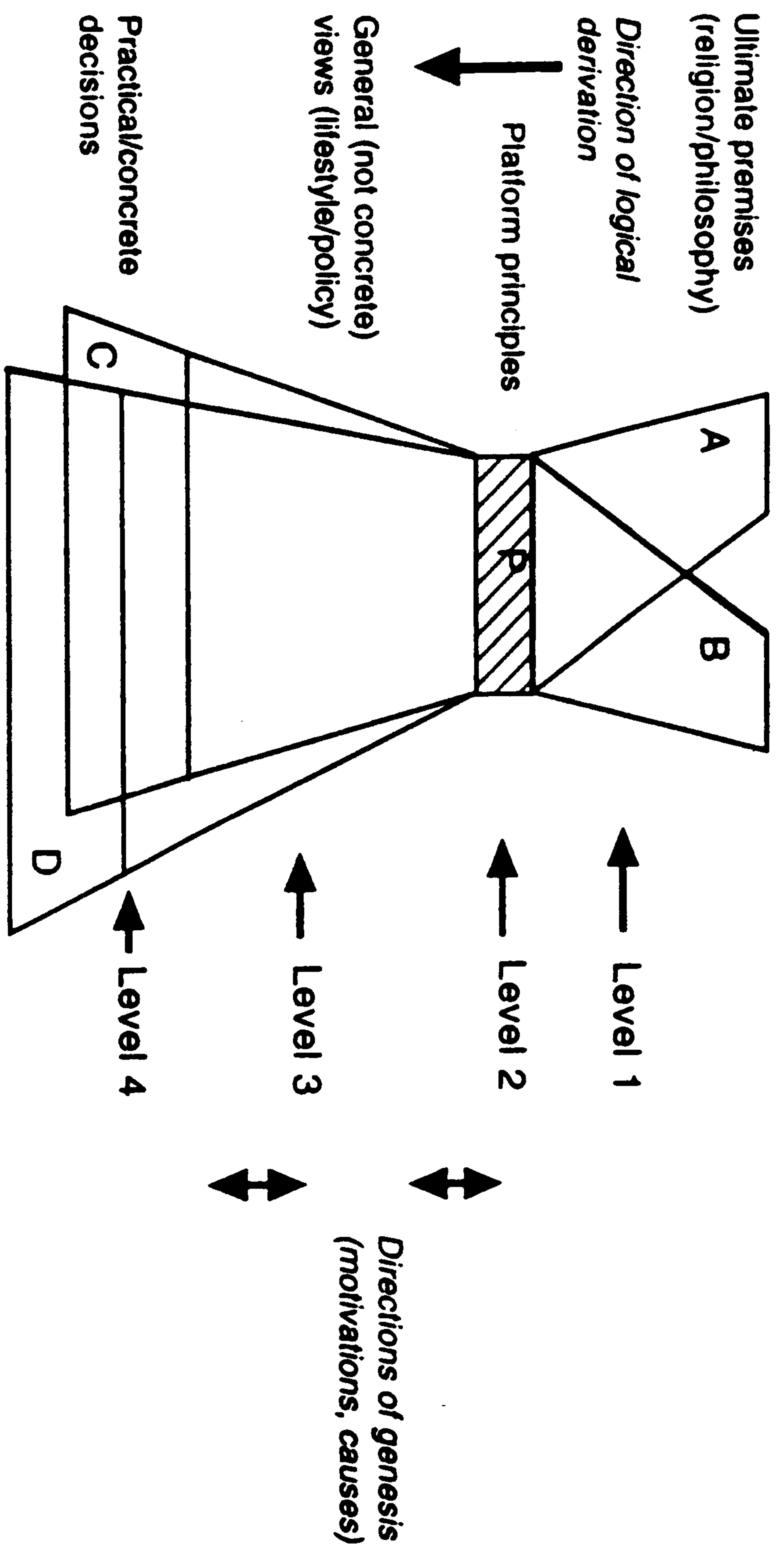
execution rather than a summary. The way in which everything that is not part of the deep ecology movement is dismissed with an 18-word generalisation implies that there is no alternative to the deep ecology movement which warrants any analysis. Rothenberg (1995 p155) attempted to distinguish between deep and shallow ecology in the following way:

"The term (deep ecology) is meant to characterize a way of thinking about environmental problems that attacks them from their roots, i.e., the way they can be seen as symptoms of the deepest ills of our society. This is to be contrasted with 'shallow ecology' - treating merely the symptoms themselves, not the causes, through technological fixes..."

While few would argue that attacking problems at their roots was the correct way to proceed, there may be some debate regarding what constitutes the roots of environmental problems. For instance, some in the environmental movement may argue that patriarchy or capitalism is the root of many environmental problems. This, however, does not mean that they necessarily see themselves as part of the deep ecology movement.

In order to explain the structure of the deep ecology movement, Naess devised the Apron Diagram (see fig. 1). This shows the way in which practical decisions in day to day situations are derived from ultimate premises of a religious or philosophical nature. An important feature of this diagram is the way in which different ultimate premises (level 1) can lead to the same platform principles (level 2) while the same general consequences (level 3) can lead to different practical decisions (level 4). There is room for differences of opinion at all the levels apart from level 2, the platform principles. As Naess (1995 p12) puts it: "The deep ecology movement thus can manifest both plurality and unity: unity at level 2, and plurality at the other levels". In fact, agreement on the platform principles is *required* in the deep ecology movement. The platform principles are meant to "promote clarity and consensus about the core principles shared by the supporters of the deep ecology movement" (Drengson and Inoue 1995 p xxiv). Although more than one set of principles exists and their authors stress that they do not see them as definitive, the Apron Diagram does imply that there is a need for one definitive platform.

Fig. 1: The Apron Diagram (Naess 1995)



4.1.3 Two sets of platform principles for the deep ecology movement

4.1.3 a Naess and Sessions 1984

A platform for deep ecology was devised by Naess and Sessions in 1984 which was revised later and set out in the following terms (Naess and Rothenberg 1989 p29):

- "1. The flourishing of human and non-human life on Earth has intrinsic value. The value of non-human life forms is independent of the usefulness these may have for narrow human purposes.
2. Richness and diversity of life forms are values in themselves and contribute to the flourishing of human and non-human life on Earth.
3. Humans have no right to reduce this richness and diversity except to satisfy vital needs.
4. Present human interference with the non-human world is excessive, and the situation is rapidly worsening.
5. The flourishing of human life and cultures is compatible with a substantial decrease of the human population. The flourishing of non-human life requires such a decrease.
6. Significant change of life conditions for the better requires change in policies. These affect the basic economic, technological, and ideological structures.
7. The ideological change is mainly that of appreciating *life quality* (dwelling in situations of intrinsic value) rather than adhering to a high standard of living. There will be a profound awareness of the difference between big and great.

8. Those who subscribe to the foregoing points have an obligation directly or indirectly to participate in the attempt to implement the necessary changes."

4.1.3b Rothenberg 1987

Rothenberg (1995 p156) states that his platform was devised after "Arne Naess challenged me to come up with such a platform that would be accessible to a wider audience than the one for which he had written". His platform is expressed in the following terms and it should be noted that exclamation marks are used to identify a point as a "moral imperative" (Drengson and Inoue 1995 p xxiii):

- | | |
|---------------------------|---|
| I. LIFE! | There is intrinsic value in all life. |
| II. NATURE! | Diversity, symbiosis, and thus complexity explain the life of nature itself. |
| III. HUMAN IN/AND NATURE! | Humanity is part of nature, but our potential of power means that our responsibility towards the Earth is greater than that of any other species. |
| IV. NO FALSE DISTANCE! | We feel estranged from the Earth because we have imposed complication upon the complexity of nature. |
| V. OUTSIDE CHANGE! | On the outside, we should change the basic structures of our society and the policies which guide them. |
| VI. INSIDE CHANGE! | On the inside, we should seek quality of life rather than higher standard of living, self-realization rather than material wealth. |

VII. SPREAD OF IDEAS!

New kinds of communication should be found that encourage greater identification with nature. Only then will we see our part in it again.

ACTION!

CONCLUSION: Those who accept the above points have an obligation to try to implement the necessary changes.

(Rothenberg 1995 p158)

4.1.4 Criticisms of Deep Ecology

Both the platforms outlined above reiterate certain fundamental assumptions in deep ecology such as:

- All life has intrinsic value.
- Many environmental problems are the result of humanity's estrangement from nature.
- Nature is transcendent.

These assumptions are discussed with reference to the platform principles and other aspects of the deep ecology movement and the followings criticisms are made of it:

- Its norms are misconceived;
- It lacks a self-critical dimension;
- It is based on a flawed view of nature;
- It is atavistic;

- It has misanthropic elements.

4.1.4.1 Deep Ecology's Norms

The idea that all living things are equally important is a recurrent theme in deep ecology and underpins its ideas. Both platforms outlined in 4.1.3 have as their first principle the intrinsic value of all life and go on to defend the fundamental importance of biological diversity. Rodman (1995) argued that all living things have their own telos and that "one ought not to treat with disrespect or use as a mere means anything with its own telos" (p251). This is in contrast to the dominant Western worldview where the rest of nature is viewed as different from humanity and judged in terms of its instrumental, rather than inherent, value. Thinking of nature in non-hierarchical, egalitarian terms may seem laudable, especially given our recent history of exploiting nature for financial gain, however it could be that it is a reaction to our exploitation of nature rather than a realistic or desirable position per se. It does not necessarily make sense for all living things be considered equal when they are not all the same. No one could argue that a tree is like a fly, or a fly like a monkey. There are obvious differences in biological complexity and levels of consciousness. However, it is debatable whether or not these differences should be used to discriminate between life-forms and organise them into hierarchical taxonomies in ways that legitimise exploitation.

Part of the difficulty in discussing these issues comes from using concepts peculiar to humans when discussing the rest of the biosphere. Deep ecologists would object to arranging animals into a pecking order of higher order to lower order based on the level of biological sophistication or consciousness we assign to them. If one agrees with Darwin then life existed prior to our evolution and would presumably carry on unconcerned if we ceased to exist. The point is that other species exist separately and independently of the human world no matter how we classify them. They may eat each other in order to survive but to think of this as exploitation in the human sense, a term which implies far more calculated action than simple predation, and to use this to legitimise exploitation in human society is to misrepresent what actually occurs. Humans are different but, although this means that we relate to nature in fundamentally different ways from other animals, this does not give us a *carte blanche* to redefine the rest of the biosphere as a store of chemicals and materials which exists for our convenience.

The idea that all things are equal may be a difficult one for a leopard to grasp. As with exploitation, equality and the right of self-realization are concepts which have arisen through the gradual development of civilised society and taken from that context and applied to the animal kingdom they have no meaning. While it may be right that we should not deliberately cause the extinction of any other species, there is no reason for us to expect other animals to act according to our sense of right and wrong. After all, competition and extinction are two of the driving forces of evolution. It makes no sense to think of all living things as having equal rights, instead we need to recognise the differences and behave accordingly. Because of our mental development we have a unique responsibility for the welfare of the rest of nature which is not shared by other animals. Rothenberg (1995 p158) recognises this in his third platform principle: "Humanity is a part of nature but our potential of power means that our responsibility towards the Earth is greater than that of other species". However, he does not make the connection that Bookchin (1990) does between our difference from other species and our potential to beneficially transform nature.

Bookchin (1990 p202) has argued that we are the embodiment of nature's thrust towards self-consciousness and self-reflexivity, thus the "second nature", i.e. human society, that has emerged from first nature is fundamentally different yet still natural. We need to realise that we are part of and different from, though not necessarily better than, the rest of nature and are a "distinctive moral agent" which can "bring the prospect of 'biospheric democracy' into the natural world by practising ecological stewardship" (Bookchin 1990 p215). As he puts it:

"Not only does this imply that humanity, once it has come into its own humanity as the actualization of its potentialities, can be a rational expression of nature's creativity and fecundity, but that human intervention into natural processes can be as creative as that of evolution itself" (Bookchin 1990 p216).

Instead of despising our uniqueness and calling for its destruction by going back to nature we should celebrate our development as an "expression of nature's creativity".

In the deep ecology's defence it could be argued that bioequality is justified because all life *is* in principle the same and the differences mentioned above only arise because certain human criteria are applied. Rodman (1995) has criticised the way in which rights are granted to other animals because they are intelligent, or can

experience pain, or are conscious. The hierarchies created by this moral extensionism are rejected by the deep ecology movement.

While extending the liberal principle of egalitarianism from society to the rest of nature is one way of arriving at the idea of bioequality, there are other reasons based on religion and ecology for deep ecology to adopt it as one of its norms. There is a spiritual element running through deep ecology which manifests itself in different ways, for example in the following quotes:

- a. "...Insofar as these deep feelings are religious, deep ecology has a religious component, and those people who have done the most to make societies aware of the destructive way in which we live in relation to natural settings have had such religious feelings" (Naess in Devall and Sessions 1985 p76).
- b. "The platform of the deep ecology movement is grounded in religion or philosophy" (Naess 1995 p11).
- c. "At this point (about 1968), he (Naess) tells us, he began to live his philosophy and function in part more as a 'minor prophet' than a strictly academic philosopher" (Sessions 1995 p59).
- d. "Beneath Muir's somewhat periodical tendency to depict particular landscapes as 'temples' and 'cathedrals' lay both a rather pantheistic view of nature as animated by a divine power (God being sometimes equated with beauty) and also a very ancient and widespread notion that certain natural areas were sacred places where human beings encounter the holy. This has been a potent and enduring strand in American environmentalism going back to Emerson and Thoreau" (Rodman 1995 p245).
- e. "We must find our way to seeing the mineral cycles, the water cycles, air cycles, nutrient cycles, as sacramental - and we must incorporate that insight into our own personal spiritual quest" (Snyder 1995 p71).

A common feature of most religions, whether based on Native American, Christian or Buddhist beliefs, is the idea of a creation myth. These explain the formation of the Earth in terms of an omniscient being or force, from the Christian God to the Blackfoot's Napi or Old Man. As we were created along with all the other animals this leads to the view, either explicit or implicit, that the Earth is the creator's

and we have no more right than anything else to live on it. Some Christians have proposed an Eleventh Commandment: "The Earth is the Lord's and the fullness thereof: thou shalt not despoil the Earth, nor destroy the life thereon" (Devall and Sessions p34). This is obviously a simplification as some people consider Man to have been created in God's image and granted dominion over the rest of nature, however this is not a view which has much support among deep ecologists. More typical are the sentiments expressed by Chief Seattle when he said "One thing we know for sure. The earth was not made for man, man was made for the earth" (Devall and Sessions 1985 p96).

Ecology can also lead to a belief in bioequality, for quite different reasons from religion. This can occur because of the emphasis ecology places on the interconnectedness of the various parts of the biosphere. Organisms are considered interdependent and reliant on each other for their survival and are therefore all equally important to the overall balance of the ecosystem they are part of. This is expressed in the phrase mentioned above "no one is saved until we are all saved". Although all the elements of an ecosystem may be important to it at any given time, it must be remembered that nature is in dynamic equilibrium rather than fixed and unchanging. Organisms and ecosystems evolve in response to their circumstances and what may in one period be a vital link in the food chain can become extinct. Indeed, the history of life on the Earth could be described as one of continual change punctuated by mass extinction events such as the late Permian extinction event when "96% of all the species in the oceans vanished" (Allen and Briggs 1989 p29). Put in this context the idea that all things are equal and "no one is saved until we are all saved" begins to seem like a curiously human and "unnatural" one. That is not to say that we should be unconcerned about the way that human activity has changed the extinction rate in recent years as it has been estimated that between 40 and 100 species become extinct every day (Orr 1992 p3). However this has to be compared to the overall extinction rate, which has varied greatly since life began, and the rate at which it changes. Most importantly, we need to be aware of nature as it is, not as we would like think it is.

Whether or not bioequality is correct in principle, it leads to a series of dilemmas when its practical implications are considered. For instance, can we ever intervene in nature for our own benefit at the expense of another organism? According to the principle of bioequality we cannot. However, if the organism is something harmful to human health, such as a virus or mosquito, its elimination may be justified, after all, the Ebola virus shows little respect for bioequality. It is not

clear whether or not we can eat animals or farm and grow crops. Presumably we should be herbivorous but other animals eat each other and we are all supposed to be equal. Growing crops is manipulating nature for our own ends and involves the selective production of certain species and the elimination of other animal and plant species in ways incompatible with bioequality. Paul Shepard, whose ideas have influenced the deep ecology movement, has called farming an "ecological disease" (Shepard 1973 p33) and called for return to the hunter-gatherer form of existence because:

"Just as 'goofies' poured out when the domestication of animals broke the balanced genetic systems of their wild progenitors, a thousand 'goofy' ideologies have been exploding since agriculture shattered the life of the hunting clan." (Shepard 1973 p103)

The reasoning behind this deterministic stance is not clear and the desirability or practicality of becoming hunter-gatherers open to question. Besides, the difference between collecting berries and growing them is not clear. Both affect the ecosystem to some extent, as do most of the actions of humans and other animals. Whether an action is justified is as much a matter of degree as of principle. The damage caused needs to be weighed against the resulting benefit. Instead of condemning all farming it makes more sense to distinguish between someone's organic vegetable plot and a large scale, intensively farmed monoculture. Both involve the manipulation of nature but in contrasting ways. In the same way, it is not clear why hunting should be considered acceptable and animal husbandry unacceptable. It is the way in which either is done which makes it right or wrong: it would seem unreasonable to suggest that whale hunting is intrinsically better than the humane rearing and slaughter of cattle.

4.1.4.2 The Need For Self-Criticism

The way in which the advance of science and technology has accelerated in the second half of the twentieth century has led to some complex ethical questions regarding the extent to which we should manipulate nature. The technology exists to alter genetically plants and animals for our benefit. Whether we should do this just because we can is a difficult issue and to a certain extent the debate on the ethics of

this lags behind the technology. It raises the questions of what we regard as natural and unnatural and how we perceive our relationship with the rest of nature. Our understanding of these issues needs to be improved through discussion rather than decided according to dogmatic principles such as bioequality. If deep ecology is to contribute to this it needs to become more self-critical and less dependent on the prescriptive ideas which underpin it. Intellectual conservatism appears frequently and is at odds with the statement that "The essence of deep ecology is to keep asking more searching questions about human life, society, and Nature as in the Western philosophical tradition of Socrates" (Devall and Sessions 1985 p65). Sessions (1995 p59) has said that:

"everyone using the deep questioning process, should attempt to make their overall worldview and ultimate commitments clear, at least to themselves, thus becoming aware of how they are related to specific actions and practical decisions in environmental and everyday life situations".

Despite this questioning process and the possibility of plurality at three of the levels of the Apron diagram, unity is still required on the platform principles. As Rothenberg (1995 p165) admitted: "there is, beneath all its qualifying statements, a certain absolutist character to this platform". The deep ecology movement needs to be self-critical and question its own norms, principles and underlying assumptions as well as those of the dominant worldview. The values and workings of the cultures it admires and is based on, for instance North American Indians and Buddhism, need to be examined carefully and in their entirety. Unfortunately, conservatism and dogma often impede or replace the deep questioning process as the following quotes from two of the deep ecology movement's most important influences show:

"'Old' means true, right, normal: in the flow of the universe. Old also because it is the basic way to live - Taoism, Hinduism, Buddhism are the younger brothers, slightly confused because passing through the temporary turbulence called civilization" (Snyder in Devall and Sessions 1985 p84).

"A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise" (Leopold 1949 p224-225).

Snyder has a conservative, deterministic, mystic view of nature. The first part of his quote betrays an overriding respect for tradition. The notion that there is one true way which is natural, "in the flow of the universe" and thus independent of humanity has authoritarian overtones and could be used to justify the imposition of one's beliefs on others. This need not necessarily happen but such statements hardly encourage debate. One must ask where these definitions of what is true, right and normal come from and what gives them authority. This could be interpreted as meaning, for example, that men hunt and women cook and raises some doubt as to the status of people whose beliefs and behaviour deviates from accepted social norms.

There is a certain irony in someone like Snyder believing in one true way after studying primal cultures. If anything, they tend to exhibit varying taboos and values depending on their circumstances: some cultures worship cows, others pigs; some cultures are monogamous, others polygamous; some are vegetarian, others meat-eating. Young (1990) gives an illuminating discussion of the way in which taboos and lifestyles arise in response to the survival needs of the culture. In a similar way the perpetual inter-tribal conflict and bloodshed of some of the North American Indian tribes, a feature often ignored by those who draw on them for inspiration, was necessitated by the harsh conditions in which they had to survive. Many of the often daring attacks were not carried out for material gain but to inure those involved against the hardships of their lives as Bancroft-Hunt and Forman (1981 p56) explain:

"If a person, and by extension a tribe, felt himself to be weak he easily succumbed to any force that he considered stronger, whether a human, environmental or metaphysical one".

Leopold's statement and his idea of a 'Land Ethic' from which it is taken are often quoted as inspiration by the deep ecology movement (see for example Drengson and Inoue 1995 p v; Rodman 1995 pp253-254; Devall and Sessions 1985 p86). His quote is similarly prescriptive to Snyder's in that it tells us what is right. However, instead of referring to tradition he tries to define which actions are right in terms of their effect on ecosystems: those which preserve the integrity, stability and beauty of the biotic community are right. The question is, right for whom? It is not clear who he is speaking for. And how are integrity, stability and beauty to be measured? These are not simple, concrete dimensions which can be unambiguously quantified but elusive concepts whose assessment is inevitably subjective. It is a pity

that the two sentences which precede Leopold's famous statement are rarely quoted as they shed some light on its meaning:

"The 'key log' which must be moved to release the evolutionary process for an ethic is simply this: quit thinking about decent land-use as solely an economic problem. Examine each question in terms of what is ethically and aesthetically right, as well as what is economically expedient. A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise." (Leopold 1949 p224-225).

In context, Leopold's statement seems like a reasonable call to involve ethical, aesthetic and economic criteria when making decisions about land use. This is in contrast to the overriding importance attached to economic criteria by industry or to platform principles by the deep ecology movement.

The speculative nature of some of the ideas of deep ecology makes criticism, in particular self-criticism, essential. For instance, Paul Shepard has claimed that "there is a natural psychogenetic development for humans. Some cultures foster this more than others" (Devall and Sessions 1985 p183). He believes that it is our failure to relate to nature that is the cause of vandalism and destructive behaviour and that "Men are born human. What they must learn is to be an animal" (Shepard 1973 p83). While noting that his ideas are tentative, Devall and Sessions avoid the obvious criticisms of Shepard - that his ideas are unfounded and his explanation of anti-social behaviour ignores the role that unemployment and alienation play - and by implication give his ideas some credibility.

4.1.4.3 Flawed View of Nature

4.1.4.3.a Humility

The preservation of wilderness is central to deep ecology because it is thought to have its own intrinsic value and right to self-realization. Wilderness is also prized because it is considered essential that humans experience it so that they are able to engage in the process of:

"1. developing a sense of place

2. redefining the heroic person from conquerer (sic) of the land to the person fully experiencing the natural place
 3. cultivating the virtues of modesty and humility and
 4. realizing how the mountains and rivers, fish and bears are continuing their own actualizing processes"
- (Devall and Sessions 1985 p.110).

Particular emphasis is placed on areas unchanged by humanity, or at least by the "destructive technology of modern society". This is because untouched nature is idealised: as Thoreau said "all good things are wild and free" (Devall and Sessions 1985 p109). We should "consider flowing with rather than forcing natural processes" (Devall and Sessions 1985 p145). Similarly, Rothenberg (1995 p162) suggests that we should model society on nature: "We should try to create and explain our organisations with structure and language based *in nature*". This is acceptable if the natural process is benign, but not all are and it is doubtful that we should flow with disease and decay.

Four laws of ecology have been devised:

1. Everything is connected to everything else;
 2. Everything must go somewhere;
 3. Nature knows best;
 4. There is no such thing as a free lunch;
- (Commoner in Devall and Sessions 1985 p88).

The reasoning behind the statement that nature knows best is not clear, but it may be because nature has been around so long or because it was created by divine intervention. "The third law of ecology holds that any major man-made change in a natural system is likely to be *detrimental* to that system" (Commoner in Devall and Sessions 1985 p88). He attempts to justify this assertion by comparing the random changes produced in a living thing through exposure to x-rays to

anthropogenic changes in nature: the mutations tend to be harmful therefore our interventions in nature will tend to be harmful. This bizarre analogy demonstrates the weakness of his argument as it can only be maintained by making inappropriate comparisons. Conscious human intervention is equated with radiation-induced random mutations and nature with one living organism.

"We need to take seriously the ecologist's principle that nature is more complex than we know now and more complex than we possibly can know" (Devall and Sessions 1985 p145). While we may not understand nature now, it is fatalistic to presume that we can never understand it. The reasons for believing that nature is best are not clear and it seems unreasonable that we should accept that only things that are wild are good, and that human interaction with nature must result in it being degraded in some way. This only follows if one takes a selective view of nature and a negative view of human potential. The result of this is that it leads to the belief that we should be passive and humble in the face of a perfect nature which reflects the glory of its creator, i.e. "I think that it is our privilege and felicity to love God for his beauty, without claiming or expecting love from him. We are not important to him, but he to us" (Jeffers in Devall and Sessions 1985 p102). It has been argued that as we increase our control of the environment we lessen our quality of life by lessening our "joyful wonderment and sense of place" (Devall and Sessions 1985 p114). This is a matter of opinion as one person's joy and wonderment could be another's ignorance, superstition and helplessness.

Whether or not we should exhibit humility and passivity in the face of nature depends on whether or not one believes that we can have a positive influence on nature. There seems to be an underlying assumption amongst the deep ecology movement that nature is perfect and therefore cannot be improved upon. As Rothenberg (1995 p162) puts it: "I would say that complexity is the single word for the virtue and perfection of nature that we are slowly discovering more about". Nature is seen as perfect and possessing virtue which implies not neutrality but a sense of goodness or moral excellence. However, if one does not think that nature is perfect and believes that humanity can have a positive effect then it follows that we should seek to exert some influence on nature for our, and its, benefit. It does not make sense that we should be constrained by some of the more arbitrary processes when we possess imaginations and senses of what is right and wrong. We have created new worlds and alternative environments through the development of music, literature, television and computers. Although the potential of these to elevate the

spirit is often converted into potential to make money, they demonstrate the capability we have for creatively transforming our environment.

Deep ecologists have criticised the notion that we can act as wise stewards of the environment because the idea incorporates the premise of instrumental rationality and separates us from wilderness: "'we have emerged from the first world of nature' the wise steward seems to say 'and can never return to our place crackling with spirit'" (Devall and Sessions 1985 p126). Rothenberg's fourth platform principle states that "We feel estranged from the Earth because we have imposed complication upon it". Everything that modern society has done, good and bad, is lumped together and condemned as 'complication' or worse by the deep ecology movement. Instead of confronting the undeniably complicated state of the modern world, the deep questioning process appears to end in the following logic: modern society has damaged the environment, therefore modern society is inferior to primitive society, hence we need to return, in Snyder's words, to:

"The wisdom and skill of those who studied the universe firsthand, by direct knowledge and experience, for millennia, both inside and outside themselves, in what we might call the Old Ways" (Snyder 1995 p73).

4.1.4.3b Mysticism and Intuition

Some aspects of Eastern thought have influenced the deep ecology idea of humility in the face of nature, e.g. Taoism and Buddhism. The insight achieved through contemplation and meditation is more valued than rational understanding. In fact the two ultimate norms, self-realization and biocentric equality, are:

"...not derivable from other principles or intuitions. They are arrived at by the deep questioning process and reveal the importance of moving to the philosophical and religious level of wisdom. They cannot be validated, of course, by the methodology of modern science..." (Devall and Sessions 1985 p66).

Taoism indicates that we need to forget ourselves and follow the flow of energy. Naess elevates intuition over rationality:

"This view (ecosophy) is intuitive, as are all important views, in the sense that it can't be proven...it shows a lack of education to try to prove everything, because you have to have a starting point" (Devall and Sessions 1985 p75).

Heidegger also stressed the importance of contemplation: "We never come to thoughts. They come to us. That is the proper hour of discourse" (Devall and Sessions 1985 p99).

While it is true that only certain things can be proven scientifically this does not mean that all important views are intuitive and science is worthless. Naess argues that it is not necessary to know the facts concerning an issue, for instance nuclear power, in order to act on it. However, it is difficult to see how an informed judgement can be made on an issue such as this without some factual evidence. Relying solely on subjective information leaves one open to prejudice and manipulation. For instance a lot of people may feel that stricter sentencing of criminals leads to a reduction in crime, despite evidence that it is not the harshness of the punishment but the likelihood of being caught which influences crime rates. This intuition can then be exploited by the Home Secretary for whom increasing sentences is an easier option than increasing the rate at which criminals are apprehended.

Leopold (1949 p205) has claimed that "the biotic mechanism is so complex that its workings may never be fully understood". The elevation of insight and intuition over rationality goes hand in hand with the re-enchantment of nature and the acceptance that understanding it may be beyond us, or at least beyond rational analysis. Myths and rituals are considered appropriate ways of understanding and communicating with an animist nature:

"Through the ancient enchanting use of the poetic voice, Snyder becomes the spokesman for Mother Gaia and all of her living creatures, calling upon us to return to sanity and "right livelihood" by readopting the old ways" (Devall and Sessions 1985 p84).

Similarly, LaChapelle emphasises the importance of communicating with the Earth through ritual and thinks that we need to do "Earth bonding" as primitive peoples do (LaChapelle in Devall and Sessions 1985 p95). Fleming and Lacy (1995) describe one such ritual, the 'Council of All Beings', before which participants are encouraged to:

"Let another life form occur to you, one for whom you will speak at this afternoon's Council of All Beings. No need to try to make it happen. Just relax and let yourself be chosen by the life-form that wishes to speak through you. It could be a form of plant or animal life, or an ecological feature like a piece of land or a body of water" (Fleming and Lacy 1995 p237).

During the ritual the participants assume the identity of a bird or flower or mountain and let it 'speak through them' and communicate with the group, for example:

"I come to this Council as weeds. Weeds, a name humans give to plants they do not use. I am vigorous, strong. I love to thrust and push and seed - even through concrete. Pushing through paving I bring moisture and life. I heal the burned and wounded earth. Yet I am doused with poison now and crushed, as are creatures who live in and through me" (Fleming and Lacy 1995 p230).

By using the first person and embellishing their chosen feature with human characteristics, the ritual enables the participants to identify with the features. Or more accurately, to identify with an *interpretation* of the feature. Mountains and plants do not, as far as we know, experience pain or have emotions. However, this conceit is essential if the ritual is to have any meaning. In order to communicate with the Earth one has to believe that it has a form of consciousness, for instance Earth spirits, as the North American Indians did. Without this the rituals are meaningless. We are required to believe in the sort of spirits which were created by the Indians as a way of understanding, justifying and controlling the forces of nature they were at the mercy of. However, we now know that the sun rises because the Earth has rotated, not because the sun god is appeased by our sacrifices. We can never return to our place "crackling with spirit" as some would wish.

Myth is said to be "encompassing, intuitive, comforting, involving. The (scientific) model is limited, cold, manipulative, distant from reality" (Devall and Sessions 1985 p151). This would seem to be a somewhat loaded summary of the attributes of myths and models. To criticise models as "distant from reality" while praising myths as "comforting" is odd - almost an argument for believing in the tooth fairy. While a scientific understanding of a natural system may well be only a partial understanding, it can provide information which is vital if we are going to subject

proposals which could alter an ecosystem to the sort of intensive questioning deep ecologists and others seek (Devall and Sessions 1985 p151).

One of the more extreme supporters of the re-enchantment of nature is Eiseley (Devall and Sessions 1985 p164). He thinks that it is terrible that we have alienated ourselves from the "spirits in every tree or running brook" and made our lives "unreal and sterile". In order to repair the damage this has caused he suggests that we "pursue the paradox of return" but observes that "man does not wish to retrace his steps down to the margins of the reeds and peer within, lest by some magic he be permanently recaptured". According to Eiseley man must "reenter and preserve, for his own safety, the old first world from which he originally emerged".

4.1.4.4 Atavism

The idea of returning to a past way of life when our relationship with nature was harmonious is of great importance to the deep ecology movement. Whether or not this is possible or desirable has been discussed in section 3. The desire to return is frequently expressed and primitive societies, particularly those of the North American Indians, are used as examples and models of ways in which we could live with respect and reverence for nature, in an interconnected web of life. Devall and Sessions urge that we develop "a philosophy that draws from the Earth wisdom of Native Americans and other primal cultures" and observe that "In 1972, Arne Naess began discussing such a philosophy which he called *deep ecology*." (Devall and Sessions 1985 p61).

Diamond described primitive societies as being in dynamic equilibrium in contrast to modern civilisation which is in disequilibrium due to its technology, ideology or social organisation being out of joint with nature. The sense of progress and movement in civilisation makes primitive society seem to be in equilibrium and desirable: "The longing for a primitive mode of existence is no mere fantasy or sentimental whim, it is consonant with fundamental human needs" (Diamond in Devall and Sessions 1985 p21). While there may be some truth in the observation that we long for primitive societies because they are perceived as being in equilibrium, it is an over-simplification to equate primitive societies with equilibrium. There are many examples of supposedly primitive societies drastically altering their environment (see Young 1990 for examples). What appears to be equilibrium may be a temporary stasis caused by certain barriers, whether physical, mental or social,

being insurmountable. In any case, equilibrium is a dynamic process governed by the population change related to competition, predation and evolution. Therefore the impact of any species upon its environment and upon other species could be regarded as being in equilibrium at any moment in time.

The atavism that this reinterpretation of past cultures encourages is demonstrated by Snyder who has "provided a well rounded vision for a new tribe of 'white indians' to reinhabit the land based on the 'old ways'" (Devall and Sessions 1985 p84). According to Snyder we must "Master the archaic and the primitive as models of basic nature-related cultures" and transform into "a new ecologically sensitive harmony-oriented wild-minded scientific/spiritual culture" (Devall and Sessions 1985 p172). Exactly what this entails is not obvious but it clearly implies a reversion to past ways of life. He calls this process "Re-inhabitation" and describes it thus:

"Re-inhabitory refers to the tiny number of persons who come out of the industrial societies (having collected or squandered the fruits of 8000 years of civilization) and then start to turn back to land, to place." (Snyder 1995 p72)

Shepard (1973 p36) goes further and suggests that "In other ways, we remain creatures of the older time. Fundamentally we are people of the Pleistocene, and in this lies our hope for tomorrow." Because of this he suggests that we should become hunter-gatherers again and live in cities around the edges of continents, leaving the interiors as wilderness for hunting in. Fleming and Macy (1995) also suggest that the past has left some sort of genetic imprint which we should attempt to rediscover through ritual processes:

"As we explore different group processes for reconnecting with nature, we discover that it is not hard to find ones which work and feel authentic to us. This is not surprising when we consider the thousands of generations of humans who have participated in such processes, and how few the generations since we temporarily forgot them" (Fleming and Macy 1995 p226).

The overriding concern seems to be one of re-establishing a balance with the rest of nature by changing the way in which we interact with it. As Devall and Sessions (1985 p127) point out:

"While primal peoples lived in sustainable communities for tens of thousands of years without impairing the viability of ecosystems, modern technocratic-industrial society threatens every ecosystem on Earth and may even be threatening to drastically change the pattern of weather in the biosphere as a whole."

While it is bad that modern civilisation is damaging the Earth it does not follow from this that primitive societies were good because they did not. If living in unchanging harmonious relationship with our surroundings is the only criteria by which worth is measured then worms, as a species, come near the top of the league. This does not mean that we should model ourselves on worms. Besides, it is not true that all primitive cultures lived in harmony, and those that did often had little choice in the matter.

It is not always obvious whether this atavism is the result of disillusionment with modernity or is the cause of it. Both are possible and the link often demonstrated in deep ecology:

"Many primal peoples were excellent observers of natural processes, knowing the weather, patterns of changes in the seasons, habitats of wildlife and so forth. Science and technology can be an aid but they are no substitute for this kind of direct land wisdom" (Devall and Sessions 1985 p145).

It is not clear why science and technology cannot be a substitute for land wisdom. An over-developed sense of respect for the past leads to conjecture such as this being presented as fact, thereby stifling debate. The fact that "The basic philosophy of the Ecotopians tends to be patterned after the American Indian" (Devall and Sessions 1985 p163) means that we need to examine critically what the Indian culture involved, not accept or revere it.

The desire to return seems to stem, at least in part, from a mistrust of progress. Technology is singled out as one of the main reasons that our present development is unsustainable as the following quotes illustrate: "Technological society not only alienates humans from the rest of Nature but also alienates humans from themselves and from each other" (Devall and Sessions 1985 p48) and "Based upon its radical critique of this worldview, the deep ecological perspective leads to an uncompromising stand against the main thrust of modern, technocratic culture" (Devall and Sessions 1985 p48). It is interesting that this "radical critique" focuses on technology and largely ignores the role that, for instance, economic systems or

religions have played. Technology is singled out as the defining problematic feature of our culture, however one needs to consider whether technology and a technocratic society are inherently wrong, or whether it is just the technology that capitalism or instrumental rationality produces that is wrong. Technology is criticised without being clearly identified. In one sense technology is nothing more than the manipulation of your surroundings to your benefit, something that all primal cultures and indeed many other species engage in. Obviously, Devall and Sessions have a more specific idea of the technology that is leading us to the brink. It is the high-technology of scientists in white coats and lab animals in cages. We need to consider whether this is really the cause of what is going wrong or the symptom of another malaise. Brower recalls that he was converted to deep ecology when he realised expert scientists' accounts at hearings on the siting of a nuclear reactor were not neutral but deceitful and manipulative (Devall and Sessions 1985 p107). However, this is not an argument against technology but against deceit and corruption. We need to look at the context in which science and technology operate to understand the reasons for their frequent failings. This is important because while technology is affected by its context, it also affects its context.

Finally, deep ecologists often have unfavourable views of the impact of technology because they have selective views of it. There is a tendency to accept and then forget about some of its positive aspects, for instance the printing press, medicine and sanitation, and condemn the bad aspects without analysing the way in which all these things developed and the overall effect they have on our modern lives. We can only guess what would have happened if Gutenberg had decided to go and live like an Indian before inventing the printing press. It is unlikely that anyone would have come across the ideas of Naess or Devall and Sessions.

On the first page of "A Sand County Almanac", Leopold himself recognises the role that science and technology have played in emancipating humanity and the complexity of our relationship with nature:

"Like winds and sunsets, wild things were taken for granted until progress began to do away with them. Now we face the question of whether a still higher 'standard of living' is worth its cost in things natural, wild and free. For us of the minority, the opportunity to see geese is more important than television, and the chance to find a pasque-flower is a right as inalienable as free speech.

These wild things, I admit, had little human value until mechanization assured us of a good breakfast, and until science disclosed the drama of where they come

from and how they live. The whole conflict boils down to a question of degree. We of the minority see a law of diminishing returns in progress; our opponents do not" (Leopold 1949 p vii).

Unlike many in the deep ecology movement whom he has inspired, Leopold does not write off all the changes that have taken place since the industrial revolution as a matter of principle. In fact he points out that there have been some benefits in terms of the way we think of nature and argues that its role is a question of degree not principle. If, as Leopold says, mechanisation and science have given nature value then the deep ecology movement's rejection of science and mechanisation could have the opposite outcome to the one they seek.

While periods of change such as the Enlightenment or the Industrial Revolution are often implicated in the environmental problems we have today, one needs to look at the entire range of effects they have had, good and bad, to be able to understand better where we are, where we have been and where we could go.

4.1.4.5 Misanthropy

There are times when deep ecology seems to shift from being ecocentric to being actively misanthropic, obviously bioequality is a difficult balancing act to maintain. This is a recurrent theme and is demonstrated in some of Naess and Session's Platform Principles. Principle no. 3 is that "Humans have no right to reduce this richness and diversity (of life) except to satisfy vital needs". Who defines what is vital and does this mean that all we can justifiably do is survive from day to day like other animals? Principle no.4 states that "The flourishing of human life and cultures is compatible with a substantial decrease of the human population. The flourishing of non-human life may require such a decrease". This misses the point that although the flourishing of non-human life may benefit from a decrease, the flourishing of humanity requires changes such as less exploitation, fairer distribution of resources, greater democracy, better education. Most resource depletion and environmental damage is done by a rich minority in Europe, Japan and the USA. To call for a population reduction is simplistic and morally questionable. Principle no. 5 is "Present human interference with the non-human world is excessive and the situation is rapidly worsening". This is not so much a principle as a judgement using subjective terms, i.e. "excessive".

This subtle degradation of humanity at the core of deep ecology pales in comparison with the vehemence of Muir and Snyder's attacks: "...if a war of races should occur between the wild beasts and Lord Man, I would be tempted to sympathise with the bears..." (Muir in Devall and Sessions 1985 p104) and "...mankind has become a locust-like blight on the planet that will leave a bare cupboard for its own children..." (Snyder in Devall and Sessions 1985 p171). The fact that Muir can consider such a contrived scenario in order to portray our effect on nature in the worst light illustrates his hostility. He also seemed amused at the idea of alligators eating people:

"Honourable representatives of the great saurians of an older creation, may you long enjoy your lilies and rushes, and be blessed now and then with mouthful of terror-stricken man by way of dainty" (Muir in Wall 1994 p66).

Snyder likens us to a plague of locusts: unthinking, all equally voracious, driven only by our desire to consume and be completely destructive. His metaphor ignores the reality of day to day life in which many people struggle to make ends meet and have their lives manipulated by others in positions of power. The emotional appeal of his words is bought at the expense of truth. Watts also views our actions and achievements as little more than evolutionary means of adaptation and survival like giraffes' necks (Devall and Sessions 1985 p195). The fact that art and science are the product of consciousness rather than random mutations is deemed irrelevant. It would seem that all animals are equal - except perhaps locusts and humans.

4.1.5 Summary

Although presented as a radical philosophical response to the environmental crisis, deep ecology is fundamentally conservative in its analysis and proposed solutions. This is the result, at least in part, of viewing the crisis as one of Western cultural development since the Enlightenment. If problems are thought to be caused by modernity and the rise of technological society then it follows that the solutions are to be found outside technology and rationality. It is hardly surprising that primal, pre-scientific, cultures should be seen as models for the development of a harmonious relationship with nature, and non-rational ways of thinking accorded more importance. This has encouraged people to undertake the impossible and undesirable

journey back to a mythical past instead of trying to understand the present and create a better future.

