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THINKING ENVIRONMENTALLY:

CONSIDERATIONS FOR EDUCATION AND CURRICULUM

IN THE YUKON

by

Robert James Lindsay Jickling

B.P.E., University of British Columbia, 1972

M.P.E., University of British Columbia, 1976

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ABSTRACT

Major reports such as Our Common Future and the Report of the Task Force on Northern Conservation advise us of a need to examine cultural values in light of environmental issues, and point to the need for more education to enable this task. Unfortunately the authors of these reports do not clarify what they mean by education, nor do they tell us what such education might look like. This creates an expectation without the provision of an adequate framework to direct the task. To proceed without this direction devalues education and makes it susceptible to those who seek to make people behave in a particular way or implement a single strategy. The direction required was sought within the field of environmental education.

Conceptualizing environmental education requires a coherent understanding of the nature of schooling and education. An examination of the literature shows several attempts to define environmental education. However, the dominant interpretations of this field appear at considerable variance with the concept of education; the field lacks clarity in defining its central concepts. Thus, environmental education has a problem; it does not provide an adequate framework to direct education about the environment.

To address this problem, I constructed an alternative framework for environmental education and presented it to a group of teachers, school administrators, and parents from the Yukon. In addition to being asked to discuss this alternative framework, they were also asked to discuss the nature of environmental education, questions about content and pedagogy, and implementation concerns. These conversations were recorded and

transcribed. The text was then entered into a data base which enabled the sorting of interview segments according to various themes.

Inspection of these interview themes enabled me to conclude that the alternative framework for thinking about environmental education, presented in chapter four, can provide a basis for re-directing emphasis in this field. I argued that the framework's aim, enabling students to understand ecology, environmental history, environmental ethics, and aesthetic experiences, responds to questions about what students must know and understand if they are to be enabled to transcend their present and particular circumstances.

I also concluded that logical approaches to curriculum planning need to be complemented by participation on the part of the various stakeholders during the planning process. I suggest that the participants from this study can make contributions to the conceptualization of environmental education. Further, they can provide practical suggestions about how educators might accommodate the study of complex issues of the sort found in environmental education.

DEDICATION

To Hannah and Peter, for whom it matters most.

QUOTATIONS

Despite nearly a century of propaganda, conservation still proceeds at a snail's pace; progress still consists largely of letterhead pieties and convention oratory ... The usual answer to this dilemma is 'more conservation education.' No one will debate this, but is it certain that only the volume of education needs stepping up? Is something lacking in the content as well?

Aldo Leopold

The conflict between Right and Fact goes back to the dawn of human society. To bring it to an end, uniting the pure thought with human reality, peacefully causing Right to pervade Fact and Fact to be embedded in Right, this is the task of wise men.

Victor Hugo

ACKNOWLEDGEMENTS

There are many things to thank Dr. Kieran Egan for, but perhaps the most important was a chance remark about students who acknowledge deprivation on the part of their families while they pursue studies and complete dissertations. This should not, he claimed, be necessary of conscientious students who would also have time for loved ones. For this I am grateful. Nevertheless, I thank Wendy, Hannah, and Peter for joining me on this project with a spirit of good humour, cooperation, and adventure. They alone can judge the efficacy of Dr. Egan's remarks.

I am grateful to Dr. Bob Horsfall for his support and criticism from the beginning. I would also like thank other committee members: Dr. Marvin Wideen, Dr. Robin Barrow, and Dr. George Ivany for criticism, encouragement, advice, and companionship.

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TABLE OF CONTENTS

LIST OF FIGURES

CHAPTER ONE

THE STUDY: ITS NATURE AND PURPOSE

Introduction To The Problem

We, as human beings, are part of a total global ecosystem. Furthermore, the existence and quality of all life depends on the maintenance and stability of that system. This much appears clear and uncontentious; we are not, as Norwegian authors Arne Naess and Ivar Mysterud (1987) observed, confronted with any well articulated anti-conservation philosophy. We are, nonetheless, confronted with myriad conflicting interests which threaten the viability of this ecosystem. Widespread industrial development conflicts with needs for clean air and water; use of aerosols and refrigerants conflicts with needs for a protective layer of atmospheric ozone; consumption of forests and burning of fossil fuels conflicts with a need to mitigate global warming trends; and utilization of forests and other wild lands competes with needs for genetic diversity of the world's ecosystems. Meanwhile we must contend with issues concerning acid rain, ozone depletion, the greenhouse effect, and species extinction. These examples represent but a few testimonials to the difficulties we have experienced in thinking clearly and acting intelligently in matters concerning the environment. We are told by the United Nations World Commission on Environment and Development in their report, Our Common Future (1987), that this is not good enough. We are reminded, as oft times before, that we must act with haste and decisiveness to improve human potential to manage global resources. The security, well-being, and

indeed the very survival of the planet depend upon these improvements, now.

Similar issues find expression in the Canadian north, the setting for this study. Justice Berger, in his Royal Commission report, Northern Frontier, Northern Homeland: The Report of the Mackenzie Valley Pipeline Inquiry (1977), recognizes that the north is a region of conflicting goals, aspirations, and interests. Today in the Yukon, a strong subsistence economy conflicts with the demands of a resource-based economic structure; Yukon as a hinterland conflicts with Yukon as a resource; Yukon as a last frontier conflicts with Yukon as a homeland; Yukon as a nuclear free zone conflicts with military activities. Meanwhile we must contend with issues concerning high unemployment, habitat destruction, threatened ways of life, and the location of military installations. Berger advises us of a need to examine cultural values as they apply to northern environmental issues. Failure to do so, he warns, poses a threat to quality of life in the north and perhaps to the very existence of its cultures. In the north, as elsewhere, the security, well being, and survival of its residents will be dependent upon improved ability to think clearly about environmental conflicts.

Reports such as Our Common Future (1987) and the Report of the Task Force on Northern Conservation (1984) are significant in that they also posit a need for more education. However, it is not made sufficiently clear what the authors mean by education or what such education might look like. For example, the report of the World Commission on Environment poses the question: "How are individuals in the real world to be persuaded or made to act in the common interest" (Our Common Future, 1987 p. 46)? The answer, they reply, will lie partly in education. While few would

dispute the need for behavioural changes which would lead to more effective mitigation of environmental problems, the question does pose further questions for those concerned with education. Is it the job of education to make people behave in a particular way? Can this implied coercion be justified as educational?

Similarly, the Report of the Task Force on Northern Conservation (1984) suggests: "As a key element of [conservation] strategy implementation, governments should reinforce programs for information, education, communication and training..." (p. 38). Again this is problematic to educators concerned with the instrumental connotations of such a mandate for education. Is it correct to use education as a means of implementing one's own strategy or view? Furthermore, who decides what this strategy will be, and why should everyone else be cajoled, under the guise of education, into accepting it? The lack of clarity illustrated by these two examples is a problem which must be addressed as educators work with environmentalists to develop a framework for sound educational programs.