The relationship between the mythical worldview of the deep ecology movement and the rational, post-enlightenment worldview it opposes can be viewed as a dialectic between Faith and Enlightenment in which "both Faith and Enlightenment are defined and redefined by adversarial reference to each other" (Schoolman in Bennett 1994 p xii). This may mean that the deep ecology movement's worldview is vital to the rationalist worldview as "Neither Faith nor Enlightenment, Bennett shows unequivocally, can achieve coherence without the assistance of the other" (Schoolman in Bennett 1994 p xii). In this way, the deep ecology movement may achieve its aim of "getting as many people as possible to think about themselves and nature in a new way" (Rothenberg 1995 p157), regardless of whether or not one agrees with their analysis.

4.1.6 Educational Implications of the Deep Ecology Perspective

- Education is seen as a way of inculcating the non-negotiable norms of deep ecology: bioequality and self-realisation.
- Nature knows best so humility and passivity in the face of nature are encouraged.
- Intuition, contemplation and sensory experience of wilderness are favoured over rational knowledge.
- We should develop a sense of place.
- We should re-educate in the old ways and knowledge of harmonious primal people.

4.1.7 Educational Implications of the Critique of Deep Ecology

- We need to encourage critical thinking and debate of (ethical) issues and past, present and future cultures.

- We need to understand the historical development of civilisation, technology, modernity, political and economic systems.
- We need to focus on how we can creatively transform our physical, social and cultural environments, not conserve them, to avoid being trapped in the past.
- We need to encourage faith in our abilities, not passivity and humility.
- We need intuitive and rational ways of understanding.

The next section goes on to examine how some of the principles of the deep ecology movement have been interpreted in one area of environmental education, earth education.

4.2 Earth education

4.2.1 Introduction

Earth education is a response to the environmental crisis which has as its primary aim the reduction of humanity's impact on nature by changing individuals' behaviour. It has its roots in the Acclimatization program (Van Matre 1972; 1974) which grew out of work Van Matre did in boys' camps in the sixties and since then has developed through his work and the Institution of Earth Education which he founded (Van Matre 1979; Van Matre and Johnson 1987; Van Matre 1990). Although predominantly American, the Institute of Earth Education has branches in Britain, France, Australia, New Zealand and Canada and claims to be "the world's largest group of educators in the environmental field" (Van Matre 1990 pv).

4.2.2 The aims of earth education

The original Acclimatization program was designed to be an alternative to the perceived inadequacies of the traditional collecting and labelling type of nature study

as it was thought that "a sense of the inter-relatedness of life, a respect for the wholeness of the environment, cannot be conveyed piecemeal by a dissection of its parts" (Van Matre 1972 p9). Instead of neutral, scientific understanding of ecology, emphasis was put on conveying "appreciation and feelings for the natural world" and a "deep and abiding love for it" (Van Matre 1972 p9). Sensory experiences were used to help the individual "come to 'feel' his environment. To draw it close to him. To love it. To understand it - not for its labels and fables and fears - but as an intrinsic part of himself" (Van Matre 1972 p11). In *Acclimatizing*, Van Matre (1974) restated his aim as developing education which makes people feel part of nature:

"Let's just say that I am interested in education for living as part of the natural world (that natural world which exists in spite of man's present aberrations), and that I am engaged in helping young people learn about themselves, not as isolated entities, but each one as a coalescence in the sun's web of life" (Van Matre 1974 p9).

In *Sunship Earth: An Earth Education Program Getting to Know Your Place in Space* (Van Matre 1979), the subtitle gives a clear indication of the program's purpose which was to "convey something about their place in the universe" and conveying "a feeling for life's wondrous mysteries" (Van Matre 1979 pxvi). Central to this was the analogy of the Earth as a craft on which "we are not the pilots", but rather "passengers who have by chance become crew members as well" (Van Matre 1979 p3).

Both *Sunship Earth* and the follow up, *Earthkeepers* (Van Matre and Johnson 1984), defined earth education as "the process of helping people to live more harmoniously and joyously with the natural world" (back page of both). Van Matre and Johnson (1984 p6) argue that:

"In order to live more in harmony with other life on our planet, people first need a basic understanding of its ecological systems and communities. Next, they must feel a deep and abiding emotional attachment to all life. And finally, they must begin processing their new understandings and feelings by making changes in their own lifestyles".

The principles which underpin earth education were outlined in terms of its whys, whats and ways (Van Matre 1990 pp87 - 88):

THE "WHYS"

PRESERVING

We believe that the earth as we know it is endangered by its human passengers.

NURTURING

We believe people who have broader understandings and deeper feelings for the planet as a vessel of life are wiser and healthier and happier.

TRAINING

We believe earth advocates are needed to serve as environmental teachers and models, and to champion the existence of earth's nonhuman passengers.

THE WHATS

UNDERSTANDING

We believe in developing in people a basic comprehension of the major ecological systems and communities of the planet.

FEELING

We believe in instilling in people deep and abiding emotional attachments to the earth and its life.

PROCESSING

We believe in helping people change the way they live on the earth.

THE WAYS

STRUCTURING

We believe in building complete programs with adventuresome, magical learning experiences that focus on specific outcomes.

IMMERSING

We believe in including lots of rich, firsthand contact with the natural world.

RELATING

We believe in providing individuals with time to be alone in natural settings where they can reflect upon all life.

4.2.3 Criticisms of earth education

The criticisms of earth education outlined below are based on five earth education texts (Van Matre 1972; Van Matre 1974; Van Matre 1979; Van Matre and Johnson 1987; Van Matre 1990), a selection of papers on earth education, attendance at one of Van Matre's lectures and discussions with earth education practitioners . Although some reference is made to the Acclimatization program which pre-dated earth education, this is only done to illustrate points which have been consistent throughout the development of earth education and thus remain relevant. The order in which the following points are made is not meant to imply anything about their importance, however there is a loose progression in the discussion from matters concerning the organisation and practice of earth education to its theoretical underpinnings.

4.2.3.1 Intolerance

Earth education is reluctant to accept that there are legitimate forms of environmental education whose aims differ from its own. While it is one thing to disagree with and criticise other initiatives (indeed it could be argued that this is vital for the continued development of the field as a whole) it is quite different to doubt their right to exist and dismiss them as being "environmental miseducation" as Van Matre has done (Van Matre 1990 pvii). The outcome of this has been that earth education has set itself apart from environmental education, "we no longer believe we are environmental education; we think we are an alternative to it" (Van Matre 1990 pv), and bemoaned everything else as being in a "sickening state" (Van Matre 1990 pvi) and "little more than so much mush" (Van Matre 1990 pv).

It would seem that the reason earth education is so keen to disassociate itself from the "ineffective, moribund environmental education movement" (Van Matre 1990 p83) is that it considers environmental education to have "gone astray" (Van Matre 1990 p1) because of its failure to adopt and implement the aims of earth education:

"Poke your head into almost any school today and see how much real environmental education you find going on there. I don't mean a couple of supplemental activities (inside or out) led by one or two valiant teachers, or a nature bulletin board in the hallway. I mean *focused, sequential instructional programs* as a regular, integral part of the whole curriculum" (Van Matre 1990 p4) and

"...if a few teachers do include an environmental lesson or unit, chances are good that they still do not systematically address what environmental education set out in the beginning to accomplish i.e., how life functions ecologically, what that means for people in their own lives, and what those people are going to have to do in order to lessen their impact upon the earth" (Van Matre 1990 p5).

In other words, environmental education is only considered legitimate and "real" if it stays true to the aims and origins it shares with earth education. Randle (1992 p26) has noted that "it (earth education) has been seen as extremist in its sweeping condemnation of virtually all environmental education as practised outside the brotherhood." This criticism was refuted by Rhymer (1992 p29):

“Nowhere did I get the impression that the Institute for Earth Education claims to be ‘the only ones who are doing it right’. Steve Van Matre has been at pains, whenever I have heard him speak, to point out that Earth Education does not profess to be the only way of helping children to learn to care for the earth”.

However, when Van Matre and Johnson (1987 p5) say that "we don't think our way is the only way to get there" it is qualified with "but we do think knowing where we're going and paying attention to how people learn is a big advantage". The implication is that the aims or destination of environmental education should be non-negotiable and research should be a matter of developing more efficient techniques for getting there.

4.2.3.2 Simplistic view of the environmental crisis

The idea that there is one real environmental education presupposes that there is a single solution to the environmental problems which the world faces. This is a simplistic view which is discussed in sections 3.3 and 6.2. If a single educational initiative is to solve global problems then it needs to have relevance to a wide range of people all over the world. Earth education assumes that by conveying a basic understanding of ecological systems and an emotional attachment to nature that people will change their lifestyles and the planet will be saved. While it is possible that some may change their lifestyles, it is unrealistic to expect that people who are struggling to make ends meet would be able to make living more lightly their prime concern, even if they wished to. When one realises that much of the world's population live in poverty and even 14.5 % of the population of America (Danziger et al 1994 p1) are poor, the proselytising of the Institute of Earth Education starts to seem misplaced.

Earth education is based on the assumption that the environmental crisis is the result of individuals' lack of ecological understanding and lack of emotional attachment to nature which results in environmentally damaging behaviour. The incorporation of social, economic or political dimensions into environmental education is considered a distraction:

"Those folks, however well-intentioned, went about creating collections of activities that focused primarily on getting along with each other instead of getting along with the earth.

Please don't misunderstand. Helping people become more humane, caring, etc., and helping them get in touch with the space they live, are praiseworthy goals, but lumping them together with the goals of environmental education and serving up the results as the same thing just created confusion for all concerned" (Van Matre 1990 p11).

"Another concern we have with much of the issues-oriented environmental education is that it tends to externalize the problems. Environmental problems are viewed as the result of something or someone out there, rather than within us as individuals. It encourages the perspective that if only *they* would do this, or if they hadn't done that, then everything would be fine. But that's not true; we are the *they* we complain about later" (Van Matre 1990 p22).

Environmental education is thus limited to the relationship between the individual and the natural world. However, given that the way in which people relate to the natural world is mediated and profoundly influenced by the way they relate to each other and factors such as social organisation, economic structures and legislative frameworks it is difficult to see how a study of "getting along with each other" can be avoided by those wishing to explore the complex relationship between humanity and nature.

4.2.3.3 Earth education is manipulative

Van Matre has expressed strong views about humanity's impact on the Earth:

"Make no mistake, there is a malaise upon the land. The film of life glazing planet earth has given birth to a parasitic species of intense destructive capabilities" (Van Matre 1974 p10) and more recently:

"The human species of life has become so pervasive and grown so powerful and arrogant that it presently threatens much of the other life with which it shares its garden-like vessel" (Van Matre 1990 p90).

Considering earth education's rejection of anything other than the individual as the focus for environmental education and the above statements, it should come as no surprise that earth education is predominantly behaviouristic/manipulative in its approach as the following quotes illustrate:

a. "...we are drawing upon both Skinnerian and Brunerian learning theory. We are concerned with both immediate terminal behaviors and long-range perception" (Van Matre 1979 p26)

b. "All programs should require their participants to begin making personal improvements in their own environmental habits" (Van Matre and Johnson 1987 p viii)

c. "...most of the environmental education activities that have been developed are merely sprinkled, like so much spice, over a melange of other educational pursuits. They seldom lead one into developing a complete, integrated educational program with real behavioral change in mind. To put it bluntly, the point of environmental education should be change. If there is no change, there is no point."
(Van Matre and Johnson 1987 p x)

d. "We believe in building complete programs with adventuresome, magical learning experiences that focus on specific outcomes" (Van Matre and Johnson 1987 p7)

e. "An Earth Education program:

- Proceeds in an organized way to a definite outcome that the learners can identify beforehand, and rewards them when they reach it.
- Uses what we know about good learning by building focused, sequential, cumulative experiences that start where the learners are mentally and end with lots of reinforcement for their new understandings.
- Transfers the learning by completing the action back at school and home in specific lifestyle tasks designed for behavioural change."
(Van Matre and Johnson 1987 pp8)

Despite this, there has been some disagreement over whether or not earth education is in fact behaviouristic or overly manipulative. Robottom and Hart (1993 p22-27) used earth education as their prime example of interpretivist environmental education, describing its educational purpose as “liberal progressive” (Robottom and Hart 1993 p26) and its goals as “externally derived but often negotiated” (Robottom and Hart 1993 p26). Gough (1987 p59) notes that:

“...many Earth Education techniques are rationalised as though they exemplified the principles of Skinnerian behaviourism. But I would argue that the effectiveness of Earth Education is better explained by its similarities with, say, de Bono’s courses in generative thinking.”

Rhymer (1992 p29) is dismissive of the suggestion that earth education is too manipulative:

“The charge of indoctrination is normally levelled by those who produce ineffective learning materials which fail to achieve anything of significance. Having ‘specific learning outcomes in mind’ is surely just another way of saying that we should clarify our aims and objectives first, then design the activities in order to fulfil these.”

However, clarifying one's aims and objectives does not necessarily need to involve expressing them in terms of specific behavioural change. These could only be considered equivalent if one believes that any outcome other than pre-determined changes in behaviour is insignificant and indicative of ‘ineffective learning materials’. Rhymer (1992 p30) also claims that:

“The overall aim of the Earth Education programmes which I use is to encourage youngsters to identify their level of commitment to the environment and to help them make an informed choice as to how they might wish to alter their own impact on the planet and its systems.”

He presents earth education as an essentially neutral process whose activities are:

“...no more propaganda than a maths teacher designing an activity to teach that two plus two equals four. The concept teaching activities of earth education teach what

are undisputed scientific facts. The activities to develop perceptions of and feelings for the natural environment are intended to achieve what many teachers attempt through art, music, literature or outdoor activities" (Rhymer 1992 p30).

This argument, and to an lesser extent Gough's as well, is beside the point as it is not the objectives of individual activities or techniques which are problematic. Rather it is the fact that they are organised into programmes which have the stated aim of inculcating earth education's values.

It is misleading to suggest that earth education programmes are simply designed to help people make informed choices when they are, in fact, designed with predetermined behavioural changes in mind. For example, in Earthkeepers one of the informed choices which the children taking part make consists of selecting four of ten tasks designed by Van Matre and Johnson which have to be carried out after the program. In order to complete the Earthkeepers program, parents check that their children are carrying out the tasks as they are set out in Earthkeepers (Van Matre and Johnson 1987 pp101-103).

Whether or not earth education is behaviouristic or not, there is certainly a focus on environmental education as a one-way transfer of information:

"We believe a genuine learning program is a carefully-crafted, focused series of sequential cumulative learning experiences with specific outcomes in mind. I think those are characteristics of most learning programs and it doesn't matter whether it is a program for learning how to play tennis, how to speak another language, how to do mathematical division...or how to live more lightly on the earth"
(Van Matre 1990 p16).

In comparing environmental education to learning to play tennis, speak another language or do mathematical division Van Matre reduces it to a set of skills, facts or rules to be memorised and mastered. This exemplifies his view of environmental education as an activity in which there is no room for dialogue or debate. In doing so he misses a crucial difference between environmental education and the other learning programs with which it is compared: while no-one could argue that four divided by two equals two or "Je suis" means "I am", there is ample opportunity for interpretation and disagreement when it comes to humanity's relationship with nature.

This is perhaps the central problem with earth education - it fails to recognise that there may be alternatives to the earth education worldview and uses this to justify the imposition of its values. Van Matre puts it in the following terms:

"And please spare us the sophistry contained in the line, "We teach students how to think, not what to think." Or even worse, the argument that it is unethical for us to impose our values upon them. We make them go to school don't we? We don't ask them if we are imposing on their values when we teach them how to write do we?...In the end, I want them to live more lightly on the earth. Influencing their values is exactly what I have in mind" (Van Matre 1990 p14).

Duckworth argues that because no education is value free - "not only is the selection of material for study a value-laden activity, but so is even defining that which we consider to be knowledge to select from" (Duckworth 1989 p125) - earth education's imposition of its values is justified. However, although it is true that education is inevitably value-laden, this does not mean that education which seeks to encourage debate regarding values is the same as education which simply seeks to impose its own. While transmitting society's norms and values is one function of education - albeit one which has been criticised, see for example Illich (1971) - it is misleading of Van Matre to equate universally agreed values, e.g. that it is good to be able to read and write, with his particular values regarding how we should relate to nature. However, Van Matre makes it clear that he considers his aims to be at least as important as literacy:

"After all, is learning to read really more important than learning about our place in space? Is learning how to write more basic than learning how to live within the ecological limits of the earth?" (Van Matre 1990 p19).

Besides the programs of activities with specific learning outcomes, solitude and reflection also play a part in earth education: "We believe in providing individuals with time to be alone in natural settings where they can reflect upon all life" (Van Matre 1990 p238). The purpose of this is to:

"... help our learners relate both *with* and *to* the other life on the earth. We want them to relate *with* it personally on an affective level, relate *to* it individually on a cognitive level, then examine their own lives in light of both experiences".

This approach is justified by comparing the brain to a cluttered warehouse (Van Matre 1990 pp71-72) which gets tidied up and sorted out during the solitude and reflection. In common with the rest of the earth education program, there is no sense of education as an activity involving social interaction. The participants receive information and activities designed to change their feelings towards nature then they go away on their own and rearrange their thoughts and behaviour in response to this. This is underpinned by Van Matre's belief that "to learn you have to see and hear and do, but not talk" (Van Matre 1990 p xi).

The one-way nature of earth education is encapsulated in the imagery of the path which Van Matre uses to describe earth education:

"...please consider joining us on the path of earth education" (Van Matre 1990 p vii)

"Before you begin your journey in discovering the earth education path..."
(Van Matre 1990 p ix)

"Any path will do as long as you don't know where you are going"
(Van Matre 1990 p4).

Earth education in particular and environmental education in general are characterised as consisting of a series of paths, only one of which is correct. Given the character of earth education, the image of the path as something pre-determined which one follows, or is led down, is a fitting one.

4.2.3.4 Does earth education achieve its aims?

Irrespective of what one thinks of the ethics of earth education's approach to education, or doubts regarding whether it could solve any global problems, there is the practical question of whether or not it achieves its aims. For an approach to education which places great emphasis on specific learning outcomes, earth education has been slow to evaluate its effectiveness in achieving these. Its efficacy is assumed and its importance is based on speculation rather than empirical evidence:

“We are convinced that it is unnatural and unhealthy that many people in our societies today have become so completely removed from the actual source of the energy and materials that support them...Perhaps we cannot statistically prove that people who are more connected to the earth are wiser and healthier and happier, but common sense tells us that it must be so” (Van Matre 1990 p95)

“...without lots of firsthand experience with the natural world people grow up just as deprived as children without good nutrition” (Van Matre 1990 p96)

“Don’t be misled by the “Where’s your research?” question. Not surprisingly, given the costs involved, long-term evaluation is practically nonexistent in this field, but doesn’t it make sense, at least, that you would be more likely to get such behavioral change if that is what you were aiming for in the first place? Some leaders are fond of asking about your data, but surely you will have a better chance of producing people who will live more lightly on the earth if you tell them that’s your goal and begin helping them to do it” (Van Matre 1990 p42).

Duckworth (1986 p23) dismissed the need for evaluation and cited the responses of participants as adequate justification for earth education: “...there is no more concrete way of making the case for Earth Education programmes than by the consumer reactions of those taking part.”

While it is true that relationships may exist even though they cannot be proven statistically, some of Van Matre’s other assertions are more contentious. The reasoning behind his assertion that people who are more connected to the earth are wiser, healthier and happier is not obvious. The comment that malnutrition and lack of firsthand experience of nature are equivalent is also open to question. These assertions would not matter so much if they were not so fundamental to earth education, a movement which seems to be held together by such articles of faith masquerading as common sense.

It may seem that “Heightened feeling for the natural world combined with the increased understandings about its systems form the foundations for positive environmental action” (Van Matre and Johnson 1987 p viii) is common sense. This, however, does not mean that it is true. Duckworth (1989 p127) has asserted that “Action is most often initiated by feelings rather than knowledge or awareness”. This depends on what sort of action you mean. He refers to the success of Band Aid and states that “It is the goal of Earth education to help develop this kind of productive

relationship with the natural world" (Duckworth 1989 p127). This suggests that Duckworth believes that world famine could be solved by Band Aid type initiatives, a debatable idea as Giddens (1989 pp528-529) points out:

“Even if the richer countries were more generous in providing food aid than in fact they are, fundamental problems would still remain. The provision of aid does nothing to improve the capacity of poor countries to develop more effective agriculture, and may even have the opposite effect...what is needed is a large-scale transfer of *production* resources”.

However, even providing the means of producing more food may not solve the problem as some poor countries have the capacity to produce enough food to meet their needs at the moment but are forced to sell much of it to make money. It could be argued that an emotional response may produce more short-term (re)action than other approaches, however this does not mean that it produces more beneficial change in the long term. Band-Aid type initiatives only deal with emergency situations when in fact “severe shortage of food has become general among the poor of the world, rather than being confined to particular times and places” (Giddens 1989 p528).

The relationship between attitudes, knowledge and behaviour may well be more complicated than the common sense of Van Matre and Duckworth suggests (see, for example Hines, Hungerford and Tomera (1986)). The adoption of earth education requires belief that such common sense is true: “We must believe that this personal involvement will motivate them to try to salvage what they can of their natural heritage and ours” (Van Matre 1972 p 21). The need to believe in earth education and have faith in some of the assumptions which underpin it may be one of the reasons that “there is, for many, a strong whiff of religiosity about EE (earth education) as promulgated by its leaders” (Randle 1992 p26).

4.2.3.5 The earth education view of nature

In earth education nature is personified as something all-powerful yet essentially benevolent, a force with which we should flow, for example:

“...she is fragile, yet formidable; delicate yet omnipotent” (Van Matre 1972 p12)

“...we must strive to merge with the environment, not overcome it. To pit your energies against nature is to do battle with yourself” (Van Matre 1974 p12) and

“We must become ever alert to the rhythms of the earth. We must become attuned to its natural harmony and flow, and our constant watchword must be *caution, caution.*” (Van Matre 1979 p4).

Van Matre uses the analogy of the Earth as a sunship or life raft to define our relationship with it and highlight what he perceives to be the insanity of our actions:

“Should someone inquire of us if we would allow our fellow passengers to tear holes in a life raft we shared, or if we would willingly board a craft piloted by someone who didn’t know how to fly, we would probably think the questioner slightly mad in both instances” (Van Matre 1979 p3).

On the other hand, if someone was to find themselves on a craft with an unconscious pilot it would be sensible to try to guide it and learn about its operation in the process. Besides, most people would be unhappy at the prospect of travelling on a craft where some of the other passengers were eating each other. If it were the only one available, then a separate cabin would be desirable.

The point is that we are not passengers on some idealised sunship. The analogy is a weak one and serves only to obscure and oversimplify the complex relationship between nature and humanity. While we are undeniably dependent on the Earth’s biogeochemical systems, humans are also dependent on each other. It is inevitable that our relationship with the rest of nature should change and this should not be seen as necessarily a bad thing.

Van Matre’s suggestion that “We must become attuned to its natural harmony and flow, and our constant watchword must be *caution, caution.*” (Van Matre 1979 p4) implies that we cannot improve in any way upon the harmony of nature. However, given some of the less pleasant aspects of nature, such as predation, starvation and disease, it could be that Van Matre is mistaking equilibrium for harmony - two quite different things. His harmonious view of nature may not be shared by those who have gone hungry after crop failures or suffered from ‘natural’ diseases such as malaria or arthritis. Environmental education needs to be based on a realistic, rather than an idealised, view of nature which takes into account all aspect of

it. Instead, earth education refers constantly to harmony and presents a selectively positive and distorted view of nature.

The distortion of the reality of nature required to justify earth education reaches its zenith in the form of the “Tellurian Gnomes” (Van Matre 1990 pp ix-xii) who act as guardians of the Earth and guides on the earth education path. These creatures have “large eyes, ears and hands, but very small mouths, because to learn you have to see and hear and do, but not talk” (Van Matre 1990 p xi).

Mystification is an important element of earth education, whether in the form of the Gnomes or in “the secret ingredient” of magic (Van Matre 1990 pp72-80). Van Matre argues that magic is important for both children and adults, however this depends on how you define magic, something which he is reluctant to do: “I have been trying to define that word for twenty some years, and I can’t do it” (Van Matre 1990 p73). Although magic may be helpful, particularly for children, there is a danger that it could be nothing more than escapism for adults. The problems of mystification in earth education are similar to those in deep ecology, with which it shares common ground: “In The Institute for Earth Education we see ourselves as an educational voice in the broad deep ecology movement” (Van Matre 1990 p99).

4.2.4 Conclusions

There are a range of problems associated with earth education which have been highlighted in this discussion:

- Its unwillingness to contemplate alternatives to its own aims;
- Its simplistic view of the environmental crisis;
- Its manipulative, one-way view of education;
- It is underpinned by speculation rather than evidence;
- Its mystification of nature.

These criticisms would not matter so much if it were not for the fact that the Institute for Earth Education believe that: “Earth education should be a separate and

distinct part of every school curriculum, youth program and adult organization” (Van Matre and Johnson 1987 p viii) and is consequently striving to achieve this goal.

While an understanding of the ecology of the earth and an emotional attachment to it should indeed be a central part of environmental education, it is doubtful if they are enough on their own to facilitate the transformation to a future where we all live in harmony with the earth. Humanity’s relationship with nature is complex and influenced by factors other than individuals’ knowledge and attitudes and this needs to be reflected in educational responses to the environmental crisis. Any environmental education which involves consideration of these other factors requires dialogue between participants and practitioners to compliment the sensory experience of nature and reflective solitude advocated in earth education.

Finding the balance in environmental education between its various aims, such as developing emotional attachments to nature or understanding the natural world or the social world, depends on the particular situation and is one of the constant challenges of environmental education. Although earth education may not be the “path” which its proponents consider it to be, it could be part of the jigsaw.

5. A THEORETICAL BASIS FOR ENVIRONMENTAL EDUCATION

5.1 Introduction

These suggestions for environmental education are based on the work completed in the previous three chapters. They represent a synthesis of the observations and conclusions contained therein and attempt to provide a clear and concise indication of the direction in which environmental education should be developing. While detailed references to the previous chapters are not made it is hoped that the recommendations made below are clear, logical and their origins easily traced to the arguments set out already.

5.2 Discussion

One of the main conclusions reached is that the remit of environmental education needs to be expanded from focusing primarily on the ecological aspects of environmental issues to take account of the broader economic, social, political and cultural contexts in which they occur. Issues are often assumed to be environmental when, like the tips of icebergs, the environmental dimensions are just the most visible symptoms of deeper, underlying problems. Emphasis is placed on the environmental manifestation of issues because of their visibility and the high level of interest in such matters at the moment.

The broadening of environmental education calls for a change in the way that the environment is commonly perceived. At present it tends to be thought of as our physical surroundings, in particular green areas which have the appearance of being unchanged by humanity. In reality the socio-political and cultural dimensions are equally important. This bias towards the natural environment is also present in concepts such as sustainability. It is not enough to think merely in terms of ecological sustainability as a guiding principle for our actions. We must remember that it is possible for a totalitarian state to be ecologically sustainable.

Central to understanding environmental issues and the contexts in which they occur is the development of an historical perspective. Without this it is difficult to see beyond the norms and practices of the day. One needs to understand how civilisation has developed in the past to understand how it works in the present and have any idea

of how it may develop in the future. How and why have our political and economic systems changed through time? To what extent has the Enlightenment and subsequent rise of science and technology changed the way we perceive our environment? How has industrialisation changed society? What roles do materialism and consumerism play in our lives? Questions such as these should be at the heart of environmental education so that people can develop an holistic understanding of the way in which the world works, rather than detailed knowledge of specific environmental issues. In this sense, environmental education should be emancipatory, enabling people to identify and take control of the forces which control their world and lives. It is important for people to realise that the world has been ever-changing, rather than static, so that they believe in the possibility of changing the world for the better. Rather than encouraging an ecological sense of place, we need to develop an historical sense of place. Another reason that the development of an historical perspective is important is to prevent atavism. This is an unfortunate aspect of some green thought and is the result of misinterpreting the past. Previous cultures have been identified as environmentally benign and proposed as models for our own society. However, while certain favourable aspects are selected, such as their sustainability or spirituality, other aspects, such as reduced life expectancy or the subjugation of women, are conveniently ignored. Any alternative culture must be examined in its entirety and its implications made clear.

Probing and critical examination are essential elements of environmental education and need to be directed at uncovering the assumptions underpinning stances on environmental issues and education. For instance, we need to consider:

- The influence our personal perspectives have on the way we approach environmental issues;
- The voices which are not heard in the environmental debate;
- What are perceived as the limits to development, and why;
- What is nature and how has our relationship with it changed through time.

This last point is particularly important as the idea that some things are natural and some are not has far reaching implications for environmental education. What is considered natural varies with time and between cultures and should be an active

topic of debate. Equally important are questions such as: What is humanity's relationship to nature? What should it be? How has the concept of nature and our relationship with it developed throughout history? How has life on the planet evolved? What are the changes taking place now and are they fundamentally different from those that have occurred in the past? These should lead to an active investigation of the environmental crisis rather than a passive acceptance of it.

Active investigation requires an equally critical approach to both the dominant worldview *and* proposed alternatives. If this is not attempted there is the danger that alternatives will seem favourable, not because they are inherently better but because they have been scrutinised with less rigour. The ideological bases of beliefs need to be exposed so that they may be discussed. For example, in section 4.1 an attempt was made at highlighting some of the assumptions underlying the deep ecology movement and exploring their bases. Assumptions, such as natural systems cannot be improved upon by humanity, that we need to get back to nature, or that the development of science and technology inevitably leads to environmental degradation, need to be challenged as part of a wider process of de-mystifying nature.

This approach requires the abandonment of unquestioning faith. As well as challenging the dogma of others and convention and conservatism in society, one needs to be self-critical and prepared to re-evaluate and revise ideas in response to new information and understanding. A discerning approach to information and arguments needs to be developed so that fact can be distinguished from fiction and vested interests and the manipulation of issues recognised. For instance, the increasing amount of corporate sponsorship of teaching materials in environmental education needs to be examined and the information in them and the motivations of the sponsors evaluated carefully.

Finally, while this is primarily a discussion of the features which environmental education should possess, it is also worth mentioning briefly some that should be avoided. There are different forms of knowledge and no one form should be favoured to the exclusion of all others. That is not to say that one cannot believe that rational thought is more important than intuition, but rather that this should not be used as a reason for completely dismissing intuitive ideas. However, ideas whose logic is not made known and open to scrutiny, for instance ideas based on dogma or authority, need to be criticised thoroughly as their validity depends on the strength of the counter arguments made against them.

It is vital that environmental education does not lapse into misanthropy. When looking at some of the damage which has resulted from the development of humanity,

it possible to come to the conclusion that we, as a species, are no good. This is a mistaken and dangerous assumption to make and mitigates against the sort of confidence in humanity which is required to create truly harmonious relationships with each other and with nature. We should not let the glory of nature prevent us from realising the potential that human consciousness has for transforming our environments for the better.

Environmental education should not be a process of covertly manipulating people's knowledge, attitudes and behaviour so that they act in accordance with predetermined norms. This may seem inconsistent given that this discussion has set out several behavioural aims for environmental education. The difference is that these aims are not to be operationalised in environmental education initiatives and then applied to students who are ignorant of their purpose. Rather they are made explicit and should be debated by those for whom they are intended.

5.3 Summary

- The remit of environmental education needs to be expanded to include economic, cultural, social and political dimensions as well as ecological (50, 56, 68);
- The way in which the environment is conceived needs to be changed (50, 65, 68);
- Environmental education needs to help people develop an historical perspective and sense of place so that they can understand the way in which the world has developed and how it may be changed (22-23, 47-48, 69);
- Environmental education should be emancipatory (50, 69);
- Environmental education should counter atavism (44-47, 69);
- Environmental education should encourage probing and critical examination of environmental issues to help uncover underlying assumptions (15, 61-62, 69);
- Environmental education should ask "What is nature and what should our relationship with it be?" (10-11, 32-33, 70);

- Environmental education should question both the dominant worldview and proposed alternatives (23, 36-38);
- We need to abandon unquestioning faith and be self-critical (40-41, 64, 70);
- Environmental education should encourage a discerning approach to information and arguments (15, 70);
- Environmental education should not exclude forms of knowledge (50, 70);
- Environmental education should not lapse into misanthropy (48-49, 70);
- Environmental education should not be a process of covertly manipulating people (57-61, 71).

Following on from this discussion of what environmental education should be like in theory, Part B looks at the development and practice of environmental education and the implications that they have for teacher training.

PART B - THE HISTORY AND PRACTICE OF ENVIRONMENTAL EDUCATION

6. A BRIEF HISTORY OF ENVIRONMENTAL EDUCATION

6.1 Introduction

There is some difference of opinion as to what exactly environmental education is and consequently it is impossible to tell one definitive story of its development. To a certain extent, what you believe environmental education is determines how you think it developed and what the important events have been. Thus it makes sense to think of environmental education in the widest sense when reviewing its history to avoid omitting any potentially important events. Several reviews have been written of the history of environmental education (Fensham 1978; Sterling 1992; Palmer and Neal 1994 ch2; Tilbury 1994; Smyth 1995). The intention here is not to add another history of environmental education but to highlight briefly what are considered to be the landmark events in its development. This should help identify some of the forces which have shaped different views of what environmental education should be, an appreciation of which is important for understanding current developments in environmental education.

6.2 Important events in the development of environmental education

Although the term "environmental education" was first used in Paris in 1948 and in the UK in 1965, its roots seem to go back further to the Scottish botanist and town planner Patrick Geddes. He opened the first field studies centre in Edinburgh in 1892, making the link between education and the environment. Between the wars in Britain there was a growth of interest in rural studies and countryside protection which led, after the Second World War, to the recognition of Environmental Studies as a subject.

The late 60's and early 70's witnessed a marked increase in concern about the effect humanity was having on nature following the questioning of the Western way of life in the 60's and events such as the publication of Rachel Carson's "Silent Spring" in 1962. This gave renewed impetus to environmental education and led to a series of events which have influenced it up to the present day. The Biosphere Conference in 1968 is said to have been the first time that environmental education was put on an international stage. In 1972 the UN held the Conference on the Human Environment in Stockholm which raised the profile of environmental education. This turned out to be an important event as it led to the establishment of the United Nations Environment Programme (UNEP) which in 1975 gave rise to the UNESCO/UNEP International Environmental Education Programme (IEEP). This programme, which was launched in Belgrade in 1975, set out the following objectives for environmental education:

1. To foster clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas.
2. To provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment.
3. To create new patterns of behaviour in individuals, groups and society as a whole towards the environment.

Belgrade and the follow-up intergovernmental Conference on Environmental Education in Tblisi in 1977 are particularly important events as they acted as catalysts for further research and "continue to provide the framework for the development of environmental education in the world today" (Palmer and Neal 1994 p13).

The next major development after Tblisi was the launch of the World Conservation Strategy in 1980. This was a document produced by the IUCN, UNEP and WWF which looked at the links between conservation and development. In defining the role of education it echoed the third objective of the IEEP by suggesting that:

"Ultimately the behaviour of entire societies towards the biosphere must be transformed if the achievement of conservation objectives is to be assured...the long

term task of environmental education (is) to foster or reinforce attitudes and behaviour, compatible with a new ethic." (IUCN 1980 in Palmer and Neal 1994 p13)

In both Belgrade and Tblisi emphasis is placed on the role that education needs to play in changing the behaviour of individuals and societies. The follow up to Tblisi, Tblisi Plus Ten, in 1987 also mentioned this:

"Human action depends upon motivation, which depends upon widespread understanding. This is why we feel it is so important that everyone becomes so environmentally conscious through proper environmental education"
(UNESCO 1987 in Palmer and Neal 1994 p14)

This is a simplistic, if not mistaken, conception of the way human actions are determined. It is based on a linear view of behaviour where knowledge determines attitudes which in turn determine behaviour. This ignores the complex interplay between knowledge, attitudes and behaviour and the effect that circumstances have (for further discussion of this see section 4.2).

Besides the uncertainty regarding exactly how education could change behaviour is the question of whether education should be used in this context to change people's behaviour. Previous definitions of environmental education seemed to accept that one of its roles is to make people and societies behave in ways "compatible with a new ethic" determined by some authority. Although the potentially radical changing of society was mentioned the emphasis, as events has since shown, was on altering the individual's behaviour within an unchanging social structure. There have been critics of this essentially conservative approach, notably John Huckle in Britain and John Fien in Australia. Both have adopted a critical approach and have questioned the manipulative nature of much environmental education, particularly the work of Hungerford and his colleagues in America (see for example Huckle 1993, Fien 1993). This has presaged an ongoing debate in environmental education .

The World Conservation Strategy highlighted the need for sustainable development and a proactive, rather than a reactive, approach to environmental problems. The implications of sustainable development for education were investigated in the 1987 "Brundtland" report, Our Common Future (WCED 1987) and at the United Nations Conference on Environment and Development (1992) (UNCED) in Rio in 1992 (the "Earth Summit"). One of the main problems with

education for sustainable development is the uncertainty that surrounds the term sustainable development. It could refer to development which is, for instance, environmentally, economically or culturally sustainable and it is not clear how the sustainability of different actions should be determined. The debate regarding its meaning has not been resolved and, although the uncertainty has enabled a wide range of people to agree that sustainable development is a desirable goal, Smyth has warned that there is a danger of the term becoming:

"... the property of a priesthood of the environmentally enlightened presented as symbols of goodness to be enshrined, not explained, and taken up without question by many who, for political or commercial reasons, just want to look good" (Smyth 1995 p11).

The main results of UNCED were the Rio Declaration which outlined 27 principles for sustainability and Agenda 21 which tries to show how these principles could be put into practice. Chapter 36 of Agenda 21, entitled "Promoting Education, Public Awareness and Training", proposes that:

"Governments should strive to update or prepare strategies aimed at integrating environment and development as a cross-cutting issue into education at all levels within the next three years" (UNCED 1992 p221).

In the context of teacher education, this is in agreement with the resolution passed by the European Community in 1988 which recommended:

"...giving consideration to the basic aims of environmental education when drawing up curricula...taking appropriate measures to develop teachers' knowledge of environmental matters in the context of their initial and in-service training..." (Journal of the European Communities, 6 July 1988 in Palmer and Neal 1994 p16).

The political will to establish cross-curricular environmental education in teacher education seems to exist, in theory at least. This was further demonstrated with the publication of the Toyne Report (Department for Education and the Welsh Office 1993), which is discussed in section 10.4. In practice there are problems associated with cross-curricular environmental education, not least of which is deciding what environmental education is.

In the hundred or so years since Geddes first established his field studies centre, environmental education has evolved from the relatively straightforward study of nature to a complex area of research and practice which has as its objectives concepts such as environmental awareness, environmental literacy, environmental responsibility, environmental competence, environmental citizenship, sustainable development, ecoliteracy, self-realization, bioequality, critical thought, independence and democracy. It is a crowded and diverse field in which it is sometimes difficult to see the hardwoods for the rainforest. This is inevitable given the different backgrounds of the people involved and the range of ideas concerning the causes of the environmental crisis and the role of education.

One of the most useful classifications of environmental education was devised in 1974 for the Schools Council's Project Environment. There are three divisions in this: education about the environment; education from the environment; education for the environment. Education *about* the environment is largely factual knowledge and understanding of the environment. Education *from* the environment is education which uses the environment as a medium for teaching, regardless of whether the education concerns the environment. Finally, education *for* the environment involves developing the behaviour towards the environment which is consistent with increased concern for and understanding of it. This classification was refined by Lucas (1979). There are many variations and conflicts within this classification, some of which are discussed in the next section. Before looking at these issues it is worth looking briefly at some factors which influence perceptions of environmental education.

Listing the approaches to environmental education on a country by country basis would result in a lot of unnecessary repetition as

"One of the conclusions drawn from global meetings is how similar are the aims, objectives and methods of approaching environmental education in various countries. Only the specifics of organisation for learning and opportunity are different" (Palmer and Neal 1994 pvii).

A certain degree of uniformity is to be expected given the efforts of international bodies such as UNESCO to provide the basis for a common agenda in environmental education. However, it would be wrong to assume that because there is a great deal of consensus at global meetings that this represents the whole picture. There is a bias in environmental education research in which white, Western, male

perspectives drawing on natural and psychological science approaches dominate (see Greenall Gough 1993 p6-8; and Lewis and James 1995 for further discussion of this).

There is also some variation in the environmental education that is approved of, and required by, different nations. Education all over the world is government funded and therefore inevitably reflects, if not the national interest of that country then the interests of the government. While it could be argued that it is in all our interests to avoid an environmental crisis, certain aspects of it are of more relevance to some countries than to others. For instance, low lying nations such as Holland and Bangladesh have a keen interest in halting global warming and sea-level rise. Discussions on limiting population growth evoke varied responses as they present political problems of different magnitudes for different governments. Some of the regional variation that exists on the importance of different environmental issues was shown by the difficulty involved in getting all the countries at UNCED to agree on levels of carbon emissions. Countries with large fossil fuel reserves, such as China and the USA were understandably reluctant to limit emissions because they had the most to lose from stricter regulations. Despite these differences the Rio Declaration was passed. It remains to be seen how successful its implementation is. This is important for environmental education because if agreement cannot be maintained on how to tackle the pressing environmental problems of the day it is difficult to see how any common agenda for environmental education can be implemented.

Perhaps the way forward for environmental education does not lie in a top-down global agenda. To a certain extent the varying political, cultural and socio-economic situations in different countries makes one agenda unworkable. Bak (1995) has described how the particular history of South Africa means that it cannot be taken for granted that everyone there is going to consider environmental education a "good thing" which ought to be implemented urgently and widely. There is currently a programme in South Africa to redress some of the economic and material imbalances between the rich and poor which have been caused by apartheid and the anti-materialism and austerity of some environmental education could be seen as a way of preventing the poor's overdue acquisition of material goods. In more general terms, the imposition of green technology or education for sustainable development on less developed countries could well be resented by people in those countries. The West could appear hypocritical in trying to prevent other parts of the world doing what they have already benefited from, for example exploiting their natural resources such as forests or taking advantage of nuclear power. Besides, it is unreasonable to expect people who face starvation and disease in their daily lives to make environmental

citizenship their top priority. It makes more sense to encourage people to create their own environmental education which is relevant to their circumstances and consistent with the wider aims of environmental education. An example of a project where environmental education is tailored to the local needs is described by Fien and Corcoran (1996). In this project the environmental education of teachers in the Asia-Pacific region involves the participants writing workshop modules which are then critiqued and adapted in other countries according to their needs. This adaptation has obvious advantages in a region which contains 20 countries of widely varying circumstance. An action research approach is used which encourages reflection and critical self-appraisal. This is in contrast to the dominant "research, development, diffusion, adoption" (RDDA) model of educational change where teachers adopt the role of passive technicians who deliver the curriculum they are given.

6.3 Summary

From simple origins, environmental education has developed into a complex, sometimes controversial, area of research. While there have been concerted international efforts to establish an agreed definition and agenda for environmental education this, for a variety of reasons including geographical and ideological differences, has not been achieved. There are now many different views of what environmental education should and should not be and some of these are outlined in the next section.

7. CURRENT VIEWS OF ENVIRONMENTAL EDUCATION

7.1 Introduction

In order to get a balanced picture of the potential scope of environmental education one needs to consider a wide range of opinions. Limiting the discussion to the views of environmentalists or government bodies leads to the omission of some relevant opinions and skews the debate on what should constitute environmental education. As has been stated before, it is a mistake to think there is one universal definition of environmental education, or that there should ever be one. This is not necessarily a bad thing as different circumstances demand different educational responses and it is to be hoped that the tension between these results in debate which moves the field as a whole forward.

The views are divided up under the following headings:

- Supranational organisations;
- Government bodies;
- Non-governmental organisations (NGOs);
- Educationalists;
- Environmentalists;
- Student teachers;
- LJMU Management;
- LJMU School of Education and Community Studies Staff.

The order of the headings is not meant to imply anything about the relative importance of the views discussed under them. Rather, it is intended that there is an overall movement from the general situation to the more specific situation at the I.M.Marsh Campus. There is a certain amount of overlap between categories, for instance it is possible to be an environmentalist, an educationalist and to speak for an

organisation. This is irrelevant as the aim of this section is to illustrate the range of current thinking on environmental education, not to provide a comprehensive breakdown of all the ideas that exist. It is not possible to prepare an exhaustive list of all the definitions of environmental education that have been suggested so a small number of environmentalists and educationalists have been selected in order to illustrate the variety that exists. Most of these are well known and have distinct points of view to add to the debate. The selections are skewed in favour of those with less mainstream perspectives as the conventional views are well represented by governments and supra-national organisations. Indeed, many of these people have formed their arguments in reaction to the status quo in environmental education.

The treatment of these different views of environmental education is largely descriptive and the lack of criticism should not be interpreted as implicit agreement. Instead of carrying out what would have been superficial critiques of all these views it was decided that the more profitable course of action was to attempt detailed critiques of some of the views of environmental education which were of particular relevance to teacher training in the UK (see section 10).

7.2 The different views of environmental education

7.2.1 Supranational organisations

There have been several international developments in recent years, notably the EC Resolution in 1988, The United Nations Conference on Environment and Development in 1992 which led to Agenda 21 and the UNESCO/UNEP International Environmental Education Programme (IEEP). These have all, to a greater or lesser extent, been influenced by the conferences in Belgrade and Tblisi in the mid-seventies and subsequent events. In fact, the IEEP was launched at the Belgrade conference in 1975 (For further discussion of the development of the international educational response to the environmental crisis see section 6.)

In the EC Resolution of 1988 (88/C 177/03), the aim of environmental education is clearly stated as being:

"to increase the public awareness of the problems in this field, as well as possible solutions, and to lay the foundations for a fully informed and active participation of the individual in the protection of the environment and the prudent and rational use of natural resources".

A meeting of the Council and the Ministers of Education in 1992 reinforced this and noted that "the urgency of protecting the environment at all levels has been thrown into greater relief" (92/C 151/02). It was recommended that "special attention should be given to the intensification of initial and in-service training of teachers in this area".

Since its launch at the Belgrade conference in 1975, more than thirty documents have been published as part of the UNESCO-UNEP IEEP (see Oulton and Scott (1995) for critique of UNESCO-UNEP). In one of the most recent (Tanguiane and Perevedentsev 1994 p18) the authors accept the basic validity of the original Tblisi objectives and define environmental education as:

"a salient and organic part and an essential dimension of lifelong education, which drawing on natural and social sciences, as well as the humanities and respective disciplines, on their links and interaction and, thus, being interdisciplinary in its nature and content, provides the necessary and constantly renewed knowledge conducive to a comprehensive perception of the environment, its complex, integrated nature, with an accurate appraisal of its state and problems. It promotes shaping environmental awareness, a moral stand, a sense of responsibility, skills and behaviour, and encourages people to acquire experience to take an active part individually and collectively in the preservation and improvement of the environment, in preventing and solving its current and future problems, and where possible, in the dissemination of environmental knowledge and ethical norms".

Chapter 36 of Agenda 21, "Promoting education, public awareness and training", also draws on the Tblisi conference for its basis:

"The Declaration and Recommendations of the Tblisi Intergovernmental Conference on Environmental Education organized by UNESCO and UNEP and held in 1977, have provided the fundamental principles for the proposals in this document" (UNCED 1992 p221).

Education is seen as:

"critical for promoting sustainable development and improving the capacity of the people to address environment and development issues...Both formal and non-formal education are indispensable to changing people's attitudes so that they have the capacity to assess and address their sustainable development concerns. It is also critical for achieving environmental and ethical awareness, values and attitudes, skills

and behaviour consistent with sustainable development and for effective public participation in decision making.” (UNCED 1992 p221)

Finally, the OECD is taking part in a project called the Environment and Schools Initiative (ENSI):

"ENSI could be described as a project which develops entrepreneurial qualities in students through challenging them to acquire knowledge for a real purpose and using it in the service of the community" (OECD 1994 p12).

The purpose of environmental education is expressed in the two main aims of ENSI:

- "i. the promotion of environmental awareness;
- ii. the promotion of dynamic qualities.

There are four principles informed by these overall aims. Students should:

- i. experience the environment as a sphere of personal experience;
- ii. examine the environment as a subject of inter-disciplinary learning and research;
- iii. shape the environment as a sphere of socially important action;
- iv. accept the environment as a challenge for initiative, independence and responsible action" (OECD 1994 p12).

7.2.2 UK Government Sponsored Bodies

One of the most revealing ways to find out about the government's commitment to, and conception of, environmental education is to study its place in compulsory education. Analyses of the status of environmental education in the school curricula of England and Wales and Scotland are detailed in section 10.1 and 10.2. In England and Wales the purpose of environmental education is summed up in the following quote from Curriculum Guidance 7 (NCC 1990a p3) which is actually taken from the 1988 EC resolution:

“The objective of environmental education is to increase the public awareness of the problems in this field, as well as possible solutions, and to lay the foundations for a fully informed and active participation of the individual in the protection of the environment and the prudent and rational use of natural resources.”

The way in which environmental education is defined in the most recent official guidance (SCAA 1996) has changed from:

- "To provide opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment" (NCC 1990a p3);

to

- "To provide all pupils with opportunities to acquire the knowledge, understanding and skills required to engage effectively with environmental issues, including those of sustainable development" (SCAA 1996a p2).

The implications of this change and of the substitution of the term “education about the environment” for environmental education are discussed in 10.1.

The situation in Scotland is outlined in the report commissioned by the Scottish Office, “Learning for Life”, which has been conditionally accepted as the basis for the “Scottish Strategy for Environmental Education”. In this, environmental education is seen as something which will:

- "Promote awareness and understanding of the environmental impact of everyday life;
- Provide everyone with the knowledge and skills for learning to live sustainably;
- Motivate everyone to act responsibly towards their environment in all activities" (Scottish Office Environment Department 1993 4.6).

Overall, this is in line with the recommendations for England and Wales, the most significant difference in Scotland being the potentially greater commitment to environmental education mentioned in 10.2.

The situations in further and higher education have implications for the extent to which the aims of many environmental education strategies are realised. For example, the ability and willingness of teachers to help achieve the aims of Learning

for Life and CG7 documents depends in part on the sort of environmental education they are exposed to at college. The Toyne Report sets out an agenda for further and higher education and in this the purpose of environmental education is seen as producing:

“rounded citizens, acceptable employees and sensitive policy-formulators and managers fine-tuned to the environmental revolution that has already begun” (Department for Education and the Welsh Office 1993 p4).

The role of environmental education is defined as promoting the individual’s environmental responsibility, a term which combines awareness and commitment:

“Everybody has some scope for doing his or her job in a more environmentally responsible way, and needs to understand the importance of this. A basic level of environmental awareness is therefore needed across the workforce as a whole” (Department for Education and the Welsh Office 1993 p5).

The place of environmental education in the UK’s strategies for sustainable development and biodiversity is expressed in term of support for the recommendations of the findings of the Toyne Report and Learning for Life:

“The Government and nature conservation agencies will encourage where possible the adoption of agreed measures arising out of the Scottish Working Group report Learning for Life, and the adoption of measures proposed in the Toyne Report” (DoE 1994a 7.78).

Education and training are considered “crucial to the achievement of sustainable development” because:

“They can provide the population, including the workforce, with an understanding of how the environment relates to everyday issues and what action they can take personally to reduce their own impact on the environment at home, at work or in their leisure activities” (DoE 1994b 32.12).

The British Government Panel on Sustainable Development was appointed to advise the government in light of the formation of the Sustainable Development Strategy (DoE 1994b) and recommended that:

“Education on environmental issues and on environmental values should be available throughout life to enable citizens to see for themselves the need for sustainability and to help convey the necessary sense of individual responsibility for a healthy environment” (DoE 1995 17).

7.2.3 Non-Governmental Organisations

In a recent essay, Martin (1996) has argued that most non-governmental organisations' (NGOs) initiatives in environmental education are unhelpful for a number of reasons, e.g. they have been too quick to adopt the World Conservation Strategy and its view of environmental education as a means of changing people's values and attitudes towards the environment. This is despite the fact that "Attitudes and values are the product of the generalities of upbringing and social interaction rather than specific parts of education" (Martin 1996 p41) and that even if values and attitudes could be changed, it is not necessarily the jobs of educational institutions to do so. The NGOs tend to focus on a nature study approach "viewed as a process of initiation into a particular set of world views" which is problematic because "All forms of initiation are selective, attracting in main only the susceptible and potentially alienating the rest" (Martin 1996 p45). Martin sees the educational initiatives of most NGOs as inevitably self-serving due to the need for niche marketing and the demands of competition between NGOs for resources and publicity. The exception to this he claims is the World Wide Fund for Nature (UK) (WWF). This is perhaps not surprising as he is principal education officer for the World Wide Fund for Nature (UK). The WWF conception of environmental education is different in that it is based on the idea that:

"In the main, environmental problems are symptoms of entrenched social systems. Therefore, understanding requires critical, social, economic and values investigation rather than environmental investigation" (Martin 1996 p45).

This is in contrast to the conception of environmental education expressed typically by NGOs. For example the RSPB has stated that:

"All living things are dependent on ecological processes and the Earth's life-support systems for their survival. EE is the means by which people develop awareness and understanding of these processes and systems" (Elcome 1991 2.1), and that

"The emphasis in EE is on first hand experience, enquiry and investigation. Direct contact with the physical environment and wildlife enhances perception, an important first step in developing understanding of ecological relationships" (Elcome 1991 2.4).

Several organisations have been formed to promote environmental education, such as the National Association for Environmental Education (NAEE), the North American Association for Environmental Education (NAAEE), the Council for Environmental Education (CEE) and the Scottish Environmental Education Council (SEEC).

The NAEE definition of environmental education is based on that of the IUCN conference in 1979:

"Environmental education is the process of recognising values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness amongst people, their culture and biological and physical surroundings. Environmental education also entails practice in decision making and self-formulation of a code of behaviour about issues concerning environmental quality" (NAEE 1992 p1).

The CEE, given its role as an umbrella organisation, is more concerned with the promotion of environmental education in the broadest sense than with any particular type of environmental education. However, Ewan McLeish, then head of the CEE, gave some idea of his view of environmental education as being "largely about sound and responsible decision making" and added:

"Ultimately, it is individuals (sometimes acting corporately) who effect change and bring about environmental improvement or degradation. In the end, environmental education seeks to promote environmental awareness, understanding and competence - to help create a society that is environmentally literate" (McLeish 1990 p7).

Finally the NAAEE, the world's largest environmental education association, defines its goal, and thus the goal of environmental education as they see it, as helping people "develop an awareness of and knowledge about the environment, as well as the ability and commitment to engage in problem-solving, inquiry, decision making, and action" (quote from a NAAEE promotional pamphlet).

7.2.4 Educationalists

Hungerford and Volk (1990 p17) have stated that:

“Environmental educators overwhelmingly agree that the major aim of EE(environmental education) is to produce individuals who will willingly and responsibly participate in environmental maintenance and remediation”.

They consider the Tblisi objectives to be the "foundation for the field" (Greenall Gough 1993) and the role of environmental education research to be the creation of curriculum goals to guide curriculum development to this end. Hungerford recommended that his "Goals for Curriculum Development in Environmental Education be used as a basis for guiding curriculum development in environmental education" (Hungerford et al 1980) and later went on to suggest that they should be accepted by everyone as the time for debating the objectives of environmental education had passed. In response to the question "What is Environmental Education?" Hungerford replied "The question...most certainly has been answered. One would dare hope that this question could, at long last, be laid to rest" (Hungerford et al 1983 pp1-2).

Hungerford is only one of the many contributors to the Journal of Environmental Education who share the belief that research in environmental education should be concerned with developing the educational means of shaping people's behaviour (for example, see Roth 1970; Borden and Schettino 1979; Sia et al 1985; Jordan et al 1986; Hines et al 1986). This type of approach is widespread and there are many environmental education strategies based on the idea of dealing with environmental problems by changing the population's knowledge, attitudes and behaviour.

In contrast, there have been a group of researchers, notably in Australia and the UK, who have argued for alternatives to the manipulative type of environmental education and research advocated by Hungerford and others. Robottom and Hart (1993) provide a detailed critique of the dominant approach to research in environmental education and conclude that:

“environmental education research should be grounded in the alternative emerging paradigm, and not in the positivist “applied science” paradigm which is antagonistic to the very nature of environmental education" (p54).

The alternative paradigm they refer to is participatory action research underpinned by critical theory. The debate between these two different methodologies has been played out on the international stage as the UNESCO-UNEP environmental education

programme has adopted the approach of Hungerford and his colleagues while the OECD ENSI project favours the sort of participatory research advocated by Robottom and Hart.

Fien (1993) has “argued the case for adopting an approach to environmental education based upon ecosocialist environmentalism and a socially critical orientation to education”. His radical conception of environmental education has much in common with John Huckle whose work he has cited as a major influence (Fien 1993 p11). Huckle has long emphasised the importance of a socially critical approach to education and the need for a true education for sustainability (i.e. Huckle 1983 ch10; Huckle 1991; Huckle 1993). However, he notes that:

“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” (Huckle 1993 p65).

The work of writers such as Giroux, Apple, Illich and Friere have been important in making the case for socially critical education by showing the ways in which most education reproduces society with its inequalities intact (see Giroux 1981; Apple 1979; Illich 1971; Freire 1985). However Kemmis, in Fien (1993), identified Stenhouse (1975) as the first to suggest a critical perspective on the curriculum as a way of challenging social reproduction in education.

Approaches to environmental education are often divided up into three different groups depending on the type of knowledge and methodology of investigation underpinning them: positivism, interpretivism or critical theory (see Robottom and Hart 1993; Huckle 1993). While Hungerford’s work is an example of research based on positivism and Huckle’s of critical theory, Robottom and Hart (1993 pp22-23) used Earth Education as an example of research based on an interpretive methodology. Given the criticisms of Earth Education in section 4.2, this is debatable. Although Earth Education does seek to develop insight and emotional response to the environment, it does so in order to make people behave in accordance with its aims.

Sterling (1993) has called for a re-vision of environmental education:

“so that today’s young people - let alone tomorrow’s - are socially and environmentally aware, self-reliant, critical, creative, confident, flexible, deeply empathetic to themselves, others and the environment, and empowered through appropriate skills, knowledge and values to create a better, greener, gentler and self-sustaining world” (pp95-96).

Such a broad definition is perhaps not surprising given Sterling's interest in holistic ethics. This breadth can be a strength and a weakness. On the one hand it is inclusive and comprehensive and has aspects with which everyone can agree. On the other, there is a danger that its lack of an overriding aim makes it difficult to get to grips with and that people will simply concentrate on one or two of the elements which suit them. Perhaps this messy complexity should not be avoided as it reflects the complexity of a holistic view of the world.

Several writers have outlined a feminist response to the environmental crisis (Shiva 1991; Merchant 1980; Greenall Gough 1993). Greenall Gough has argued for the case for "a poststructuralist and feminist" reading of environmental education which exposes the inequalities in gender relations in it and the rest of society (Greenall Gough 1993 p50). She points out that environmental education is dominated by researchers with science backgrounds so there is an inevitable bias towards "middle class, Western, white and straight men". In the same book she highlights what she has identified as six of the most influential founders of environmental education: P. J. Fensham; H.Hungerford; R.D. Linke; A. M. Lucas; R.E.Roth; W. B. Stapp.

Linke (1980) listed the following characteristics of environmental education:

1. the awareness of interrelationship between man and environment
2. it is based on, and seeks to promote, a concern for the quality of human life
3. a personal commitment to, or acceptance of responsibility for, environmental conservation.

Lucas (1979) distinguished between three different types of environmental education: education for, about and in the environment. (see section 6 for further details). Although, like Linke, much of his research is concerned with measuring the effectiveness of environmental education, he has expressed concern about the difficulties involved in assessing programmes.

Roth (1970 p65) defined environmental education, or "environmental management of education" as "being the process of developing a citizenry that is:

1. knowledgeable of the interrelated biophysical and sociocultural environments of which man is a part;

2. aware of the associated environmental problems and management alternatives of use in solving these problems;

3. motivated to work toward the maintenance and further development of diverse environments that are optimum for living".

This is a modification of the definition given by Stapp (1969). In the same paper Stapp added that:

"...for environmental education to have its greatest impact, it must: 1) provide factual information which will lead to understanding of the total biophysical environment; 2) develop a concern for environmental quality which will motivate citizens to work toward solutions to biophysical environmental problems; and 3) inform citizens as to how they can play an effective role in achieving the goals derived from their attitudes" (p31).

Out of the many definitions given at the Tblisi conference Fensham highlighted the following as having the most "operational usefulness":

"...an educational programme must develop the skills involved in recognising the alternatives that exist for an environment, and in outlining the criteria for choosing between them" (Fensham 1978 p451).

Smyth (1988) suggested that education must change:

"On the one hand, we must recover our ancient capacity to see ourselves as part of our world, the two being interdependent; at the same time we must redirect our technological and social development towards harmony and sustainability rather than exploitation and indulgence" (p35).

He stresses the importance of realising that humans are interconnected with their environment, and that the environment has "physical, spatial, social and temporal components, along with their aesthetic, cultural, political and economic characteristics" (Smyth 1988 p40).

Palmer and Neal (1994 p3) have observed that:

"...if the ultimate aim of environmental education is to sustain our planet and its resources for future generations, then a related aim must be to provide an education

which encourages people to strive towards that goal. Presumably, if environmental education is about producing well informed and environmentally active adults, then those responsible for it should have some idea of the kinds of learning experiences which help to influence the development of environmental care and concern" .

Finally, a staff development seminar funded by Scottish Natural Heritage was held in Scotland in 1995. The thirty participants, who were a selection of environmental educators, senior managers from Scotland's ITE institutions, delegates from the government agencies, NGOs and HE institutions in Scotland and England were asked to choose definitions which described what they thought environmental education should be like. The following definitions were the top three:

1. Environmental education should be encouraging environmental responsibility by educational institutions practising what they teach.
2. Environmental education is understanding the local and global impact of our decisions.
3. Environmental education is of relevance in all subject areas. (Shallcross 1996 p10)

7.2.5 Environmentalists

Earth Education (see section 4.2), in common with the deep ecology movement, places great store in the sensory experience of nature and aims to "instill in people deep and abiding emotional attachments to the earth and its life" and develop "a basic comprehension of the major ecological systems and communities of the planet" (Van Matre 1990 p87). It is believed that this will lead to people changing "the way they live on the earth" (Van Matre 1990 p88).

David Orr, proponent of ecoliteracy , has stated that:

"The kind of education we need begins with the recognition that the crisis of global ecology is a crisis of values, ideas, perspectives and knowledge which makes it a crisis *of* education, not one *in* education" (Orr 1994a p126).

Orr suggests that the aim of environmental education, in fact the overriding aim of education in general, should be to promote ecoliteracy. He believes this to the extent that he recommends that those who turn out to be eco-illiterate should be re-educated or have their qualifications revoked (Orr 1994 ch 13).

A very different view of the role of environmental education is given by Pepper (1987 pp66-68). He lists the aims of a radical curriculum as:

1. To criticise conventional wisdoms;
2. To explore the material and ideological bases of conventional wisdom;
3. To open students' minds to alternative world views;
4. To work and live co-operatively;
5. To realise that humans can act collectively to shape society.

Instead of advocating intuitive thought and forming emotional attachments to nature, Pepper focuses on the need to critically analyse human society and ideologies and look for ways of changing them. This reflects his interest in politics rather than ecology or philosophy.

It could be argued that the Ehrlichs' preoccupation with population growth as the main threat to the planet is a result of their backgrounds in biology. They refer to the "disease of overpopulation" and go as far as to say approvingly that "China's one child family programme with its goal of reducing its population size is perhaps the single most important step yet taken" (Ehrlich and Ehrlich 1987 p231) and add that "Universal adoption of the World Conservation Strategy would be another important advance". They use the seriousness of the environmental crisis to argue that "the most difficult ethical question becomes not whether governments should now attempt to control population size, but how they should" (Ehrlich and Ehrlich 1987 p232). From this sort of perspective, environmental education is seen as a way of controlling population growth and facilitating adoption of the World Conservation Strategy.

In 'Seeing Green', Jonathan Porritt put the case for "education for life on Earth" which is holistic, lifelong and community-based and stressed the need to change the curriculum:

"so that instead of focusing on a redundant exam system, it combines the teaching of essential skills with the promotion of humane, pluralist values, and provides access to the ways of the world and current affairs while allowing each child's individual interest to flourish" (Porritt 1984 p170).

In a more recent book he has said that:

"Environmental education needs to give children the confidence to make reasoned personal responses to environmental matters, must be based on child-centred participation in the learning process, and should emphasise our relationship with all aspects of the living world, to give a sense of the whole picture rather than a few of its individual parts" (Porritt 1990 p99).

In addition, he advocates some direct experience of nature:

"Getting children down to Earth, with their hands literally on the marvel and mystery of creation, must be seen as a prerequisite for any kind of ecological sanity among today's young people" (Porritt 1990 p102).

While Schumacher does not make any specific recommendations for environmental education, in 'Small is Beautiful' he makes the following point:

"Education can help us only if it produces 'whole men'. The truly educated man is not a man who knows a bit of everything, not even the man who knows all the details of all the subjects: the 'whole man' ...will be truly in touch with his centre. He will not be in doubt about his basic convictions, about his view on the meaning and purpose of his life. He may not be able to explain these matters in words, but the conduct of his life will show a certain sureness of touch which stems from his inner clarity." (Schumacher 1973 p85)

In other words, true education is that which results in wisdom rather than mere knowledge and it has a moral purpose "The essence of education...is the transmission of values" (p73). Environmental education, then, is not concerned primarily with transmitting factual knowledge about the environment, but about producing people who hold certain values and act in accordance with their convictions towards the environment.

7.2.6 Student Teachers

A survey carried out at I.M.Marsh (see Appendix C) suggested that about half of the student teachers there were interested in learning more about environmental issues and that there was considerable variation in the numbers of students wanting to learn more about environmental issues on different courses. Although one cannot generalise about student teachers' perceptions of environmental education, it is worth considering the results from Dillon and Gayford (1994). He found that when a small

group of students on a primary BEd in geography and environmental education were asked to rate statements about environmental education, the following responses had by far the highest support:

1. Environmental education is cross-curricular and therefore relates to all subjects in the curriculum.
2. Environmental education is about children studying the environment in the area in which they live and helping them to find out things for themselves.

The following statements had quite high support:

3. In environmental education we should concentrate on the main issues facing human beings, such as deforestation, pollution and population.
4. Environmental education, like other areas of education should usually involve activities where there are clearly measurable outcomes.
5. An outcome of environmental education should be that people will want to become actively involved in resolving environmental issues.

7.2.7 John Moores University

One of the specific goals of the University's environmental policy with regard to academic provision is:

- To identify those courses and modules which contribute to the development of environmentally responsible individuals.

The University's view of environmental education is based on the ideas in the Toyne Report (Department for Education and Welsh Office 1993), the recent review of the Toyne Report (Ali Khan 1996) and on the Common Learning Agenda for Environmental Responsibility which has grown out of the CEE project "Promoting Sustainable Practice through Higher Education Curricula" (Ali Khan 1995). The adoption of environmental education through curricular greening is influenced by the following statement:

“There is a widely accepted perception that human society is affecting the environment on a scale that is historically unprecedented and that its impact is damaging to both natural ecosystems and, ultimately, ourselves. The purpose of curricular greening is to enable students to explore, understand and evaluate this perception and to appreciate how their actions can contribute to, or ameliorate, human impacts on the environment” (Small and Blythe 1996 p2).

7.2.8 Education and Community Studies Staff

One of the questions in the staff survey (see Appendix A) asked respondents to complete the statement "Environmental education is...". It was hoped that this would give an idea of the teaching staff's perceptions of environmental education. In the light of the way in which the research evolved and subsequent doubts as to the usefulness of data from questionnaires, problems are recognised with any conclusions drawn from it. There will be bias in the sample as questionnaires are more likely to be returned by those who consider questionnaires a valid form of information gathering and environmental education a worthwhile enterprise. The way in which the question is presented and its context, in a questionnaire about cross-curricular greening and environmental education, are also liable to influence responses. Finally, it is impossible to be certain that the meaning that the respondent ascribes to a question is that which the questioner intended. For instance, although this question was designed to find out what staff perceived the scope of environmental education to be, one responded that environmental education was "beginning to develop in schools" and another that environmental education was "important". Both clearly misinterpreted the purpose of the question.

Bearing in mind the reservations expressed above, some tentative observations can be made. There is a general feeling among the respondents that the environment is in a bad way. However this is hardly surprising - if people did not think that there were any problems they would be unlikely to bother responding. Emphasis is placed on the need to protect the environment, specifically the natural environment, and on increasing people's knowledge, understanding, awareness of, and concern for, the environment. Education is seen as a means of changing the relationship between humanity and the environment by changing individuals. The majority of respondents thought of environmental education as being concerned with increasing people's knowledge or changing their attitudes or behaviour towards the environment (see 17.2). The overall tone is captured in the following response: "Environmental education is educating the individual to recognise, understand and protect the environment".

Certain elements of environmental education are missing from the responses. No-one mentioned the emancipatory or self-development dimensions of environmental education. Instead it was perceived as something which is meant to benefit the environment, rather than the individual or society. Only one person mentioned economics, politics or society and there was no sense of the radical side of environmental education as a subject with a transformative social agenda and which is concerned with questioning conventional wisdoms and worldviews.

7.3 Discussion

This review has demonstrated that there is variation in ideas regarding what constitutes environmental education, both between groups and within them. The extent to which ideas vary within a group depends on the group. This observation raises the question of why some groups are largely in agreement while others are sharply divided. The following discussion highlights some of the factors which are responsible for this.

These differences are partly to do with the ways in which the views are arrived at. For instance, the statements of supranational organisations are more often the result of consensus at conferences and the compromises which makes them acceptable to a range of participants whereas the views of environmentalists tend to represent a reaction against the status quo with which they are dissatisfied.

Different groupings have different reasons for their interest in environmental education. For instance, governments need to win votes to survive so they respond to public pressure. Being seen to act by the electorate is often as important as actually acting. They are also likely to see environmental education as a means of achieving their superordinate goal of increasing the country's competitiveness in the world economy.

Supranational organisations and governments are constrained in what they can recommend by the fact that they possess some of the power, and therefore the responsibility, to put their ideas into action. To a certain extent they are limited to proposing what can be achieved within the practical and ideological limits imposed on them rather than what is actually best.

Different groups have different constraints on what type of environmental education they can advocate. For instance, NGOs, as Martin (1996) has argued, are in the business of building support for their chosen cause, in competition with other NGOs, and their environmental education strategies are developed in this context.

As a result of changes to the structure of funding of Higher Education in recent years, it has become increasingly important for universities to attract students.

The logic of the free market is now prevalent in Higher Education as universities seek to gain competitive advantages over one another. Consequently, if there is a demand for environmental education amongst students, as there appears to be at the moment (see Appendix C), universities will endeavour to at least appear to provide it. However, this raises the question of what will happen if students do not see environmental education as important.

Educationalists are a heterogeneous group whose concept of environmental education and of the environmental crisis often stems from prior convictions regarding the role of education in general. They approach environmental education from the opposite direction to environmentalists whose prior convictions regarding the environmental crisis shapes their ideas of the purpose of education. Sometimes these groups converge and other times they pass each other unnoticed. What they have in common is that both have similar internal debates and disagreements regarding the role of environmental education and the way it should be researched. The breadth of opinion is particularly pronounced amongst educationalists. It is not surprising that specialists in environmental education find the most to disagree about as they tend to know the most about education and they are more likely to feel it is their job to debate such matters. The educationalists and environmentalists highlight the influence that background has in determining one's view of environmental education. My own view was, initially at least, strongly influenced by my science dominated background. This serves to emphasize the need for genuine interdisciplinarity amongst researchers in environmental education so that they can communicate and fully understand one another's arguments.

7.4 Summary

The variation in the perception of environmental education within and between different groups is the result of a range of factors, the importance of which depends on the group in question. The following have been identified:

- Different superordinate goals, i.e. a government's desire to be re-elected;
- Different constraints, i.e. those with power are limited to making proposals which can be practically implemented;
- Different views of the environmental crisis, i.e. it could be perceived as the result of individuals' actions or the inevitable result of the socio-economic structure;

- Different views of the aims of education, for instance whether education should be concerned with knowledge or values; whether education should transmit the dominant culture, be a process of developing and understanding the individual, or a way of transforming society;
- Different ways of researching environmental education, positivist v interpretivist v critical theory;
- Different context in which the idea of environmental education is developed, i.e. is it the result of an international conference or of a teacher taking the initiative in the classroom;
- Different motivation, i.e. is environmental education a marketing tool or a planet-saving necessity;
- Different worldviews.

8. METHODS OF IMPLEMENTING ENVIRONMENTAL EDUCATION

8.1 Introduction

In recent years there has been a plethora of initiatives in environmental education aimed at teachers. This can be illustrated by perusing an issue of Environmental Education Research to see some examples of the various projects from around the world. The Association of Teacher Education in Europe (ATEE) established a successful working group on environmental education in 1992, which reflects the increasing interest in this area. Indeed, there are far too many completed and ongoing projects to detail here. Instead a list of the various types of work that is being carried out and examples of each is given below. The emphasis here is on the different means of incorporating environmental education into the education of teachers rather than on the particular aims and rationale underpinning it. A review of the many different views of the purpose of environmental education was carried out in the previous section.

8.2 Ways of Implementing Environmental Education

8.2.1 In a postgraduate course

Qualified teachers may take a postgraduate course such as Nottingham Trent University's MA in Environmental Education and the Master of Environmental Education at Griffith University in Australia. These have the advantage of allowing a large amount of time to be devoted to all aspects of environmental education and provide contact with experts in the field. By their nature, these courses are expensive and time-consuming, only available in a handful of places and can interrupt the teacher's career. They are therefore only an option for a minority of teachers and are likely to attract those who already have a strong commitment to environmental education. In fact the course at Nottingham Trent University has the stated aim of "reorientating the professional practice of experienced environmental educators". Clearly, these courses are of limited relevance to most teachers.

8.2.2 Through teaching materials

In recent years much material designed to assist with the teaching of environmental education has been produced by various organisations, for instance WWF (1994), Plant and Firth (1995), Ali Khan (1995). As it is generally easier to use materials that have been prepared, rather than to design your own, these save time, de-skill the teaching of environmental education and generally make it a less daunting prospect. At the same time there is a lack of adaptability in some of the materials and they can stifle initiative instead of stimulating thought, in the process turning teachers into deliverers of other people's ideas rather than originators of their own. Another serious drawback in their use is that the agenda of environmental education is decided by the authors and sponsors of the materials, a situation which leaves environmental education open to abuse and manipulation.

8.2.3 Designing new teacher-training courses

Designing new courses has the advantage that environmental education can be made a central, integral feature and the course can be designed to meet the specific needs of the teachers. The University of Bath recently introduced a new PGCE in Partnership course in which environmental education features strongly as both a discrete aspect and through cross-curricular issues (Scott et al 1996). Graduates in environmental science are specifically selected for training as teachers. The obvious drawback to this approach is that it requires a high level of expertise and a large time investment to design new courses.

8.2.4 Designing new modules

Instead of designing whole new courses, a more realistic alternative is to introduce new modules on environmental education into existing courses, for instance in 1993 a module entitled Radical Perspectives in Outdoor and Environmental Education has recently been introduced to the BSc (Hons) QTS course in Outdoor and Science Education at LJMU. These are relatively easy to incorporate into degree structures and can be designed to meet the specific needs and interests of the student teachers. However, this may not be possible in all courses and designing and teaching on the module can be time consuming for those involved. In addition, this approach separates environmental education off from other subjects when interconnections

need to be emphasised and if the module is optional it faces the danger of preaching to the converted.

8.2.5 Cross-curricular approaches

Adopting a cross-curricular approach where environmental education is integrated and related to all subjects encourages cross-disciplinary connections to be made. This prevents environmental education from being perceived as primarily the concern of science or geography. It also means that all students have some exposure to it, rather than just those who are already interested in it. For these, and other reasons, cross-curricular approaches have been recommended as the best way of implementing environmental education in the Toyne Report.

Despite this, cross-curricular environmental education has been notable by its absence in most universities. There are several possible reasons for this. Perhaps most importantly, it is difficult to implement environmental education across the whole curriculum as it relies on many people with different backgrounds having sufficient motivation and expertise. This is unlikely and is not helped by the fact that some areas of the curriculum are, or perceived as being at least, easier to "green" than others.

8.2.6 Use of projects

Projects can be a useful way of incorporating environmental education and linking different disciplines and perspectives. For example a project at South Bank University (Blundell et al 1996) encourages student teachers to examine their urban, suburban and rural environments through walks and explore the issues that they raise in a variety of ways. This type of project has the advantage of being easily kept up to date and made relevant to the students' environment and lives. However, these advantages are offset by the fact that projects tend to portray the environment as a series of separate issues or problems which require solutions rather than in a systematic, cross-curricular, or far-reaching way.

8.2.7 Extra-curricular activities

Activities carried out outside the normal teaching time have the beneficial effect of increasing the time available for environmental education without decreasing

the time spent on other subjects. A good example of this is the Greenhaus project at LJMU (see section 16) which, although started as an undergraduate degree project, has involved many academic and technical staff and students in their spare time. Activities such as this can compliment and reinforce any environmental education which takes place within the curriculum. However, additional work on top of the compulsory curriculum may limit the appeal of such activities for students and their voluntary nature may mean that there is a degree of preaching to the converted. In addition, placing what may be important educational experience outside the curriculum could give the impression that environmental education is of peripheral importance.

Following on from the overviews of the history, views and methods of implementing environmental education, the next and final section in part B looks briefly at the current status of environmental education in teacher education across Europe.

9. ENVIRONMENTAL EDUCATION IN INITIAL TEACHER TRAINING ACROSS THE EUROPEAN COMMUNITY

There are several reasons why the way in which environmental education is practised in teacher training should vary within and between countries. Differences in, for example, educational systems, government commitment to environmental education or in the ability of universities to teach it would all tend to result in different approaches to environmental education in teacher training. Despite the passing of an EC Resolution on environmental education in 1988, Brinkman and Scott (1994 p3) note that "nowhere yet across the EU has environmental education been introduced in a consistent or coherent fashion into pre- or in-service teacher education programmes". The variation is "manifest in terms of diversity of:

- *organisation* of initial teacher training;
- practice in terms of working with students;
- the *interpretation* of environmental education;
- a *readiness* and *ability* to incorporate environmental education issues within courses;
- *opportunity* to deliver environmental education goals" (Scott 1994 p6).

Scott lists some of the factors which contribute to this diversity such as the influence that school curricula have on teacher training courses and links between NGOs and initial teacher education courses. He then goes on to describe the way in which diversity can be thought of as occurring in six different layers: national circumstances; institutions; courses, management and course teams; tutors; schools; individual students.

There is considerable variation in the environmental education in school and the environmental education in initial teacher training between different European countries. Status reports from each of the countries taking part in the "Environmental Education into Initial Teacher Education in Europe" (EEITE) project highlight some of these (Brinkman and Scott 1994).

Of the eleven countries, six have no specific provision for environmental education in schools (Belgium, Denmark, France, Greece, Netherlands and Portugal), two have specific statutory provision (Germany and Ireland) and three have made some attempts to integrate it in some cross-curricular way (Italy, UK and Spain).

These categories may be misleading as, for instance, although the Netherlands have no specific provision for environmental education this does not mean that it is not part of school education. In fact, schools in the Netherlands decide independently what their approach is going to be and the government has recommended a cross-curricular approach.

As far as environmental education in initial teacher training is concerned, two countries (Greece and Italy) have no compulsory training for secondary teachers which immediately limits the opportunities for environmental education in their schools. In three other countries (Portugal, Belgium and Denmark) the environmental education component in teacher training is small or non-existent. It is possible, though not compulsory, to study environmental education in Spain and the UK. Only three countries have made certain that environmental education is part of teacher education: Germany, the Netherlands and Ireland. Its importance to teachers seems to be most strongly felt in Germany where "The incorporation of an environmental dimension into initial teacher education is a fundamental prerequisite for the required competency of a teacher" (Jaritz 1994 p21).

Although there is considerable variation in the status of environmental education in different countries, there are also certain common features. For instance, in most countries environmental education is thought of as a subject which should be taught in the context of science and geography. Scientific solutions and approaches to the environmental crisis predominate and result in the exclusion of alternative perspectives. The exceptions to this are: Germany, where in the later years of secondary school "social, economic and ethical aspects all play a greater role" (Jaritz 1994 p20); Ireland where social and environmental studies represents an attempt at a more holistic view of knowledge; and the Netherlands where it is recommended that environmental education be infused across the curriculum in subjects such as history, economics and social studies as well as science and geography.

Most of the countries seem to think of environmental education as providing a solution to the environmental crisis by changing the behaviour of individuals. For instance, in Germany it is thought of as "seeking to generate permanent patterns of behaviour calculated to preserve and improve the quality of the human environment" (Jaritz 1994 p19) and in the Netherlands "Dutch government documents indicate that environmental education is regarded as an instrument for social regulation of society towards sustainable development and for the conservation of nature" (Lutgerhorst 1994 p38). This is in contrast to Ireland where two of the stated aims of environmental education are:

- To cultivate an inquiring attitude of mind;

- To enable pupils to arrive at general conclusions which will help them to understand and interpret problems in their own environment (Cremin 1994 p29).

Caravita (1994 p36) highlights some of the constraints which lead to conservative teacher training:

"The simplified content of the textbooks, the pre-defined sequences of activities of the manuals, the safety inside the borders of the school-class, homogeneity as the criterion for ensuring success (homogeneous age of the students, abilities, pedagogical proposals, materials...), and assessment procedures are all part of the same defensive mechanism which prevents teachers from questioning the relationship between what they teach, what the students know about the world, and what use students can make of what they have been taught."

Predictably, the barriers to environmental education vary considerably from country to country. Despite this, some are common to several countries. The subject specific nature of teacher education, in other words the way in which subjects are dealt with separately without any interdisciplinarity, was mentioned in four of the ten countries. Organisational problems in the teacher education colleges was also mentioned in four countries, however this is an admittedly wide-ranging category. The conservative nature of teacher education, lack of time to teach environmental education, lack of appropriate teaching materials, lack of qualified staff and the ambiguities and uncertainty within environmental education were all mentioned twice. Some of these are not so much barriers to environmental education in particular as barriers to educational change in general. However, criticisms such as those regarding the lack of clarity within environmental education and the absence of appropriate, demand-led teaching materials are specific. The EEITE project should go some way to addressing these problems as it arose in response to the recognition of "the lack of a commonly understood and agreed pedagogical-didactical basis to this aspect of the curriculum (environmental education), and the concomitant lack of teaching/resource materials" (Brinkman and Scott 1994 p3). The basic aim of the project is the:

"...development of teaching units to be used in teacher education, aimed at the preparation of teachers for environmental education in primary, secondary and vocational education" (Brinkman and Scott 1994 p3).

It should be borne in mind that the status reports on environmental education from each of the countries represent snapshots rather than the whole story. They are

personal accounts and as such represent interpretations of the situations rather than definitive accounts. Their brevity precludes the sort of detailed critiques carried out in section 10.1. However, as there is not enough time or data to carry out similar critiques of environmental education in other countries the status reports provide useful indicators of what is happening in other parts of Europe.

The EEITE project has not been completed but the work that has been carried out so far has certain implications. From an analysis of the barriers to environmental education one can see that there is some need to:

- Encourage and facilitate interdisciplinarity in teacher education;
- Review the way in which teacher education is organised and free more time up for environmental education;
- Clarify the ambiguities and uncertainties in environmental education;
- Provide appropriate teaching materials;
- Help trainers to learn about environmental education and how to teach it;
- Develop strategies for countering conservatism and resistance to change within teacher education.

Scott (1994 p9) has argued that because of the diversity of practice, what is needed is "a bottom-up approach with an open interchange between institutions, which is the way in which the EEITE project is operating". In a more recent report on the project Oulton (1996) pointed out that because of the diversity of approaches to environmental education throughout the EC:

“any attempt to promote environmental education at this level needs to focus on offering principles for planning such programmes, together with a range of exemplars” (Oulton 1996 p7).

This is the basis upon which the EEITE project is currently operating. He also suggested that environmental education “must be a compulsory part of the curriculum in both schools and higher education and must be subject to the normal inspection procedures” (Oulton 1996 p7) and that:

“there seems little point trying to convince them (trainee teachers) that their subject area has a contribution to make (to environmental education) if this is not supported by their experience in the school” (Oulton 1996 p12).

The following were given as a list of ways that tutors can aid the incorporation of environmental education into initial teacher training:

- Be active in national and international pressure groups promoting EE (environmental education);
- Through scholarship raise the academic profile of EE within their institution;
- Act as change agents, overtly and covertly, within institutions to get EE incorporated in the curriculum;
- Promote a realistic model for EE and provide novice teachers with the skills to manage change;
- Take account of the various needs of novice teachers from different backgrounds;
- Look for ways to work with schools to develop models of EE which support the model of EE which they are promoting in your pre-service courses (Oulton 1996 p14).