As educators we have a problem. Arguments put forward in the documents cited here suggest that we have a population which has not been sufficiently attentive towards, nor clear in its thinking about, environmental concerns. Our task as educators, however, is not to mediate environmental conflicts, resolve environmental problems, or to promote particular strategies. Our task is to enable students to think clearly and critically about the environment; to look at an issue and consider it intelligently; and to "think environmentally." In short, our problem is to educate students about the environment. At a time when this planet huddles under a black cloud of impending environmental disasters, at a

time when the United Nations reports on its "World Commission On Environment," at a time when Canadians consistently rank environmental problems to be their number one concern, we may justifiably surmise that we must do a better job of tackling this task. We may also surmise that our concern for education about the environment is timely.

We have, however, a second problem. No adequate framework exists to guide educators in developing appropriate environmental education or environmental studies materials. The field of environmental education is fuzzy, undisciplined, and lacking significant discussion about its relation to fundamental structures of schooling. Even amongst educators committed to environmental concerns, doubt exists about the clarity of goals within this field of study. Hungerford and Volk (1984) acknowledge that there is confusion within the field of environmental education about the nature, purpose, and scope of this enterprise. They argue that continuing confusion about the parameters of environmental education is a major problem contributing to the lack of impact being had by this field of study. In an attempt to rectify this problem, they make the claim that the ultimate goal of environmental education - helping students to solve environmental problems and develop problem solving skills - is either being ignored by practitioners or perceived as achievable through awareness education. Unfortunately, they fail to establish a cogent argument to support the appropriateness of their own ultimate goals. Furthermore, arguments have been advanced which question the plausibility and sensibility of these "ultimate goals" for environmental education (Kennedy, 1983; Jickling, 1989).

As goal statements are essentially broad, regulative principles that govern and characterize a person's actions, they are always in need of interpretation and defence. Scrutiny of the goals of environmental education will be required to interpret, understand, and clarify the concerns of environmental educators. Such analysis may well lead to revision or refinement of the goal statements appropriate for the field of environmental education. I will argue first that in developing school curricula, we must interpret our work within a framework for schooling, and second, work in environmental education will be legitimized by the degree to which it supports a broader concept of education. While there have been attempts to define environmental education and develop frameworks for curriculum development, no attempt appears to have been made to do so in light of the body of literature concerned with educational foundations. These observations give rise to the first question I will address in this dissertation: What educational purposes should environmental education or environmental studies seek to attain?

While those who plan curricula must reflect clear perceptions of schooling and education, they must also be mindful of those people who will be the recipients of their efforts. Curriculum development must take place in some context. The uniqueness of cultural settings defines subsets of problems and tensions reconcilable only by those who understand the issues and their complexities. While many concepts and conceptual schemes are universal, the people, the physical environment, and the social environments for education do change from one context to another. Enabling students to think clearly about issues which arise in their context will require sensitivity to their environmental education needs. These

educational needs will be, in part, defined by inherent local conflicts and dilemmas. They will also be determined by local levels of understanding, and the motivations of students, teachers, and the community. Thus the final responsibility for the education program remains in the local system (see also Brennan, 1986). The Yukon Territory is the chosen context for this study.

Scientific studies and public opinion polls indicate a need to think in an informed, intelligent, and educated way about the environment and issues concerning it. This is no less important in the Yukon than anywhere else. The North is truly a frontier where the last vestiges of a pristine natural environment can be found. Northerners must decide if this frontier is to be valued for the economic prosperity which it may be able to yield, or for its unique intrinsic qualities. Much is at stake. Ways of life and cultural patterns are threatened, as is the ecologically fragile landscape. At the time of writing a single speaker of the Tagish language remains, and the fate of Yukon's largest caribou herd is balanced against the desire to develop oil fields on Alaska's north coast. The northern environment is not forgiving. Those who live there will not have the opportunity to reconsider many decisions at a later date; the consequences of environmental actions will be irreversible. There is a need to think in an informed, intelligent, educated way now.

While the North may be considered a frontier, it is no longer a simple backwater. Fallout from the Chernobyl nuclear accident, observed in Yukon snow, reminds Northerners that they, too, are part of a global ecosystem. This point is underscored by considering the Canadian North's strategic location between the two superpowers. A proposal to build a new radar site

in the Yukon's only territorial park grimly reminds us of military activities: in Alaska, under arctic ice, and in northern Canadian air space. Yukoners have much to say about events which occur beyond their borders. Their points will need to be made in a thoughtful, informed way.

This study will develop a workable characterization of this northern context and extract from it a picture of the educational needs of Yukoners as we prepare them to think about environmental issues. At present we do not know how people in the Yukon perceive their educational needs as they relate to the environment. The second question that I propose to investigate is: What contextual considerations can have a significant bearing on education in the Yukon as it pertains to environmental studies or environmental education? What do they, in the Yukon, need to know?

The final question this dissertation will address is: What considerations should be made when developing environmental education curricula for the Yukon? This question will help to establish a link between purpose and the development of actual curricula. Closely linked is the question: To what extent, if any, is the ideal curriculum discrepant from the existing prescribed curriculum? Though reports such as Our Common Future (1987) and the Report of the Task Force on Northern Conservation (1984) call for more environmental education, a need for such change in the Yukon has yet to be verified or refuted. However there is much that would indicate that this is an important question to pursue.

The preceding discussion has indicated a need to consider both conceptual and practical concerns when answering questions such as those raised here. Defining parameters for environmental education in the Yukon will require a thoughtful synthesis of the conceptual work indicated

by the problems of clarity described earlier, and the descriptive characterization of the context for environmental education in the Yukon. This synthesis will suggest, where warranted, directions for curriculum planning as it pertains to environmental education in the Yukon.

The Research Questions

This study investigates questions arising from the problems identified above and thus attempts to answer the following research questions:

1. What educational purposes should environmental education seek to attain?

2. What contextual considerations can have a bearing on education in the Yukon as it pertains to the environment? What do they, in the Yukon, perceive to be their educational needs? What constraints are imposed upon them?

3. What considerations should be made when developing environmental education curricula for the Yukon?

An Overview Of The Study

Each of the three research questions will require application of a different approach. In what follows, I discuss the approach taken to answer each research question.

Approach To Question 1

This question, "What educational purposes should environmental education seek to attain?" is conceptual in nature and critical analysis of

literature in the fields of education, curriculum theory, and environmental education will be the dominant methodology. This analysis is divided into three major sections or chapters: chapter two, "Environmental education, schooling, and education;" chapter three, "A critical look at environmental education literature;" and chapter four, "Thinking environmentally."

Environmental Education, Schooling, And Education. Taken at face value the term "environmental education" must first be concerned with education and second with content about the environment. I argue that environmental educators must acknowledge that this field of study is justified by the degree to which it supports the broader concept of education.

This analysis considers "education," and its various meanings, and "schooling" goals. I argue that education is only one legitimate goal of schooling, and understanding differences between the various schooling goals will be important when critically reviewing the literature in the field of environmental education. Consideration is given to distinctions between education, socialization, and training which will have a significant bearing on subsequent sections.

Having argued that various functions of schooling are distinctly different, I then provide justification for the value of education and contend that environmental education can be seen within the context of education. Finally, I make a case for describing the essence of environmental education in terms of enabling students to think clearly and critically about the environment.