While this is a useful checklist for those trying to implement environmental education which highlights some problem areas, such as the absence of environmental education encountered by trainee and newly qualified teachers in schools, it also raises some questions. For instance, is being active in pressure groups necessarily a good thing? This could lead to the tutor being accused of bias and pressure groups often have their own agendas and visions of what should constitute environmental education. It may be better to retain an independent and critical perspective on all aspects and sides of the environmental debate.

10. THE UK CONTEXT FOR ENVIRONMENTAL EDUCATION

10.1 Environmental education provision in England and Wales in response to the National Curriculum

10.1.1 Origins of environmental education in the curriculum

The current provision for environmental education in state school education in England and Wales is the result of several events, most importantly the Education Reform Act of 1988. This required "all state schools to provide all pupils with a curriculum that:

- is balanced and broadly based;
- promotes their spiritual, moral, cultural, mental and physical development;
- prepares them for the opportunities, responsibilities and experience of adult life;
- includes, in addition to the National Curriculum, religious education and, for secondary pupils, sex education" (SCAA 1996b p3).

This changed education fundamentally by leading to the creation of the National Curriculum. The debate that followed the passing of the Act concerning what the objectives and themes of the new curriculum should be was informed by documents such as the Curriculum Matters series (Department of Education and Science 1989) and resulted in the introduction of five cross-curricular themes:

- Economic and Industrial Understanding;
- Health Education;
- Careers Education and Guidance;
- Education for Citizenship;

- Environmental Education.

The themes marked the first time that environmental education had been explicitly mentioned as being part of schooling. This was in response to the general increase in interest and concern for the environment, and more specifically to the Resolution on Environmental Education passed by the Council of Education Ministers of the European Community in May 1988.

The Environmental Education theme was dealt with in Curriculum Guidance 7: Environmental Education (NCC 1990) in which the aims of the theme and methods of implementing it were considered. The National Curriculum was reviewed by the Schools Curriculum Assessment Authority, chaired by Sir Ron Dearing, in 1994 (SCAA 1994). This was in response to complaints from teachers that the National Curriculum was overloaded in terms of the subject matter content and the amount of assessment that was required. The review led to the introduction of a revised National Curriculum in September 1995. Although the cross-curricular themes were omitted from the review, Gillian Sheperd, the Secretary of State for Education in 1995, said that there were "many opportunities for environmental education in the National Curriculum, especially in science and geography" stressing that "it is up to teachers to use their professional discretion and to adapt the cross-curricular approach if it is appropriate to them (RSPB 1996 p32). The following quote illustrates one of the main thrusts of the revision of the National Curriculum:

"We are all agreed, however, on one thing: the importance of helping all children to master the basics in their early years. I would have been in direct contradiction of that, and a detriment to education, to do other than maintain and, where necessary, strengthen expectation in these areas. To achieve the necessary freeing up of time for schools, this has meant extensive reductions in statutory requirements in the non-core subjects. In addition, we have left scope for the exercise of discretion; we expect teachers to pursue some issues in greater depth than others" (SCAA 1994 p ii).

Despite the impression given by Gillian Sheperd that the place of environmental education in the curriculum is secure, its position seems unclear. The implication is that it has been edged out of the picture to allow more time to be spent on the core subjects and it is left entirely up to individual teachers to decide whether they will include it or not. Despite this, SCAA maintain that:

"The revised Orders, providing only a minimal framework, offer considerably more scope for schools to decide on their own priorities and give the curriculum their own

distinctive flavour. Such a climate offers the opportunity for environmental education to thrive" (Westaway and Rawlings 1995 p37).

Both the introduction of the environmental education theme and the changes made in the revision of the National Curriculum have been welcomed by researchers in environmental education. Tilbury (1993a p25) wrote that:

"An integrated themes approach enhances the development of these common elements and provides a fuller understanding of the complex issues presented. This last point is particularly significant for environmental education, which requires a holistic outlook of environmental problems"

and Gayford (1995 p5) commented that "...what we have now in the new Orders should be counted as progress".

However, both of these articles are more concerned with the management of environmental education than with appraising the content of the curricula and its implications. The following discussion looks more at the implications of the environmental education content of the curriculum.

Although superseded to a certain extent by more recent publications (i.e. SCAA 1996 and RSPB 1996), Curriculum Guidance 7 (CG7) is still important as it sets out in some detail the government's view of the aims of environmental education and its relevance to the National Curriculum. Although the National Curriculum was changed in response to the 1994 review, the principles remain unchanged: "The issues we faced earlier in the year when we embarked on the revision were of structure, design and content, rather than of principle" (SCAA 1994 p i). A study of CG7 is therefore a study of the government's perception of the environmental crisis and the role that state education should play in addressing it.

10.1.2 Discussion of the environmental education in the school curriculum

One of the main aims of CG7 is to communicate to teachers what environmental education is in the context of the National Curriculum. Unlike established subjects such as physics or music, environmental education does not have a clear and widely understood image and can be difficult for many to define. The environmental education which is discussed in the CG7 document has several characteristics which are outlined below.

10.1.2.1 Characteristics of the environmental education in CG7

10.1.2.1.a It emphasises the natural environment: in the seven topics listed under education about the environment five of the seven are wholly concerned with our effect on the natural environment, one looks at the urban environment and one looks at "People and communities"; of the 13 main illustrations 9 feature plants or animals, 3 are inside a classroom and one features a bare playground as an example of bad school grounds.

10.1.2.1.b It emphasises the local environment: all but one of the illustrations depict local scenes and although the global dimensions of environmental issues are recognised, the action recommended is at the local level. The general way in which the issues are raised combined with the illustrations implies that the local environment is more relevant. This is put more explicitly in Department of Education and Science (1989 p2) where it is stated that pupils should "acquire a sense of responsibility for aspects of the environment, especially those close to them". In this document all the examples used to illustrate environmental education's four overlapping components - (a) curiosity and awareness about the environment, (b) knowledge and understanding, (c) skills, and (d) informed concern - are drawn from the local environment.

10.1.2.1c Fieldwork, which usually entails study of the local natural environment, is considered an important element of environmental education: "Fieldwork in country and city is an essential part of environmental education" (DES 1989 p3); "Fieldwork has an important part to play in both primary and secondary schools" (CG7 1990).

10.1.2.1d There is a focus on the individual's role with regard to the environment as the following quotes from CG7 illustrate:

A. "Environmental education is an essential part of every pupil's curriculum. It helps to encourage awareness of the environment, leading to informed concern for and active participation in resolving environmental problems" (in the Foreword).

B. "It is important that we capture this enthusiasm and that no opportunity is lost to develop knowledge, understanding and concern for the environment through school education" (p1).

C. "As consumers and producers, our use and abuse of the environment has wide-ranging effects on other people and other living things. Never has there been a greater need for young people to look after the environment. They are its custodians and will be responsible for the world in which, in turn, their children will grow up." (p1).

D. "Helping pupils to adopt a positive approach to the environment should therefore be central to environmental education" (p1).

E. "The objective of environmental education is to increase the public awareness of the problems in this field, as well as possible solutions, and to lay the foundations for a fully informed and active participation of the individual in the protection of the environment and the prudent and rational use of natural resources" (p3, quoted in CG7 from the 1988 EC Resolution).

F. (environmental education aims to) "...arouse pupils' awareness and curiosity about the environment and encourage active participation in resolving environmental problems" (p3).

G. "Promoting positive attitudes to the environment is essential if pupils are to value it and understand their role in safeguarding it for the future" (p6).

H. "Pupils are already involved in activities which affect the environment, for example they are already inhabitants, consumers, road users and followers of leisure pursuits...As adults their activities will become more extensive; they will become producers and decision-makers in the work place, local, national and international communities. Each subject can explore different aspects of human understanding and experience, and each subject can be used to help pupils develop insights into human behaviour and its effects on the environment" (p11).

I. "First-hand experience is an essential part of helping pupils to develop a personal response to the environment and to gain an awareness of environmental issues" (p12).

The repeated emphasis on the importance of the individual's actions and lifestyles in resolving the environmental crisis and creating a sustainable future gives the impression that the root cause of the environmental crisis is the behaviour of the individual. The stated purpose of environmental education is defined by this. Time and again the need to change pupil's awareness, knowledge, understanding, attitudes,

concern, responsibility, enthusiasm, curiosity, participation and patterns of consumption is mentioned. The job for teachers is expressed in terms of finding the most efficient ways of doing this.

However, it is debatable whether the role of environmental education should be limited to this as few pupils are really going to be in positions where they have a significant influence on events. Given the way our political system operates, with each person having one vote every five years, and the deregulated nature of the state, most power lies outside the average individual's grasp. The power people have as consumers and producers is small compared to that of big business, quangos and government. Yet people are told that what little power they have should be used to lessen their impact on the environment - not to obtain a more even distribution of power so that more people might influence events. Given the fact that the context in which actions take place are at least as important as the actions themselves in determining the effect they have on the environment it is an appropriate subject for study in environmental education. The role of the political, cultural and socio-economic context and ways of changing it should be central to environmental education.

Despite the liberal tone in which the aims of environmental education are expressed i.e. "*Helping* pupils to adopt a *positive* approach to the environment" (p1) it is clear that they are manipulative and conservative. The purpose of environmental education is to produce people with a positive approach, where positive is defined by the National Curriculum Council. This positive approach has several, variable elements. For instance in quote D it includes awareness, informed and active participation and prudent and rational use of natural resources. This implies that the environmental problems, as defined by the authorities, are the result of people's lack of awareness and imprudent and irrational use of resources. It suggests that all environmental education has to do is to counter these tendencies; nothing else has to change. However, there is nothing prudent or rational about a global economic system which allows people to starve when there is sufficient food production capability to feed everyone. While it recommended that pupils should "examine and interpret the environment from a variety of perspectives - physical, geographical, biological, sociological, economic, political, technological, historic, aesthetic, ethical and spiritual" (p3), the order these are placed in implies that solutions lie in the scientific understanding of the natural environment.

To a certain extent the National Curriculum Council appears to have an agenda which it is using environmental education as a means of achieving. Amongst the attitude objectives are:

- A respect for the beliefs and opinions of others;

- A respect for evidence and rational argument;
- Tolerance and open-mindedness (CG7 p6).

While these objectives are laudable, they are not strictly speaking within the remit of environmental education. They are worthwhile in their own right and while they may contribute to some aspects of environmental education, they should not be located within it. Important values such as tolerance and open-mindedness should not be thought of as means to an end, but as ends in themselves.

10.1.2.1e Besides focusing on the individual, the conception of environmental education is narrow in the sense that it predetermines the importance of different environmental problems. Instead of teachers and pupils debating and deciding what they consider to be important, they learn about the problems and possible solutions that are alluded to in CG7. As was mentioned above, the solutions tend to emphasise the importance of the individual and their action within the present system. The conservatism of this approach is expressed in the following statement:

"The long-term aims of environmental education are to improve management of the environment and promote satisfactory solutions to environmental issues." (p3)

This implies that nothing really needs to be changed in the way we relate to nature or to each other - it is simply a matter of managing the present situation better - and also raises the question of who decides what a satisfactory solution is. It encourages thought and action within the dominant world view, rather than criticism of it and the consideration of alternatives. This is reflected in the list of knowledge objectives on page 4 which focus firmly on what is, rather than what could be. Without the consideration of alternatives, environmental education traps people in the dominant world view instead of thinking about the possibilities for humanity.

10.1.2.1f It is stated in the introduction to CG7 that the debate surrounding environmental issues:

"...makes it all the more important for pupils to have opportunities at school to learn the facts about the environment, to develop a respect for evidence, to clarify their own values in relation to the environment and to understand that people hold different, equally legitimate points of view." (p1)

While facts are important they are not the only information which is relevant to discussions of the environment. Any discussion which limits itself to facts alone misses out on opinions and other more subjective dimensions which are part of environmental issues. Such issues often involve personal judgements and vested interests so the evidence that is presented is seldom neutral. Even apparently objective information such as numerical data can be misleading or skewed by the way in which the data is gathered. Statistics which are useful to one side of an argument are selected while others are conveniently ignored. For instance, the published data on road accidents in Britain expresses their health effects in terms of the number of years of life lost - an abstract statistic which provides little insight into the overall health effects of road use in terms of, for example, morbidity and stress. Some things are difficult or impossible to quantify and limiting discussion to quantifiable facts tends to sideline these. It also gives greater influence to those who compile and select the facts. The absence of data or of a statistical link can be manipulated and interpreted as meaning that there is no link. This, however misses the point that just because there is a link between two variables does not mean that it can be measured and shown to be statistically significant. Despite this the above quote states that people need to "develop a respect for evidence". One should only respect evidence when certain that it is correct, complete and impartial; otherwise it is important to examine evidence rigorously. Finally, while it is true that people can hold different but equally legitimate points of view, this should not be taken to mean that one does not have the right to challenge and criticise someone else's point of view as not all points of view are legitimate.

10.1.3 Summary of CG7 criticisms

It is difficult to convey the overall impression that the CG7 document gives to the reader and it would be possible to isolate and counter some of the specific criticisms made in this review, for instance that there is a bias towards the natural

environment. Nevertheless, the combined effect of the selection of illustrations and the way in which the stated aims of environmental education imply the causes of the environmental crisis gives the impression that the main purpose of environmental education is to protect and manage the natural environment by changing the individual's knowledge and attitudes and thus their behaviour. This is reinforced by the omission of other aspects of environmental education. The notion of it as an emancipatory or transformative process whereby people are encouraged to be critical of the dominant world view and explore alternatives is notable by its absence. Perhaps the National Curriculum Council's view of environmental education is captured in two pictures on page 18 of the document. They depict two photos of the same playground, one before and one after some environmental improvements have been made. Some bushes and a hut have been added. Remarkably the weather has also changed from being grey and overcast to being bright and sunny, however the children appear to be doing the same things in both photos. Appearances have changed but nothing else seems to have. While the playground may look a bit more green and pleasant in the sunshine, the day-to-day lives of the children and the prospects remain unchanged. In fact they could even have deteriorated slightly: the time and money used on the environmental improvements may mean that less books have been bought.

10.1.4 The cross-curricular themes

One of the concerns with having environmental education as one of the cross-curricular themes, or in some other non-statutory format, is that the amount and type of exposure to it could vary considerably. There is a danger that, as its teaching is not prescribed, it could be neglected in some schools. Indeed, given the increased workload of teachers following the introduction of the National Curriculum (addressed in part in the Dearing Review), and the increased pressure on schools to produce good exam results (which is not always the same thing as good education) brought about by the exam league tables, it is quite conceivable that elements of education which are not examined could be seen as being of secondary importance. This is borne out in discussions with teachers in the Liverpool area and in two national surveys which have been carried out. Tomlins and Froud (1994) found that in a survey of 500 secondary schools (of which 294 responded) less than 25% had a co-ordinated cross-curricular approach to environmental education, only 7% had produced a specific policy for it and 42% had no policy at all. Science and geography were the most common vehicles for environmental education: 92% and 91% of respondents used the geography and science contents of the National Curriculum as

their strategy for organising environmental education while only 22% had a co-ordinated cross-curricular approach across most subjects. Another survey of 682 primary and secondary schools using OFSTED data (Smith 1996) found that only 2% of schools had a policy for environmental education. Furthermore, "Only 17% of the evidence forms referred to environmental education and only 12% of the published reports contained any references to environmental education" (Smith 1996 p22).

Schools which are under less pressure to perform in the league tables would be expected to have more time to devote to areas outside the ten subjects of the National Curriculum. In addition to this, many of the topics in environmental education require reflection, discussion and debate amongst pupils, methods of learning which require time and favourable staff: pupil ratios. For these reasons, one would expect that the environmental education would be adopted with varying degrees of enthusiasm and success. Tomlins and Froud (1994) found that independent schools and inner-city maintained schools were significantly less likely to have appointed an environmental co-ordinator than other schools.

One of the criticisms made of CG7 was that it gave an essentially conservative and narrow impression of environmental education. To a certain extent, this is true of the cross-curricular themes as a whole. The selection of the themes and their specific aims seem to be geared to producing a passive, uncritical, career-motivated, healthy and co-operative workforce. For instance, the Economic and Industrial Understanding "prepares pupils for their future economic roles as producers, consumers and citizens in a democracy" (CG3 p4). The Education for Citizenship is ill-defined but as far as one can tell consists of information about how society works and what the individuals rights and duties are. It presents the situation as a fait accompli and makes criticism and radical thought difficult by urging participation. This criticism may seem unreasonable and it may be expecting too much to have schoolchildren examining complex ideas about how alternative societies could work. Perhaps it is quite right to use education as a starting point by encouraging environmental awareness and responsibility. This may be acceptable as a starting point but not as an end point. By presenting it as such, the environmental education in CG7 reinforces a worldview and mode of thought which makes it less likely, rather than more likely, that pupils will go on to become adults interested in the possibility of genuinely changing the world for the better.

10.1.5 Environmental education in the context of the revised National Curriculum

The review of the National Curriculum concentrated on the statutory subjects which at Key Stage 4 are:

- English
- Mathematics
- Science
- Design Technology
- Information Technology
- Modern Foreign Language
- Physical Education.

The selection of these subjects lends a technical, vocational bias to the curriculum. It is difficult to see how some of the wider aspects of environmental education could be incorporated into this yet Gillian Sheperd believes that "there are many opportunities for environmental education (in the National Curriculum), especially in Science and Geography" (Gayford 1995). The importance of science and geography is also mentioned in "Teaching Environmental Matters Through the National Curriculum" (SCAA 1996):

"In some National Curriculum subjects, notably geography and science, the programmes of study ensure that environmental matters are taught. The geography Order, for example, requires that pupils study how sustainable development, stewardship and conservation considerations affects environmental planning and management. Similarly, the science Order requires study of life processes and living things" (p4).

The study of living things is simply biology and ecology while the study of development and conservation is not new to geography. The scope of environmental education is narrow, concentrating on education about the environment and the commitment to it extends only as far as pointing out that some topics, which would have been taught anyway, are in fact environmental education.

If, as is stated in the officially recommended guidance, "Science and geography are the main carrier subjects for environmental education" (RSPB 1996 p33) then from 14 to 16 the main statutory context in which environmental issues are mentioned will be a scientific one. The implication of this is that environmental

issues are fundamentally scientific issues - not social, economic or political - which have scientific solutions and should be discussed in scientific terms.

Environmental education was not mentioned in the review of the National Curriculum and its status would thus seem uncertain. Despite this Peter Smith, HMI for geography and environmental education, has said that:

"Slimming of subject matter content has had little effect on the environmental dimensions of the principal carrier subjects of education about the environment, viz. geography, science and technology. In some respects the role of the environment has been refocused and strengthened, although there were some losses too. For example, the absence of geography as a compulsory subject at Key Stage 4 is a significant loss at an age when pupils are consolidating their attitudes to their world...They (the cross-curricular themes) have never been withdrawn, and continue to be there for schools that wish to use them as a way of tying together and making more coherent their subject teaching" (Smith 1996 p22).

It is indeed a significant loss when there are less opportunities for students to examine issues from different standpoints at the age when students are maturing and should be doing precisely that.

The latest official guidance on environmental education was published in 1996 (SCAA 1996 p2) with the aim of supporting "the work of schools both in meeting their statutory obligations and, where they so choose, in moving beyond them". There are some significant changes in the way environmental education is defined between the CG7 and the latest guidance. The original aim, which was to:

- Provide opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect the environment;

has been changed to:

- Provide all pupils with opportunities to acquire the knowledge, understanding and skills required to engage effectively with environmental issues, including those of sustainable development.

Values, attitudes and commitment have disappeared and are replaced with understanding. This is consistent with the greater emphasis placed on science and geography as the carriers of environmental education in the revised curriculum. The potentially controversial aspects involving subjective elements, such as value

judgements, have been replaced with the more neutral understanding enabling environmental education to be more easily subsumed within the science curriculum.

The behaviour desired as the outcome of environmental education has changed from "to protect and improve the environment" to "to engage effectively with environmental issues". The proactive, positive notion of protecting and improving has been replaced with the more neutral idea of engaging effectively. It is not clear what engaging effectively involves and it could be interpreted in contradictory ways. Significantly, the focus has moved from the environment to environmental issues, with emphasis placed on sustainable development, representing a further narrowing of the scope of environmental education.

On page three of the latest guidance the three types of environmental education - about, in/through and for - are defined in similar terms to CG7. However, a note is added after them:

"Although these distinctions are to help to clarify the scope of work on the environment, the phrase 'education about the environment' is used throughout this booklet to embrace all curricular approaches".

The reasoning behind this change from using *environmental education* to *education about the environment* is not explained. It can only be assumed that education about the environment is considered more important and this is consistent with some of the other changes which have been noted, such as the increasing emphasis on science and geography and the replacing of values, attitudes and commitment with understanding.

Finally, it is stated that "In studying environmental issues, pupils should develop an awareness that environmental issues are invariably complex" (SCAA 1996 p7). However, it is not necessarily true that environmental issues are *invariably* complex. This is presented as axiomatic it implies that environmental problems are all unique and have specific causes. This could prevent pupils from investigating their common factors and underlying causes. Though they are often complex, teaching pupils that environmental issues are invariably complex is a recipe for despair and may scare them away from trying to understand and deal with them because they feel they are beyond their comprehension.

The SCAA document is augmented by a practical guide to environmental education, 'Our World - Our Responsibility' (RSPB 1996), published by the RSPB in association with the Council for Environmental Education. It is endorsed by SCAA, as its Chief Executive states: "This 'Practical Guide', published by RSPB and CEE, cross-refers to the SCAA publication and is complementary to it" (RSPB 1996 p2).

One of the puzzling aspects of the guide is the fact that it is sponsored by Coca-Cola. While their intrusion into it is subtle compared to the rampant

commercialism of the abridged Agenda 21 (UNCED 1992) in which 77 of the 240 pages were devoted to adverts for large industrial and financial companies, it still raises the question of why a commercial company has been allowed to sponsor something that is going to be widely used and influential in schools. The sponsorship makes one wonder whether it has been allowed because Coca-Cola is a model company whose example should be followed or simply because of the money they are prepared to spend to buy influence. It seems particularly inappropriate that a multinational should be allowed to improve their brand image by association with environmental education. It is tantamount to government endorsement of their product and working practices. It also legitimises the whole multi-national mode of operation and puts criticism of it beyond the scope of environmental education.

The impressions that the illustrations give is particularly important in 'Our World - Our Responsibility' as it is a publication which is likely to be looked at briefly by a lot of people in education. The first thing to note about the illustrations is that there are a lot of them - 45 colour photographs of different sizes. Of these, 35 feature pupils engaged in a variety of activities. Although it is difficult to be accurate about the pupils' ages, there appear to be few in the 14 to 16, Key Stage 4, age range. The most striking thing about the photographs is the predominance of outdoor activities in which the pupils are studying or engaging with nature in some way: 24 of the 35 depict such activities. After this the next most common activities are saving resources (4 photos), in the classroom (4 photos) and in the playground (2 photos).

Although there may be reasons for the abundance of photos of younger children engaging with nature, for instance they make interesting illustrations, it also tells us something about the way in which environmental education is perceived by the authors. There is something very appealing about the images. There could be few more wholesome images than the expressions of wonder on young people's faces as they encounter nature. It should come as no surprise that such a non-controversial and appealing image of environmental education is portrayed in a publication which is designed to encourage schools to adopt an environmental policy featuring environmental education. Teachers are reassured that "Environmental education should not be regarded as an additional part of the curriculum requiring extra teaching time and preparation" and that:

"Environmental education is not an individual subject in its own right but provides a teaching and learning context and can inform the study of the separate National Curriculum subjects" (RSPB 1996 p31).

In other words environmental education does not require any change or effort and does not have its own agenda or raison d'être. Portraying environmental education in such a neutral way could do more harm than good.

The abundance of pictures featuring flora and fauna reinforce the idea that environmental education is primarily concerned with the study of nature. It is not so much the study of nature but of a stereotype of nature: green, cute and benevolent. Concentrating on the study of nature diverts attention from the curriculum and from the wider aspects of environmental education where controversy and conflict come in. In the main 42 page section, environmental education through the curriculum has 8 pages devoted to it, managing a school's resources has 9 pages, school grounds has 12 pages, involving parents and the local community has 8 pages and opportunities for teaching outside the classroom has 4 pages. Less than a fifth of the pages look at the role of the curriculum. While studying nature and the local environment is an important aspect of environmental education, and it is unrealistic to expect younger children to understand alternative worldviews, older pupils should be stimulated by these and encouraged to ask searching questions regarding the relationship between humanity and the environment. For environmental education, a mind interested in inquiry in the future is more important than a mind stuffed with factual knowledge now.

In summary, in the one fifth of 'Our World - Our Responsibility' devoted to education through the curriculum the emphasis is firmly on science and geography and the way in which extant topics in the National Curriculum subjects can be described as environmental education. There is no real onus on change or adding to the curriculum and little sense of environmental education as something with its own agenda. This is consistent with the rest of 'Our World - Our Responsibility' which contains reassurance that environmental education requires no effort. It is seen as more of a way of facilitating the teaching of other subjects, tying the curriculum together and enriching pupils' learning. The links between each National Curriculum subject and the environment that are mentioned focus, by and large, on the natural environment and are either knowledge about the environment, as in science, or about issues that affect it in geography. The potential for English, Design and Technology and History to broaden the scope is briefly mentioned. It is worth investigating the potential that English and Design and Technology have in environmental education as they, unlike history or geography, are statutory at Key Stage 4 and offer an alternative approach to science.

10.2 Environmental education in Scotland

10.2.1 Introduction

A working group with the task of looking critically at environmental education provision was set up by the Secretary of State for Scotland in 1990. Its findings were published in a report called 'Learning for Life: A National Strategy for Environmental Education in Scotland' (The Scottish Office 1993). This outlines a strategy for environmental education in the next ten years across a wide range of learning contexts: homes, community, recreation and leisure, schools, post-school education and in the workplace. It was given the backing of the Secretary of State with the following qualification:

"In a policy area which must inevitably form the background to a wide variety of sectoral policies it is important to ensure that there is a natural fit with other policy needs and initiatives" (The Scottish Office 1995 p6).

This would seem to suggest that the Learning for Life strategy is not to be adopted when it contradicts current policy. The extent to which this affects its implementation remains to be seen. It also remains to be seen what effect the recent change of government and the forthcoming Scottish Parliament will have on environmental education in Scotland.

10.2.2 The Learning for Life strategy

10.2.2.1 Commitment to environmental education

The broad remit of the strategy means that no single context for environmental education is dealt with in great detail. Despite this, there is a clear commitment to the promotion of environmental education in schools:

"Clear inclusion within the curriculum, and within the assessment procedures which in practice establish what is important to learn, would ensure that environmental education has a secure place, and that standards are subjected to rigorous appraisal."

(4.20)

"Recognising that living sustainably is something which we must all learn to do, individually and collectively, environmental education should permeate all thinking and behaviour" (4.45).

"...environmental education should be an integral part of the learning experience of every pupil and school student in Scotland" (4.45).

A cross-curricular approach is favoured, "environmental education should be delivered through permeating the curriculum, using cross-curricular initiatives" (3.87), and the following recommendations are made in order to encourage this:

"Commission the preparation and dissemination of national guidelines to ensure that environmental education in schools is delivered as a coherent and progressive learning experience from 15-18. This guidance should include the values and attitudes involved, and the assessment and monitoring procedures to be used, including the use of curriculum and environmental audit." (4.47h)

"Ensure that environmental education is included in inspection procedures by the schools inspectorate and given due prominence in published reports." (4.47k)

It is recognised that this "high level of commitment to environmental education has implications for teacher training courses" (4.21) and the following suggestions and recommendations regarding teacher training are made:

"It is important that environmental education is not seen as an optional extra but forms a basic component of teacher training courses." (3.98)

"Ensure that pre-service teacher training provides a significant element of environmental education, including holistic approaches, experience with out-of-school resources, and values education, so that all teachers are competent to deliver environmental education in the context of their own specialism" (4.47i).

"Make available specific grants to support staff development and in-service training for lecturers, teachers and their trainers, to enable them to implement environmental education effectively in their own fields" (4.47j).

The above quotes demonstrate that there is, in principle at least, a commitment to environmental education. The environmental education that is proposed in the strategy has several defining features which are discussed in the next section.

10.2.2.2 The Learning for Life concept of environmental education

What are considered to be the key features of environmental education are listed in Annex F of Learning for Life and represent "a distillation from a variety of documents produced by or for UNESCO, UNEP, Council of Europe, CEE, SEEC, SCCC, DES and others" (p91). The selected features reflect the largely conservative views of environmental education held by these organisations. However it is worth noting that there are two potentially radical objectives included:

- A critical attitude to received information, questioning assumptions, cautious about the reliability of personal interpretations;
- A respect for the human potential to work within environmental constraints and to design the future creatively.

In addition, one of the recommendations for environmental education in schools is that "Media education should use environmental issues as a means of developing critical skills, to help people distinguish between sound and unsound advice" (3.109). The list of the characteristics of environmental education in Annex F is interesting as much for the characteristics which are missing as much as for those that are included. There is no mention of any way in which environmental education could be, for instance, reflective, emancipatory or critical. The list paints a confusing picture of a subject which is by turns described as issue-based, field-based, action-orientated, holistic and learner-centred. If there is one thing which environmental education does not seem to be in Learning for Life, or in general for that matter, is that it is learner-centred. One of the main aims of the strategy is to make individuals behave in ways which will promote sustainability by:

"Recognising that living sustainably is something which we must all learn to do, individually and collectively, environmental education should permeate all thinking and behaviour" (4.45) and that

"...we need a basic level of education which will:

- promote awareness and understanding of the environmental impact of everyday life

- provide everyone with the knowledge and skills for learning to live sustainably
- motivate everyone to act responsibly towards their environment in all activities" (4.6).

This manipulative view of environmental education is reflected in the list of objectives given for the strategy, which includes:

- generate a sense of responsibility for the state of the environment from local to global levels
- ensure a sense of ownership of environmental issues and empowerment to take action when appropriate (4.13).

Research has been commissioned by the Scottish Office entitled "Environmental Education: Is the Message Getting Through?", the aim of which is to "explore the relationship between environmental awareness and action and thus identify how individuals might be encouraged to adopt more environmentally sustainable ways of living" (Scottish Office 1995). This confirms the impression given in Learning for Life that the aim of environmental education is to change individuals' behaviour.

It is suggested that "environmental education can provide the necessary information for people to make informed decisions" (4.5) and that a necessary prerequisite of action is "the provision of reliable, accurate and accessible information for all" (4.13). This is a desirable, if somewhat unrealistic, aim. It also misses out the point that as well as being reliable, accurate and accessible, information needs to be complete and unbiased. Obtaining this sort of information in a world in which individuals, organisations and nations are seeking to gain competitive advantage over one another is inevitably difficult. In addition, emphasis is placed on the importance of scientific information over other types:

"There is a temptation to avoid the complex scientific analysis required to unravel relationships between human impacts and the environment, and substitute exhortations on value systems and lifestyles. A national environmental education strategy should be founded on a sound basis of scientific enquiry and research ..."

(4.11)

Although it is recognised that "Some environmental issues should be within the proper field of study of non-scientific disciplines", science is considered as the

primary form of discourse about the environment. This ignores the need for an education which considers the wider political and social aspects of the environmental crisis, instead of limiting itself to the isolated scientific facts.

10.2.3 Conclusions

Overall, the main thrust of the proposals for school environmental education in Learning for Life is the same as that of the CG7 document. There is a commitment to education which will encourage the individual to alter their behaviour and make it consistent with the aim of sustainable development. While debate of the wider aspects and causes of the environmental crisis is not encouraged, Learning for Life does at least mention the importance of adopting a critical approach to information and recommends that sources should be established which are "accurate, reliable and accessible". However, the impact of this is limited by the difficulty of establishing such sources and the bias towards science as the most important form of discourse about the environment.

The biggest difference between Learning for Life and CG7 is in the level of commitment to the delivery of environmental education. In England and Wales environmental education is non-statutory and may be included as a cross-curricular theme according to the inclination and ability of individual schools and teachers. While it is also non-statutory in Scotland, Learning for Life makes several suggestions which are intended to encourage and help schools to include environmental education, such as: the inclusion of environmental education in assessment and inspection procedures; the preparation, implementation and monitoring of national guidelines for environmental education; the inclusion of environmental education in all teacher training courses and the provision of funding for teachers and lecturers to undertake training in environmental education.

While the form of environmental education may not be ideal, at least its inclusion in the education of every pupil is being encouraged. It may be a more successful strategy to first of all get schools used to the idea of environmental education, even if it is fairly conservative and unchallenging, and then gradually change it within schools rather than developing environmental education with a radical agenda outside schools and trying to get this adopted.

10.3 Initial teacher training course requirements

Consultation documents have been circulated (February 1997) outlining the proposed "Training Curriculum and Standards for New Teachers" (TTA 1997a; TTA 1997b). There are four booklets in this, two of which are of particular relevance to the status of environmental education in initial teacher training:

- Revised Requirements for all Courses of Initial Teacher Training;
- Standards for the Award of Qualified Teacher Status.

In the first of these, there is no mention of environmental education or the cross-curricular themes, however the document is quite general. It states that: "All providers must ensure that courses comply with the requirements set out in the ITT National Curriculum for the core subjects" (TTA 1997b p5) and, depending on the age range of the children the teachers are learning to teach, vocational courses and a specialist subject must also be covered.

The second document departs from purely general recommendations to make the subject-specific suggestion that there should be:

"a requirement for all new teachers, regardless of phase or subject, to have sound knowledge of Information Technology (IT) and of its contribution to their specialist subjects" (TTA 1997a p1).

It also recommends that new teachers are "familiar with subject-specific health and safety requirements, where relevant, and plan lessons to avoid potential hazards". There is still no mention of the cross-curricular themes and, as in the other document, there is more emphasis on the core curriculum. Under Planning, Teaching and Class Management the importance of planning and exploiting "opportunities to contribute to pupils' spiritual, moral, personal, social and cultural development" is mentioned. While this does not refer to the environment, indeed the only time the environment is mentioned is in passing reference to the learning environment, it could be used as a way of encouraging the incorporation of environmental education into initial teacher training.

It should be remembered that these are consultation documents rather than statements of policy. Depending on the results of the consultation, there is still a

chance that the opportunity to green teacher training which has been missed here will be taken in the final documents.

10.4 The Toyne Report

10.4.1 Introduction

When the research proposal upon which this thesis is based was originally written it was, in part, a response to the agenda set out in the 1993 report "Environmental Responsibility: An agenda for further and higher education", commonly known as the Toyne Report. Although the Toyne Report's impact on this particular piece of research has been limited, it is still an important document because of its widespread distribution in further and higher education (FHE). Along with the follow up to it (Ali Khan 1996) it has potentially far reaching implications for environmental education in FHE in Britain.

10.4.2 Discussion

One of the first things to note about the Toyne Report is the terminology and the language used in it as this sets the tone. The needs of employers are prominent and free market rhetoric prevalent as the following quotes illustrate:

- a. "All sectors of the economy must seek to improve their environmental performance" (p5);
- b. "Labour market demand for holders of specialist 'environmental qualifications' has in general been modest" (p6);
- c. "...there is a need for reappraisal of course content and objectives in the light of the employment opportunities actually available to graduates" (p7);
- d. "FHE will face strong competition from other training providers for a share in this expanding market (environmental training)" (p7);

e. "Although many employers see a need for 'greening', it has not so far received the attention it deserves either from FHE institutions or from national examining, validating and accrediting bodies" (p8);

f. "Particularly...institutions should seek to improve their dialogue with employers" (p9)

g. "Further research may be needed into the current and likely future needs of employers, particularly small and medium enterprises" (p9).

To a certain extent, the language used influences the way in which environmental education is perceived and also has certain implications regarding the purpose of education. There is a preoccupation with meeting the economy's demands for environmental expertise and environmental education is seen as a way of achieving this:

"FHE must surely give serious thought to its role in preparing students to take their place in a world of work where they will be increasingly expected to act as 'environmentally responsible individuals' " (p31).

This illustrates the report's commitment, when talking about the student body at large and not just the workforce, to environmental education as a way of meeting the needs of the economy by producing 'environmentally responsible individuals', whatever they may be. When consulted, the CBI replied that "industry's need is for an environmentally literate workforce" (p68). While there is nothing wrong with asking industry for their views on environmental education, these must be balanced by paying equal attention to the views of others such as students and educationalists. Unless this is done there is a danger that a new type of environmental education will be created - education for the economy. This would be unfortunate as it is difficult for environmental education to question aspects of environmental issues which relate to the way the economy is run if it is based on suggestions made by those who are responsible for its running.

The underlying assumption seems to be that education is a matter of matching people up with jobs, hence the greatest importance is attached to what employers view as desirable skills and understanding with respect to the environment. This raises the question of whose views matter when discussing environmental education. While it is unsatisfactory for one group with particular interests to dominate the debate, the significance attached to the demands of the market are partially justified

by the Toyne Report's terms of reference. The committee responsible for the report was appointed to:

"...review the current provision of environmental education in FHE in England and Wales, and identify priorities for its future development, with particular reference to the present and likely future needs of the workforce" (p15).

With the emphasis placed on the needs of the workforce, rather than on the environment or society as a whole, it is not surprising that the views of employers were so eagerly sought. However, just because particular reference is being made to the workforce this should not preclude consideration of the wider provision and purpose of environmental education. The terms of reference themselves raise some questions about the role which the government envisages for environmental education in FHE. Why has the scope of the committee been effectively narrowed by placing emphasis on the workforce? Why was the term workforce used? Whatever the reasoning behind these decisions, it would seem that the potential of the committee to look in depth at the wide range of issues surrounding environmental education has been deliberately limited.

One of the most significant restrictions on the report is its unwillingness to engage in the debate regarding the purpose of environmental education. While it recognises that there is "an area of sharp controversy...about what must be done" in response to the environmental crisis, it avoids the issue by saying that "It is not our business as a committee to enter in to these controversies" (p21). However, it is difficult to see how a rational basis for environmental education can be established without some exploration of these controversial issues. In fact, the report's broad, uncritical acceptance of the stance outlined in "This Common Inheritance" (p21) and its stated unwillingness to enter into areas of controversy is in itself a tacit ideological position. In any case it is not strictly true that the report has not touched upon some of the areas of debate in environmental education. By occasionally mentioning in general terms what it considers to be the way forward, the report alludes to its standpoint on environmental education without stating it clearly. For instance, although the attempt at defining the terms "education" and "environmental" separately on p16 is somewhat obsfucatory, it does show that, in the view of the committee, "an issue is thought to be environmental if it relates to:

- the responsible and sustainable use and reuse of natural resources, biological and physical;
- the prevention and/or control of local and global environmental pollution;

- the conservation and sustainable management of the natural environment;

or any combination of these (p16).

If "environmental" is defined in these terms then presumably environmental education is concerned with the conservation of the natural environment and the sustainable use of resources. In order to achieve these aims "far greater environmental understanding must be developed across the population at large" (p19) where environmental understanding refers to scientific knowledge of the way in which the natural environment works and how we are affecting it.

The importance of science to environmental understanding, which is suggested throughout the report, is made clear in the footnote on p80:

"8. In the sense that many pupils will have had to continue with Science beyond the point at which they might previously have dropped it, the National Curriculum should provide an improved foundation for environmental education in FHE."

Whether or not an increased focus on science is the answer is questionable.

Szerszinski et al (1996 p1) have argued:

"that the translation of things 'environmental' into authoritative scientific and policy vocabularies occurs in ways which could be described as, amongst other things, epistemologically 'realist', positivistic, disembodied, technological and cognitivist, and that it thus tends to mask important cultural, social and existential dimensions of the contemporary 'environmental crisis'".

In order to achieve the environmental understanding mentioned above the report discusses the idea of an institution "providing *all* its students with the opportunity to develop their environmental understanding to a given level (or even requiring them to do so)" (p79). Despite the language, "providing" and "opportunity" there is little doubt that this could lead to people being forced to acquire certain knowledge and values, an act of coercion justified by the apparent consensus concerning the nature of the environmental crisis upon which the report is based. However, it has been noted that:

"there is no consensus about the extent to which physical sciences should underpin environmental education, nor about the insights offered by the social sciences, law, philosophy and ethics" (HEFCE in Ali Khan 1996 p29).

One of the results of this misconceived consensus is the report's suggestion that there should be some uniformity of approach to environmental education across the country. This could be achieved by organising a programme which develops learning materials and disseminates good practice (p98) and by establishing an award scheme which recognises:

"outstanding achievement by individual institutions, whether in terms of the development and implementation of their environmental education strategies or in terms of their general environmental management" (p99).

The problem with such schemes is that they give a small group of people the power to decide what constitutes good practice and outstanding achievement in environmental education. The existence of common learning materials and criteria defining good environmental education are unlikely to stimulate diversity in environmental education.

This highlights the central flaw in the report. It approaches FHE with a preconceived notion of the nature of the environmental crisis and an agenda for resolving it. Hence subjects are looked at in terms of how they can implement the agenda which is unstated but largely based on "This Common Inheritance". For instance, environmental education in vocational subjects is seen as a way of helping and encouraging students to carry out their jobs in more environmentally friendly ways, environmental education in the natural sciences as a way of increasing students' understanding of ecological impacts in scientific terms and creative art as a "vehicle for the expression of environmental values" (p78). Perhaps instead of this approach different areas should be looking at aspects normally beyond their remit to help encourage interdisciplinarity and holism. For instance artists could look at the chemistry of the atmosphere, ecologists at philosophical dimensions of humanity's relationship with nature and while sociologists expressed their values through art.

Subjects should not be used as tools to help implement agendas imposed from outside. Instead they should be creating their own responses and agendas. If the environmental crisis is considered to be one part of a wider crisis of modernity rather than an isolated ecological problem then the perspectives of philosophy, economics, art and sociology are as important as those of natural science.

10.4.3 Conclusions

The following conclusions are drawn from the preceding discussion of the Toyne report:

- A clear definition of environmental education needs to be given along with the reasons for arriving at the definition thus exposing the assumptions and ideology underpinning the definition and making them open to debate;
- Environmental education should be justified on its own terms and not used as a way of meeting other agendas, such as that of the business community;
- Environmental education should embrace a range of disciplines and should not be based solely on natural science;
- Definitions of 'good practice' in environmental education need to be carefully examined;
- Common learning materials are of limited value;
- Environmental education should be as much a process of actively investigating the environmental crisis and responding to it as a way of implementing predetermined agendas for solving it;
- In order to encourage interdisciplinarity, a complimentary approach to environmental education could be adopted where, for instance, artists learn about ecology and ecologists about art;
- The wider processes of modernity need to be investigated and the environmental crisis placed in this context.