A Critical Look At Environmental Education Literature. In critically reviewing the environmental education literature, I argue that failure to pursue environmental education within a clearly articulated framework for

education has weakened its conceptual basis, and may frustrate efforts to make environmental education more pervasive. Further, little reference is made to the body of literature concerned with educational foundations and curriculum theory. We have reached the time where we must, in critical reflection, juxtapose the work of environmental educators against the literature about schooling, education and curriculum. Ideas about problem solving, education for sustainable development, and environmental action are also considered.

Thinking Environmentally. This section develops a positive conception of the principles upon which a core curriculum in environmental education may be developed. Concerns of environmental philosophers are discussed and placed within an educationally-sound framework. This argument draws attention to the need to foster breadth of epistemological possibilities. The central thesis I advance is that this field of study should seek to enable students to think clearly and critically about the environment.

Approach To Question 2

This question, "What contextual considerations can have a significant bearing on education in the Yukon as it pertains to the environment?" is concerned with empirical matters. Before designing an environmental education curriculum for the Yukon it will be important to know the people: how they perceive their educational needs, and what constraints are imposed upon them. A curriculum planner needs to know about the social context, and the factors that its uniqueness brings to bear upon its educational needs. A sample of Yukon teachers, school administrators, and parents were thus interviewed. The research design and detailed procedures

employed are described in chapter six. The results of this descriptive investigation are reported in chapter seven.

Approach To Question 3

Answering the question, "What considerations should be made when developing environmental education curricula for the Yukon?" requires the synthesis of the conceptual analysis directed by "Question 1" and the empirical descriptions directed by "Question 2." The resulting synthesis, also reported in chapter seven, describes considerations for education and curriculum in the Yukon. The eighth chapter provides a summary of the key considerations and a discussion of implications for curriculum theory which arise from this study.

CHAPTER TWO

ENVIRONMENTAL EDUCATION, SCHOOLING, AND EDUCATION

Taken at face value the term environmental education must first be concerned with education and second with content about the environment. Environmental educators must acknowledge that this field of study is justified by the degree to which it supports the broader concept of education. In chapter three I will argue that environmental education has not been pursued within a clearly articulated framework for education. This has weakened its conceptual basis and may frustrate efforts to make environmental education more pervasive. I believe that these problems are exacerbated by a failure to be clear about the different roles that we may choose to play in society. While it may be important for citizens to promote changes in attitudes and behaviours, this must not be confused with our work as educators. We must, I will argue, be sure that we are educating, rather than advocating a particular environmental view.

I have made the claim that our understanding of environmental education is confused and that it needs to be grounded in a more conceptually solid footing. Before I can explain this claim further, and provide some justification for it, I must describe what I mean by the term "education." In what follows I will examine various meanings of education, distinctions between education and other schooling goals, and justification for the particular conception of education advanced in this dissertation.

Education And Its Various Meanings

Part of the confusion about education is due to the varying meanings given to the word in its ordinary use in the English language. Prior to the nineteenth century, education was characterized by the all round development of the individual (see Peters, 1973a). In a similar sense we sometimes refer to all one's lifelong learning experiences as part of an education. For instance, we might say that a visit to the big city was a real education for a country boy, or that a child really got an education on a playground or in the streets. Of course meaning given to "education" in this sense is inappropriate for those concerned with schooling. Most obviously, much of what falls under this rubric is beyond the jurisdiction of schools. It is simply not part of what we consider to be education in the same sense as that which is intended to take place in schools. Just as important, we regard education in the schooling sense, as a worthwhile achievement, whereas mugging or burglary learned in the streets are not generally regarded as such.

Frequently education is taken to be co-terminus with schooling; we often talk about our education system when, in fact, we are referring to everything which schools do. Indeed, it is the Yukon's Department of Education which is responsible for schooling in this Territory. Schooling is concerned with a wide range of activities: Christmas concerts, discipline policies, school bussing, hiring teachers, choosing curricula, and teaching literature. Though most of these activities can be said to support education by, for example, ensuring that the school employs competent teachers and

maintains an attractive positive environment for learning, they are certainly not all educative in the same way that teaching literature is.

A third sense of education can be illuminated by thinking about what actually takes place in schools. While there are many worthwhile activities, they are not all educational. As I sit before my word processor I am very thankful for my high school typing course, yet the learning of typing skills was not necessarily an educational achievement. Once again, an appeal to our ordinary use of the English language will illustrate my point. We often talk about training a person in typing, as a carpenter, or for industry but we do not speak of educating a person in, as, or for anything (Kazepides, 1987). Typing, as with other forms of training, is of narrow and instrumental value, while the value of education goes beyond this immediate utility. Consider what differences there might be between sex education and sex training (Peters, 1966)! Though many students might gleefully proclaim a preference for training, this is clearly not what the educators have in mind. Similarly, participation on a school athletic team is frequently perceived to be a valuable social experience which contributes to the overall development of the individual. In fact, the important role of these social experiences is often invoked as a major point when making a case against non-formal, or home education. However, while arguably valuable, playing rugby for the school team is not necessarily of particular educative value. Education, in a third sense, can be seen as one of the goals of schooling alongside other functions which are concerned with training, and socialization. Further elucidation of these schooling goals is required.

Schooling Goals

Education

As mentioned above, education describes an achievement that transcends immediate utility. It is this quality, for instance, which distinguishes it from training. Education is thus pursued because it is perceived to be something valuable in itself as opposed to a means to attain some particular end. Thus, a criterion for distinguishing educational from other schooling activities is that educational activities are of intrinsic value. While it is now becoming clear that education, in the third and most specific sense, is concerned with something other than the acquisition of trained skills and social functions, more attention must be given to describing education, justifying these distinctions, and elaborating upon education's intrinsic nature.

British philosopher R. S. Peters (1966) contributed much to our modern understanding of the term education. Though some have interesting and legitimate criticisms about the details of his arguments, considerable general agreement exists about his assessment of the concept. To "be educated," one must have acquired knowledge and understanding. We would not say that someone is educated but they do not know anything. However, while the dissemination of information is an important function of schools (more will be said of this later), being educated implies more than the accumulation of mere facts and disconnected information. While my nine year old son can go to a map of the world and readily identify an astonishing number of countries, this is hardly sufficient to convince us that he is educated. We also expect the educated person to have some

understanding of the relationships and concepts between these bits of information which enable a person to make some sense of the world. We expect this person to understand why a relationship exists. If my son is to be educated with regard to Southern Africa, it is not enough that he can point out Namibia and South Africa, he must also understand: why these political boundaries exist, something about the colonial histories of the Dutch, British and Germans, and the implications of the history and political distinction upon the lives of the residents of these two countries now. These relationships, or relationships like them, are not tied to some immediate usefulness, yet they are important to our understanding of the world; they are intrinsically valuable. This commitment to intrinsic value pre-supposes a general valuing of reasonable and rational interpretations of the world as opposed to irrational or purely visceral reactions. Educating is thus a cognitive activity, concerned with rationality, truth, understanding, and development of mind. To study science, literature, or history would, in this sense, be educative while typing would not.

Finally, there would be a greater tendency to characterize an educated person by his or her breadth of knowledge and understanding than by a particularly in depth knowledge in one narrow field of inquiry. Thus an educated person with a concern for rational interpretations of the world will necessarily require a broad understanding of many facets of life and forms of investigation. While we might admire a man who has made a lifetime study of an obscure butterfly of the Amazon jungle, we would likely be unimpressed with his level of educational achievement if he knew little about anything else.