10.5 The review of the Toyne Report

10.5.1 Introduction

One of the recommendations of the Toyne Report was that a "national appraisal of the progress which FHE has made in the development of environmental education against the background of this report" should be carried

out. This review (Ali Khan 1996) and its implications for environmental education are discussed below.

10.5.2 Discussion

One of the main conclusions of the review was that little progress has been made in achieving the aims set out in the Toyne Report. The review goes as far as to say that there has been "considerable indifference to the Report's recommendations" (p2) and that "Hardly any progress has been made in respect of curriculum 'greening' " (p2). In the preface to the review, Toyne himself states that "lack of prescription has meant that very little progress has been made in taking forward the agenda" (p1). In response to this perceived failing of the report the review "sharpen up the agenda by setting more clearly defined targets to achieve" (p1).

Whether or not it was the lack of prescription in the report which led to the lack of progress, or a combination of other factors, is difficult to determine. What is known is that the recommendations in the review are based on this assumption. One consequence of this has been that a greater effort has been made to define environmental education. In fact, the term environmental education is replaced with "learning for sustainability" which aims to promote "responsible global citizenship". Thus Key Recommendation 1 (for Government) of the review states that:

"Responsible global citizenship should be recognised as a desired core learning outcome. 'Enabling responsible citizenship' should be recognised as a core business of learning institutions and a legitimate purpose of lifetime learning" (p3).

Key Recommendation 4 (for FHE Institutions) states that:

"Within three years all FHE institutions should have developed the capacity to provide all students with the opportunity to develop defined levels of competence relating to responsible global citizenship" (p3).

Responsible global citizenship (RGC) is clearly a central concept in the review, but what is it and how can it be achieved? The review defines it in the following terms:

“Responsible global citizenship is a useful catch-all phrase which includes an understanding of natural, industrial and economic systems and how they interact: in other words how the world works. The term also implies the development of a range of core skills which enable individuals to participate actively and creatively in society both as enterprising members of the work force and responsible members of a community. In short responsible global citizenship can be achieved through the acquisition and application of core knowledge and core skills” (p13).

Thus RGC would seem to involve a rather narrow view of “how the world works” if it is thought to be merely the interaction of natural, economic and industrial systems. One could argue that some understanding of, for instance, society, culture and history are also necessary to understand “how the world works”. As the core skills and language required for RGC are not defined it is difficult to judge whether these are what is required for people to “participate actively and creatively in society”, or even to tell what RGC is. There is a danger with “catch-all” phrases that their generality can lead to them being mean-nothing phrases.

Further clues as to the meaning of RGC are given in the review's “Learning Agenda for Sustainability and Responsible Global Citizenship” (p35). This consists of five core themes:

- Sustainable development;
- Holist viewing and systems thinking;
- Interdisciplinary perspective;
- Responsible citizenship;
- Management of change.

The agenda raises a number of questions. Sustainable development is described as including a “recognition that all life forms are intrinsically valuable and that human duties and obligations towards other species need to be reviewed” (p35). Does this mean that we should not try to eliminate the malaria carrying mosquito which causes the death and disablement of so many? The problem of bioequality was discussed in section 4.1 and it only needs to be added here that it is a matter which should be debated in environmental education, not imposed. Sustainable development is also said to recognise that “reducing people's demands

on natural resources and reducing waste will increase demand on their moral resources" (p35). Exactly what is meant by this statement is not clear, however it could be trying to suggest that a certain lack of morality is responsible for our present unsustainable practices and as a consequence of this is something which the learning agenda needs to address. The learning agenda is quite open about its aim of changing people:

"The overall objective of the learning agenda for sustainability is to enable learners to become responsible global citizens who have the knowledge, capacity and inclination to make personal and work-related choices and decisions which are in keeping with sustainable development principles" (p36).

In other words, people are free to make decisions, as long as they are consistent with the sustainable development principles. Again this raises some important questions. What if one disagrees with some aspect of the principles? Are the principles negotiable? Who decides what the principles are?

The learning agenda represents a desire for standardisation which has resulted in the creation of terms such as RGC and "graduateness" ("The generic attributes that might be expected of a graduate" p34). These concepts are invented then invested with authority and used as ways of guiding education. As such they need to be examined and the motivation and ideology underpinning them exposed.

Another initiative which is proposed in the review is the introduction of community service programmes to provide students with "the opportunity to practice being responsible global citizens" (p37) on the basis that student's "learn IT skills by practising IT skills, they learn to drive by driving" (p37). Thus becoming a responsible citizen is likened to learning to drive - it is a process of acquiring sufficient skill to be able to follow a set of rules without error. This is inconsistent with the active participation in society which one would expect to underpin citizenship and it is difficult to see how requiring students to take part in these schemes is the best way to achieve this. Perhaps there are other reasons behind the enthusiasm for community service programmes. For instance:

"The local community represents a business community - a local pool of customers for the services the institution offers - and in this context, institutions need to establish good customer relations" (p38).

This is an aim which community service programmes could no doubt facilitate. The review goes further:

"Another benefit (of community service) may be a revaluing of service as an honourable act, willingly undertaken by people from all walks of life and not seen as a form of punishment. If the UK is to profit from the predicted increase in employment in the service sector, its attitude to the concept of service needs to change" (p38).

It would appear that the idea of community service is being used as a cover for the promotion of the interests of business and the economy. Issues regarding ideas such as service and the relationship between the individual and the state are complex and should be debated rather than used as convenient justifications for actions. If one is aiming to reintroduce the idea of service then one should be open about it and make a detailed case for it rather than try to introduce it by the back door.

The need to produce the type of graduates demanded by the economy is a recurrent theme in the Toyne Report. Although the needs of the economy are mentioned less in the review, they are still an important consideration:

"The identification of RGC both as a core learning outcome and as an enhancement of employability would seem to be in keeping with calls for efficient delivery, breadth and commonality" (p34).

In fact it is doubtful that students will "demand learning to enable them to develop employability" (p12) which has led the review to conclude that there are "common learning needs which transcend the learning which individuals want" (p12). This may or may not be a controversial statement depending on one's view of the purpose and remit of formal education. Key recommendation 6 makes it clear that financial force is to be used as well as persuasion to achieve certain aims of the review:

"Within three years further and higher education funding councils should introduce some mechanism for linking environmental performance to the allocation of funds." (p15)

Regardless of whether one believes it is justified or not, coercing institutions into adopting agendas is likely to have certain undesirable outcomes. Institutions are going to become 'green' (in the funding council terms) not because they are committed to the environment, but because they are committed to getting funding. This sends out entirely the wrong signals about environmental policies and education as it reduces them to means of securing funding rather than

activities with their own intrinsic worth. It will also lead institutions to concentrate on visible greening which can be measured and assessed at the expense of other types of environmental initiatives which may be more important in the long run but less tangible and easily assessed.

10.5.3. Conclusions

The following conclusions are drawn from the preceding discussion:

- Concepts such as sustainable development and responsible global citizenship should have their meaning and underlying assumptions made crystal clear;
- Responsible global citizenship should involve a broader understanding of “how the world works” than that which can be achieved through the study of nature, the economy and industry;
- Education should not be used to enforce principles such as sustainable development;
- Educational agendas should be open to criticism and negotiation and their ideology and motivation exposed;
- The interests of students, society and the environment should not come second to the interests of the economy;
- Environmental education should not be used as a way of implementing other agendas and interests;
- The use of financial incentives to promote environmental initiatives is likely to be detrimental to the long term aims of environmental education.

10.6 Cross curricular greening in Higher Education in Britain

One of the problems with determining what is happening throughout Britain in terms of cross-curricular greening is the lack of reliable information. Because of the number of institutions involved, surveys have had to rely on brief, self-reported accounts which can be misleading as a result of simplification, generalisation and

bias. For instance, two institutions may answer in the same way when asked if they have a policy for environmental education, however this does not mean that the policies are in any way equivalent. In addition, individuals chosen to reply on behalf of an institution may be aware of the policy but unaware of its implementation. For instance, Willis (1994) notes in her survey that when LJMU was asked if it had established "a curriculum policy, statement, or progress towards a range of environmental courses?" (Willis 1994 p3) the response was "Yes - any course that is validated (new) or reviewed (existing) is obliged to demonstrate that it is considering the relevance of environmental issues in the curriculum" (Willis 1994 p11). However, this is contradicted by the results of the staff survey (section 17) which revealed that 19 out of 20 respondents in the School of Education and Community Studies were not aware of environmental issues being mentioned at validation. The question from Willis' survey also demonstrates the ambiguity of some items. A yes response to this item may mean that either a statement or a policy has been made or that "progress towards a range of environmental courses" has been made or some other combination of both.

The picture is further complicated by the desire some institutions may have to appear active in environmental issues. There is the possibility that institutions may be unwilling to expose their failure to implement an environmental policy and may instead overstate the importance of any initiatives in order to project a suitably green image.

Although it is difficult to draw firm conclusions about the overall or relative activity of institutions, certain trends seem to be emerging. The number of institutions with environmental policies appears to be increasing. Willis (1994) found that 13 out of the 51 institutions which responded had environmental policies in winter 1993, while the figures in autumn 1995 were 39 out of 65 (Ali Khan 1996 p9). Both Willis and Ali Khan make similar observations about the areas in which progress is being made:

"In most universities progress is being made on the service side. This can roughly be shown by the number of universities who have initiated recycling or energy efficiency measures (twenty-nine and thirty-two respectively) compared with the number of institutions which have adopted a curriculum policy (three). Indeed energy efficiency and recycling seem to be the only measures that have been successfully integrated into the everyday workings of a reasonable number of institutions. These statistics can be a little misleading, since often the motivations for such measures are cost-related..." (Willis 1994 p19)

"The implementation of environmental policy is at an early stage in both the further

and higher education sectors. Most progress has been made on improving housekeeping practices, particularly in areas where there are obvious cost savings, such as energy efficiency, or where the 'green ticket' can help institutions to introduce otherwise unpopular measures...Although a commitment to 'curriculum greening' is included in most institutional environmental policy statements, implementation has hardly begun." (Ali Khan 1996 p11)

These comments suggest that when it comes to actually implementing environmental policies, progress tends to be made where there are cost savings and other benefits to be gained. This may explain why there has been very little activity in terms of cross-curricular greening.

Despite the overall lack of progress, the following institutions were identified as 'trail-blazers' in the review of the Toyne Report:

Cheltenham and Gloucester College of Higher Education

University of Hertfordshire

Lancaster University

Middlesex University

North East Wales Institute of Higher Education

University of Northumbria at Newcastle

The Nottingham Trent University

University of Sunderland

The Surrey Institute of Art and Design
(Ali Khan 1996 p10).

The trail blazers were identified "from materials sent in by FHE institutions in response to the general call for best practice" (Ali Khan 1996 p10). Some examples of the environmental education initiatives which have taken place in these institutions are:

- “Cheltenham and Gloucester College of Higher Education offers a level 3 module entitled Environmental Quality and Tourism” (Roberts 1995 p41);
- “The University of Hertfordshire has established a particularly pro-active Environmental Responsibility Centre...the University of Lancaster has established a unit for innovation in HE which is speeding its development” (Toyne 1994 p1);
- Middlesex University has a Green Approaches to Community Liaison programme and uses its cross-institutional modular degree scheme to encourage individual and group projects on environmental themes (Goulding 1994);
- The University of Northumbria at Newcastle has put a lot of effort into greening staff development, arranging training days and producing an informative booklet on curriculum greening (Irvine and Manns 1994);
- Nottingham Trent University has developed a Master’s programme in Education for Sustainability and produced a teacher education pack for Teaching Through Controversial Issues (Plant and Firth 1995);
- The University of Sunderland has “pioneered two staff development courses on Environmental Responsibility” (Alabaster and Blair 1994 p7) and is “developing the theory and practice of environmental reporting through the World Wide Web” (Ali Khan 1996 p65).

These are examples of some of the environmental education initiatives which are taking place in trail blazing universities. However, this does not mean that they are necessarily suggestions for implementation as Willis (1994 p19) notes:

“The creativity with which individuals promote environmental issues is often the key to the success of the initiatives, and therefore it is difficult to list examples of good practice because initiatives that are successful in one university may be totally inappropriate in another.”

It is therefore up to individual universities to develop and implement their own strategies for cross-curricular greening which are suited to their particular circumstances.

11. BARRIERS TO ENVIRONMENTAL EDUCATION

In section 8 some of the pros and cons of different modes of implementing environmental education were discussed and these are now put in context by considering some of the factors which constrain the implementation and teaching of environmental education. There are different barriers to environmental education depending on what type of education is being discussed, whether it is formal or informal, primary, secondary or university. In addition, it is important to distinguish between barriers to the implementation, teaching and learning of environmental education. Although the range of barriers varies between, for instance, implementing environmental education and teaching environmental education, there are also common features. Thus, although the main concern here is to identify the barriers to environmental education in teacher education, some of the barriers to other types of environmental education are considered. In order to make the cross-curricular greening of teacher training most effective, it is necessary to be aware of the barriers they are likely to face in their subsequent employment as well as in their immediate education.

Ham and Sewing (1987) identified four categories of barriers to environmental education in American public schools: conceptual, logistical, educational and attitudinal. Of these, they found the primary barrier to teaching environmental education to be lack of time, due to too many other curriculum responsibilities and a lack of preparation time. Lack of instructional materials and lack of funding were also thought significant. In a recent case study of an American school, Samuel (1993) found that the main impediments to implementing an environmental education project were: (1) conceptual problems about environmental education, (2) poorly defined school philosophy and goals, (3) difficulties in co-ordinating the project between individual efforts and departments, (4) a hiatus between administration and teacher perceptions. In "Let's Reach Out" (WWF 1994 p12), the authors observe that "without professional development, teachers will find curriculum development fragmentary and unsatisfactory" and "without institutional development, curriculum and professional development can't be effectively articulated". Hence, professional and institutional development need to go hand in hand. Tomlins and Froud (1994) suggested that environmental education INSET was constrained by limited INSET funding, lack of time and perceived low priority. In "Biodiversity: The UK Action Plan" (DoE 1994a p120) the range of factors which could limit the speed of progress on environmental and biodiversity matters is listed:

- **Conflicting curriculum pressures and problems in the definition of biodiversity as a concept within environmental education;**

- The fact that biodiversity and environmental education are not generally a component of other examination subjects;
- The amount of preparation in initial teacher training (ITT);
- The availability of suitable INSET programmes;
- The availability of suitable published materials.

While these are primarily the barriers to biodiversity, there is reason to believe that they may also act as barriers to environmental education in general.

While looking at environmental education in ITT, Shallcross (1996) identified five types of barriers to innovation: conceptual, logistical, attitudinal, educational, and structural. The first four categories are the same as Ham and Sewing's (1987), and a fifth has been added - structural. In 1990 Williams carried out a survey of environmental education within ITT and found the following factors were constraining it (Williams 1992):

- Difficulties relating to time, staffing and resources in support of environmental education;
- Lack of expertise and experience of staff, particularly with regard to the cross-curricular and holistic dimensions of environmental education;
- Competing priorities within institutions;
- Other demands on students' time and energy; their attitude towards environmental education was possibly influenced by experience in school;
- Institutions were seen as ill-prepared to introduce environmental education;
- Uncertainty as to what constitutes environmental education;
- Monitoring and assessment was seen as problematic.

In order to develop a "realistic model" for pre-service training, Oulton and Scott (1995) tried to identify the characteristics of pre-service programmes and listed them as follows:

1. it is difficult to find space for new initiatives as courses are short and densely packed;
2. the curriculum is already full of "necessary" and fully "justified" content which will be defended by special interest groups;
3. EE (environmental education) is not seen as a real priority by curriculum planners and senior managers, even when they see it as important;
4. most tutors are currently not willing to incorporate EE within their specialist subject didactics programmes, even if they could see some justification for doing so; nor are they *able* to because they lack the skills, awareness, and motivation to do so;
5. novice teachers have their own set of priorities which they bring with them from prior experience of diverse kinds;
6. novice teachers have not seen EE prioritised by their own educational experiences, and are motivated through pre-service courses by the need to develop their own competence as a teacher;
7. institutional policies might exist, but are unlikely to be fully followed through in practice;
8. courses tend to be reliant on experience in schools to further and nurture the professional development of the novice teacher and EE is not always firmly and positively located within a school curriculum (adapted from Oulton and Scott 1995).

Section 9 mentioned the barriers which had been identified throughout Europe. Based on the reviews in Brinkman and Scott (1994), the following were identified:

- Subject specific nature of EE/lack of interdisciplinarity;
- Organisational problems;
- Conservative nature of teacher education;

- Lack of time to teach EE;
- Lack of appropriate teaching materials;
- Lack of qualified staff;
- Ambiguities within and uncertainties about EE.

Smyth (1988) has noted that in general, perceptions of environmental education are a problem. It is seen as a peripheral activity compared to the main purpose of education which is to act as a means of entry to higher education and employment. This is the sort of idea which could act as a barrier to all sorts of environmental education.

The barriers discussed so far are to environmental education in the general sense. When specific types of environmental education are looked at different barriers appear. For instance, one would not expect the barriers to a nature study approach to environmental education and a classroom based expository approach to be exactly the same as they place different demands on staff and resources. Greenall Gough (1993) has argued that the socially transformative dimensions of environmental education are difficult to realise because of the institutionalised practices of schools and the practical classroom theories of many teachers. In addition to this, half of the studies discussed above have relied on information from teachers. The barriers identified in these are therefore the barriers to environmental education as teachers perceive environmental education. Given that uncertainty regarding its purpose and scope was expressed more than once, these results should be treated with caution. If the fundamental difference between environmental education as it is perceived and as it should be is not recognised there is a danger of misinterpreting the actual barriers and focusing attention on the wrong areas.

There are notable differences between the barriers identified by teachers (Ham and Sewing 1987; Samuel 1993; Tomlins and Froud 1994) and those by researchers in teacher training (Williams 1992; Oulton and Scott 1995; Brinkman and Scott 1994). For instance, lack of funding and uncertain school philosophies were only mentioned by teachers, while lack of expertise, competing demands on students' time and energy and competing curriculum priorities were only mentioned in relation to ITT. However, there was also considerable overlap with the following being mentioned by both groups:

- Lack of time;

- Lack of materials;
- Conceptual problems about environmental education;
- Problems of co-ordination;
- Perceived low priority of environmental education.

Although these barriers are similar to those reported by staff at I.M.Marsh (see section 17) they differ markedly from the following list of constraints identified by UNESCO in 1977:

- Lack of adequate funds;
- The inflexibility of curricula in schools and institutions;
- Neglect and lack of determination by educational policy-makers and planners;
- The inadequate training of personnel - even in those countries where there are sympathetic policy-makers and enlightened teacher educators (in Williams 1992 p2).

Some of the apparent differences may be due to the ways in which the constraints are expressed. Although lack of funds does not seem to be the problem that it was, lack of time and materials do. It is possible that there is not as much difference as may first appear as a lack of funds could manifest itself as a shortage of materials and as lack of time through understaffing. Neglect and lack of determination by educational policy makers and planners may be a manifestation of the perceived low priority of environmental education highlighted above. Similarly, the inflexibility of curricula in schools and colleges could lead to some of the problems of co-ordination, and the inadequate training of personnel could be the reason for some of the conceptual problems people have about environmental education today. It would seem that the underlying barriers to environmental education have not changed that much, although the ways in which they manifest themselves have. This may be deceptive though: just because some of the barriers appear to be the same does not mean that the causes of the barriers are. It is possible that some of the conceptual problems may have arisen because of the changing nature of environmental education and the increase in scrutiny of it and debate surrounding its purpose. In any case, those engaged in environmental education should be encouraged to debate and question its purpose

rather than accept a definitive account from "experts," many of whom have their own conceptual difficulties to wrestle with. The way in which the barriers are identified and categorised could lead to an over-simplification and misreading of the actual situation by hiding some of the changes that have occurred. There have been considerable changes in school education in recent years with the introduction of the National Curriculum, and in the role of teachers and teacher education. There has been a deprofessionalising of teaching which has changed the role of teachers from that of creative, reflective professionals to technicians whose job it is to *deliver* a preset curriculum. Huckle (1993 p64) has argued that teachers are being "proletarianised and deprofessionalised by changes in work practices and management consistent with post-Fordism". There is increasing emphasis on neutral knowledge and skills and less consideration of the wider social context in which actions take place which is making it more difficult for teachers to be reflective and critical.

12. SUMMARY OF PART B

The purpose of section B was to look at the historical development of environmental education and its current practice so that their implications for cross-curricular greening could be highlighted. Some of the key findings are outlined below along with their links to other parts of the thesis.

The barriers to environmental education in Initial Teacher Training (ITT) vary depending on the particular situation, whether the barriers are to teaching, learning or implementation, and depending on what form of environmental education is being referred to (144). Despite this, there seem to be certain factors which have persistently acted as obstacles to environmental education over the last twenty years:

- Lack of time;(145)
- Lack of materials;(147)
- Conceptual problems about environmental education;(147)
- Problems of co-ordination;(147)
- Perceived low priority of environmental education.(147)

These need to be addressed in ITT but the changes in education in recent years make this increasingly difficult. In addition, only paying attention to these problems may not be an adequate response as each situation needs to be analysed and dealt with individually. Environmental education in ITT institutions varies considerably within and between countries and what works in one setting may not be appropriate in another (78). It is for this reason that the next section attempts to place the theory and practice of environmental education discussed thus far in the context of the ITT which takes place in LJMU at the I.M.Marsh Campus. While the recommendations for I.M.Marsh are specific and inapplicable elsewhere, the analyses they are based on and the process by which they have been arrived at could be applied more widely. This approach is similar to that adopted in the EEITE project which offers " principles for planning...together with a range of exemplars" (Oulton 1996 107).

The status of environmental education in the National Curriculum and Whole Curriculum is of particular importance for environmental education in ITT. It is important that trainee teachers are aware that there is more to environmental education than that which is outlined in the official documentation (i.e. SCAA 1996, NCC 1990). There should be an attempt in ITT to counter the imbalances in these

documents such as the emphasis placed on the natural environment and field studies and on the importance of individual action (117). Knowledge of ecology and guilt at the environmental damage caused by one's actions should be balanced with an understanding of the political, cultural and socio-economic contexts in which these actions take place. The influence that the wider social structure has on our actions and ways of changing it should be a central feature of environmental education.

Investigation and criticism of the dominant worldview needs to be encouraged so that people think about what life could be like, rather than just what life is like (115). This requires a sense of possibility and belief that change for the better is possible. When investigating environmental issues, trainee teachers need to be aware of the limitations of factual evidence and the danger of accepting statistical data as objective and inherently superior to other, qualitative sources of information (116). Science is not the only method of investigation and basis for making decisions. This is particularly important given the bias towards science as the medium for environmental education in the revised National Curriculum. Besides, the development of an active, enquiring mind is more useful than the production of one stuffed with specific, factual knowledge. The potential of English, Design and Technology and History as ways of teaching environmental education need to be investigated and exploited as they provide opportunities to broaden the framework in which the environment is placed beyond science(122).

Overall, environmental education should not be presented as an unproblematic and agreed field. The controversial aspects of many environmental issues, disagreements over the purpose of environmental education, and disagreements over the way in which it should be researched should be explored by trainee teachers as there is more to environmental education than the narrow education about the environment recommended in the revised National Curriculum (SCAA 1996). It should be borne in mind that there are many different definitions of environmental education and that there are a range of factors which determine these(97). When considering a definition of environmental education, one should try to see how it was arrived at and the factors which influenced it. While different factors have different implications for environmental education, the overriding conclusion is that there is a need for interdisciplinarity among those working in environmental education so that they are able to communicate properly and fully understand one another's positions. A proactive attitude should be encouraged and students should be aware that although environmental issues are often controversial and sometimes complex, this does not mean that they are insoluble.

The tendency to portray environmental education as merely a learning context for other subjects which requires little extra effort from teachers, rather than a subject with its own demands and *raison d'être*, should be avoided as it is liable to do more

harm than good(123). On the other hand, one strategy for implementing environmental education in some schools may be to get those in schools used to the idea of environmental education, even if it is of a fairly conservative nature study type, then develop it once it has become an accepted part of the curriculum(128). This may be easier in some situations than trying to get a more radical type of environmental education adopted from the start.

Finally, although lack of materials is a persistent problem in environmental education, the use of materials sponsored by corporate bodies is not recommended as they are liable to do more harm than good in the long term(122).

While the above observations are of a general nature, the next section examines the specific context at LJMU for environmental education. By placing the work of the previous sections in this context the analysis of environmental education in theory and practice is complemented by an awareness of the opportunities and constraints which LJMU represents. Although the three sections are closely linked by the progression from the theoretical to the applied to the immediate, observations made at the end of each section are autonomous and rooted in arguments presented in the section. Despite this, more obvious links can be made for certain issues. For example, the conclusion that environmental education should encourage probing and critical examination of environmental issues (p71), combined with the conclusion that concepts such as sustainable development should have their meanings made clear (p140) may lead one to think that the Greenhaus project should be developed in a way that led to the consideration of such questions. There are many different ways in which the recommendations can be combined, rather than one “right” way, depending on one’s views and the circumstances in which one is operating. Because of this, the emphasis in this work has been on explaining the reasoning underpinning the different elements of a strategy for environmental education.

PART C - THE IMPLICATIONS OF THE LJMU CONTEXT FOR CROSS CURRICULAR GREENING

13. UNIVERSITY AND SCHOOL MANAGEMENT

13.1 Introduction

The School of Education and Community Studies is one of the largest in the university (see Appendix B for a brief overview of it). Although the various schools within the University have some autonomy, the aims and operation of the School of Education and Community Studies is broadly consistent with that of the University as a whole. The School's mission statement "...is derived directly from the Mission of the University and reflects its nine core principles" (Bell 1997 p1) and is expressed as follows:

"Striving for excellence by working in partnership with education, business and industry to develop enthusiastic, competent and independent graduates"
(Bell 1997 p1).

The policy and strategy of the School are influenced by a range of factors, the most important of which are the Teacher Training Agency (TTA) intake targets and related information about core funding. Also important are data "pertaining to funding from the HEFCE and the success of the School's enterprise activity" (Bell 1997 p2).

13.2 Potential Barriers to Cross-Curricular Greening (CCG)

There is an overriding concern with financial pressures and this is reflected in the School's research policy which is designed to:

- **Make explicit the expectation that all members of staff should engage in some form of research or research based professional development;**
- **Promote the development of a limited number of major projects that will incorporate a team approach to project management, that will result in income generation;**

- Encourage and enable staff to bid successfully for external funding;
- To consolidate and build upon the 3a rating in the 1996 Research Assessment Exercise (Bell 1997 p18).

Research seems to be perceived primarily as a way of generating income or improving the School's research rating. Although there is an expectation that all staff should be involved there is no overall vision of the purpose of research beyond fund raising. For instance there is no mention of the role research could play in pushing back the frontiers of knowledge, stimulating staff, enhancing the students' education or anything else which benefits the participants. The School's research policy is designed to benefit the finances of the School and in this sense is self-serving. It could be argued that this is the inevitable result of the structures imposed on universities, such as the Research Assessment Exercises, which determine how they operate.

Financial pressures determine many of the School's other priorities:

"This School, like most others, is driven by the need to meet its student number targets and to retain those students throughout their courses. This has the highest priority. It is important to avoid any drawback of funds by the TTA" (Bell 1997 p23).

This approach is reflected in the university's policy towards the local community. While acknowledging that the "community use of the facilities on the I.M.Marsh Campus...adds significantly to the quality of life for many families in the local area" the School is only willing to offer these facilities "as long as it remains cost effective" (Bell 1997 p23). This is in spite of the inconvenience that the School creates for locals in terms of parking and disturbance.

Employment conditions are based on "prudent financial management" which involves "fixed term contracts to give flexibility and to ensure that appointments are appropriate to the needs of the School" (Bell 1997 p22). The interests of employees, for whom fixed-term contracts provide no long-term security and are often inadequate, are subordinate to the well-being of the School. This lack of commitment to staff compares unfavourably with the University's willingness to commit large sums of money to capital projects and executive posts. The inconsistency between this large scale investment on the one hand and fiscal conservatism on the other has not gone unnoticed by staff. Recent industrial action on 19 November 1996 was taken when a pay rise in line with other sector pay awards was sought. By February 1997 an award of 2.5% was made to all academic staff and 3.5% to manual staff. It is

perhaps no surprise that 52.5% of university staff and 56.8% of ECS staff rated their pay as bad in the Staff Feedback Survey (LJMU 1997). This financially prudent approach does not foster the atmosphere of goodwill towards the University which is required for initiatives such as cross-curricular greening to succeed. As cross-curricular greening requires the support of a wide cross-section of staff, for many of whom it would mean extra work, it is unlikely to succeed where a significant proportion of staff are demoralised or disenchanted with the university.

The recent Staff Communication and Attitude Survey carried out by Austin Knight (1997) presents a confusing picture of the University as a place considered by many to be a good place to work yet where:

- Morale is very low and people are worried about the quality of academic achievement;
- Pressure, lack of recognition and insecurity are uppermost in most people's minds;
- Pay is an issue for all levels in the university (Austin Knight 1997).

However, the fact that people agree that "I enjoy working for JMU" (67%) (LJMU 1997) but disagree that "Morale is high at JMU" (77.2%) (LJMU 1997) is not necessarily contradictory. It suggests that those who enjoy working for JMU are more likely to spend time on an activity which is designed to help JMU, i.e. filling in a questionnaire. As the dissatisfied may well be less likely to return the questionnaire, the picture may be worse than the results suggest.

Besides the School's concern with financial success, there are other factors which could act as barriers to CCG. Firstly, there is an "extremely unfavourable" staff-student ratio (SSR) of 28.3:1 and "inadequacies in existing teaching accommodation" (Bell 1997 p20). The SSR is of particular concern as lack of time to teach and lack of time to prepare teaching materials were cited as the two most significant barriers to cross-curricular greening by staff in the School (see section 17). This is backed up by the Staff Feedback Survey (LJMU 1997) in which 62.8 % of university staff and 68.8% of Education and Community Studies staff said they were dissatisfied with their workloads (Austin Knight 1997). Secondly, the School's current Strategic Plan is based on narrow conceptions of both the environment and of education. In section 5 of the Strategic Plan, "Quality of the environment", the focus is firmly on the campus environment, its teaching space, security and cleanliness. There is no mention of the actual or potential impact the School could have on the

wider environment either directly through its actions or indirectly via the educational experiences of those who work and study here. Although most of the courses at I.M.Marsh are vocational, it is important that they have elements which are not directly related to the students' employment prospects. This is important for all students, especially trainee teachers. If education is perceived as being simply about increasing one's ability to do a job then this will give the impression that employment and economic productivity are by far the most important aspects of life. This narrow utilitarian view of education is unacceptable and is incompatible with humanistic and emancipatory ideas of education and with the aims of much environmental education.

13.3 Responsibility For Cross-Curricular Greening

In order to facilitate cross-curricular greening an individual or group within the school needs to take responsibility for its development. Given the barriers to CCG discussed elsewhere (see above and section 11) this post requires enthusiasm for, and knowledge of, environmental education and the resources to develop and implement a strategy for CCG which has campus-wide support. Although this thesis outlines a strategy for CCG which may be of help in doing this, there is still much work to be done. Funding may be required to free up the time which needs to be devoted to CCG if coherent and long-lasting change is to be achieved.

Under the present management structure it would appear that the Assistant Director (Quality and New Developments) may be best placed to take some responsibility for the promotion of CCG as it is a new development and “the overall responsibility for helping colleagues in all programmes to improve the quality of what is offered to students” (Bell 1997 p3) falls within the Assistant Director’s remit. The Assistant Director may want to use the Quality and New Developments Committee as a forum for discussing the best ways of implementing CCG. As the School Learning Methods and Resources Committee “ensures that teaching and learning developments are related to the whole School context” (Bell 1997 p11), it may have a role to play in ensuring that any greening that takes place is cross-curricular and related to the wider School context. It could instigate a task group on cross-curricular greening in order to inform the process.

The alternative to making someone within the present management structure responsible for CCG is to create a new post whose purpose would be to develop and implement CCG. This could be someone who currently works in the School, someone from another part of the university, or someone from outside the university. On balance, it would probably be easiest for someone who knows the School well to decide on the most appropriate ways of implementing CCG, although someone new

to the School would have the advantage of providing a fresh perspective. One of the most important factors in determining whether this post is successful or not is the amount of time the appointee can devote to it.

Regardless of who is made responsible for CCG, it is important that they liaise closely with the University's Curriculum Greening Working Group once it is established. It was recommended in the Environmental Management Unit's "Curriculum Greening" report that this group should be established as a sub-committee of the Academic Board and should include "members of staff designated as responsible for curriculum greening by school directors as suggested in the Environmental Policy and Action Plan"(Small and Blythe 1996 p12).

13.4 Opportunities for Cross-Curricular Greening

There is a range of factors which limit the amount of change which is possible in the School. Some of these are general, such as the lack of time and resources many staff feel they have, while others are specific to CCG, for instance lack of knowledge of environmental education amongst staff, or the perceived lack of relevance of their subjects to environmental education. While initiating change in an institution such as the School is difficult, initiating change in the name of something which is not fully understood or perceived as relevant is liable to be even more difficult. Whoever is given responsibility for CCG will have to look at ways of overcoming the factors which act as barriers to environmental education and to institutional change within the school.

One way of avoiding some of the barriers to institutional change is to look at the changes that are likely to occur in the future anyway and see how these could be of benefit to the process of CCG. For instance, the School is keen to make staff and students more computer literate and aware of the benefits of IT-based learning methods. Indeed, part of the TTA guidelines are that teachers should "have sound knowledge of Information Technology (IT) and of its contribution to their specialist subjects" (TTA 1997). Perhaps an environmental education computer aided learning package could increase knowledge of IT while achieving some of the aims of environmental education. The School's commitment to staff development and the "dissemination of good practice" (Bell 1997 p13) may also provide opportunities for CCG or at least raise awareness of it amongst staff. One Whole School Meeting, entitled "How green is my campus? Towards a better working environment on the I.M.Marsh campus", has already been held (see section 14) and there is scope for more of these initiatives. The education of staff is important as there are already courses within the School which could contribute to CCG in ways which are not

always immediately obvious. Environmental education tends to be associated with the natural environment and those working outside this field tend not to see how their subject relates to the environment (see section 17). In their report on curricular greening across the whole university Small and Blythe (1996) identified 13 modules with an environmental theme, all but three of which were concerned with the natural environment. The scope of environmental education needs to be much broader and several authors have demonstrated the relevance of environmental education to a diverse range of subjects such as English, Art, RE and PE (see, for instance, Goodall (1994), Collett and Karakshian (1996)). In the context of I.M.Marsh, courses such as Philosophy, Applied Community Studies, Consumer Studies and Food, Health and Nutrition could be easily related to the environment, and almost all subjects have some relevance which may not be immediately obvious.

Before embarking on any programme of change it is important that the most is made of what already exists and this applies to both the curriculum and the campus. For instance the Greenhaus project has potential, as yet mainly unrealised, for initiating and facilitating environmental education. It is well placed to act as a focal point for cross-curricular greening and could be developed in a number of ways (see section 16).

13.5 Summary

While adopting an opportunistic approach to cross-curricular greening has the benefit of avoiding some barriers it is not ideal and should not be thought of as a long-term solution. Such an approach may lead to educational initiatives which are inconsistent with the aims of environmental education. It is also liable to be piecemeal and is no substitute for a coherent strategy. However, in the short-term it provides a way of starting the process and raising awareness of environmental education amongst students and staff which is a pre-requisite of CCG. This is clearly urgently required as staff were not even asked if they had heard of the University's Environmental Policy in the Policy Documents section of the Staff Feedback Survey (LJMU 1997).

The following recommendations are made in order to illustrate the type of changes which may need to be made in order to facilitate the process of CCG. One of the main conclusions drawn from analysing the School's Strategic Plan is the importance of recognising that financial security should not be pursued to the exclusion of other aims. There needs to be an expanded definition of success, *outlined in word and demonstrated by deed*, which takes into account staff morale,

the School's standing in the local community, and the fact that research needs to be treated as more than a means of securing funding. Also important are:

- Improving the staff:student ratio;
- Improving teaching facilities;
- Broadening the way in which the environment is perceived;
- Emphasising the non-vocational, life-enhancing dimensions of education.

This is a deliberately ambitious set of aims and could be criticised as being unrealistic and idealistic. It is important to remember that there have been considerable changes in higher education over the last 10 to 15 years and universities have been increasingly exposed to the demands of the free market with subsequent emphasis on cost-cutting and competition. The context in which universities operate has changed dramatically and, although most have responded to this, not all would agree that this has been to the benefit of either students or universities. With the recent election of a new government, ostensibly committed to "education, education, education" (Tony Blair, widely quoted in the media, April 1997), there may be more opportunity for reform of higher education than there has been for years. This is therefore not the time to accept the education system as a *fait accompli* but to start a debate regarding the sort of education system we wish to have in the next millennium.

The recent review of higher education "Higher Education in the learning society" (NCIHE 1997) is part of this debate and sees an expansion in higher education as essential to the maintaining of a competitive economy:

"When capital, manufacturing processes and service bases can be transferred internationally, the only stable source of competitive advantage (other than natural resources) is a nation's people. Education and training must enable people in an advanced society to compete with the best in the world" (NCIHE 1997 p9);

"The economic imperative is, therefore, to resume growth (in higher education)" (NCIHE 1997 p9);

It employs free-market rhetoric and recommends that students contribute more to the funding of higher education:

"The level of investment needed in a learning society is such that we see a need for those who benefit from education and training after the age of 18 to bear a greater share of the costs. As a result, we expect students of all ages will be increasingly discriminating investors in higher education, looking for quality, convenience, and relevance to their needs at a cost they consider affordable and justified by the probable return on their investment of time and money." (NCIHE 1997 p11)

Reducing higher education to a financial transaction in which students seek a "probable return on their investment of time and money" has implications for environmental education. The likely shift in focus from the idea of higher education as a broadening of one's horizons and more general training of the intellect to vocational courses and bankable skills could be damaging to the prospects of environmental education. Students' enthusiasm for environmental education may become partially dependent on whether or not they see it as an activity which helps them gain an advantage in the competitive jobs market. This pressure could in turn lead to developments in environmental education which serves the interests of employers rather than the environment.

On a more positive note, the review may be of some benefit to environmental education if its proposals to encourage interdisciplinary research are implemented. It was noted that "the competitive nature of the RAE and its strong subject focus has discouraged interdisciplinary work." (NCIHE 1997 p185) and the review thus recommended that:

"...the Funding Bodies and the Research Councils commission a study to evaluate the funding of interdisciplinary research, including the incentives and disincentives. The report should be ready to inform the next Research Assessment Exercise" (NCIHE 1997 p186).

At LJMU, an immediate start can be made to encourage cross-curricular greening in the School of Education and Community Studies by adopting some of the following measures:

- **Make someone responsible for CCG - either by creating a new post or by appointing someone from within the current management structure;**
- **Whoever is made responsible should liaise with the University's Curriculum Greening Working Group once it is established;**

- **Barriers to CCG need to be analysed in greater detail and ways of overcoming them devised;**
- **In the first instance, areas where change is occurring may be used to facilitate CCG thereby raising awareness without additional resource demand;**
- **Raise awareness of the potential links between current teaching and environmental education;**
- **Make the most of current initiatives and realise the potential of the campus, as it is, for environmental education.**

14 I.M.MARSH CAMPUS OPERATION

14.1 Introduction

The purpose of this section is to highlight ways in which the I.M.Marsh campus (see Appendix B for a map of the campus) could be improved in terms of its impact on the environment and the working conditions of staff and students. It is worth trying to do this for three reasons. In the first instance it represents an opportunity to improve the quality of life of those who work and study on the campus. On average, a full time member of staff will spend up to one quarter of their time at I.M.Marsh, and although this figure varies considerably between individuals, it is a large proportion of their lives. Secondly, through waste production, purchasing policy, and use of energy and materials there is a direct effect on the quality of the local and global environments. Finally, the state of the campus and the manner in which it operates represents one of the unofficial lessons students are taught when they study here. Features such as the presence or lack of recycling facilities, cycle parking, or litter, for instance, imply things about the university's relationship with the environment. Orr (1994b p25) has called the design of academic buildings a "kind of crystallised pedagogy full of hidden assumptions about power, about how people learn, how they relate to the natural world and how they relate to each other". Whether this is true or not, it is important for educational establishments, particularly those universities which have signed the Toyne Report and the Talloirres Declaration, to "practice what you teach" to avoid being hypocritical.

14.2 Sources of Information

14.2.1 The Whole School Meeting

In order to find out what the staff's views of the I.M.Marsh campus were, to provide suggestions for ways in which it could be improved, and to raise the staff's awareness of environmental issues and the university's environmental policy, the whole school meeting on 22/ 5/96 was organised around the idea of the environment and entitled "How green is my campus? Towards a better working environment on the I.M.Marsh campus". Twenty three people attended the meeting and after a brief introduction explaining the purpose of the meeting they were split up in to seven groups, each of which was given a map of the campus with an area of it highlighted (see Appendix B). The groups then spent an hour examining their area and noting

what was good and bad and the possible improvements that could be made. After tea, one person from each group spent five minutes reporting their findings.

This was followed by two third year Outdoor and Science Education students who described plans they had for developing part of the site into a "green" garden and teaching resource. Their case study showed the potential that areas of the campus have for enriching the working, learning and green environments simultaneously. The afternoon was rounded off with a presentation by Dr Richard Small, the university's Environmental Policy Officer, on the development and current state of the university's Environmental Policy.

14.2.2 Questionnaire

Ten days before the meeting, a programme of events and a short, thirteen item questionnaire, which was a revised and annotated version of an earlier staff survey, was sent to all members of staff in the School of Education and Community Studies. The questionnaire (Appendix A3) was designed to (a) give all staff the chance to say what they liked and disliked about the campus and suggest how it could be improved and (b) to get some idea of the academic staff's perceptions of environmental education. 75 were sent out and 17 were returned completed.

14.3 Findings

Many interesting observations and suggestions were made, some specific to certain parts of the campus, others more general. These have been grouped under the following headings:

- Transport;
- Security;
- Energy use;
- Waste;
- Land use;
- Site maintenance/operation;

- Aesthetics/appearance;
- Social/cultural environment;
- Educational facilities;
- Good points.

It is difficult to assess the relative importance of the comments from the frequency with which they occur as some, i.e. litter, may be mentioned more often because they are highly visible, ubiquitous problems, whereas other equally important issues are mentioned less because they are particular to one area and less obvious. Also the fact that the meeting and survey had the environment, which people tend to associate with certain issues and aspects of their lives, as their themes meant that some features of the campus were more likely to be noticed and considered relevant.

14.3.1 Transport

The manner in which staff and students travel to the site has a major effect on both the site and those travelling. This was highlighted by frequent criticism of the parking arrangements: four of the seven groups mentioned car parking as a bad point. It was described as irregular, overcrowded, disorganised and inadequate. It is often difficult for visitors to find a parking space and many people have to park on Barkhill Rd creating congestion. There is no area reserved for motorcycles and bicycle parking is inadequate. Lack of bike racks has led to bikes being chained to railings which in some cases has blocked disabled access. Comments such as "The procrastination over car parking improvements is a disgrace" demonstrates the level of feeling which this generates amongst some staff. Despite the concern about this issue there were few specific suggestions from the staff for improving the situation, apart from adding more cycle racks. One person pointed out at the Whole School Meeting that efforts had been made to get more cycle racks but that these had been frustrated by lack of available money. The university's rolling programme of adding facilities for ten bikes a year was criticised as inadequate.

In order to relieve some of the pressure on car parking spaces we need to either (i) reduce the demand for car parking, (ii) increase the supply of car parking, or (iii) have a combination of both (i) and (ii). There are problems associated with trying

to do either of these things. If the demand for car parking is to be reduced difficult decisions have to be made as to whether it should be done by devising ways of encouraging people to use other forms of transport or by imposing restrictions. Restricting access means that someone has to decide who can park where. Restricting parking raises some difficult and sensitive questions as it is an issue which tends to come high on the list of staff concerns . There are also significant difficulties with increasing the supply of car parking, not least of which is the question of where the extra parking space comes from. While many staff may agree in principle that there should be more space in order to make parking easier, in practice some green areas of the campus may have to be sacrificed to provide it. Considering that the green areas were the most commonly cited good point about the site, three of the groups and eight of the questionnaire respondents mentioning them, turning them into car parks may not be a good idea. There is also the possibility that increasing the availability of parking could encourage people to drive to work in the same way that new roads generate new traffic. We would then find ourselves with the same problem as before, minus some money and greenery. Given the social and environmental costs of car use, encouraging it can hardly be considered ideal in an institution committed to the environment.

What is required is a coherent transport policy which encourages and aids those wishing to use alternatives to the car without penalising those who quite legitimately want and need to use their cars. Some possible measures are:

- Car sharing;
- Improved cycling facilities - racks, showers etc.;
- Loans for season tickets, bike purchase;
- Encouraging the council to build bike lanes;
- Minibus between Marsh and town;
- Motorcycle parking;
- Improved management of the current traffic flow and parking.

It is worth noting that since the meeting some of these measures have been put in place, for instance, loans for bus season tickets and bike purchase and the minibus service.

14.3.2 Security

Lack of security, in particular the threat of thefts, was cited by two of the groups and three of the questionnaire respondents as a problem. This can not only create anxiety but it can also have knock-on effects. For example, because cars and possessions have been stolen from Holmefield some staff leave lights on and park their cars under their windows where they can see them. In this way one problem, lack of security, can lead to others, i.e. energy wastage and poor car parking.

Several suggestions were made to make the campus more secure. Access could be more tightly controlled by introducing a barrier system or by planting prickly hedges around the perimeter. Better lighting of dark areas, particularly in winter, and removal of the rhododendron bushes were also suggested as ways of making the site safer.

The size and layout of the campus means that, short of erecting some impassable barrier all the way around the perimeter, stopping someone who is determined to gain access would be very difficult. Having some sort of system where people have to show ID to get through a barrier only works if you can ensure that these points are the only ways of getting in, something which would be very difficult, expensive to achieve and would inconvenience everyone without necessarily being of great benefit to anyone. Improving lighting in some areas is worth considering as the library is open until 9pm and there are often staff and students around then. Before taking any action some information needs to be collected on what the actual and perceived security risks are on the site. When and where have thefts occurred and how could they have been prevented? Is there any evidence that the rhododendrons pose a threat? Are those in the halls or using the library happy with the current arrangements? Any changes made should be in response to a wide ranging survey of staff and students, not based on the anecdotes and perceptions of a few.

14.3.3 Energy Use

A great deal of energy is used on the campus in a number of ways such as heating, lighting and powering electrical appliances. In 1992/93 the total cost of water, gas and electricity at I.M.Marsh was £106,825 (LJMU 1993 p4). In addition to the financial cost of this are the environmental effects of our energy use. These depend on how the energy is generated, transported and used. Methane is often considered a clean fuel and compared to coal or oil which produce sulphur dioxide and nitrogen oxides, thereby contributing to acid rain, it is. However, burning

methane produces carbon dioxide which is a greenhouse gas and is thought to be the main cause of global warming, although there is still some controversy regarding this (see, for example, Pearce 1997). Even before it is burned methane is a very effective greenhouse gas and emissions from leaks in the transportation process are also potential contributors to global warming. Besides its direct environmental effects, methane should be used sparingly because the reserves are limited. Estimates vary but at present extraction rates North Sea gas will last approximately 50 years. It is also a high quality fuel in that it can be stored, transported and used efficiently without having to be converted into other forms. Unfortunately the "dash for gas" since the privatisation of the energy industry means that gas is being used very inefficiently. Because gas-fired power stations are quick and cheap to build, with payback periods of 2 to 3 years, many have been built in order to provide dividends for shareholders. Gas is burned and converted into electricity in the power stations wasting a lot of the energy, then transported to customers who in some cases convert it back to heat in order to cook. The net result of this is that less than 10% of the initial chemical energy is used. It would be more efficient to use gas in ways that exploited its quality as a fuel rather than its potential to make money.

Most of this may seem irrelevant to the environment at I.M.Marsh, however it is important to remember that we are inextricably linked to the rest of the global environment and have the ability in some situations to affect it. As a consumer of large amounts of energy and other resources we are in a position to put pressure on those we buy from to act in ways consistent with the stance taken in our environmental policy, in this case to use gas more wisely.

There are clearly strong financial and environmental reasons for maximising the efficiency with which we use energy. In order to do this a detailed energy audit of the site is required. This would supply information on the amounts of energy used on various parts of the site at different times and provide a basis for energy management and monitoring and targeting.

We use energy for a wide variety of applications such as heating, lighting, computers, air conditioning, kitchens and laboratories and the amount each of these requires varies considerably according to the time of day and year. A range of ways of saving energy was suggested at the whole school meeting. Lights could be turned off when rooms are not in use. Given the frequency with which lights are left on unnecessarily it may be worth considering timer switches or some sort of automatic switching system which uses sensors to turn lights off when a room is not in use. Diffusers behind all lights and low energy/long life light bulbs could also be used.

Heat was wasted in some cases by leaving doors open which could be easily rectified with spring closures. Some buildings, notably the Egg Dance Studio, have large glazed areas. This can present problems with temperature control as the room

tends to be too hot in the summer and too cold in the winter. Windows in the dance studio are opened to cool the building when it is hot which results in the noise from the studio disturbing some of those working nearby. Secondary glazing could help keep it warm in winter and spectrafloat glass could be used to regulate the temperature. However the Dance Studio presents unusual temperature control problems because of its function. Maintaining a comfortable temperature for those rehearsing is difficult because as they dance their activity heats the room. Changing the glazing and heating systems of a building is expensive so it would be unwise to make any proposals without finding out if the present features are inadequate and what the actual requirements of those using it are. The possibility of placing solar panels on the roof of the primary base for generating electricity or heating water was mentioned as a way of saving energy. Hot water could be heated and pumped to the nearby dance studio showers. Whether or not solar energy would be practical in terms of its efficiency is open to question as the time when there is most sunshine coincides with the summer holidays when the site is least used. However, the design, maintenance and operation of a solar energy site would provide interesting material for student projects and would also raise the profile of renewable energy and symbolise the university's commitment to it.

14.3.4 Waste

A variety of different sorts of wastes are produced on the site and the principles of refrain, reuse, reduce and recycle should be applied in order to minimise the amount that has to be disposed of by landfill or incineration. There are sound environmental reasons for doing this, as well as the added financial incentive of the new landfill tax, and a recent University Factfile (Issue 94) announced an environmental campaign emphasising the reduction and reuse of resources. Some of the major sources and types of waste are:

- Paper;
- Water;
- Aluminium and steel cans;
- Textiles;
- Furniture;

- Laboratory waste;
- Canteen waste;
- Garden waste.

A number of suggestions were made by the staff for reducing our waste. Paper could be saved by having more recycling bins, particularly next to places where a lot of paper is discarded, such as photocopiers. The amount of paper used for circulating memos could be reduced by making them smaller and encouraging the use of e-mail, bulletin boards and notice boards as alternative means of communication. The amount of photocopying by staff and students could be reduced by having adequate copies of key readings available for consultation in the library. The lack of recycling facilities was one of the most commonly cited bad points with three of the groups and questionnaire respondents mentioning them. As well as paper, aluminium and steel cans, plastics and textiles could be recycled. There is furniture and office equipment in the shack which, though surplus to requirements here, may be of use to some others. At the moment the canteen uses disposable cups, cutlery and plates. Reusable items may have higher financial cost than disposable ones but this has to be weighed against the hidden costs of wasting resources. Using disposables helps staff and students to become accustomed to throwing things away and justifying their use on the grounds that they save money sends out a clear message about the university's priorities.

The above suggestions for waste reduction are fairly self-evident and based on a brief review. As with energy, in order to make a coherent and rational set of proposals for waste reduction the first step is to carry out an audit of where, why, when and how different types of wastes are produced and disposed of. Once this has been done it is possible to draw up a list of options and decide which are worth pursuing.

14.3.5 Land Use

The most frequently cited good feature of the campus was that it is a spacious green site and three of the groups and eight of the questionnaire respondents praised this aspect. This, however, should not be a reason for complacency as some felt that much land and space is wasted. A range of suggestions were made for improving the land use and these can be divided roughly into aesthetic improvements and functional

improvements whose purpose is to make the site a better place to use. These categories are not strict as functional changes can often lead to aesthetic improvements and vice versa. Some possible aesthetic improvements are:

- Removal of litter, sponsored cleanups;
- Bird boxes;
- More plants in general, and around fences in particular;
- Murals on some external walls and other pieces of environmental artwork;
- Renovation of the concrete plant pots;
- Establishment of a wildlife pond.

The following is a list of possible functional improvements which could be made to the site:

- Seating areas;
- A garden;
- Renovating and reusing the greenhouses;
- Renovating and reusing the shack;
- Design of an environmental trail;
- Make the tractor entry official;
- Reuse the area next to the asphalt;
- Build a handball court;
- Build a barbecue.

14.3.6 Site Maintenance and Operation

Opinion seems to be divided as to whether the site is well maintained or not, probably depending on the standards of maintenance the individual is accustomed to and the part of the site they are familiar with. Someone whose office provides them with a view of the shack every day could be forgiven for thinking maintenance inadequate. In fact, it is difficult to make a general statement about the site as some areas are well kept, other areas less so.

One suggestion that met with a general murmur of approval at the Whole School Meeting was that there should be an assured finish to all maintenance work. There should certainly be more communication about proposed work. Those who will be affected should be consulted for advice on the appropriateness and timing of the work. Failure to do this can lead to avoidable expense and inconvenience as was recently shown by the decision to paint the Science Block. Someone from outside the school decided, without inspecting the building or consulting anyone who used it, that the building required redecorating and arranged for painters to come in on certain days. The first that anyone in the Science Block knew of this decision was when they were informed that they would be unable to use their rooms between certain dates. Not only was this inconvenient, as exam boards were due to meet during this period, it was an unnecessary inconvenience and waste of money as it was generally agreed that the building was not in need of redecorating. This example shows the importance of consulting before acting. Several specific suggestions for improving maintenance were given:

- Stricter enforcing of the no food or drink in teaching areas rule;
- Removal of litter;
- Keep the notice boards tidy and up to date.

It was pointed out that the students bear some of the responsibility for maintaining the site and some have been guilty of neglecting it in the past. It may be worth considering ways of raising their awareness of the campus and involving them in realising its potential. Finally, it was suggested that more attention should be given to the environmental psychology of the site.

14.3.7 Educational Facilities

Some of the features described elsewhere in this report, such as the environmental trail or garden, could be described as educational facilities in that they have potential for use in educating people. However, the emphasis in this section is on existing educational facilities and how they could be improved.

The tiered lecture theatre was criticised for having inadequate audio-visual facilities and being poorly designed in general. The library could be improved by increasing the amount of study space and, as noise is a distraction, establishing areas where groups could work together and discuss assignments without disturbing others. Having multiple copies of readings available would lower the demand for photocopying saving paper, students' money, and the time wasted queuing for photocopiers.

Seminars for staff on practical aspects of environmental issues, for instance energy saving techniques, was suggested and could be a useful way of helping them to live in a more environmentally friendly way and incorporate some of the issues in their teaching. More sharing of educational facilities, information and expertise should also be encouraged, perhaps with some sort of register of expertise and resources which could be consulted.

14.3.8 The Social and Cultural Environment

An easily forgotten feature of the campus is the socio-cultural environment. It does not spring as readily to mind because it is not as visible as the physical environment and is not as strongly associated with our preconceptions of green issues. Despite this it is still important, especially as there are a large number of residential students, that the site should benefit the mental and physical health of its users and realise its potential as an enjoyable place to work and study.

There is more to this than merely making the campus a more pleasant place. It has been argued that avoidance of environmental disaster requires radical changes in society and in the way we live our lives, individually and collectively. If this is the case then we should examine the role that the campus can play in facilitating these changes. We should ask how it can encourage the interests, values and lifestyles compatible with the transition to a sustainable society, and also question what these values are. This is a contentious issue and as such there is no definitive answer. Despite this, it has been argued (see section 5) that we should encourage such things as critical thinking and independence of mind. At the same time we should be

questioning the materialistic basis of our consumer society and thinking of the society and lives we would like to have.

This is obviously a tall order but there are certain ways in which the campus can contribute to these aims. We are well placed to encourage students to take part in activities such as music, art, drama and photography that would benefit them creatively and socially while helping them to develop lifestyles which are more stimulating and environmentally sustainable. The facilities and expertise exists to set up, for example, an I.M.Marsh Music Society which could provide a focal point for people who wished to play together to meet, and for beginners to receive some instruction and encouragement. The sports facilities could be used to encourage more healthy lifestyles and leagues for team games set up. Speakers and debates could be arranged and cultural events such as exhibitions, musical and dramatic performances could be organised. It may also be possible to get students involved in developing the site and local environmental and community projects.

The main barrier preventing most of these things from happening is co-ordination and their success depends on someone being prepared to initiate and administer them. This would probably be too time consuming for a full-time member of staff so a student co-ordinator along the lines of the Societies Officer would be a better idea. This would be an interesting and rewarding role and could provide a suitably motivated individual with useful experience.

To summarise, a range of cultural and sporting societies and events, arranged by a student co-ordinator, would be beneficial by promoting better:

- Mental and physical health;
- Social contact;
- Environmental values and lifestyles.

14.3.9 Positive Features

As well as highlighting the shortcomings of the site and thinking of ways it could be improved, it is important to recognise what the positive features are so that they can be preserved and consolidated upon. If they are not known there is the risk that the things people like about the site will not be discovered until they are gone. For this reason, it is desirable to find out what these features are and consult widely when changes are proposed before deciding what action should be taken. It would be ironic if one of the good points of the site was lost when trying to make improvements in

response to complaints about a bad point. For instance, one of the most common grievances is that car parking is overcrowded and inadequate. A possible response to this would be to increase the area available for car parking. However, the fact that we have a nice, green site with lots of grass, plants and clean air was cited by three of the groups and eight of the questionnaire respondents as being a positive aspect and this could be diminished by building another car park. Clearly this is the sort of conflict of interests which makes it important to look at the possible effects of any change and to consult before decisions are made.

After the "greenness" of the site the other most frequently cited good points were:

- It is well maintained (2 groups, 2 questionnaire respondents);
- It is spacious and flexible (2, 2);
- It has diverse flora and architecture (2, 1);
- It has a lot of potential for development (1 group);
- It has keep fit classes (1 questionnaire respondent).

14.4. Summary and Action Plan

There are some actions which can be made, or at least initiated, immediately and some of these are listed below. However, many of the flaws of the site cannot be dealt with satisfactorily without gathering more information. Unfortunately the views of only a small proportion of the people who use the site are represented here because of the low turnout at the meeting and return rate of the questionnaires. This highlights one of the problems faced by anyone who is interested in improving the site: apathy. If people are not interested in getting involved with the process of improvement then it will be an uphill struggle. Clearly more needs to be done to demonstrate the potential of the site and get more people, both staff and students, interested in realising some of its potential. The Whole School Meeting and questionnaire were designed to be a first step in this direction. Other information that is required includes:

- An assessment of the security risks and arrangements;

- An energy audit;
- A waste audit;
- A literature review of books and articles on campus operation;
- An overview of best practice elsewhere.

Staff and students need to be consulted not only to raise the profile of the environment but also to avoid bad decisions and unwanted actions being made. In order to alleviate the car parking problem a coherent transport policy based on wide consultation is required, not a few isolated actions based on the views of a small group. Some other proposals could be acted on :

- We should ensure that the principles and practices of those companies the university deals with are consistent with those of the university's environmental policy;
- The security arrangements should be improved based on a review of current practice and consultation;
- In the long term an energy management strategy based on an energy audit should be developed;
- In the short term energy efficiency should be encouraged, i.e. closing doors and turning off lights;
- In the long term a waste policy based on a waste audit and the principles of refrain, reduce, reuse and recycle should be developed.

In the short term other actions should be taken to reduce our waste production:

- The provision of more recycling facilities;
- Reducing the amount of paper used in memos through the promotion of alternative media;
- Reducing photocopying by putting copies of readers in the library;

- Using non-disposable cutlery and crockery in the canteen;
- By making the equipment in the shack known and available to those who want it.

The land use on the campus could be improved by adopting some of the functional and aesthetic improvements suggested in section 14.3.5. Some of these have been done since the meeting, notably the creation of a garden with a barbecue, mural and wildlife pond and the renovation of the greenhouses. In order to improve the operation of the site the following are suggested:

- Obtaining an assured finish to all maintenance work;
- Enforcing the ban on food and drink in teaching areas;
- Better maintenance of the notice boards;
- Raising the awareness of the need to maintain the site amongst the students.

Finally, two improvements which could be made in the teaching facilities would be to upgrade the audio-visual equipment in the tiered lecture theatre and to look into ways of increasing the amount of study space in the library. Of particular value would be the creation of an area where students could work in groups without disturbing others. Perhaps the shack could be renovated and turned into a group study annexe of the library.

While the actions listed above would go some way to improving the site they should not be thought of as an end but rather as the beginning of an ongoing development process. In order to keep things moving, to consolidate on actions made and to generate new ideas, someone needs to act as an environmental co-ordinator. Although this role could be combined with that of the proposed social/cultural co-ordinator it would probably be best to keep them separate as they involve different skills and interests. In addition, it would be better if the environmental co-ordinator was a member of staff so that they could carry out the functions over a longer time scale thereby providing the continuity required. They would be responsible for developing an environmental policy and action plan for I.M.Marsh after consulting staff, students and the environmental policy officer and implementing it.

This is not going to be without its problems as there are barriers to overcome such as:

- Lack of money;

- Lack of interest amongst students and staff;
- Conflicting interests relating to certain issues, such as car parking;
- Lack of time to help amongst staff;
- Lack of knowledge to base decisions on.

It may be possible to get funding from industry for certain projects such as the solar panels and some money could be obtained from educational consultancy with initiatives such as the environmental trail, education centre and garden. This does not mean that the process of improving the environment could or even should be self-financing. The university must be prepared to back up its green rhetoric with some financial backing if this is to be more than an academic exercise. When deciding whether or not something should be done all the costs and benefits, including the environmental and social, as well as the financial ones, should be taken into account. If profitability is the only criterion by which decisions are made there is little chance of lasting improvement.

A positive step was made recently when £500 was made available to two students who wanted to renovate the greenhouses and area behind the science block. Anyone who has witnessed the growth of the Greenhaus project (see section 16) would have to agree that it has been money well spent. In some ways, though, the most difficult days are ahead. The exciting, transformative stage is over and the more mundane but vital task of nurturing and maintaining the garden is at hand. There is a risk with this and environmental policies in general that too much attention is paid to the first phase at the expense of the maintenance and this is something that should be borne in mind by those involved.

As was mentioned earlier, apathy is a barrier to change and needs to be overcome. Staff and students need to be involved and consulted to facilitate change and help resolve conflicts of interest. Even those who are interested may feel that they do not have the time or knowledge to get involved and this is where an environmental co-ordinator could help by making it easier for people to contribute.

One of the most beneficial ways of gathering the information and proposals required to develop the site would be to combine it with educational initiatives. For instance competitions could be held to find the best designs for how parts of the site could be changed to improve the environment and/or provide educational facilities. Student projects could gather information required by carrying out, for example, waste and energy audits. They could investigate the issues surrounding some of the

proposed changes: what would be the environmental effects of increasing car parking? What are the attitudes of staff and students to this? What about residents of Barkhill Rd? What conflicts arise and how do you decide between different options? Not only would projects such as these inform the development of the site, they would also provide stimulating real-world situations to investigate giving the students a chance to see the results of their work being used and giving them a sense of ownership and involvement in the site. It is the latter that could be the key to the long-term transformation of the I.M.Marsh Campus.

15. UNIVERSITY-WIDE CHANGES

15.1 Introduction

Over the last few years several university-wide changes have occurred which have significantly altered the context in which cross-curricular greening can take place. Three of these were the restructuring of the academic year, the introduction of a modular system and the development and implementation of the university's environmental policy.

15.2 Semesterisation

LJMU moved from a traditional three term academic year structure to one which consists of two semesters in 1994. In itself the change to semesters has few implications for cross-curricular greening, however it is possible that in the future a third semester could be brought in to fill the summer vacation thus facilitating the introduction of two years degrees (Donnelly 1994). Such courses would appeal to many students facing the prospect of three years of debt accumulation and would thus give the University an advantage in attracting students.

While it may be possible to transfer all the curriculum from three years to two this does not mean that the two types of degrees represent the same learning experience. Much of the learning, personal development and wider understanding of one's discipline that makes University education so valuable takes place outside formal settings such as the lecture theatre and lab. In addition two year degrees could lead to demoralised staff as their introduction would probably lead to increased teaching workloads thereby decreasing the opportunities for staff to carry out their own research. Lack of research would affect the quality of teaching and staff who do not have the time to carry out their own research are unlikely to have time to devote to helping implement cross-curricular greening. For these reasons it seems less likely that cross-curricular greening and the holistic, interdisciplinary understanding required for environmental education would flourish with the introduction of two year degrees.

15.3 Integrated Credit Scheme (ICS)

The University operates an Integrated Credit Scheme which allows students to choose some elective modules in addition to the core modules for each programme which all students have to take. In practice the amount of freedom of choice which students have is limited, particularly on vocational degrees such as teaching. Small and Blythe (1996 p8) have noted that:

“In general ICS structures allow, but do not facilitate, inter-school co-operation. This isolation is exacerbated by the school structure and devolved budgeting which discourages joint teaching of modules by staff from different schools. This at best causes some modules to be one-sided, at worst leads to duplication of module content or even of staff”.

The ICS system makes cross curricular initiatives difficult as it divides subjects up into separate compartments which are then assessed individually. Exams have to be taken in the same semester as the module and cannot be based on the knowledge of more than one module. There is therefore no incentive for students to make links between different subjects which they study during their degree. Detailed, specialised knowledge of separate topics at one point is rewarded rather than any form of integrative thinking.

15.4 LJMU Environmental policy

15.4.1 Development of the policy

The University's current environmental policy has its origins in the "Statement on the Environment" (Factfile 15/02/91) made by the Liverpool Polytechnic Green Task Group in 1991. Times change - the Polytechnic is now called John Moores University, the Green Task Group has metamorphosed into the Environmental Awareness Committee and the current Policy Statement on the Environment and Action Plan is a distant relative of the original Statement on the Environment.

Two events have been particularly significant in the development of the environmental policy: the establishing of an Environmental Policy Unit in late 1992 and the publishing of the Toyne Report in 1993 which provided the impetus for policy development:

"In response to the DFE report Environmental Responsibility, the Environmental Policy Unit, in consultation with the University community, has prepared a comprehensive environmental policy statement with an action plan for its implementation" (Factfile issue 3/10/94 Issue 54).

The LJMU "Policy Statement on the Environment and Action Plan" was adopted in July 1994 after a couple of years of debate and university-wide consultation. It was developed through an iterative process under the guidance of the Environmental Policy Officer who devised and repeatedly revised the policy in response to feedback from the Environmental Awareness Committee, students and staff.

In autumn 1996 the Environmental Policy Unit, consisting of the Environmental Policy Officer and the Environmental Policy Assistant, changed its name to the Environmental Management Unit (EMU). This was done "As a reflection of the evolving environmental agenda within JMU" (Blythe 1996 p1). As the environmental policy was complete, although subject to ongoing review, the Unit's emphasis shifted from policy development to implementation of the action plan. The EMU also stated that it would:

"provide ongoing communication on environmental activity, awareness training on environmental matters and will lead the challenge to implement the recommendations of the Toyne Report" (Blythe 1996 p1).

The importance of the Toyne Report and Review in determining the EMU's agenda was reiterated in its recent mission statement:

"The Environmental Management Unit is the executive body charged with developing, co-ordinating and monitoring the implementation of JMU's Environmental Policy. It is responsible for strategic direction of the University in relation to environmental improvement and the challenge to implement the recommendations of the 1996 Toyne Review of Environmental Responsibility" (EA 97/04 attached to EAC agenda 16/05/97).

The Environmental Management Unit is due to merge with the Health and Safety Unit in September 1997 to form the Health, Safety and Environment Unit (HS&E) for the following reason:

"The creation of the new HS&E recognises and reinforces the relationship between health and safety provision, environmental management and the University's desire

to provide a clean, healthy and safe learning and working environment” (HS&E 1997 p3).

15.4.2 Implications of the environmental policy for cross-curricular greening

One of the general principles of the environmental policy states that the University is committed to "ensuring the appropriate environmental content is present throughout its academic programme". The Academic Provision section of the environmental policy expands on this principle and has as its objective "To monitor the environmental academic course provision of the University". This objective is expressed in five specific goals:

- To promote those programmes and modules which lead to, or form part of, a specialist environmental qualification;
- To identify those programmes and modules which contribute to environmental 'updating' for those already in employment;
- To identify those courses and modules which contribute to the development of environmentally responsible individuals;
- To encourage the incorporation of environmental issues and consideration into all programmes offered by the University;
- To designate a member of staff in each school to encourage the integration of environmental perspectives into programmes within that school.

The last two goals represent the cross-curricular greening elements of the policy. While it is to be welcomed that there is a recognition of the need for some form of environmental education to be present in all programmes, the nature of the environmental education proposed and the level of commitment to it is difficult to determine from the policy. However, given the policy's aim of implementing the recommendations of the Toyne report and Review it would seem logical that the policy's views of environmental education and cross-curricular greening are consistent with those outlined in the reports. If this is the case then many of the criticisms in sections 10.4 and 10.5 will hold for the environmental policy.

The EMU recently produced a report entitled "Curriculum Greening: A Report on Undergraduate Environmental Course Provision" (Small and Blythe 1996).

This report sets out the University's view of environmental education in greater detail and recommends that:

"A Curriculum Greening Working Group (CGWG) be established as a sub-committee of the Academic Board to stimulate discussion on environmental education, specifically the recommendations of the 1996 report *Environmental Responsibility - the Toyne Review and Taking Responsibility - Promoting Sustainability Through Higher Education Curricula*".

The report goes on to recommend that the "Common Learning Agenda for Environmental Responsibility" outlined in *Taking Responsibility* (Ali Khan 1995) should be adopted. It also lists "environmental responsibility indicators" adapted from *Taking Responsibility* and suggests that these should "form the basis of the remit of the CGWG". Clearly the *Taking Responsibility* report is an important influence on cross-curricular greening at JMU.

Some reservations have already been expressed regarding the usefulness of common agendas (see 10.4.2). In addition, there are some specific concerns with the Common Learning Agenda for Environmental Responsibility. While it is encouraging that "social scientific approaches" (Ali Khan 1995 p14) are recognised as relevant to environmental education, their role only stretches as far as helping students "to understand the nature and status of scientific evidence and analyse its social implications" (Ali Khan 1995 p14). In other words, science is still perceived as being the appropriate form of discourse on environmental matters. Although other disciplines may be valued for their ability to clarify scientific knowledge, the environmental crisis is still perceived as a fundamentally scientific problem which can be solved through a better understanding of natural science.

This is reflected in the learner outcomes of the Common Learning Agenda for Environmental Responsibility (Ali Khan 1995 p11) which emphasise the need for scientific understanding. While it is important to have a sound grasp of the scientific principles which explain how the natural world works, this is not enough on its own. It is just as important to understand the socio-political and philosophical dimensions of the environmental crisis and to appreciate that these problems can be thought of as, for instance, aspects of larger cultural or economic crises (see section 3). Instead of putting environmental problems in these wider contexts the Common Learning Agenda emphasises the role of individual's actions in solving, and thus creating, environmental problems and in doing so narrows its focus.

It is difficult not to wonder whether there may be a hidden agenda as well as a learning agenda as the Common Learning Agenda "fits well with the increasingly familiar 'wish-list' of graduate qualities identified by employers" (Ali Khan 1995

p13). It could just be a fortunate coincidence that the education required to produce environmentally responsible citizens fits so well with employer requirements. Alternatively, those who have had input into the Common Learning Agenda may have been influenced, consciously or unconsciously, by the demands of employers. Business and industry were well represented on the Taking Responsibility Steering Group with representatives from the CBI, ICI, the TUC, The Business and Technology Education Council, the NFU and the International Chamber of Commerce making up 6 of its 16 members.

Whether these criticisms of Taking Responsibility and, by association, the University's plans for cross-curricular greening are of practical, as well as theoretical, interest depends on to the extent to which the action plan is implemented. In terms of cross-curricular greening, Small and Blythe (1996 p11) noted that: "There has been no co-ordinated, University-wide activity within this sphere". Professor Toyne has noted that within LJMU:

"We have also made a beginning, albeit very tentatively, on the extremely difficult and contentious matter of 'greening the curriculum'. We have made an encouraging start, though progress is frustratingly slow." (HS&E 1997 p2)

The establishing of a CGWG and the designation of a member of staff in each school to encourage the integration of environmental perspectives could help with cross-curricular greening and recent evidence suggests that this may happen in the near future:

"The Vice-Chancellor has expressed his intention to establish a Curriculum Greening Steering Group during the Academic year 1997/98. The campaign to implement the recommendations of the 'Toyne' Review relating to the curriculum will be spearheaded by the Curriculum Greening Development Officer; resourced through the Provost's Office. All Directors of School will identify a member of their staff to take responsibility for curriculum greening in their area of discipline." (HS&E 1997 p18)

However, it should be borne in mind any individuals given this responsibility need to have considerable motivation and resources in order to succeed.

Most of the progress that has been made in implementing the action plan has come about where there are committed individuals and potential cost-savings. This is a pattern that has been repeated throughout Higher Education (see section 10.6). The impetus for improvements in areas such as paper recycling and waste reduction was provided by the introduction of the landfill tax as much as by the environmental

policy. Progress in areas which do not provide any opportunities for cost-saving, such as cross-curricular greening, has been slower and as a result LJMU was not identified as a "trail blazer" in the Toyne Review. However, it should be noted that there are some doubts about the way the trail blazers were identified as the list was "compiled from materials sent in by FHE institutions in response to the general call for best practice included in the survey of Vice Chancellors and Principals" (Ali Khan 1996 p10). It therefore favours those institutions which are adept at self-publicity.

Regardless of whether or not LJMU is a trail blazer, the difficulty that there has been in obtaining funding for the environmental policy suggests that its priority and profile could be higher. In the recent Staff Feedback Survey (LJMU 1997) there was a section which asked staff about their awareness of a series of University policies and initiatives such as the Equal Opportunities Plan and Vision for the Millennium. The environmental policy was conspicuous by its absence.

15.5 Conclusions

- The introduction of two year degrees should be resisted;
- There should be a forum established, perhaps the CGWG, which can encourage inter-school co-operation and find ways of overcoming the compartmentalisation of subjects;
- Debate regarding the purpose of cross-curricular greening and environmental education should be encouraged within the University instead of the uncritical acceptance of the Toyne Report, Review, and Taking Responsibility. These should be used to "stimulate discussion" not "form the basis of the remit of the CGWG";
- The priority and profile of the "Policy Statement on the Environment and Action Plan" need to be raised.

16. GREENHAUS CASE STUDY

16.1 Introduction

Greenhaus is an environmental education project which consists of a garden, pond, seating area, newsletter and internet site. Its aim is to provide examples of sustainable living and "positive learning experiences for participating LJMU students, staff, local community groups, schools, businesses and agencies" (Greenfile 19/05/97).

It was decided to investigate the Greenhaus environmental education project in order to highlight the problems and potential of this initiative and also to shed some light on the general process of cross-curricular greening at I.M.Marsh. The observations in this section are based on information from three sources:

- A file containing minutes of meetings, copies of memos and other communications connected to Greenhaus;
- An interview with the Greenhaus Co-ordinator, Richard Jackson, carried out on 01/07/97;
- Regular informal contact with those involved in Greenhaus.

16.2 The development of Greenhaus

Greenhaus was set up in the spring of 1996 by two fourth year Outdoor and Science Education students as part of their honours projects and became a charitable company limited by guarantee with a co-ordinator, trustees, members and volunteers in the winter of 1996. The company was set up in order to keep the project going once its founders left and was preferred to making Greenhaus a university resource as it was thought trust status would:

- Make funding easier to obtain;
- Make Greenhaus more respectable and taken more seriously;

- Ensure that environmental education remained the primary aim and not come second to University PR or income generation. (minutes of Greenhaus meeting 13/12/96).

As the project proceeded its emphasis shifted from using the garden for demonstrating how school grounds could be utilised in teaching to looking more at the ways in which it could provide positive examples of sustainable living for a wider range of people on Merseyside. The draft vision and aims which Greenhaus adopted are outlined in the minutes of Steering Group Meeting 2 (26/2/97):

"Greenhaus will exist to provide and promote environmental education, seeking to improve the quality of life and of the environment by developing the knowledge, skills, attitudes and practices necessary to live and work sustainably in the urban environment".

Its Draft Aims were:

1. To promote practical sustainable living initially in Merseyside;
2. To develop an environmental education resource at I.M.Marsh consisting of a centre of exemplary environmental practice and training which involves the organisation, the building and the grounds;
3. To develop mechanisms by which this resource will be effectively utilised and valued by LJMU students and staff, local schools and the wider community.

The draft Greenhaus business plan in the Steering Group Meeting Record 3 (18/3/97) outlined some of the reasoning behind Greenhaus:

"One in ten people in Britain today belong to an environmental organisation. This is an indication of the current level of interest in environmental issues.

However, while happy to support these organisations on their behalf, these same people are unsure how to make a difference to global environmental problems through their own actions and general lifestyle. This is unfortunate as it is this grassroots action that provides the best solutions...

...There is a general and local unfilled need, therefore, for an example of an 'environmentally sustainable' lifestyle, at an individual and organisational level,

which forms the basis of a training programme in 'living sustainably', targeted at the needs of each participant or group".

This implies that the environmental crisis is largely the result of the ignorance of individuals which leads them live to unsustainable lifestyles. The solution is therefore to provide us each with "a training programme in 'living sustainably' ". Whether or not this is true is debatable and should indeed be one of the issues debated as part of environmental education. One of the problems with the Greenhaus view is that its "approach to environmental education reflects that currently advocated by central government, environmental charities and Agenda 21" (minutes of Steering Group Meeting 2 (26/2/97)). Although these are not all the same they do not, by and large, encourage active debate of the fundamental issues in environmental education.

16.3 Problems with Greenhaus

Certain barriers have arisen as Greenhaus has developed. In the Management Plan (13/12/96) the following weaknesses were identified:

“• Outgrowing organisational arrangements:

5 people running it:

2 very busy lecturers

2 very busy students due to leave in 6 months time

1 busy volunteer who will have to take the next job going

Co-ordination of activities bigger job than a part-timer can do.

No agreed medium or long-term vision.

- Activity is seasonal and clashes with exams and holidays
- Risks are high - no security of tenure, low income.
- Only one student at "What next?" meeting.
- Perception of group as student project; assumption that it is short lived.
- Little formal market research into client base”.

It was suggested that Greenhaus needed "a formal relationship with JMU" before it could make any progress (Memo from Richard Jackson to Dave Huddart 13/1/97) and "a clear, shared idea of why the organisation exists, what we are trying to do and how we are trying to do it" (Greenhaus Steering Group Meeting Record 22/1/97). There was also evidence of the University being unable to match its theoretical commitment to the project with material support, for example:

"We look forward to future collaboration in this exciting and worthwhile project, but you must bear in mind the difficult financial constraints that the University is under at the moment" (Memo from Elaine Prisk, Assistant Director of ECS to Richard Jackson 28/1/97).

"I am convinced of the value of the project to our students and staff - but it must be balanced with other calls on our limited income" (e-mail from Elaine Prisk to Dave Huddart, 14/2/97).

The interview with the Greenhaus co-ordinator, Richard Jackson, highlighted some of the problems which have been encountered by the project. When asked what the main problems had been, the following were mentioned:

- An inadequate supply of volunteers, particularly from the student body, due to lack of time, awareness and interest;
- Lack of a clear strategy and plan.
- Ownership and control of the project.

As well as these problems, a chicken and egg situation had arisen which meant that funding was difficult to obtain without a clear, detailed strategy and plan while, on the other hand, it was difficult to devise a strategy or plan without some longer term funding and security. Finally, "university politics" was cited as a factor outside the control of Greenhaus which acted as a barrier. This was not necessarily a reflection of the particular situation in the School but rather the inevitable result of the relatively low priority given to projects such as Greenhaus within universities. Although there was a great deal of encouragement and verbal support for the project, competing priorities meant that the school was not always able to provide as much resources as it would have liked.

In addition to the logistical problems noted above, the Greenhaus definition of environmental education is problematic in that it is underdeveloped and is based, in part, on an uncritical acceptance of Agenda 21 and the Government's view of environmental education. There is the danger that Greenhaus will become a means of showing people how to live sustainably without encouraging them to question the concept of sustainability. However, the most recent Draft Strategic/Business Plan for Greenhaus (11/8/97) suggests that it is moving away from this approach to one encouraging more active participation which involves asking "local experts and communities to help develop answers". There is also the possibility that the enjoyable, gardening element of Greenhaus could result in the project being perceived as a leisurely means of escape from the problems of the world rather than a means of confronting them. While there is nothing wrong with gardening as a pastime it does not, on its own, constitute environmental education. However, the gardening element of Greenhaus could lead into other issues relevant to environmental education by, for instance, asking questions such as:

- What does "organic" mean? (This could lead into issues concerning the concept of nature)
- Why is organic produce more expensive? (This could lead into an examination of the way the economy works and how we price nature and evaluate environmental risks)
- Do we need modern intensive farming? How does the international food trade work? Why do famines occur?

Greenhaus thus has considerable potential as an environmental education project which encourages people to ask questions and actively engage in the environmental debate rather than merely provide people with training programmes in living sustainably. It could be of great use as a catalyst and focus for cross curricular greening at I.M.Marsh.

16.4 Conclusions

Greenhaus is an example of a project which has made significant progress, despite the existence of barriers, largely due to the commitment of a few individuals. Despite this, there are some barriers which commitment alone is not enough to overcome, such as the lack of student involvement, University politics, and the

difficulty of devising longer-term strategies without some security of tenure and funding.

Although the problems discussed in 16.3 are specific to Greenhaus, they also indicate some of the problems that are likely to arise in the implementation of collaborative cross-curricular greening projects within the University. Bearing this in mind, the following general suggestions are made:

- Projects require consistent participants who can commit time all year round;
- A long-term strategy and a clear definition of environmental education should be devised early on in the project;
- Projects require security for longer-term planning;
- Encouraging students to participate can be difficult, and their involvement tends to be seasonal and short-term when they do get involved;
- Projects require a committed co-ordinator who is supported by the institution and by others involved;
- Institutional resources are strictly limited which means that verbal support is often unmatched by material support;
- Nature-study projects are seasonal and a lot of the activity occurs in the summer when students are away.

17. THE STAFF SURVEY

17.1 Introduction

In October 1994 it was decided to carry out a survey in order to highlight what the barriers to cross-curricular greening were from the point of view of academic staff in the School of Education and Community Studies. A 21 item questionnaire (see Appendix A1) was designed and then tested on three members of staff. After revision it was distributed to all 61 members of staff on the 2/11/94. A reminder was sent out on the 18/1/94 and a total of 24 completed questionnaires were returned (a response rate of 39.3%).

17.2 Coding and analysis

The results of 7 of the original 21 questions were discarded as they were not deemed sufficiently relevant to warrant analysis and the remaining 14 were coded and analysed using SPSS for Windows. The coding for most of the questions was straightforward and can be seen in Appendix A. For three of the questions - 5, 11 and 21 - coding was slightly more complicated. With question 5, the answers were collated and 10 different purposes of environmental education were identified. For each case, every purpose was listed and given a score of one if it had been mentioned by the respondent or a zero if it had not. This made it easier to record the multiple purposes of environmental education given by some respondents. A similar procedure was followed with question 11: the responses were collated and categorised, then the total number of responses in each category calculated. With question 21 the ranking of each barrier was calculated separately on a scale where 1 corresponded to the most significant and 11 to the least significant barrier.