Training

Education differs from training in that the latter is a much more narrowly defined enterprise closely associated with the acquisition of discrete skills. While different from education, training is also an important schooling activity and in many cases will be a pre-condition to education. For instance, we would say that students are trained to read, or to behave in a way that does not infringe upon another's rights. Basic literacy is, of course, a pre-requisite to further learning, as is the maintenance of a positive classroom environment. The purpose of such training is to prepare people to perform particular activities. In this sense, memorization of the basic addition facts, learning to type, or practicing cross-country skiing, while potentially worthwhile activities, all are examples of training rather than education. Skilled activities, such as these, are perfected through repetition and practice and minimally involved with understanding (see Barrow, 1987).

It follows from the above discussion that training students to perform particular activities or specific competencies will necessarily be a narrowing, or focussing experience, rather than a broadening one. This is particularly true in schools where the function of training is often associated with vocational preparation. Those concerned with schooling, particularly at the secondary and tertiary levels must have an eye to the future and the transition from schooling to getting a job. Vocational preparation, as with education, is justified as part of a broad preparation for adult life in society. We should introduce students to a variety of possibilities, developing their talents, and assisting them in matching these talents with likely opportunities. As Barrow (1981) argued, we must avoid limiting these

students' abilities and opportunities under the guise of helping them. While training can be supportive, and in fact necessary, for education and the fruitful development of young persons entering adult life, it is quite different in form and function from education.

Socialization

A third important function of schools is one of socialization; the initiation of students into the norms of society. Language, cultural and behavioural expectations, and attitudes all contribute to these norms. Social conventions are not necessarily doctrinaire nor dogmatic, they are simply the generally accepted ways in which we go about the business of life. They are not unchanging and schooling is seen by many as the vehicle by which the institutionalization of changing norms can be accelerated: witness the metrification of textbooks and efforts to eliminate sexist language. Society simply cannot exist without some common agreement about language and the capacity of its members to use this communications tool. Similarly, society cannot function effectively and justly without widespread understanding of the rights and freedoms of individuals and a disposition towards cooperative behaviour. Schools are justifiably a vehicle for initiating the young into the ways of many of these traditions. These expectations are built into many school activities: the use of group work, team projects, and observance of school rules.

While a legitimate schooling function, the socialization of students is not the same as their education and a proper distinction between these two concepts is required. Egan (1983) put it quite starkly, claiming that socialization, as described above, will have a tendency to make people more alike. While to a certain extent this is important, socialization in itself

would lead to a society with a narrow and conforming, rather than broad, perspective. The utility of such a function can be seen as a means of supporting and maintaining important, and commonly agreed upon, social structures. Of course there is a danger in placing a heavy emphasis on socialization in that it militates against efforts to transcend current social structures and thus tends to perpetuate the status quo. Education, as has been noted earlier, transcends such immediate social utility.

Summary

Education, as described here, clearly differs in form, function, and outcome from training and socialization. Both training and socialization are concerned with the cultivation of specific outcomes. Training outcomes are manifest in the acquisition of particular abilities and skills; socialization outcomes are manifest in the acquisition of particular behaviours. Both of these outcomes are minimally involved with understanding and rational capacities. Both training and socialization can be seen to encourage conformity: to standards established for certain skills; to expected standards of behaviour. Both training and socialization tend to define how activities should be done and life lived and, as such, tend to be narrowing experiences.

Education is concerned with the acquisition of a breadth of knowledge and understanding which, in contrast with socialization and training, is intrinsically valuable and not governed in its pursuit by the demands of a particular end. Breadth of knowledge and understanding thus tends to enable individuals to: have broader outlooks on life, see new possibilities, pursue inquiry critically, and use reason. Education has the power to enable individuals to reflect critically upon their society and to transcend the limitations dictated by tradition. The resulting tendency is to make people

more distinct (see Egan, 1983), or to liberate them from the present and particular (see Bailey, 1984).

Justifying Education

I have argued that various functions of schooling are distinctly different and have presented a brief sketch of socialization, training, and education. I have also argued that education, in its most specific sense, is worthwhile. In what follows, I intend to provide some justification for this positive valuation of education and some further understanding of its importance in schooling. The type of justification required for this task will not be found in the form of a concrete proof, or airtight argument. More appropriate for the discussion of such a complex and difficult problem will be the advancement of good reasons and a coherent argument.

Transcendental Argument

Fundamental to the concept of education is the pursuit of rational knowledge. It has been suggested that to ask for justification of the rational mind and its development is a somewhat peculiar question to ask in the first place. "To ask for a justification of any form of activity is significant only if one is in fact committed already to seeking rational knowledge" (Hirst, 1974, p. 42). This quotation directs us to consider carefully the meaning and implications of the concept of justification, which is in itself a rational activity. By asking for justification it is already clear that we are committed to rationality and the knowledge which supports rational judgements.

In a general sense this argument is useful. It is clearly better to pursue knowledge rationally rather than irrationally. Thanks to the work of people like Scheffler (1965) and Bailey (1984), we understand that it would be impossible to do otherwise. The acquisition of knowledge implies that we have good reason for believing that something is true, and we surely cannot claim to "know" something which is either false or without apparent justification. Pursuit of knowledge is thus an inherently rational activity.

In any more specific sense, this form of justification is less convincing. For instance, the quotation by Hirst speaks of the justification of "any form of activity," and implies this justification is sufficient so long as the proponent is seeking rational knowledge. What is ignored are questions about the worthiness of the knowledge pursued. We might do well to question the wisdom of pursuing knowledge about the methodology of torture or brainwashing. Though those activities might be engaged in a rational fashion, their rejection does not weaken our commitment to the pursuit of rational knowledge. The examples given do demonstrate, however, that not all knowledge is of equal worth. This points to the need to, "question the advisability of pursuing further our undoubtedly rational knowledge of [for example] how to make nuclear weapons without being hoist by the petard of our own presuppositions" (Bailey, 1984, p. 38).

While this transcendental argument is of some value in justifying the pursuit of rational knowledge through education, it cannot assist us in determining what knowledge is of most worth. Clearly all knowledge is not of equal value and further justifications need be pursued to seek clues to determining some criteria for deciding what knowledge should be included in an educational program.

Before moving on, however, there is one further problem to which the transcendental argument points. It does pre-suppose sufficient commitment to rationality to seek justification in the first place. While this may be true of myself and the reader, it does not necessarily follow that it will be true for everyone, and in particular, students in our schools. As Bailey (1984) points out, many students will be required to engage in educational activities before this ideal, and intrinsically motivating, commitment to rational understanding is acquired. For some, and perhaps many, this may never come about. He thus argues that the transcendental argument will need positive accompaniments to support the justification of education. Furthermore, this point will have some bearing on the selection of curriculum materials and will be discussed in chapter five.