The full results of the questionnaire are given in Appendix A2. The main findings were as follows:

- a. 16 out of 24 respondents (66.7%) had not read the University's Environmental Policy (*question 1*)

- b.** 19 out of 24 respondents (79.2%) had not read the Toyne Report (*question 2*)
- c.** 17 out of 24 respondents (70.8%) thought they understood what was meant by environmental education either fully (4) or quite well (13) (*question 3*)
- d.** 10 out of 24 respondents (41.7%) thought they understood what was meant by cross-curricular greening either fully (4) or quite well (6) (*question 4*)
- e.** 23 out of 24 respondents (95.8%) agreed with the statement "humanity's impact on the environment is causing serious, long-term consequences and requires urgent action" (*question 7*)
- f.** 24 out of 24 respondents (100%) agreed with the statement that "education has a role to play in reducing our impact on the environment" (*question 8*)
- g.** 21 out of 24 respondents (87.5%) thought that their subjects could help with reducing our impact on the environment (*question 9*)
- h.** 15 out of 24 respondents (65.2%) related their teaching/course material to environmental issues either never (6) or now and then (9) (*question 12*)
- i.** 15 out of 24 respondents (65.2%) had introduced an environmental perspective to their subject (*question 13*)
- j.** 12 out of 20 (60%) respondents had considered introducing an environmental perspective to their subject (*question 16*)

k. 19 out of 20 respondents (95%) who had modules they were involved with validated since 9/93 said that environmental issues had not been discussed as a criterion for validation (*question 19*)

l. The barriers to cross-curricular greening were ranked as follows (*question 21*) :

<u>Barrier</u>	<u>Median ranking</u>
lack of time to teach	3
lack of time to prepare material	3.5
lack of appropriate knowledge	4
lack of institutional support	5
lack of teaching materials	5.5
lack of financial resources	6
difficulty of organising/co-ordinating	6
environmental issues not relevant to subject matter	6
lack of appropriate staff development	6
lack of a science background	9
outside the responsibility of the University	11

where 1=most significant and 11=least significant.

m. When asked "Which initiatives/changes /resources would help you the most to green your curriculum?" (question 11) the responses fell into the following categories:

<u>Category</u>	<u>No. of responses</u>
staff development and/or advice	5
more time and space	5
don't know	4
environmental information and resources	4
really implementing a University-wide policy	2
first-hand experience of environmental problems	1
more environmental education in schools	1
an environmental module	1
consideration of environmental education at validation	1
money for resources	1
nothing	1
no response	5

n. The table below gives the number of times certain categories of response were given to question 5, "Environmental education is..."

<u>Category</u>	<u>No. of responses</u>
about increasing knowledge of the environment and the issues concerning it	10
about changing attitudes towards the environment	6
about changing behaviour towards the environment	5
important	2
about changing the relationship between humanity and nature	2
for, in, and about the environment	1
about understanding how the present came to be as it is	1
education in the environment	1
to raise awareness and concern about economic, social, political and ecological interdependence	1

17.3 Discussion

Although most staff had not read the University's environmental policy or the Toyne Report, there was a high level of recognition of the seriousness of the environmental crisis and of the role of education in responding to it. However, these results may be misleading as one could assume that those who do not believe that there are serious environmental problems or that environmental education has any relevance to their subjects would be less likely to respond to the questionnaire. What the results do

indicate is that although the majority of those who returned the questionnaire think that their subjects have roles to play, there were 60.7% who did not even return the questionnaire. There would seem to be a marked variation in the perceived importance of environmental education and cross-curricular greening and this needs to be reflected in any strategy for overcoming staff barriers to cross-curricular greening. Instead of developing initiatives designed to apply to all staff, a range of initiatives which deal with the different needs of staff should be developed. For instance, some awareness raising activities may help to persuade some of those who did not respond that cross-curricular greening is worth considering while a database of environmental education resources would be useful to others.

The responses to **l.** and **m.** suggest that some of the following measures may prove useful:

- Allowing staff more time to teach and prepare materials;
- Providing opportunities for staff to find out more about environmental education and the ways in which their subjects could relate to the environment;
- Providing information and teaching resources relevant to environmental education;
- Greater institutional support for cross-curricular greening and provision of staff development, resources and help in managing curricular change.

Lack of time to teach and to prepare materials were considered the most significant barriers to cross-curricular greening and this may reflect the poor staff/student ratio in the School (see section 13). As one respondent noted on the questionnaire "groups too large to teach = lack of time". Lack of appropriate knowledge, institutional support and teaching materials were ranked third, fourth and fifth most significant respectively and need to be addressed. It should be remembered that the above suggestions only deal with the barriers highlighted by staff who responded to the questionnaire. Further work needs to be carried out to identify the barriers facing the non-respondents.

18. CONCLUSIONS: A STRATEGY FOR THE IMPLEMENTATION OF CROSS-CURRICULAR GREENING AT I.M.MARSH CAMPUS

18.1 Introduction

The strategy set out in this section is comprised of two distinct parts which reflect the way in which the research has been carried out. Firstly, there is a set of recommendations which outline the direction in which it is believed environmental education should be moving. Secondly, there is a set of recommendations which highlight changes believed to be necessary in order to facilitate cross-curricular greening at I.M.Marsh. It is hoped that this separate treatment of educational and institutional measures, as well as providing the basis for a strategy for cross-curricular greening at I.M.Marsh which is theoretically justified and practically attainable, has enabled some educational suggestions to be made which are of interest and relevance outside I.M.Marsh and LJMU.

The temptation to produce a detailed list of learning outcomes for environmental education which points *the* way forward has been resisted. There are already many such agendas in existence whose ideas of what needs to be done are set out much more clearly than the assumptions which underpin the ideas. Instead, a collection of more general principles or pointers have been produced whose origins can be traced to arguments and observations within the text (page numbers are given in italics). It is hoped that by doing this the principles will be open to criticism and the assumptions underpinning them challenged. One of the central arguments of this thesis is that it is only by encouraging this process of communication and open debate that environmental education can respond to the changing demands placed upon it.

18.2 Educational Recommendations

18.2a The remit of environmental education is, in most cases, too narrow and science-based and consequently needs to be expanded to take account of its political, socio-economic, cultural and philosophical dimensions. This should enable people to decide for themselves what the causes of the environmental crisis are and how they should respond. In order to achieve this holistic understanding, genuine interdisciplinarity is required. One way of encouraging this would be to develop complementary

environmental education where students concentrate on perspectives which are different from their own subject specialisms. (50, 56, 68, 87, 98-99, 107, 118, 120, -121, 128, 133-134, 151)

18.2b The meaning of terms such as "sustainability", "environmental responsibility" and "good practice" need to be clearly defined. (68, 76, 107, 131, 135, 140)

18.2c Environmental education should encourage an historical perspective in order to counter atavism and so that students can better understand how humanity has developed and the ways in which present norms and practices have arisen. (22-23, 48, 69)

18.2d Environmental education should have an emancipatory element which encourages students to identify the forces which control their lives and try to create the sort of world they desire. This requires a sense of hope rather than guilt, and a belief in the possibility of change. (50, 69)

18.2e Environmental education should be probing and critical so that it can uncover the assumptions and ideologies underpinning beliefs and the hidden agendas, superordinate goals and motivations behind environmental education initiatives (15, 61-62, 69, 139, 154). It is important that questions regarding humanity's changing relationship with nature, the causes of the environmental crisis and the purpose of education are contemplated by students if bottom-up approaches to environmental education based on active investigation are to have any success (115, 151). The alternative is universal definitions of environmental education devised by panels of experts and imposed by governments and intergovernmental organisations with their own agendas and interests (78). Active investigation requires a discerning approach to information sources and an awareness of the limitations of scientific evidence. (116, 118, 151)

18.2f Environmental education should not:

- Exclude certain forms of knowledge (50, 70);
- Lapse into misanthropy (48-49, 70);

- Be a process of covertly manipulating people - its aims should, at least in part, be open to negotiation by the participants (57-61, 71);
- Hide its disagreements and controversies (98, 132);
- Be seen as simply a novel way of teaching other subjects, but rather as a subject with its own *raison d'être* (123).

18.3 Institutional/Organisational recommendations

18.3a The priority and profile of the environmental policy and environmental education need to be raised in LJMU. While financial pressure should not be used to encourage institutional greening, the possibility of incorporating environmental education into ITT course requirements and making it part of inspection procedures should be considered. (108, 136, 140, 160-161)

18.3b Different modes of implementing environmental education have different strengths and weaknesses which vary depending on the purpose of the education and the people it is intended for. Given the purpose of environmental education outlined in this thesis and the situation at I.M.Marsh a cross-curricular approach augmented, where necessary, with other approaches is most appropriate. (103)

18.3c Likewise, there are different barriers to the implementation, teaching and learning of environmental education depending on the type of education and the context in which it is being carried out. (144-149). In order to make the cross-curricular greening of teacher training most effective it is necessary to identify the barriers in each particular ITT setting and the likely barriers trainees will face once qualified and then devise strategies to overcome them. At I.M.Marsh the following may help overcome barriers:

- Allowing staff more time to teach and prepare materials;
- Providing opportunities for staff to find out more about environmental education and the ways in which their subjects could relate to the environment;

- Providing information and teaching resources relevant to environmental education;
- Greater institutional support for cross-curricular greening and provision of staff development, resources and help in managing curricular change (196-197);

While it is possible to try to predict what the barriers to a certain type of initiative will be, it is only by actually trying to implement the initiative that all the barriers and their relative importance becomes apparent. The Greenhaus case study highlights the problems associated with that particular project and also throws some light on some of the more general barriers to environmental education at I.M.Marsh. In light of this, it is suggested that projects will require some or all of the following:

- Consistent participants who are willing to commit time all year round;
- A long term strategy;
- A clear definition of environmental education;
- Security to enable long-term planning;
- A committed co-ordinator (191)

18.3d Initial teacher training courses should be reviewed in order to provide time for environmental education. (108, 129)

18.3e Those responsible for training teachers should be allowed to learn about environmental education and finances made available, if required, to fund their training. (108, 128)

18.3f While increasing the availability of teaching materials may help they should be rigorously examined, particularly if sponsored by industry, and should not be treated as a substitute for teachers developing their own materials. (122)

18.3g Environmental education should develop strategies for countering the conservatism and resistance to change in schools and teacher training and provide

teachers with the skills to manage change. It may be easier to introduce a conservative and unthreatening form of environmental education, such as wildlife study, and then gradually make it more radical once it is in place than to try to introduce a radical form of environmental education in the first place. (108, 128)

18.3h Teacher training institutions should collaborate with schools on environmental education, for instance through projects such as Greenhaus, so that newly qualified teachers have some support in teaching environmental education when they start off in school. (108)

18.3i The potential for environmental education through English, Design and Technology and History should be explored as they are present at KS4 and provide alternative perspectives to Science. (123)

18.3j Debate regarding the purpose of cross-curricular greening should be encouraged rather than automatic acceptance of the Toyne Report, Review and Taking Responsibility. These documents should be used to "stimulate discussion" not "form the basis of the remit of the CGWG". (185)

18.3k There should be a forum for cross-curricular greening which can encourage inter-school co-operation, find ways of overcoming the compartmentalisation of subjects and encourage interdisciplinarity. (184)

18.3l Cross-curricular greening must go hand in hand with changes in campus operation and institutional practice and management. (161)

18.3m Enthusiasm and interest in the I.M.Marsh campus and its potential for environmental education needs to be raised. One example of how this could be done would be to ask staff and students to make innovative suggestions for changes, the best of which could then be awarded funding and implemented. (178)

18.3n Information regarding areas such as energy use and waste production needs to be gathered to ensure that changes to the campus operation have sound bases. Much of this information gathering could be combined with student projects to generate useful data and at the same time interesting projects and a sense of ownership of the campus. (175, 178)

18.3o Environmental education necessitates a change from the predominant one-way expository style of teaching to greater use of other methods which are more interactive and involve more discussion and debate. This would be facilitated by the creation of group study space and an improved staff:student ratio. An improved staff:student ratio is also required to give staff the time to learn about environmental education and engage in the process of cross-curricular greening. (159)

18.3p While an opportunistic approach to cross-curricular greening is not a satisfactory long-term substitute for a coherent, co-ordinated approach, it may be useful in initiating change thereby raising the profile of environmental education and generating interest. (158)

18.3q The university, and the schools within it, need to implement and develop their own distinct strategies for cross-curricular greening. These may be informed by, though not necessarily based on, best practice elsewhere. (143).

18.3r An individual should be made responsible for cross-curricular greening, preferably a member of staff, and allocated a budget. They should help establish the Curriculum Greening Working Group and liaise with it. In the context of I.M.Marsh they should: analyse the barriers to cross-curricular greening; identify where change is occurring; raise awareness of the potential links between current courses and environmental education; maximise current initiatives and help realise the potential of the campus. (176)

18.3s An individual, preferably a student, should be made responsible for the social and cultural development of the campus and allocated a budget. (176)

18.3t The School needs to base its development on an expanded definition of success, outlined in word and demonstrated by deed, which takes into account staff morale, the School's standing in the local community, the wider aims of research and the non-vocational, life enhancing dimensions of education. (158)

18.3u The introduction of two year degrees should be opposed. (179)

The strategy outlined above may appear to raise more questions for the process of cross-curricular greening than it answers. This is deliberate and should not be interpreted as a sign of uncertainty. Rather, it indicates the changing circumstances of higher education and environmental education at the moment. In particular, it reflects the debates regarding the purpose of education and what humanity's relationship with nature should be. This thesis has not attempted to provide the answers to these complex questions. Instead it has attempted to outline some of the ways in which higher education can help more people to become involved in the debates, and provide some stimulation for the ensuing arguments.

References

Alabaster, T. and Blair, D. (1994) Sunderland - An Integrated Approach . *Greening Universities 1(2)* 6-7

Ali Khan, S. (1995) *Taking Responsibility: Promoting Sustainable Practice through Higher Education Curricula*. London: Pluto Press

Ali Khan, S. (1996) *Environmental Responsibility: A Review of the 1993 TOYNE REPORT*. London: HMSO

Allen, J.E. (1992) *Energy Resources for a Changing World*. Cambridge: Cambridge University Press

Allen, K.C. and Briggs, D.E. (1989) *Evolution and the Fossil Record*. London: Belhaven Press

Apple, M. W. (1979) *Ideology and Curriculum*. London: Routledge and Kegan Paul Ltd

Appleton, J. (1990) *The Symbolism of Habitat: An Interpretation of the Landscape in the Arts* Washington: University of Washington Press

Appleyard, B. (1992) *Understanding the Present: Science and the Soul of Modern Man*. London: Pan Books Ltd

Austin Knight (1997) *Feedback: Staff Communication and Attitude Survey* . Austin Knight

Bak, N. (1995) Green Doesn't Always Mean Go: possible tensions in the desirability and implementation of environmental education. *Environmental Education Research 1 (3)* 345-52

Bancroft-Hunt, N. and Forman, W. (1981) *The Indians of the Great Plains*. London: Orbis

- Beckerman, W. (1995) *Small is Stupid*. London: Duckworth
- Bell, L. (1997) *School of Education and Community Studies, Strategic Plan 1997-1998*
- Bennett, J. (1994) *Thoreau's Nature: Ethics, Politics and the Wild*. Thousand Oaks: Sage Publications
- Blaumires, H. (1984) *A Short History of English Literature*. London: Methuen
- Blundell, D., Claire, H., Eligoloff, J., Graham, J., Jeffs, H., King, R., Lynn, S. and Meadows, J. (1996) Walking: A Cross-Curricular Environmental Project for Teacher Education. In *Thinking Futures* Inman, S. and Champain, P. eds Godalming: WWF pp77-100
- Blythe, J. (1996) *Greenfile 1*. JMU
- Bookchin, M. (1987) Social ecology versus "deep ecology" a challenge for the ecology movement *The Raven 1(3)*
- Bookchin, M. (1990) Ecologizing the Dialectic. In Clark, J. (ed) *Renewing the Earth: The Promise of Social Ecology* London: Green Print
- Bookchin, M. (1991) *Defending the Earth: A Dialogue Between Murray Bookchin and Dave Foreman*. Boston: South End Press
- Borden, R.J. and Schettino, A.P. (1979) Determinants of Environmentally Responsible Behaviour. *Journal of Environmental Education 10(4)* 35-39
- Bourassa, S.C. (1991) *The Aesthetics of Landscape*. London: Belhaven Press
- Bowers, C.A. (1993) *Education, Cultural Myths and the Ecological Crisis*. Albany: SUNY Press
- Brinkman, F. G. and Scott, W. A. H. (1994) *Environmental Education into Initial Teacher Education in Europe: "The State of the Art"*. Brussels: ATEE

- Cairncross, F. (1991) *Costing the Earth*. London: The Economist Books Ltd
- Capra, F. (1993) What Is Ecological Literacy? In *Guide to Ecoliteracy: A New Context for School Restructuring* Berkeley: The Elmwood Institute 4-10
- Caravita, S. (1994) EEITE Italy Status Report. In Brinkman, F.G. and Scott, W.A.H. (eds) *Environmental Education into Initial Teacher Education in Europe: "The State of the Art"*. Brussels: ATEE
- Carr, W. and Kemmis, S. (1986) *Becoming Critical: Education, Knowledge and Action Research*. London: The Falmer Press
- Clark, J. ed (1990) *Renewing the Earth: The Promise of Social Ecology*. London: Green Print
- Collett, J. and Karakshian, S. (1996) *Greening the College Curriculum*. Washington D.C.: Island Press
- Cosgrove, D. (1984) *Social Formation and Symbolic Landscape* Totowa: Barnes and Noble
- Costonis, J. J. (1989) *Icons and aliens: law, aesthetics, and environmental change* Urbana: University of Illinois Press
- Council of Education Ministers of the European Community (1988) *Environmental Education, Resolution of the Council and the Ministers of Education meeting within the Council* (88/C177/03) EC
- Cremin, P. (1994) EEITE Ireland Status Report. In Brinkman, F.G. and Scott, W.A.H. (eds) *Environmental Education into Initial Teacher Education in Europe: "The State of the Art"*. Brussels: ATEE
- Danziger, S.H., Sandefur, G.D. and Weinberg, D.H. (1994) *Confronting Poverty: Prescriptions for Change*. New York: Harvard Press

Department for Education and The Welsh Office (1993) *Environmental Responsibility: An agenda for further and higher education*. London: HMSO

Department of Education and Science (1989) *Curriculum Matters 13: Environmental education from 5 to 16* London: HMSO

Devall, B. and Sessions, G. (1985) *Deep Ecology*. Utah: Gibbs Smith

Diamond, S. (1974) *In Search of the Primitive: A Critique of Civilisation* New Brunswick: Transaction Books

Dillon, P. and Gayford, C.G. (1994) *Environmental Education, Personal Values, and Perceptions of Environmental Issues: A Pilot Study with Student Teachers*. Paper presented at the ATEE Conference 1994, Prague

DoE(1994a) *Biodiversity: The UK Action Plan*. London: HMSO

DoE(1994b) *Sustainable Development: The UK Strategy*. London: HMSO

DoE (1995) *British Government Panel on Sustainable Development: First Report* London: DoE

Donnelly, S. (1994) Action replay in higher education. *New Scientist* 8/1/94 44-45

Drengson, A. and Inoue, Y. (1995) *The Deep Ecology Movement: An Introductory Anthology*. Berkeley: North Atlantic Books

Duckworth, I. (1986) A Response to Criticism of Acclimatization by the Institute of Earth Education. *NAFSO Journal* 22-25

Duckworth, I. (1989) Down to Earth. In *Teaching Green* 125-129 (ed) Randle, D. London: Green Print

EA 97/04 attached to EAC agenda 16/05/97)

EC Council (1988) 88/c 177/03

EC Council (1992) 92/c 151/02

Ehrlich, A. H. and Ehrlich, P.R. (1987) *Earth*. London: Methuen

Ehrlich, P. R. (1971) *Population Bomb*. London: Pan

Elcome, D. M. (1991) *Environmental Education: The Vital Link*. Sandy: RSPB

Factfile Special Issue 15/02/91

Factfile 3/10/94 Issue 54

Fensham, P.J. (1978) Stockholm to Tblisi - the evolution of environmental education
Prospects 8 (4) 446-55

Fien, J. (1993) *Education for the Environment: Critical Curriculum Theorising and Environmental Education*. Geelong: Deakin University

Fien, J. and Corcoran, P.B. (1996) Learning for a Sustainable Environment: professional development and teacher education in the Asia-Pacific region. *Environmental Education Research* 2 (2) 227-36

Fleming, P. and Macy, J (1995) The Council of All Beings, in: Drengson, A. and Inoue, Y. (eds) *The Deep Ecology Movement: An Introductory Anthology*. Berkeley: North Atlantic Books

Freire, P. (1985) *The Politics of Education: Culture, Power and Liberation*. London: Macmillan

Gayford, C. (1995) Environmental Education in the Revised National Curriculum. *Environmental Education* Summer 1995 p5 Walsall: NAEF

Giddens, A. (1989) *Sociology*. Cambridge: Polity Press

Giroux, H. (1981) *Ideology, Culture and the Process of Schooling*. London: The Falmer Press

Goodall, S. (1994) *Developing Environmental Education in the Curriculum*. London: David Fulton Publishers Ltd

Gough, N. (1987) Learning with environments: Towards an ecological paradigm for education. In *Environmental Education: Practice and Possibility* 49-67 (ed) Robottom, I. Geelong: Deakin University Press

Goulding, K. (1994) *Taking Responsibility: Art, Design and Performing Arts*. London: Pluto Press

Greenall Gough, A. (1993) *Founders in Environmental Education*. Geelong: Deakin University

Ham, S.H. and Sewing, D.R. (1987) Barriers to Environmental Education. *Journal of Environmental Education* 19(2) 17-24

Harvey, D. (1974) What kind of geography for what kind of public policy? *Trans. Inst. British Geographers* 63 18-24

Hines, J.M., Hungerford, H. and Tomera, A. (1986) Analysis and Synthesis of Research on Responsible Environmental Behaviour: A Meta-Analysis. *Journal of Environmental Education* 18(2) 1-8

HS&E (1997) *Environmental Performance Report 1997*. Liverpool John Moores University

Huckle, J. (1983) Environmental education. In Huckle, J. (ed) *Geographical Education: Reflection and Action* Oxford: Oxford University Press

Huckle, J. (1991) Education for Sustainability: Assessing Pathways to the Future. *Australian Journal of Environmental Education* 7 43-62

- Huckle, J. (1993) Environmental education and sustainability: A view from critical theory. In Fien J. *Environmental Education: A Pathway to Sustainability* Geelong: Deakin University 43-68
- Hungerford, H., Peyton R. and Wilke, R. (1980) Goals for curriculum development in environmental education. *Journal of Environmental Education* 11(3) 42-7
- Hungerford, H., Peyton R. and Wilke, R. (1983) Yes, EE Does Have Definition and Structure. *Journal of Environmental Education* 14(3) 1-2
- Hungerford, H.R. and Volk, T.L. (1990) Changing Learner Behaviour Through Environmental Education. *Journal of Environmental Education* 21(3) 8-21
- Illich, I. (1971) *Deschooling Society*. London: Calder and Boyars
- Irvine, S. and Manns, H. (1994) *Towards a Greener Curriculum*. Newcastle: University of Northumbria at Newcastle
- Jaritz, K. E. (1994) EEITE Germany Status. In Brinkman, F.G. and Scott, W.A.H. (eds) *Environmental Education into Initial Teacher Education in Europe: "The State of the Art"* Brussels: ATEE
- Jordan, J.R., Hungerford, H.R. and Tomera, A.N. (1986) Effects of Two Residential Environmental Workshops on High School Students. *Journal of Environmental Education* 18(1) 15-22
- La Chapelle, D. (1978) *Earth Wisdom* Silverton: Way of the Mountain Center
- Lash, S., Szerszynski, B. and Wynne, B. (eds) (1996) *Risk, Environment and Modernity: Towards a New Ecology*. London: Sage
- Lewis, S. and James, K. (1995) Whose Voice Sets the Agenda for Environmental Education? Misconceptions Inhibiting Racial and Cultural Diversity. *Journal of Environmental Education* 26(3) 5-12

Linke, R.D. (1980) *Environmental Education in Australia*. Sydney: George Allen and Unwin

LJMU (1993) *Interim Energy Conservation Report*. LJMU

LJMU (1997) *Supplementary Results of Staff Feedback Survey 1996*. LJMU

Leopold, A. (1949) *A Sand County Almanac and Sketches Here and There*. New York: Oxford University Press

Lucas, A.M. (1979) *Environment and Environmental Education: Conceptual Issues and Curriculum Implications*. Melbourne: Australian International Press and Publications

Lutgerhorst, W. (1994) EEITE Netherlands Status Report. In Brinkman, F.G. and Scott, W.A.H. (eds) *Environmental Education into Initial Teacher Education in Europe: "The State of the Art"* Brussels: ATEE

MacLeod, M (1995) *An Outsiders View of the Vegetarianism and Health Debate*. Proceedings of the 1995 Vegetarianism and Health Conference, Liverpool John Moores University

Martin, P. (1996) A WWF View of Education and the Role of NGOs. In *Education for Sustainability* (eds Huckle, J. and Sterling, S.) London: Earthscan 40-51

McKibben, B. (1990) *The End of Nature*. London: Viking

McLeish, E. (1990) *Environmental Education - The Vital Link*. British Gas

Merchant, C. (1980) *The Death of Nature*. London: Harper and Roe

Milbrath, L. (1989) *Envisioning a Sustainable Society: Learning Our Way Out*. Albany: SUNY Press

NAEE (1992) *Environmental Education*. Walsall: NAEE

- Naess, A. (1973) *The Shallow and the Deep, Long-Range Ecology Movement: A Summary* *Inquiry* 16 95-100
- Naess, A. and Rothenberg, D. (1989) *Ecology, Community and Lifestyle*. Cambridge: Cambridge University Press
- Naess, A. (1995) *The Apron Diagram*. In: Drengson, A. and Inoue, Y. (eds) *The Deep Ecology Movement: An Introductory Anthology* Berkeley: North Atlantic Books 11-12
- National Curriculum Council (1990a) *Curriculum Guidance 7: Environmental Education*. York: NCC
- National Curriculum Council (1990b) *Curriculum Guidance 3: The Whole Curriculum*. York: NCC
- NCIHE (1997) *Higher Education in the learning society: Report of the National Committee*. London: HMSO
- New Scientist Editorial (June 3 1995) *Apocalypse tomorrow...*
- North, R.D. (1995) *Life On A Modern Planet*. Manchester: Manchester University Press
- OECD (1994) *Evaluating Innovation in Environmental Education*. Paris: OECD
- Orr, D. (1992) *Ecological Literacy: Education and the Transition to a Postmodern World*. Albany: SUNY
- Orr, D. (1994a) *Earth in Mind: On Education, Environment and the Human Prospect*. Washington DC: Island Press
- Orr, D. (1994b) *Environmental Literacy: Education as if the Earth Mattered*. Carlingcott: Human Scale Education

Oulton, C.R. (1996) *Educating for uncertainty and change: some issues regarding the inclusion of an environmental education dimension in the pre-service training of teachers*. Paper presented at the 1996 ATEE conference, Glasgow

Oulton, C.R. and Scott, W.A.H. (1995) The "Environmentally Educated Teacher": an exploration of the implications of UNESCO-UNEP's ideas for pre-service teacher programmes. *Environmental Education Research* 1(2) 213-31

Paglia, C. (1995) *Sex and Violence, or Nature and Art*. London: Penguin

Palmer, J. and Neal, P. (1994) *The Handbook of Environmental Education*. London: Routledge

Pearce, D., Markandya, A. and Barbier, E.B. (1989) *Blueprint for a Green Economy*. London: Earthscan

Pearce, F. (1997) Greenhouse Wars. *New Scientist* 19/7/97 38-43

Pepper, D. (1984) *The Roots of Modern Environmentalism*. London: Routledge

Pepper, D. (1987) The Basis of a Radical Curriculum in Environmental Education in Education. In *Ecology and Development* (eds Lacey, C. and Williams, R.) London: Kogan Page/WWF 65-79

Pepper, D. (1993) *Eco-socialism: From deep ecology to social justice*. London: Sage

Plant, M. and Firth, R. (1995) *Teaching Through Controversial Issues*. Nottingham: Nottingham Trent University

Porritt, J. (1984) *Seeing Green*. Oxford: Blackwell

Porritt, J. (1990) *Where on Earth are we going?* London: BBC Books

Prickett, S. ed (1981) *Romantics*. London: Methuen

- Randle, D. (1992) Earth Education. In *Education Now Special Report: Issues in Green Education* 25-28 (ed) Randle, D. Ticknall: Education Now Publishing Co-operative
- Richards, F. (1989a) Can capitalism go Green? *Living Marxism*, February 1989 18-23
- Richards, F. (1989b) Red and Green won't go. *Living Marxism*, October 1989 20-23
- Roberts, C. (1995) *Taking Responsibility: Sport, Leisure, Hospitality and Tourism*. London: Pluto Press
- Robottom, I. and Hart, P. (1993) *Research in Environmental Education: Engaging the Debate*. Geelong: Deakin University Press
- Rodman, J. (1995) Four Forms of Ecological Consciousness Reconsidered. In Drengson, A. and Inoue, Y. (eds) *The Deep Ecology Movement: An Introductory Anthology* Berkeley: North Atlantic Books 242-256
- Roth, R.E. (1970) Fundamental concepts for environmental management education (K-16). *Journal of Environmental Education* 1(3) 65-74
- Rothenberg, D. (1995) A Platform of Deep Ecology. In: Drengson, A. and Inoue, Y. (eds) *The Deep Ecology Movement: An Introductory Anthology* Berkeley: North Atlantic Books 155-166
- RSPB (1996) *Our World, Our Responsibility*. Sandy: RSPB
- Rhymer, J. (1992) Complaint. In *Education Now Special Report: Issues in Green Education* 29-32 (ed) Randle, D. Ticknall: Education Now Publishing Co-operative
- Samuel (1993) Impediments to Implementing Environmental Education. *Journal of Environmental Education* 25(1) 26-29
- Schools Curriculum and Assessment Authority (1994) *The Review of the National Curriculum: A Report on the 1994 Consultation*. London: SCAA

Schools Curriculum and Assessment Authority (1996a) *Teaching Environmental Matters Through The National Curriculum*. London: SCAA

Schools Curriculum and Assessment Authority (1996b) *A Guide to the National Curriculum*. London: SCAA

Schumacher, E.F. (1973) *Small is Beautiful: Economics as if People Really Mattered* London: Blond and Briggs Ltd

Scott, W.A.H. (1994) Diversity and Opportunity - Reflections in Environmental Education Within Initial Teacher Education Programmes Across the European Union. In Brinkman, F.G. and Scott, W.A.H. (eds) *Environmental Education into Initial Teacher Education in Europe: "The State of the Art"* Brussels: ATEE

Scott, B., Oulton, C., English, T. and Bullock, K. (1996) Reflections on an Environmental Education Staff Development Initiative for Teacher Educators. In *Thinking Futures* (Inman, S. and Champain, P. eds) Godalming: WWF 167-200

Scottish Office (1995) *A Scottish Strategy for Environmental Education*. Edinburgh: HMSO

Scottish Office Environment Department (1993) *Learning for Life: A National Strategy for Environmental Education in Scotland*. Edinburgh: HMSO

Sessions, G. (1995) Arne Naess and the Union of Theory and Practice. In: Drengson, A. and Inoue, Y. (eds) *The Deep Ecology Movement: An Introductory Anthology* Berkeley: North Atlantic Books 54-63

Shallcross, T. (1996) *Success has Many Parents: Failure is an Orphan*. Paper presented at the 1996 ATEE Conference, Glasgow

Shepard, P. (1973) *The Tender Carnivore and the Sacred Game*. New York: Charles Scribner's Sons

Shiva, V. (1991) *Staying Alive: Women, Ecology and Development*. London: Zed Books

Sia, A.P., Hungerford, H.R. and Tomera, A.N. (1985) Selected Predictors of Responsible Environmental Behaviour: An Analysis. *Journal of Environmental Education* 17(2) 31-40

Skolimowski, H. (1993) *A Sacred Place to Dwell: Living with Reverence Upon the Earth*. Shaftesbury: Element Books Ltd

Small, R.W. and Blythe, J. (1996) *Curriculum Greening: A Report on Undergraduate Environmental Course Provision*. LJMU Environmental Management Unit

Smith, P (1996) "Call to action". In *The Annual Review of Environmental Education* 1995 Reading: CEE

Smyth, J. C. (1988) What Makes Education Environmental? In Briceno, S. and Pitt, D.C. (eds) *New Ideas in Environmental Education*. London: Croon Helm

Smyth, J.C. (1995) Environment and Education: a view of a changing scene. *Environmental Education Research* 1(1) 3-20

Snyder, G. (1995) Re-Inhabitation. In: Drengson, A. and Inoue, Y. (eds) *The Deep Ecology Movement: An Introductory Anthology*. Berkeley: North Atlantic Books 63-73

Stapp, W.B. (1969) The concept of environmental education. *Journal of Environmental Education* 1(1) 30-31

Stenhouse, L. (1975) *An Introduction to Curriculum Research and Development*. London: Heinemann

Sterling, S. (1992) *Coming of Age: A Short History of Environmental Education*. Walsall: NAEE

Szerszynski, B., Lash, S. and Wynne, B. (1996) Ecology, Realism and the Social Sciences. In *Risk, Environment and Modernity: Towards a New Ecology* (Lash, S., Szerszynski, B. and Wynne, B. eds) London: Sage 1-26

- Tanguiane, S. and Perevedentsev, V. (1994) *Pedagogical and Scientific Criteria for Defining Environmental Content of General University Education*. Paris: UNESCO-UNEP
- Thomas, K. (1983) *Man and the Natural World: Changing Attitudes in England 1500-1800*. London: Allen Lane
- Thompson, D. (ed) (1992) *The Pocket Oxford Dictionary of Current English (8th Edition)* Oxford: Clarendon Press
- Tilbury, D. (1993a) A Common Ground: Environmental Education and the Cross-Curricular Themes. *Environmental Education* Summer 1993 8-9, 25
- Tilbury, D. (1993b) *Environmental Education: Developing a Model for Initial Teacher Training* Phd Thesis, University of Cambridge
- Tilbury, D. (1994) The International Development of Environmental Education: A Basis for a teacher education model? *Environmental Education and Information* 13(1) 1-20
- Tomlins, B. and Froud, K. (1994) *Environmental Education: Teaching Approaches and Students' Attitudes*. Slough: NFER
- Toyne, P. (1994) Green Shoots on Campus - A Year of Progress? *Greening Universities* 1(3) 1-2
- TTA (1997a) *Standards for the Award of Qualified Teacher Status* . London: TTA
- TTA (1997b) *Revised Requirements for all Courses of Initial Teacher Training*. London: TTA
- United Nations Conference on Environment and Development (1992) *Earth Summit '92*. London; The Regency Press Corporation
- Van Matre, S. (1972) *Acclimatization: A Sensory and Conceptual Approach to Ecological Involvement*. Martinsville: American Camping Association

- Van Matre, S. (1974) *Acclimatizing: A Personal and Reflective Approach to a Natural Relationship*. Martinsville: American Camping Association
- Van Matre, S. (1979) *Sunship Earth: An Earth Education Program Getting to Know Your Place in Space*. Martinsville: American Camping Association
- Van Matre, S. and Johnson, B. (1987) *Earthkeepers: Four keys for helping young people living in harmony with the earth*. Greenville: Institute for Earth Education
- Van Matre, S. (1990) *Earth Education...a new beginning*. Greenville: Institute for Earth Education
- Vidal, J. (1995) Apocalypse Never. In *the Guardian* 16/3/95
- Wall, D. (1994) *Green History: A reader in environmental literature, philosophy and politics*. London: Routledge
- Warnock, J.W. (1987) *The Politics of Hunger: the Global Food System*. London: Methuen
- Westaway, J. and Rawling, E. (1995) The Place of Environmental Education in the Revised National Curriculum. *Environmental Education* Autumn 1995 36-37
- White Jr, L. (1967) The Historical Roots of Our Ecologic Crisis. In *Science* 155 (3767) 1203-1207
- Williams (1992) Report of a Survey of Provision for Environmental Education. In *Initial Teacher Training in Environmental Education and Teacher Education - Preparing for Change and Participation* University of Sussex at Brighton
- Willis, K. (1994) *Environmental Initiatives in Britain's Universities*. Manchester: University of Manchester
- WWF (1994) *Let's Reach Out*. Godalming: WWF
- Young, J. (1990) *Post Environmentalism*. London: Belhaven Press

Appendix A1: The Staff Survey

HELP! IMPORTANT RESEARCH INFORMATION REQUIRED

Have you heard of the Toyne Report?

No, it's not that consumer watchdog programme on ITV, that's the Cook Report. The only thing the Toyne and Cook Report have in common is the word report: one gives a balanced and rational view while the other looks at environmental responsibility in higher education (only kidding Pete, er Professor Toyne, sir).

This report was carried out to find out what role higher and further education could play in reducing humanity's impact on the environment. Two of the main conclusions of the report were:

- (a) that each student has an entitlement to some education regarding the environment and
- (b) that all courses should be examined to see if they should be related more to the environment (this is called cross-curricular greening, CCG).

It was partly in response to this report that I started doing research here in the School of Education and Community Studies about a year ago. I am trying to develop strategies for the implementation of cross-curricular greening in this school and elsewhere. I am most certainly NOT telling people that they should be changing their modules in this way or that because if they don't the seas will rise, rainforests will disappear and lots of cute little animals will die (although this may be true!).

What I need to know from you is what you think of and know about cross-curricular greening and the problems it raises for you. If you could take 15 or so minutes to fill in the attached survey it would be of enormous help with my research. Please complete it as soon as possible and return it to either Dave Huddart's or Geoff Griffith's pigeon hole.

Please feel free to contact me on x5271 if you wish to discuss any aspects of this survey, cross-curricular greening or the wider environmental issues involved.

THANK YOU FOR YOUR HELP.

**Michael MacLeod, Research Student, room L007.
02/11/94**

1. Have you read the University's Environmental Policy?

yes

no

2. Have you read the Toyne Report "Environmental Responsibility: An agenda for further and higher education" and its conclusions?

yes

no

3. How well would you say you understood what is meant by Environmental education?

- a. understand fully
- b. understand quite well
- c. understand a bit
- d. don't understand

4. How well would you say you understood what is meant by cross-curricular greening?

- a. understand fully
- b. understand quite well
- c. understand a bit
- d. don't understand

5. Please complete the following sentence:

Environmental education is...

6. Please complete the following sentence:

Cross-curricular greening is...

7. Do you think that humanity's impact on the environment is:

- a. causing serious, long-term consequences and requires urgent action
- b. causing effects which we are bringing under control
- c. exaggerated and a relatively minor threat compared to some of the other problems facing humanity
- d. other(please state)

8. Do you think that education has a role to play in reducing our impact on the environment?

yes

no(please explain briefly why not)

9. Do you think that the subjects you teach could help with this?

yes

no(please explain briefly why not)

10. How do you think cross-curricular greening could be best incorporated into your courses and teaching materials?

11. Which initiatives/changes/resources would help you the most to green your curriculum?

12. How often do you relate your teaching/course material to the environment at the moment?

a. never

b. now and then

c. frequently

d. continually

13. Have you introduced an environmental perspective to your subject?

yes(go to Q14)

no(go to Q16)

14. What problems did you encounter while doing this?

15. Do you think this has increased your students' awareness of environmental issues:

a. a lot

b. a little

c. not at all

d. impossible to estimate

16. Have you considered introducing an environmental perspective to your subject?

yes(go to Q17)

no(please say why not then go to Q18)

17. What problems have you encountered during this consideration?

18. Have any of the modules you're involved with been validated since 9/93?

yes(go to Q19) no(go to Q21)

19. Were environmental issues discussed as a criteria for validation?

yes(go to Q20) no(go to Q21)

20. What was the outcome of this?

21. The following is a list of eleven possible barriers you could encounter when trying to implement cross-curricular greening. Please rank them from most significant(1) to least significant(11). Also, please indicate whether you think each is very significant(A), quite significant(B), or insignificant(C).

lack of teaching materials
lack of financial resources
difficulty of organizing/co-ordinating
lack of time to prepare material
lack of institutional support
lack of appropriate knowledge
lack of a science background
environmental issues not relevant to subject matter
lack of time to teach
lack of appropriate staff development
outwith the responsibility of the university

Please add any other barriers you can think of and indicate their significance

Appendix A2: Results of the Staff Survey

1. Have you read the University's environmental policy?

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
no	0	16	66.7	66.7	66.7
yes	1	8	33.3	33.3	100.0
		-----	-----		
	Total	24	100.0	100.0	
Mean	.333	Median	.000	Mode	.000
Std dev	.482	Sum	8.000		
Valid cases	24	Missing cases	0		

2. Have you read the Toyne Report?

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
no	0	19	79.2	79.2	79.2
yes	1	5	20.8	20.8	100.0
		-----	-----		
	Total	24	100.0	100.0	
Mean	.208	Median	.000	Mode	.000
Std dev	.415	Sum	5.000		
Valid cases	24	Missing cases	0		

3. How well would you say you understood what is meant by environmental education?

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
understand fully	1	4	16.7	16.7	16.7
understand quite wel	2	13	54.2	54.2	70.8
understand a bit	3	6	25.0	25.0	95.8
don't understand	4	1	4.2	4.2	100.0
Total		24	100.0	100.0	
Mean	2.167	Median	2.000	Mode	2.000
Std dev	.761	Sum	52.000		
Valid cases	24	Missing cases	0		

4. How well would you say you understood what is meant by cross-curricular greening?

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
understand fully	1	4	16.7	16.7	16.7
understand quite wel	2	6	25.0	25.0	41.7
understand a bit	3	10	41.7	41.7	83.3
don't understand	4	4	16.7	16.7	100.0
Total		24	100.0	100.0	
Mean	2.583	Median	3.000	Mode	3.000
Std dev	.974	Sum	62.000		
Valid cases	24	Missing cases	0		

7. Do you think that humanity's impact on the environment is:

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
serious	1	23	95.8	95.8	95.8
other	4	1	4.2	4.2	100.0

	Total	24	100.0	100.0	
Mean	1.125	Median	1.000	Mode	1.000
Std dev	.612	Sum	27.000		
Valid cases	24	Missing cases	0		

8. Do you think that education has a role to play in reducing our impact on the environment?

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
yes	1	24	100.0	100.0	100.0

	Total	24	100.0	100.0	
Mean	1.000	Mode	1.000	Std dev	.000
Sum	24.000				
Valid cases	24	Missing cases	0		

9. Do you think that the subjects you teach could help with this?

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
no	0	3	12.5	12.5	12.5
yes	1	21	87.5	87.5	100.0

	Total	24	100.0	100.0	
Mean	.875	Median	1.000	Mode	1.000
Std dev	.338	Sum	21.000		
Valid cases	24	Missing cases	0		

12. How often do you relate your teaching/course material to the environment at the moment?

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
never	1	6	25.0	26.1	26.1
now and then	2	9	37.5	39.1	65.2
frequently	3	4	16.7	17.4	82.6
continually	4	4	16.7	17.4	100.0
.	1	4.2	Missing		
Total		24	100.0	100.0	
Mean	2.261	Median	2.000	Mode	2.000
Std dev	1.054	Sum	52.000		
Valid cases	23	Missing cases	1		

13. Have you introduced an environmental perspective to your subject?

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
no	0	9	37.5	37.5	37.5
yes	1	15	62.5	62.5	100.0
Total		24	100.0	100.0	
Mean	.625	Median	1.000	Mode	1.000
Std dev	.495	Sum	15.000		
Valid cases	24	Missing cases	0		

16. Have you considered introducing an environmental perspective to your subject?

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
no	0	8	33.3	40.0	40.0
yes	1	12	50.0	60.0	100.0
	9	4	16.7	Missing	

	Total	24	100.0	100.0	
Mean	.600	Median	1.000	Mode	1.000
Std dev	.503	Sum	12.000		
Valid cases	20	Missing cases	4		

19. Were environmental issues discussed as a criteria for validation?

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
no	0	19	79.2	95.0	95.0
yes	1	1	4.2	5.0	100.0
	9	4	16.7	Missing	

	Total	24	100.0	100.0	
Mean	.050	Median	.000	Mode	.000
Std dev	.224	Sum	1.000		
Valid cases	20	Missing cases	4		

21. In response to question 21, the barriers were ranked in the following way:

(note that 1=least significant , 11=most significant)

Lack of teaching materials

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	1	4.2	6.3	6.3
	2	1	4.2	6.3	12.5
	3	1	4.2	6.3	18.8
	4	1	4.2	6.3	25.0
	5	3	12.5	18.8	43.8
	6	1	4.2	6.3	50.0
	7	2	8.3	12.5	62.5
	8	2	8.3	12.5	75.0
	9	3	12.5	18.8	93.8
	10	1	4.2	6.3	100.0
	99	8	33.3	Missing	
Total		24	100.0	100.0	
Mean	6.125	Median	6.500	Mode	5.000
Std dev	2.705	Sum	98.000		

* Multiple modes exist. The smallest value is shown.