General Utility Argument

It has been argued that education involves pursuit of knowledge and understanding which is intrinsically valuable. Education transcends immediate utility. This is, in fact, the basis for important distinctions drawn between education, and socialization and training. Yet it seems doubtful that this criterion, of intrinsic worth, will alone be sufficient to describe an activity as educational. There are many activities which may be judged intrinsically valuable. Studying fishing, basket weaving, popular music, or love making may, in the judgement of many individuals, be every bit as intrinsically valuable as studying literature, science, history or philosophy. Peters makes the argument that when making a selection between poetry and push-pin, anyone who really cares about poetry will realize its superiority over push-pin. This argument might be more correctly called an assertion and remains unconvincing. For someone who has come to regard

push-pin as an art form, the choice would not be at all obvious. If this example seems unconvincing or foreign, we can substitute ice-hockey in place of push-pin. When asked to choose either the study of poetry or ice-hockey, it seems less sure that poetry would be chosen. All activities judged to be intrinsically valuable are not of equal educational value.

On the other hand pursuing activities on the basis of their immediate utility will lead to other problems. Depending on the nature of the function, or its utility, such study will lead inevitably to achievements more correctly called socialization or training. In both instances the student's opportunities are being focused, and tied to present conditions. Criteria for education presented earlier are thus violated.

It appears from the discussions presented so far that neither a purely intrinsic argument, nor a utilitarian one, is adequate to the task of justifying the concept of education. An alternative to these two options would be to argue for a justification of a more generally useful sort.

It seems clear that it is useful, in a democratic society, to have citizens who are knowledgeable and concerned with rational judgements. As Bill Stapp pointed out (1969), citizens are being asked to make decisions which would affect environmental quality. Clearly informed decisions, and careful judgements would be the ideal expectations from these citizens. To ask for the performance of such tasks from citizens who were not informed, or prepared to inform themselves, or who were not committed to discriminating judgements would be counter-productive.

Such utility is, however, elusive of clearly specified ends; today's problems are tomorrow's history. What is being sought is a more general utility which arises from a broad understanding of human experience and

the way that the world works. In this sense, utility is more the logically necessary consequence of an education than an end in itself. By obtaining a broad general education a student will be prepared to think about future concerns without pre-specifying, or aiming directly at those concerns. An education, comprised of intrinsically worthwhile activities, is thus useful to a citizen without intending to be so in any clear, direct, or specific way.

Education is most useful in that it: enables rational thought, broadens perspectives, and encourages critical inquiry. Education mitigates the tendency to conform unquestioningly to social expectations and trends. It encourages citizens to think clearly and critically about social norms, and make the best possible judgements about them based on available data and arguments. Education means more than to be simply trained to perform a task for which there is a current societal demand, but to also ask the question: Is this task worthwhile? Is it something that ought to be pursued? Both of these instances point to education's role in creating new possibilities for the future as opposed to allowing the future to be defined by apathy, manipulation, or the status quo. In these ways education is useful to students in that they will, "not be trapped in response to the present and the particular" (Bailey, 1984, p. 30). What we wish to do through education is to enable students to think clearly and critically about issues of importance to them, and to society, and to enable them to make informed choices. This will be of great utility.

Ethical Argument

In the earlier discussion about the transcendental argument, it was noted that many students would be required to engage in education before

they will be intrinsically motivated to do so, or before they value rationality. Justification for this practice follows.

If we have respect for persons' freedom and rational autonomy, we then have an obligation to ensure that these rights are not limited, encroached upon, or cancelled. As argued earlier, the two schooling functions, training and socialization, tend to limit an individual's possibilities and are designed to enable persons to take a place in society. However, they also limit these possibilities to the demands of the existing society. While there is some value in understanding how one's society works, and preparing for a job, the trained and socialized person will be restricted to taking a place from existing opportunities. The rational and autonomous individual will have the ability to think critically about existing conditions, see new possibilities, and create new opportunities. Education enables a student to become a rational autonomous being rather than another cog in the unexamined wheel of society. Educators are obliged to maintain opportunities not to limit them. As Peters (1973b) puts it so well: "It would be unreasonable, therefore, to deprive anyone of access in an arbitrary way to forms of understanding which might throw light on alternatives open to him" (p. 256). Inclusion of education within the broader concept of schooling is an obligation not a mere option.

Thinking About The Environment

I began this chapter by stating that environmental education must first be concerned with education, and that this field of study is justified by the degree to which it supports the broader concept of education. For the

balance of this dissertation I will use education in the third, and most specific sense. I will also assume that education in environmental education is also used in the same sense. In justifying this assumption we must first consider that in arguing for something like environmental education, educators are clearly interested in something more particular than all of one's life's experiences. There is intent to include something quite specific. Second, there is never, as far as I can tell, the suggestion that environmental education should replace schooling, but rather that it should be a part of a larger education or, in this sense, schooling. Education is therefore not used synonymously with schooling but is meant to be a part of it.

In the event that some educators are actually meaning to convey a mini-schooling approach within the broader concept of schooling then nothing much hangs on my assumption. I have provided a rationale for the importance of education in the most specific sense, and it is the extent to which this type of education can be provided that I wish to discuss. I will first appraise the efforts of educators in terms of my sense of education. Had I made the alternate assumption that educators had been using education in a more general schooling sense, I would still be interested to examine the extent to which education, in the third sense, was given prominence; my essential intent remains the same. Hereafter, education will be used in the third and most specific sense.

Environmental education can thus be seen within the context of education, albeit limited in scope to the learning and understanding about that part of the world which we commonly call the environment. I see no problem with this as long as it is clearly understood to be only a part of the

broader context of education. Given the preceding discussion, certain implications follow. Environmental education must be concerned with enabling students to: think clearly and rationally about the environment, reflect critically upon social attitudes towards environmental quality, and broaden their perspectives on the environment; to bring an increased range of understanding to bear on an argument concerning some environmental issue. Thus, the task for environmental education is to enable students to think clearly and critically about the environment, to <u>think environmentally</u>.

CHAPTER THREE

A CRITICAL LOOK AT ENVIRONMENTAL EDUCATION LITERATURE

The term "environmental education" surfaced in the late 1960's and quickly became a slogan which captured the ideas and attitudes of a growing educational movement. As such, it drew attention to the need for a citizenry which could, and would, think about environmental issues. Thanks to the work of people like Scheffler (1960) and Popkewitz, Tabachnick, and Wehlage (1982), we now understand that while slogans are often useful, they can in time be taken as literal doctrines or arguments. It is now important to evaluate environmental education, and goal statements attributed to it, as literal assertions.

A review of the evolution of environmental education goal statements will be required prior to such analysis. Consequently, I have organized this chapter in two parts. A literature review, "Establishing The Field," is followed by "A Critical Analysis."

In Establishing The Field, I will first present key developments of "Environmental Education in North America." Then, I will trace the efforts of the United Nations Educational, Scientific and Cultural Organization, "The UNESCO Program" to conceptualize environmental education. Finally, I will briefly review comments pertaining to "Education and Our Common Future," with reference to the report of the United Nations World Commission on Environment and Development. I have made extensive use of quotation. This is not intended as an appeal to authority. Rather, I intend to take a critical look at the field of environmental education and wish the reader to see clearly what it is that I am critiquing.

Critical analysis will begin by considering "Environmental Education and the Concept of Education." I will then consider the topics "Environmental Education, Problem Solving and Some Humility Please," "Education For Sustainable Development?" and "On Action."

Establishing The Field

Environmental Education In North America

In 1969 Bill Stapp wrote about problems of environmental planning, pesticides, community blight, air and water pollution, and traffic congestion. He also proposed a new approach designed to reach citizens who were increasingly being asked to make decisions which would affect environmental quality. He called it "environmental education." Further, he defined this endeavour in the following way:

> Environmental education is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution. (p. 31)

This early objective, to develop informed attitudes for environmental quality, was reiterated by other spokespersons for the rapidly emerging movement (Swan, 1969; and Roth, 1970).

Swan (1971) later acknowledged semantic arguments with Stapp's (1969) definition, but claimed that most agreed with its direction. Additionally he stated:

> The ultimate goal of environmental education is the development and maintenance of a high-quality system in which man interacts through culture on the biophysical environment to advance human welfare. (p. 226)

This quotation again prescribes resolution of the environmental crisis through environmental education.

Roth (1973) later restated Stapp's (1969) goals and attempted to clarify their intent:

> Environmental education is directed at modifying man's attitudes toward his world. (p. 39)

This point was not lost on Childress and Wert (1976) who were intent on carrying this goal one step further. They lament:

> On the whole, most environmental education programs which have been problem-focused have only resulted in the continuous re-identification of the same problems without any constructive action or follow-through to provide solutions. (p. 4)

According to these two, scant attention had been given to evaluation of processes resulting in wise and conserving behaviours, or improvement in environmental conditions. They make the further claim:

> If a program participant does not exhibit desirable behaviors which result in conservation of resources and improvement to the environment, then changes need to be made to the program, old projects terminated and new ones implemented. (p. 6)

One might wonder if the desirable behaviors we are implored to develop are as uncontentious as Childress and Wert believe. We might also ponder the relationship between behaviourism and education.

Harvey (1976) sought a generally accepted definition of environmental education through an exhaustive search of the professional literature. Concluding that no such definition existed, Harvey set about to synthesize one from existing interpretations. After identifying and tallying key words and phrases in published definitions, he used these key words and phrases to construct the following definition of environmental education:

> the process of developing an environmentally literate, competent, and dedicated citizenry which actively strives to resolve values conflicts in the man-environment relationship, in a manner which is ecologically and humanistically sound, in order to reach the superordinate goal of a homeostasis between quality of life and quality of environment. (p. 189)

Volk (1983) concludes that Harvey's work is comprehensive and definitive in light of the broad scope of the research base and the thoroughness of the synthesis.

Seeking to bring further order to the field, and to facilitate the application of its definition and structure, Hungerford, Peyton, and Wilke (1980) developed goals for curriculum development based on Harvey's (1976) definition. Their ultimate, or "superordinate," goal is to provide an education which results in environmentally affirmative citizenship, or:

> to aid citizens in becoming environmentally knowledgeable and, above all, skilled and dedicated citizens who are willing to work, individually and collectively, toward achieving and/or maintaining a dynamic equilibrium between quality of life and quality of environment. (p. 43)

Goals for curriculum development were also devised to aid development of programs directed at the realization of this superordinate goal. In a somewhat self-fulfilling move, the authors requested a panel of distinguished North American environmental educators to validate their work. Further, they initially requested that the panelists assume conceptual correctness of the superordinate goal, attempting to circumvent questions about their precept. They also validated their goals against the goals for environmental education developed by the United Nations Educational, Scientific, and Cultural Organization (UNESCO), and published in their 1977 Tbilisi declaration. The UNESCO program will be discussed in the next section.

Following a paper discussing parameters of outdoor education in the Fall 1982 issue of the Journal of Environmental Education, the editor

observed that environmental education was more than a decade old (Nichols, 1982). He also posed the questions: Can we define it as well? Do we need to? Interestingly, these questions prompted a tirade of criticism by Hungerford, Peyton, and Wilke (1983).

Criticisms by Hungerford et al. (1983), in the article called "Yes, EE does have definition and structure," warrant close inspection. They said:

> Here were those same questions again - years after they should have been laid to rest once and for all!
>
> In an effort to bring increased order to the field and to operationalize the structure of EE, the writers developed and published a set of goals called "Goals for Curriculum Development in Environmental Education" [1980] ... These goals were validated against the Tbilisi objectives. Further, they were submitted to a jury of outstanding educators. ... Following modifications suggested by the distinguished jury, the goals were considered to be valid.
>
> The premises on which the goals are based are sound. The components of the framework reflect the dialogue and trends of contemporary EE.
>
> It is disconcerting (to say the least) for those involved in the implementation of EE goals to hear again the question: "What is EE?"
>
> We submit that EE does have a substantive structure that has evolved through the considerable efforts of many and that the framework has been documented formally in the literature. The question asked in The Journal of Environmental Education in the fall of 1982 most certainly been answered. One would dare hope that this question could, at long last, be laid to rest. No doubt, it would behoove the EE community to keep a critical eye on its goals and to reassess them as necessary, but the field is quite definitely beyond the goal setting stage and into the business of goal implementation. (p. 1-2)

I am struck by the belittling tone: "Here were those same questions again - years after they should have been laid to rest once and for all!" They scold the editor and serve notice, as Robottom (1987a) observed, that those who query their goals can expect public admonishment. Second, attention is directed away from the substance of the questions. "What is EE?" is a conceptual matter, clarified through argument and justification of premises. Here, as in previous work (Hungerford, Peyton, and Wilke, 1980), the

authors appeal to authority rather than reason in promoting their claims: "These goals were validated against the Tbilisi objectives. Further, they were submitted to a jury of outstanding educators." Finally, they simply assert the correctness of their position: "The premises on which the goals are based are sound," and "The question asked in The Journal of Environmental Education in the fall of 1982 most certainly has been answered. One would dare hope that this question could, at long last, be laid to rest." It is unsettling that Hungerford et al. (1983) have chosen to make their case through an implicit ad hominem attack on the editor, inappropriate appeals to authority, and assertion of their correctness.

Hungerford and his associates have, in effect, suppressed discussion about the nature and purpose of environmental education rather than contributed to it. The suggestion that practitioners accept definitions uncritically is both insulting and arrogant. It is ironic that educators attempt to engage students in critical reflection, yet this article, in an influential international journal, discourages critical scrutiny. To oppose discussion about aims and aspirations can only be described as anti-intellectual.

In order to provide structure and impetus to policy making discussions, the North American Association for environmental education held a national congress in 1983. To this end Hungerford et al. (1983) tabled a paper called "The challenges of K-12 environmental education." A year later Hungerford and Volk (1984) submitted substantially the same work in response to a request for a definitional paper for Monographs in Environmental Education: Volume I. While this paper will be discussed in more detail later, it is appropriate to draw attention to a few points.

Hungerford and Volk (1984) begin by observing that environmental education is "neither pervasive nor very persuasive" (p. 5). They later claim that the ultimate goal of environmental education, their interpretation of Harvey's (1976) work, "is either being ignored by practitioners or perceived as something that can be met through awareness education" (p.6). The explanation given for the latter claim is that educators most likely lack understanding about what is required to achieve environmental literacy. Their lack of introspection is notable. The possibility that their ultimate goal does not make sense to practitioners, or that it may not be conceptually sound is not entertained. Rather, Hungerford and Volk consider options for selling their view to the masses.