Valid cases 16 Missing cases 8

Lack of financial resources

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	2	2	8.3	11.1	11.1
	4	4	16.7	22.2	33.3
	5	1	4.2	5.6	38.9
	6	4	16.7	22.2	61.1
	8	3	12.5	16.7	77.8
	9	1	4.2	5.6	83.3
	10	1	4.2	5.6	88.9
	11	2	8.3	11.1	100.0
	99	6	25.0	Missing	

	Total	24	100.0	100.0	
Mean	6.333	Median	6.000	Mode	4.000
Std dev	2.808	Sum	114.000		

* Multiple modes exist. The smallest value is shown.

Valid cases 18 Missing cases 6

Difficulty of organizing/co-ordinating

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	2	1	4.2	6.3	6.3
	3	2	8.3	12.5	18.8
	4	2	8.3	12.5	31.3
	5	2	8.3	12.5	43.8
	6	2	8.3	12.5	56.3
	7	4	16.7	25.0	81.3
	9	1	4.2	6.3	87.5
	10	1	4.2	6.3	93.8
	11	1	4.2	6.3	100.0
	99	8	33.3	Missing	

	Total	24	100.0	100.0	
Mean	6.000	Median	6.000	Mode	7.000
Std dev	2.556	Sum	96.000		

Valid cases 16 Missing cases 8

Lack of time to prepare material

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	1	4.2	5.6	5.6
	5	1	4.2	5.6	11.1
	6	2	8.3	11.1	22.2
	7	3	12.5	16.7	38.9
	8	2	8.3	11.1	50.0
	9	3	12.5	16.7	66.7
	10	4	16.7	22.2	88.9
	11	2	8.3	11.1	100.0
	99	6	25.0	Missing	

	Total	24	100.0	100.0	
Mean	8.000	Median	8.500	Mode	10.000
Std dev	2.497	Sum	144.000		
Valid cases	18	Missing cases	6		

Lack of institutional support

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	2	2	8.3	12.5	12.5
	4	1	4.2	6.3	18.8
	5	1	4.2	6.3	25.0
	6	3	12.5	18.8	43.8
	7	2	8.3	12.5	56.3
	8	2	8.3	12.5	68.8
	9	1	4.2	6.3	75.0
	10	2	8.3	12.5	87.5
	11	2	8.3	12.5	100.0
	99	8	33.3	Missing	

	Total	24	100.0	100.0	
Mean	7.000	Median	7.000	Mode	6.000
Std dev	2.852	Sum	112.000		
Valid cases	16	Missing cases	8		

Lack of appropriate knowledge

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	2	8.3	11.8	11.8
	2	1	4.2	5.9	17.6
	3	1	4.2	5.9	23.5
	4	1	4.2	5.9	29.4
	5	2	8.3	11.8	41.2
	6	1	4.2	5.9	47.1
	8	2	8.3	11.8	58.8
	9	1	4.2	5.9	64.7
	10	1	4.2	5.9	70.6
	11	5	20.8	29.4	100.0
	99	7	29.2	Missing	

	Total	24	100.0	100.0	

Mean 6.882 Median 8.000 Mode 11.000
 Std dev 3.756 Sum 117.000

Valid cases 17 Missing cases 7

Lack of a science background

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	5	20.8	33.3	33.3
	2	2	8.3	13.3	46.7
	3	5	20.8	33.3	80.0
	4	1	4.2	6.7	86.7
	6	1	4.2	6.7	93.3
	10	1	4.2	6.7	100.0
	99	9	37.5	Missing	

	Total	24	100.0	100.0	

Mean 2.933 Median 3.000 Mode 1.000
 Std dev 2.404 Sum 44.000

* Multiple modes exist. The smallest value is shown.

Valid cases 15 Missing cases 9

Environmental issues not relevant to subject matter

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	1	4.2	5.9	5.9
	2	4	16.7	23.5	29.4
	3	1	4.2	5.9	35.3
	4	2	8.3	11.8	47.1
	6	1	4.2	5.9	52.9
	8	1	4.2	5.9	58.8
	9	1	4.2	5.9	64.7
	10	1	4.2	5.9	70.6
	11	5	20.8	29.4	100.0
	99	7	29.2	Missing	

	Total	24	100.0	100.0	

Mean 6.353 Median 6.000 Mode 11.000
 Std dev 4.015 Sum 108.000

Valid cases 17 Missing cases 7

Lack of time to teach

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	3	12.5	17.6	17.6
	6	2	8.3	11.8	29.4
	7	1	4.2	5.9	35.3
	8	2	8.3	11.8	47.1
	9	3	12.5	17.6	64.7
	10	2	8.3	11.8	76.5
	11	4	16.7	23.5	100.0
	99	7	29.2	Missing	

	Total	24	100.0	100.0	

Mean 7.588 Median 9.000 Mode 11.000
 Std dev 3.537 Sum 129.000

Valid cases 17 Missing cases 7

Lack of appropriate staff development

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	1	4.2	5.9	5.9
	3	2	8.3	11.8	17.6
	5	3	12.5	17.6	35.3
	6	3	12.5	17.6	52.9
	7	3	12.5	17.6	70.6
	8	2	8.3	11.8	82.4
	9	1	4.2	5.9	88.2
	10	1	4.2	5.9	94.1
	11	1	4.2	5.9	100.0
	99	7	29.2	Missing	

	Total	24	100.0	100.0	
Mean	6.294	Median	6.000	Mode	5.000
Std dev	2.568	Sum	107.000		

* Multiple modes exist. The smallest value is shown.

Valid cases 17 Missing cases 7

Not the responsibility of the university

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	8	33.3	61.5	61.5
	2	2	8.3	15.4	76.9
	3	1	4.2	7.7	84.6
	4	1	4.2	7.7	92.3
	9	1	4.2	7.7	100.0
	99	11	45.8	Missing	

	Total	24	100.0	100.0	
Mean	2.154	Median	1.000	Mode	1.000
Std dev	2.267	Sum	28.000		

Valid cases 13 Missing cases 11

5. In response to question 5, "Environmental education is..." the following definitions of environmental education were suggested:

about increasing knowledge of the environment

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
not mentioned	0	14	58.3	58.3	58.3
mentioned	1	10	41.7	41.7	100.0
		-----	-----		
Total		24	100.0	100.0	
Mean	.417	Median	.000	Mode	.000
Std dev	.504	Sum	10.000		
Valid cases	24	Missing cases	0		

about changing people's behaviour

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
not mentioned	0	19	79.2	79.2	79.2
mentioned	1	5	20.8	20.8	100.0
		-----	-----		
Total		24	100.0	100.0	
Mean	.208	Median	.000	Mode	.000
Std dev	.415	Sum	5.000		
Valid cases	24	Missing cases	0		

about changing attitudes

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
not mentioned	0	18	75.0	75.0	75.0
mentioned	1	6	25.0	25.0	100.0
		-----	-----		
Total		24	100.0	100.0	
Mean	.250	Median	.000	Mode	.000
Std dev	.442	Sum	6.000		
Valid cases	24	Missing cases	0		

important

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
not mentioned	0	22	91.7	91.7	91.7
mentioned	1	2	8.3	8.3	100.0
Total		24	100.0	100.0	
Mean	.083	Median	.000	Mode	.000
Std dev	.282	Sum	2.000		
Valid cases	24	Missing cases	0		

developing in schools

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
not mentioned	0	23	95.8	95.8	95.8
mentioned	1	1	4.2	4.2	100.0
Total		24	100.0	100.0	
Mean	.042	Median	.000	Mode	.000
Std dev	.204	Sum	1.000		
Valid cases	24	Missing cases	0		

about changing our relationship with nature

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
not mentioned	0	22	91.7	91.7	91.7
mentioned	1	2	8.3	8.3	100.0
Total		24	100.0	100.0	
Mean	.083	Median	.000	Mode	.000
Std dev	.282	Sum	2.000		
Valid cases	24	Missing cases	0		

education for, in, and about the environment

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
not mentioned	0	23	95.8	95.8	95.8
mentioned	1	1	4.2	4.2	100.0
Total		24	100.0	100.0	
Mean	.042	Median	.000	Mode	.000
Std dev	.204	Sum	1.000		
Valid cases	24	Missing cases	0		

about understanding development

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
not mentioned	0	23	95.8	95.8	95.8
mentioned	1	1	4.2	4.2	100.0
Total		24	100.0	100.0	
Mean	.042	Median	.000	Mode	.000
Std dev	.204	Sum	1.000		
Valid cases	24	Missing cases	0		

to raise awareness and concern about economic, social, political and ecological interdependence

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
not mentioned	0	23	95.8	95.8	95.8
mentioned	1	1	4.2	4.2	100.0
Total		24	100.0	100.0	
Mean	.042	Median	.000	Mode	.000
Std dev	.204	Sum	1.000		
Valid cases	24	Missing cases	0		

WHOLE SCHOOL MEETING MAY 22nd 1996

HOW GREEN IS MY CAMPUS ? : TOWARDS A BETTER WORKING ENVIRONMENT ON THE I.M. MARSH CAMPUS

We would like the staff to fill out a brief questionnaire before they take part in this whole school meeting and this will be circulated with the invite. Please return to Mike Macleod c/o Dave Huddart's pigeon hole.

Programme:

1400-1700 in the Lecture Theatre and the Primary Base

- 1. Briefing on the purpose of the afternoon David Huddart
5 minutes**
- 2. An overview of the I.M. Marsh Campus as a good working environment and ways of improving this environment. Fieldwork in small groups. Be prepared for wet weather. 90 minutes**
- 3. Tea: approximately 1545 for 20 minutes**
- 4. Improving an area of the campus: two views of a case study by way of a debate 15 minutes**
- 5. The University's Environmental Policy: a presentation by Dr. Richard Small 30 minutes**
- 6. An overview of the action needed: the staff 15 minutes**

The Whole School Meeting on May 22 has the working environment at L.M.Marsh as its theme. This should provide an opportunity for staff to air their views about what is good, bad and indifferent about our campus, both indoors and out, and suggest ways in which it could be improved. In order to make the most of this, it would be helpful if you could fill in the following short survey and bring it to the meeting.

SECTION A

1. Please make a note of what you think are the good and bad points about our campus and the way it affects the environment.

2. In what ways do you think it could be improved?

3. Have you read the University's Environmental Policy?

yes

no

SECTION B - Only complete this section if you are involved in teaching.

1. Have you read the Toyne Report "Environmental Responsibility: An agenda for further and higher education" and its conclusions?

yes

no

2. How well would you say you understood what is meant by Environmental education?

a. understand fully

b. understand quite well

c. understand a bit

d. don't understand

3. How well would you say you understood what is meant by cross-curricular greening?

a. understand fully

b. understand quite well

c. understand a bit

d. don't understand

4. Do you think that humanity's impact on the environment is:

a. causing serious problems which require urgent action

b. potentially serious but under control

c. exaggerated and less serious than some of the other problems facing humanity

d. other(please state)

5. Do you think that education in general has a role to play in reducing our impact on the environment?

yes

no

6. Do you think that the subjects you teach could help with this?

yes

no

7. How often do you relate your teaching/course material to the environment at the moment?

a. never

b. now and then

c. frequently

d. continually

8. Have you:

a. tried to introduce an environmental perspective to your subject?

b. considered trying to introduce an environmental perspective to your subject?

c. *not* considered trying to introduce an environmental perspective to your subject?

9. Were environmental issues discussed during the validation of any of the modules you are involved with?

yes

no

don't know

10. What would you say were the most significant barriers to introducing an environmental perspective in your teaching?

Please add any additional comments below. Thank you for your help.

Appendix B: The School of Education and Community Studies

The School of Education and Community Studies runs a wide range of courses, many of which lead to qualified teacher status. Table B1 lists the courses and the target intakes for 1997. The school is based on the I.M.Marsh Campus, four miles to the south of the city centre, and also uses some of the specialist Design and Technology facilities at the St Nicholas Centre in the city centre. The I.M.Marsh Campus was originally a women's P.E. college and has undergone considerable development in recent years (see figure B1). It currently includes teaching and study facilities, sports facilities, a refectory and bar, student accommodation, and is also home to the Greenhaus project (see figure B2 and section 14).

Table B1: Target figures for courses in the School of Education and Community Studies

UNDERGRADUATE COURSE TITLE	TARGET 1997 Intake
BA (Hons) QTS Secondary	
PE with Dance	10
PE with Science	20
PE with English	20
PE with Art & Design	15
PE with Youth Sport Dance	27
BSc (Hons) QTS Secondary	
Outdoor Science Education	37
BA (Hons) QTS Secondary	
Design & Technology	22
BA (Hons) QTS Primary	
English	19
Art & Design	18
PE	19
Science	15
BA/BSc (Hons) QTS Keystage 2/3	
Design & Technology	25
Physical Education	25
Maths	10
Science	20
BA (Hons.) Full Programmes	
App. Community St.	24
Home Economics	19
Consumer Studies	40
Food and Nutrition	22
Community Dance	20
Tourism & Leisure with a Language	20
Product Design Engineering	17
BEd (Hons) Shortened Secondary	
Biology	6
Chemistry	6
Physics	5
Design & Technology	25
Information Technology	20

Figure B1: Map of the I.M.Marsh site.
 The location of Greenhaus is coloured green.
 The area marked G is an example of one of
 the areas used during the Whole School Meeting
 (see 14.2.1)

— APPRDX. 200m —

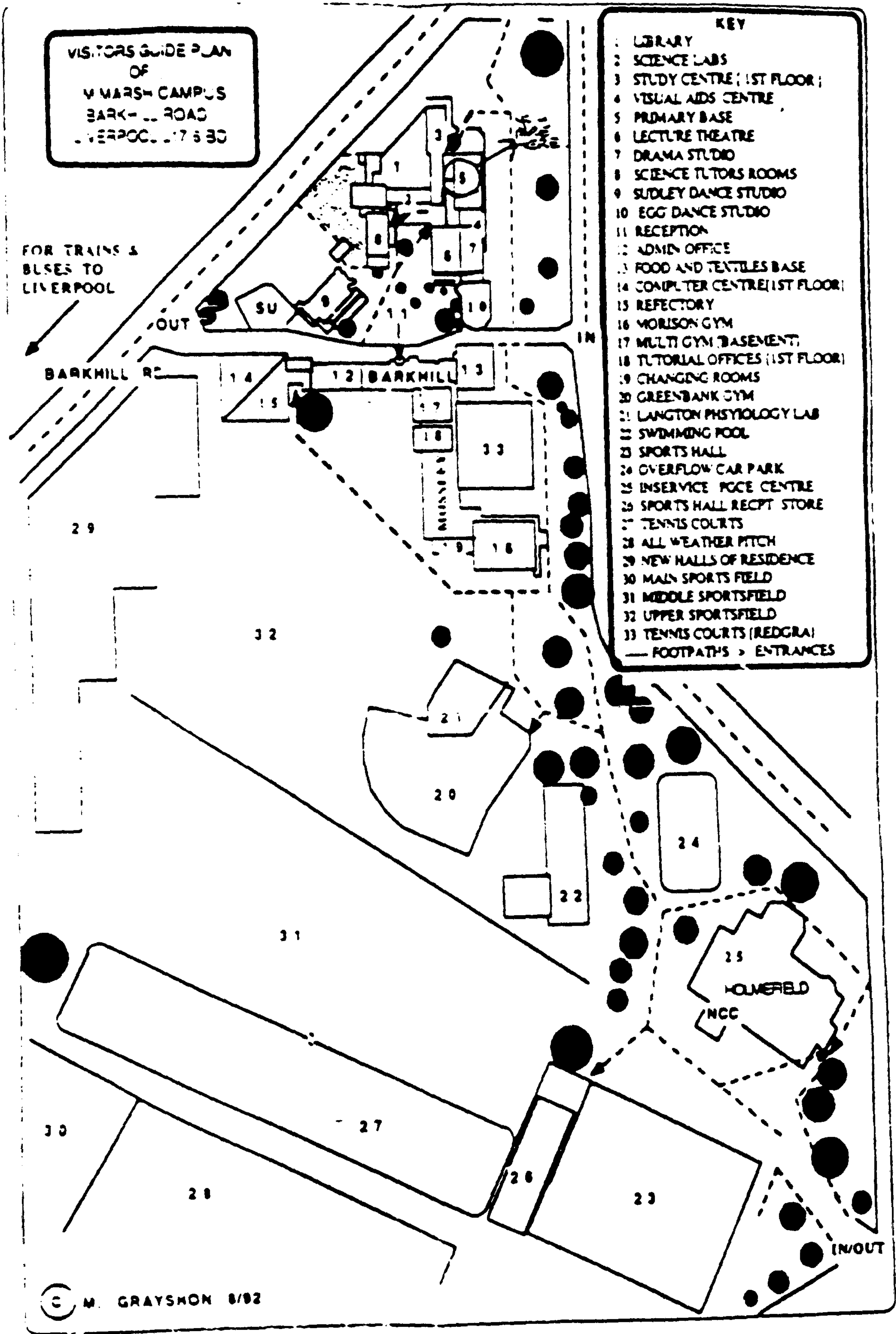
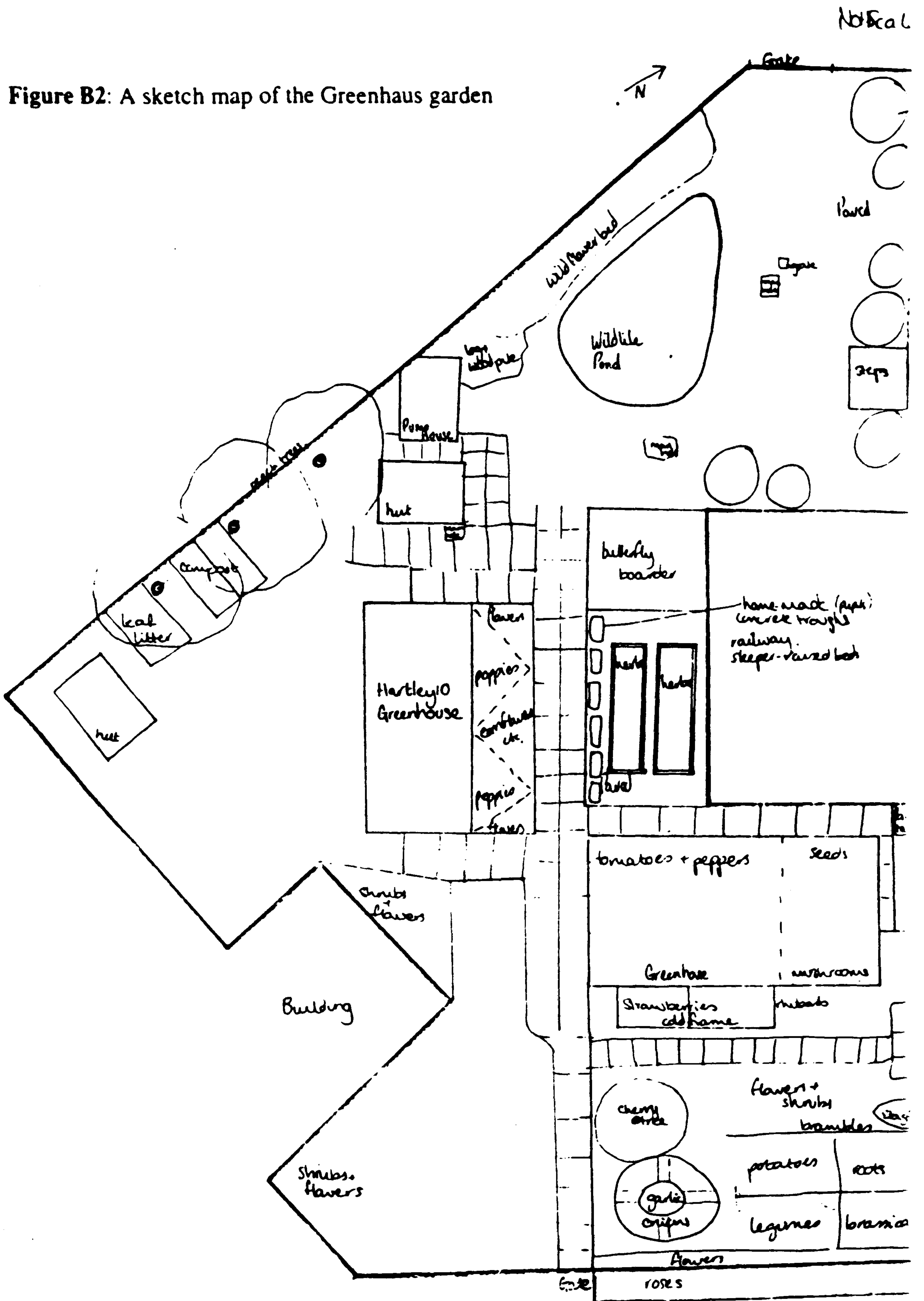


Figure B2: A sketch map of the Greenhaus garden



Appendix C1: The student survey

1. Introduction

The student survey was initially designed as a means of gathering information on the students at I.M.Marsh's attitudes relating to, knowledge of, and behaviour towards the environment. It was designed in the context of a project which initially had an experimental element and looked at the questionnaire as a means of assessing the effectiveness of environmental education by measuring students' attitudes, knowledge, and behaviour before and after various initiatives.

As the research design changed (see section 1. for a discussion of this), the questionnaire became less important. The assessment of students' attitudes, knowledge and behaviour became less relevant and consequently sections of the questionnaire became redundant. However, there was still useful information regarding their views of education and the responses to these questions are analysed below.

2. Design and analysis

The questionnaire was piloted in early 1994 with 161 students at I.M.Marsh. Several changes were made as a result of this: ambiguous terms were clarified; some questions were revised; the first section was reduced from thirty to twenty items to increase inter-item correlation. The revised questionnaire was administered to 227 first years at I.M.Marsh in November 1994. The purpose of the exercise was explained briefly to students who were then given a copy of the questionnaire and asked to fill it in straight away. This was done at the start of lectures and practicals and took between 10 and 20 minutes to complete.

The results of the analysis of questions 3-6 in section D of the questionnaire are given below. Overall students were evenly split on the question of whether or not they wanted to learn more about environmental issues on their courses, with 53% answering yes and 47% no. When the responses to this question are broken down for different courses the variation between courses becomes apparent: only 18 out of 69 P.E. students said yes while 34 out of 35 outdoor and science education students did. This strong association between course and interest in learning more about environmental issues is reflected in the Cramer's V value of 0.4994. The results show that there is also variation between courses on the way students believe environmental education should be taught in schools and at I.M.Marsh. Overall most students thought

that it should be an optional module at I.M.Marsh (49.1%) but that it should be integrated in schools (47.6%).

3. Results

**Which course are you on?
(COURSE)**

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
home economics	1	28	12.3	12.4	12.4
applied community studies	2	6	2.6	2.7	15.1
consumer studies	3	7	3.1	3.1	18.2
outdoor science and P.E.	4	35	15.4	15.6	33.8
primary BEd	5	74	32.6	32.9	66.7
craft, design and technology	6	69	30.4	30.7	97.3
food, health and nutrition	7	1	.4	.4	97.8
no response	8	5	2.2	2.2	100.0
	9	2	.9	Missing	
		-----	-----	-----	
	Total	227	100.0	100.0	

Valid cases 225 Missing cases 2

Do you think that environmental education at I.M.Marsh should:

- a. Be integrated into all teacher training courses
- b. Be a separate, optional module
- c. Be integrated and present as a separate, advanced module
- d. Other (please specify)

(EEATIMM)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
integrated	1	83	36.6	37.4	37.4
optional module	2	109	48.0	49.1	86.5
integrated and optional	3	24	10.6	10.8	97.3
other	4	6	2.6	2.7	100.0
no response	5	5	2.2	Missing	
		-----	-----	-----	
	Total	227	100.0	100.0	

Valid cases 222 Missing cases 5

Do you think that environmental education in schools should:

- a. Be integrated into all subjects across the curriculum
- b. Be present in separate, optional modules
- c. Be integrated and present as a separate, advanced module
- d. Other (please specify)

(EEINSCH)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
integrated	1	108	47.6	47.6	47.6
optional	2	59	26.0	26.0	73.6
integrated and optional	3	39	17.2	17.2	90.7
other	4	7	3.1	3.1	93.8
	5	1	.4	.4	94.3
no response	9	13	5.7	5.7	100.0
		-----	-----	-----	
	Total	227	100.0	100.0	

Valid cases 227 Missing cases 0

Are you interested in learning more about environmental issues in your courses?

(INTOENV)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
no	0	101	44.5	47.0	47.0
yes	1	114	50.2	53.0	100.0
no response	9	12	5.3	Missing	
		-----	-----	-----	
	Total	227	100.0	100.0	

Valid cases 215 Missing cases 12

INTOENV interested in evnl issues? by COURSE

Page 1 of 2

INTOENV	Count	COURSE					Row Total
		home economics	eco commun	applied studies	consumer science	outdoor P.E.	
		1	2	3	4	5	
no	0	11	4	2	1	51	100 46.7
yes	1	16	1	4	34	18	114 53.3
Column Total		27	5	6	35	69	214
(Continued) Total		12.6	2.3	2.8	16.4	32.2	100.0

INTOENV interested in evnl issues? by COURSE

Page 2 of 2

INTOENV	Count	COURSE			Row Total
		primary BEd	craft, design	and	
		6	7	8	
no	0	29	1	1	100 46.7
yes	1	37		4	114 53.3
Column Total		66	1	5	214
Total		30.8	.5	2.3	100.0

Statistic	Value	ASE1	Val/ASE0	Approximate Significance
Phi	.49940			.00000 *1
Cramer's V	.49940			.00000 *1

*1 Pearson chi-square probability

Number of Missing Observations: 13

EEATIMM envl educ at Marsh by COURSE

Page 1 of 2

Count	COURSE					Row Total
	home nomics 1	eco communit 2	applied studies 3	consumer science 4	outdoor P.E. 5	
1	5	1	1	19	16	83 37.6
2	21	3	4	6	47	108 48.9
3	2	2	1	7	6	24 10.9
4				3	3	6 2.7
Column Total	28 12.7	6 2.7	6 2.7	35 15.8	72 32.6	221 100.0

(Continued)

EEATIMM envl educ at Marsh by COURSE

Page 2 of 2

Count	COURSE			Row Total
	primary BEd 6	craft, design an 7	d 8	
1	38	1	2	83 37.6
2	25		2	108 48.9
3	5		1	24 10.9
4				6 2.7
Column Total	68 30.8	1 .5	5 2.3	221 100.0

Statistic	Value	ASE1	Val/ASE0	Approximate Significance
Phi	.48695			.00017 *1
Cramer's V	.28114			.00017 *1

*1 Pearson chi-square probability

Number of Missing Observations: 6

EEINSCH envl educ in schools by COURSE

Count	COURSE					Row Total
	home economics	eco communit	applied studies	consumer science	outdoor P.E.	
	1	2	3	4	5	
EEINSCH	-----+-----+-----+-----+-----+-----+-----					
1	18	1	4	12	30	107
integrated	-----+-----+-----+-----+-----+-----+-----					47.6
2	6	1		5	24	59
optional	-----+-----+-----+-----+-----+-----+-----					26.2
3	4	4	2	14	10	39
integrated and o	-----+-----+-----+-----+-----+-----+-----					17.3
4				3	3	7
other	-----+-----+-----+-----+-----+-----+-----					3.1
5					1	1
	-----+-----+-----+-----+-----+-----+-----					.4
9			1	1	6	12
no response	-----+-----+-----+-----+-----+-----+-----					5.3
Column	28	6	7	35	74	225
(Continued) Total	12.4	2.7	3.1	15.6	32.9	100.0

EEINSCH envl educ in schools by COURSE

Count	COURSE			Row Total
	primary BEd	craft, d esign an		
	6	7	8	
EEINSCH				
1 integrated	39	1	2	107 47.6
2 optional	21		2	59 26.2
3 integrated and o	5			39 17.3
4 other			1	7 3.1
5				1 .4
9 no response	4			12 5.3
Column Total	69 30.7	1 .4	5 2.2	225 100.0

Statistic	Value	ASE1	Val/ASE0	Approximate Significance
Phi	.50210			.01152 *1
Cramer's V	.22455			.01152 *1

*1 Pearson chi-square probability

Number of Missing Observations: 2

Appendix C2: The Student Survey

SECTION A-please read each of the following statements and circle the number corresponding to your level of agreement or disagreement.

	Agree strongly	Agree	Undecided	Disagree	Disagree strongly
1. Most people say that they care about the environment because it's fashionable to do so.	1	2	3	4	5
2. Reducing pollution should have priority over economic growth.	1	2	3	4	5
3. It should be up to the Government to solve our environmental problems.	1	2	3	4	5
4. There is no point in worrying about environmental problems because there isn't enough information to draw firm conclusions.	1	2	3	4	5
5. We should be prepared to make radical changes in our lifestyles in order to save the planet.	1	2	3	4	5
6. Environmental campaigners aren't living in the real world.	1	2	3	4	5
7. Concern for the environment is understandable but it musn't lead to restrictions in the way people choose to live.	1	2	3	4	5
8. University catering should use organic fruit and vegetables instead of the produce of intensive agriculture.	1	2	3	4	5
9. Road tax should be increased by 50% and the extra revenue spent on improving public transport.	1	2	3	4	5
10. Changes to the global environment represent the greatest threat to mankind.	1	2	3	4	5
11. Being green is all very well if you've got the money to do it.	1	2	3	4	5
12. We must be prepared to have limitations imposed on our freedom if the Earth is to be protected.	1	2	3	4	5
13. Each generation has to solve problems created by the preceding one. Let the next generation solve our environmental ones.	1	2	3	4	5
14. It is impossible for modern economies to develop without some pollution. We should concentrate on devising ways of cleaning up afterwards.	1	2	3	4	5
15. Concern for the environment is a passing trend which will be forgotten in 10 years time.	1	2	3	4	5

(continued over the page)

	Agree strongly	Agree	Undecided	Disagree	Disagree strongly
16.It is only right that we should develop the Earth's resources as much as necessary for the benefit of mankind.	1	2	3	4	5
17.Town planning is a complex job which qualified people should be allowed to get on with, without interference from the public.	1	2	3	4	5
18.To aid recycling, everyone should have to separate different types of domestic refuse, i.e. metal, glass and organic waste, into different bins.	1	2	3	4	5
19.Everyone should pay some tax specifically to fund research into cleaner electricity generation technology.	1	2	3	4	5
20.Man has no more right to live on the Earth than any other animal.	1	2	3	4	5
21.I do very little damage to the environment compared to industry so it is up to them to clean up their act first.	1	2	3	4	5
22.Environmental issues get too much coverage in the media.	1	2	3	4	5
23. The most serious consequences of our impact on the environment are being concealed from us by vested interests.	1	2	3	4	5
24.Lifestyles involving excessive car use aren't justifiable anymore.	1	2	3	4	5
25.There aren't enough opportunities to learn about the environment.	1	2	3	4	5
26.In today's heavily populated world the demand for timber is so great that preserving forests is becoming an unaffordable luxury.	1	2	3	4	5
27.Science creates the environmental problems - let scientists solve them.	1	2	3	4	5
28.The seriousness of the environmental crisis may justify illegal action against those who have caused it.	1	2	3	4	5
29. Cars should be banned from city centres.	1	2	3	4	5
30. Conservation groups play a vital role in protecting the environment.	1	2	3	4	5

SECTION B - please circle the appropriate answer to each question

31. Do you ever watch nature or environment related T.V. programmes?

never sometimes often

32. Do you ever read about environmental issues in books, newspapers or magazines?

never sometimes often

33. Do you own a car?

no (go to question 35) yes

34. Do you ever share your car or try to take an alternative mode of transport (i.e. walking or the bus) for environmental reasons?

never sometimes often

35. Do you have holidays in the countryside?

never sometimes often

36. Do you try to encourage your place of work or study to engage in more environmentally friendly practices?

never sometimes often

37. Do you try to avoid excess packaging, i.e. plastic bags, when you shop?

never sometimes often

38. Do you try to avoid purchasing the products of companies you know are involved in exploitation or pollution?

never sometimes often

39. Do you ever give donations to nature or environmental organisations?

never sometimes often

40. Do you recycle any of the following?

glass bottles:	never	sometimes	often
aluminium cans :	never	sometimes	often
steel cans:	never	sometimes	often
paper:	never	sometimes	often
plastics:	never	sometimes	often
oil:	never	sometimes	often

42. Do you ever do any voluntary conservation work?

no (go on to question 43) yes (please give brief details of the sort of work and how often you do it then go on to question 43)

43. Are you a member of any environment or nature organisation such as Greenpeace or the RSPB?

no (go on to question 44) yes (please say which one(s) then go on to question 44)

44. Do you ever buy any products because they are "environmentally friendly" such as CFC-free aerosols, low energy lightbulbs or recycled paper?

no yes (please say which products)

(continued over the page)

SECTION C

45. What do Oxleas Wood and Twyford Down have in common?

46. What is THORP?

47. Who is the present British Environment Secretary?

48. Please circle any of the following methods of generating electricity which produce carbon dioxide:

- a. coal power station
- b. nuclear power station
- c. gas power station
- d. wind turbines
- e. hydro-electric power station
- f. oil power station
- g. wave power

49. What are the differences between organic vegetables and those produced using intensive agriculture?

50. Which countries still practice whaling?

51. Roughly how much more energy does someone in the USA consume compared to someone in India?

- a. x2
- b. x5
- c. x10
- d. x50

52. Draw lines joining the pollution effect on the left and the pollutant(s) responsible for it on the right:

- | | |
|-----------------|--|
| acid rain | sulphur dioxide
methane
nitrogen
CFC's
nitrogen oxides
carbon dioxide
oxygen |
| global warming | sulphur dioxide
methane
nitrogen
CFC's
nitrogen oxides
carbon dioxide
oxygen |
| ozone depletion | sulphur dioxide
methane
nitrogen
CFC's
nitrogen oxides
carbon dioxide
oxygen |

53. You have managed to get the job as adviser to the Environment Secretary who is currently trying to find ways of reducing Britain's input to global warming. Please circle any of the following measures you would recommend:

- a. Legislation making coal power stations clean their emissions
- b. Legislation making catalytic converters compulsory for all motor vehicles
- c. Legislation making double glazing and loft insulation compulsory and free for all buildings
- d. Press for a ban on the sale of tropical hardwoods
- e. The gradual phasing out of nuclear power
- f. Raising VAT on domestic fuel bills to 20%.

54. Please list as many of the environmental effects of increasing car use in the UK as you can.

SECTION D

55. Are you?
male

female

56. How old are you?

57. Which course are you on?

58. Are you interested in learning more about environmental issues in your course?
no (go on to question 60) yes (please say which areas you are particularly interested in)

59. Do you think that environmental education should:
a. Be integrated into all teacher training courses
b. Be a separate, optional module
c. Be integrated and present as a separate, advanced module
d. Other (please specify)

60. Before starting the course you are on, had you undertaken any environment related study at school or college or on your own?
no yes (please give some brief details)

(continued over the page)

SECTION E

Please put any additional information or comments you have regarding this questionnaire and the issues raised in it on this page.

Thank you for your help.

Appendix C3: The Revised Student Survey

SECTION A-please read each of the following statements and circle the number corresponding to your level of agreement or disagreement.

	Agree strongly	Agree	Undecided	Disagree	Disagree strongly
1.Reducing pollution should have priority over economic growth.	1	2	3	4	5
2.There is no point in worrying about environmental problems because there isn't enough information to draw firm conclusions.	1	2	3	4	5
3.We should be prepared to make radical changes in our lifestyles in order to save the planet.	1	2	3	4	5
4.Environmental campaigners aren't living in the real world.	1	2	3	4	5
5.Road tax should be increased by 50% and the extra revenue spent on improving public transport.	1	2	3	4	5
6.Being green is all very well if you've got the money to do it.	1	2	3	4	5
7.We must be prepared to have limitations imposed on our freedom if the Earth is to be protected.	1	2	3	4	5
8.Each generation has to solve problems created by the preceding one. Let the next generation solve our environmental ones.	1	2	3	4	5
9.It is impossible for modern economies to develop without some pollution. We should concentrate on devising ways of cleaning up afterwards.	1	2	3	4	5
10.Concern for the environment is a passing trend which will be forgotten in 10 years time.	1	2	3	4	5

(continued over the page)

	Agree strongly	Agree	Undecided	Disagree	Disagree strongly
11. Town planning is a complex job which qualified people should be allowed to get on with, without interference from the public.	1	2	3	4	5
12. To aid recycling, everyone should have to separate different types of domestic refuse, i.e. metal, glass and organic waste, into different bins.	1	2	3	4	5
13. Man has no more right to live on the Earth than any other animal.	1	2	3	4	5
14. Environmental issues get too much coverage in the media.	1	2	3	4	5
15. The most serious consequences of our impact on the environment are being concealed from us by vested interests.	1	2	3	4	5
16. Lifestyles involving excessive car use aren't justifiable anymore.	1	2	3	4	5
17. In today's heavily populated world the demand for timber is so great that preserving forests is becoming an unaffordable luxury.	1	2	3	4	5
18. Science creates the environmental problems -let scientists solve them.	1	2	3	4	5
19. Cars should be banned from city centres.	1	2	3	4	5
20. Conservation groups play a vital role in protecting the environment.	1	2	3	4	5

SECTION B - please circle the appropriate answer to each question

1. Do you ever watch nature or environment related T.V. programmes?
never sometimes often

2. Do you ever read about environmental issues in books, newspapers or magazines?
never sometimes often

3. Do you own a car?
no (go to question 5) yes

4. Do you ever share your car or try to take an alternative mode of transport (i.e. walking or the bus) for environmental reasons?
never sometimes often

5. Do you have holidays in the countryside?
never sometimes often

6. Do you try to encourage your place of work or study to engage in more environmentally friendly practices?
never sometimes often

7. Do you try to avoid excess packaging, i.e. plastic bags, when you shop?
never sometimes often

8. Do you try to avoid purchasing the products of companies you know are involved in exploitation or pollution?
never sometimes often

9. Do you ever give donations to nature or environmental organisations?
never sometimes often

10. Do you recycle any of the following?

glass bottles:	never	sometimes	often
aluminium cans:	never	sometimes	often
steel cans:	never	sometimes	often
paper:	never	sometimes	often
plastics:	never	sometimes	often
engine oil:	never	sometimes	often

11. Do you ever buy any products because they are "environmentally friendly" such as CFC-free aerosols, low energy lightbulbs or recycled paper?
never sometimes often

12. Do you ever do any voluntary conservation work?
no (go on to the next question) yes (please give brief details of the sort of work and how often you do it then go on to the next question)

13. Are you a member of any environment or nature organisation such as Greenpeace or the RSPB?
no (go on to the next question) yes (please say which one(s) then go on to the next question)

(continued over the page)

SECTION C

1. What do Oxleas Wood and Twyford Down have in common?
2. What is THORP?
3. Who is the present British Environment Secretary?
4. Please circle any of the following methods of generating electricity which produce carbon dioxide:
 - a. coal power station
 - b. nuclear power station
 - c. gas power station
 - d. wind turbines
 - e. hydro-electric power station
 - f. oil power station
 - g. wave power
5. Which countries still practice whaling?
6. Roughly how much more energy does someone in the USA consume compared to someone in India?
 - a. x2
 - b. x5
 - c. x10
 - d. x50
7. Draw lines joining the pollution effect on the left and the pollutant(s) responsible for it on the right:

acid rain

sulphur dioxide
methane
nitrogen
CFC's
nitrogen oxides
carbon dioxide
oxygen

global warming

sulphur dioxide
methane
nitrogen
CFC's
nitrogen oxides
carbon dioxide
oxygen

ozone depletion

sulphur dioxide
methane
nitrogen
CFC's
nitrogen oxides
carbon dioxide
oxygen

8. You have managed to get the job as adviser to the Environment Secretary who is currently trying to find ways of reducing Britain's input to global warming. Please circle any of the following measures you would recommend:

- a. Legislation making coal power stations clean their emissions
- b. Legislation making catalytic converters compulsory for all motor vehicles
- c. Legislation making double glazing and loft insulation compulsory and free for all buildings
- d. Press for a ban on the sale of tropical hardwoods
- e. The gradual phasing out of nuclear power
- f. Raising VAT on domestic fuel bills to 20%.

9. Please list as many of the environmental effects of increasing car use in the UK as you can.

SECTION D

1. Are you?

male

female

2. How old are you?

3. Which course are you on?

4. Are you interested in learning more about environmental issues in your course?

no

yes (please say which areas you are particularly interested in)

5. Do you think that environmental education at I.M. Marsh should:

- a. Be integrated into all teacher training courses
- b. Be a separate, optional module
- c. Be integrated and present as a separate, advanced module
- d. Other (please specify)

(continued over the page)

6. Do you think that environmental education in schools should:
- a. Be integrated into all subjects across the curriculum
 - b. Be present in separate, optional modules
 - c. Be integrated *and* present as a separate, advanced module
 - d. Other (please specify)

7. Before starting the course you are on, had you undertaken any environment related study at school or college or on your own?

no

yes (please give some brief details)

SECTION E

Please put any additional information or comments you have regarding this questionnaire and the issues raised in it on this page.

Thank you for your help.