The easiest strategy, they assert, would be to institute universal mandatory training of teachers. Philosophical objections to this approach are not discussed. Rather, this notion appears to be put aside for reasons of practical implausibility:

> Even though this has been successfully accomplished in Wisconsin, it is highly unlikely that many states will follow suit. (Hungerford and Volk, 1984, p. 25)

The alternative approach to promote their conception:

> is to "hawk" EE goals and the need for their implementation at teacher educator conferences and to do so until the message is internalized. (p. 25)

Australian environmental educator Ian Robottom (1987a) argues that to moot coercive strategies such as mandatory training, and to "hawk" goals until "the message is internalized" is to diminish the professional status of teachers to that of technicians. Under this scheme, teachers are to accept on faith the goals and embedded values of outside goal-setters.

While I agree with Robottom's (1987a) assessment, I would add to his criticism. In addition to diminishing the status of teachers, Hungerford and Volk (1984) are diminishing the status of environmental education. Incessant "hawking" of goals, while at the same time suppressing discussion about them, is clearly aimed at having teachers unquestioningly internalize these goals. This can only be described as propagandizing. Again we must conclude that the activities of Hungerford and his associates are anti-intellectual, and by association, environmental education risks being subject to the same accusations.

Subsequent to Hungerford and Volk's (1984) monograph, there is little to suggest that their goals have been significantly challenged. Indeed, a paper by Tanner (1984-85) claimed that environmental education had matured and that trends in the literature had shifted from defining structure, concepts, and goals to testing the pedagogical applications of those goals. Not surprisingly, Hungerford and a variety of associates have been at work. It will be instructive to look at their recent claims. In addition to noting their persistence, this review will help clarify the meaning and intent of the goals published in 1980 (Hungerford, Peyton, and Wilke).

In "Selected predictors of responsible environmental behavior: An analysis" (1985-86) Sia, Hungerford, and Tomera make the following claims:

> **Acquisition of responsible environmental behaviour has long been recognized as the ultimate goal of environmental education. (p. 31)**
>
> **responsible problem solving behaviour is still not given due consideration because there has been a "paucity of data available to help in the understanding, predicting, and modifying these behaviours" (p. 31).**
>
> **if professionals are to meet the major goal of environmental education, which is to produce environmentally responsible citizens who can work for a balance between quality of life and quality of the environment, it becomes imperative that these predictors [knowledge of and skill in using environmental action**

> **strategies] be addressed in EE curriculum development and instructional practice. (p. 38-39)**
>
> **Further research among the Sierra Club membership or similar activist populations seems warranted in order to further identify the factors that more fully predict their environmental behaviour. (p. 39)**

Several points warrant comment. First, these researchers are convinced that environmental education's role is to modify people's behaviour, and are intent on identifying the effective variables. Second, they provide some clues as to the meaning of environmentally responsible behaviour; evidently it is like the behaviour of Sierra Club members. This is interesting. It assumes that Sierra Club members are a homogeneous bunch, and that they typify environmentally responsible behaviour. Not only would some resource developers dispute this, so would some environmental groups (see Manes, 1990). Thus, what they are really intent on doing is producing environmental activists of a particular type.

The paper "Analysis and synthesis of research on responsible behavior: A meta-analysis" (Hines, Hungerford, and Tomera, 1986-87) also begins with the now familiar premise that it is important to develop individuals who behave responsibly toward the environment. They go on to conclude that behavioural intervention strategies were effective in increasing the incidence of target behaviours. They also write:

> **Behavioral intervention strategies consisted of the employment of some type of behaviour modification technique aimed at increasing the incidence of a particular target behaviour. (p.6)**
>
> **Thus, in situations in which individuals do not possess those personality characteristics which would lead to the development of a desire to help alleviate environmental problems, these individuals may be enticed into behaving responsibly toward the environment by the application of behavioural intervention strategies. (p. 7)**
>
> **It is not known at what point a person will forego economic and other personal benefits to do what preserves the integrity and stability of the environment. ... it may be more efficacious, in the case of certain environmental problems, to**

> manipulate situational factors in order to produce desired behavioural changes. (p. 8)

These researchers appear to have no qualms about manipulating behaviour to achieve a desired state. However, it is far from clear that such action is educative or morally acceptable. Further, questions about who should prescribe the preferred behaviour are contentious. Most recently, a paper by Hungerford and Volk (1990) announces their agenda in the title: "Changing Learner Behavior Through Environmental Education." This paper begins with the statement: "The ultimate aim of education is shaping human behavior" (p. 8), and continues to outline their plan to operationalize responsible environmental behaviour.

Recent comments would indicate that Hungerford and associates have had some promotional success. In a recent study, Cherif (1989) asserts a need for goals related to investigation, evaluation, and solution of issues as well as citizen action. Another writer recorded her observations candidly and succinctly: "Most EE practitioners still look toward producing the activist" (Pemberton, 1989, p. 10).

The UNESCO Program

The United Nations organized the 1972 United Nations Conference on the Human Environment, held in Stockholm, in response to rising international concern about the environment. This conference marked the beginning of the United Nations long term involvement in environmental education. It was recommended that organizations of the United Nations system, especially the United Nations Educational, Scientific and Cultural Organization, [UNESCO] and other international agencies concerned, after consultation and agreement, should take the necessary steps to establish an international programme in environmental education:

> Recommendation 96 of the Stockholm Conference on the Human Environment called for the development of environmental education as one of the most critical elements of an all-out attack on the world's environmental crisis. (Reported in Connect, 1976, p. 2)

Not only can United Nations involvement in environmental education be traced to the Stockholm conference, but it can also be seen to be inextricably linked to the desire to solve environmental problems.

In response to the Stockholm conference, UNESCO in cooperation with the United Nations Environment Program (UNEP) launched the International Environmental Education Program in 1975. Headed by Bill Stapp, various activities were initiated to prepare ground work. In 1975 UNESCO carried out a survey to determine international education needs and priorities, and commissioned a number of trend papers (Later published by UNESCO in 1977) prepared by selected experts. These papers purported to represent the cutting edge in worldwide thinking about environmental education.

With the survey results and trend papers as a basis for discussion, UNESCO convened the International Environmental Education Workshop at Belgrade in October 1975. Though the conference was marked by contestation and negotiation, the participants developed a document which was unanimously adopted at the close of the ten day workshop. This, "Belgrade Charter," was subsequently published in the UNESCO-UNEP newsletter Connect (1976).

The Belgrade Charter, in accordance with its mandate, described principles and established guidelines that were to be the cornerstone of the international environmental education movement. According to this document, the goal of environmental education is:

> **To develop a world population that is aware of, and concerned about, the environment and its associated problems, and which has the knowledge, skills, attitudes, motivations and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones. (UNESCO, 1976)**

Examination will reveal that this goal, consistent with the conceptualization of the Stockholm Conference, is directed towards the resolution of problems. Further, it is interesting to note how closely it mirrors the definition of environmental education prescribed by Stapp (1969).

Following Belgrade, regional meetings were held to discuss the Charter and to review its recommendations. General agreement with its goals and spirit was interpreted as a validation of the earlier exercise. A final conference at Tbilisi (Georgian SSR, USSR) culminated the first phase of the International Environmental Education Program.

The Tbilisi conference, billed as the first International Conference on Environmental Education, can be seen as an effort to consolidate the field and give it a more formal, intergovernmental recognition. This meeting also issued a summative document. The "Tbilisi Declaration" (UNESCO, 1978), a ratification of the earlier Belgrade Charter, provided "the equivalent of an action plan" (UNESCO, 1978, p. 8) for the development of environmental education.

Of interest here are the Tbilisi statements of aim and goals for environmental education. These are reported below:

> **A basic aim of environmental education is to succeed in making individuals and communities understand the complex nature of the natural and the built environments resulting from the interaction of their biological, physical, social, economic, and cultural aspects, and acquire the knowledge, values, attitudes and practical skills to participate in a responsible and effective way in anticipating and solving environmental problems, and in the management of the quality of the environment. (p. 2)**
>
> **The goals of environmental education are:**

- to foster clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas;
- to provide every person with opportunities to aquire [sic] the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment;
- to create new patterns of behaviour of individuals, groups and society as a whole towards the environment. (p. 3)

Of particular note, once again, is the centrality of problem solving in environmental education, and the desire to create new patterns of behaviour. Further, there is a recommendation that member states carry out research concerning the goals and objectives of environmental education.

Three years after Tbilisi, UNESCO published Environmental Education in the Light of the Tbilisi Conference (1980), "to pinpoint ... the main guiding principles laid down by the Tbilisi Conference" (p. 8). This document elaborates on the Declaration and, I believe there is merit to many of the claims. For example:

> The educated individual should be in a position to ask such questions as: Who took this decision? According to what criteria? With what immediate ends in mind? Have the long term consequences been calculated? In short, he [and presumably she] must know what choices have been made and what value-system determined then [sic]. (p. 27)

While the above statement could be educationally justified, I have less confidence in the persistent inclusion of statements such as the following:

> Environmental education must be directed to the solution of the practical problems of the human environment. (p. 25)

> environmental education should have as its goal the establishment of an new system of values. (p. 27)

The task of challenging these views will fall to subsequent sections of this work.

Most recently a UNESCO-UNEP International Congress on Environmental Education and Training was held in Moscow, USSR during

August 1987. The resulting document, International Strategy for Action in the Field of Environmental Education and Training for the 1990's (UNESCO-UNEP, 1988), reflects the discussion at this congress and changes that have occurred in the ten years following the Tbilisi Conference. Additionally, it highlights objectives with a view to meeting needs for the development of environmental education and training in the coming years.

This report of the Moscow Congress (UNESCO-UNEP, 1988) affirms the goals, objectives and guiding principles of the Tbilisi Conference. Further, it adds statements which will be important to inspect:

> In response to these challenges, an international strategy for environmental education and training should seek in the 1990s to consolidate the main lines of approach charted by the Tbilisi Conference of 1977 and the Moscow Conference of 1987, adapting them to the new concerns. In particular, an effort should be made to promote: (i) the search for and implementation of effective models of environmental education, training and information; (ii) general awareness of the causes and effects of environmental problems; (iii) general acceptance of the need for an integrated approach to solving these problems; (iv) training, at various levels, of the personnel needed for the rational management of the environment in view of achieving sustainable development at community, national, regional and worldwide levels. (p. 6)

> It also falls to EE to define values and motivations conducive to behaviour patterns and measures that are instrumental in preserving and improving the environment. (p. 6)

In addition to earlier mandates for a problem-solving approach, behaviour modification, and shaping new values, we now see the belief that environmental education should define values and motivations, and train persons "for the rational management of the environment in view of achieving sustainable development."

The term "sustainable development" was popularized by the United Nations World Commission on Environment and Development in their report Our Common Future (1987). In this document the authors assert that sustainable development must become central to all governmental

planning and activities. This, they argue, will involve the integration of economic and ecological consideration into development planning and will enable development which meets the needs of the present without compromising the ability of future generations to meet their own needs. Reference to achieving sustainable development in the environmental education literature is notable, and it is important to turn our attention to the proper place for this aim in the context of education.

Education and Our Common Future

A review of education references in Our Common Future (1987) is included here for three reasons. First, it is a high profile document which has generated interest in, among other things, the term sustainable development. Second, it provides an example for testing the principles of education to be discussed. Finally, the report of the Moscow Conference (UNESCO-UNEP, 1988) prescribes a relationship between environmental education and training, and sustainable development. These relationships warrant examination and clarification.

To be fair, members of The World Commission on Environment and Development are not educators, nor do they pretend to be. They can, like most, sense that education has a role to play in the consideration of environmental issues. I believe that their intention was to simply draw attention to that possibility. I do not wish to quibble over much of what is contained in their report. However, as educators we must look carefully at two comments:

> Sustainable development has been described here in general terms. How are individuals in the real world to be persuaded or made to act in the common interest? The answer lies partly in education, institutional development, and law enforcement. (Our Common Future, 1987, p. 46)

> It [education] can also instill a greater awareness of everyday environmental factors. Facilities for education beyond primary school must be expanded to improve skills necessary for pursuing sustainable development. (Our Common Future, 1987, p. 112-113)

The first statement suggests that sustainable development is in the common interest and the public must be persuaded, or made, to pursue this end. Further, education can be contributory to the process of persuasion or coercion required. The second statement demands that education be inclusive of skills required for pursuing sustainable development.

In both instances education is perceived as a tool for the advancement of sustainable development. The assumption is made, that sustainable development is an uncontested concept. This raises the question: Is it proper to advocate that education advance a particular end such as sustainable development?

A Critical Analysis

While consistent patterns emerge, the literature is not without anomalies. There have been papers which challenge conventional wisdom in environmental education and its goals. These tend, however, to raise questions rather than develop detailed arguments. Unfortunately, academics and practitioners have not rallied to the challenge of investigating the contended issues; however, this does not diminish their relevance in today's debate.

Hendee (1972), in an appropriately titled paper "Challenging the folklore of environmental education," claims that environmental education programs are dominated by the missionary zeal of its leaders. He contends

that this field is governed primarily by unquestioned truths and unproven beliefs. He further maintains:

> ... environmental education should aim first at transmitting knowledge and facts and, subordinate to that, at changing attitudes, values, and cultural perspectives toward the environment and stimulating social action. (p. 20)
>
> While developing positive attitudes toward the environment has merit, particularly since people vote more on attitude than knowledge and some environmental problems are so severe that the end may justify the means, there are some compelling philosophical arguments for keeping such missionary aspects of any educational endeavor subordinate to providing factual knowledge about the subject. In a democratic society, freedom of choice to believe as one sees fit is a necessary ideal and coercing belief through publicly financed or sanctioned educational efforts is anathema. (p. 20)

Hendee appropriately raises questions about the relative roles of knowledge, social action, and coercion of belief. It is important to consider what aims can be educationally justified, and where the boundaries are transgressed. It is precisely the points raised in these quotes that I will discuss in the next section. Hendee also provides interesting observations concerning the process of defining environmental education:

> There is excessive descriptive work defining what is meant by specific "prefix-education" designations, much of it based on surveys seeking what various terms mean to educators in the field. (p. 20)

The appropriateness of descriptive work and survey methodology for defining concepts will also be discussed in the next section.

Two other researchers raise questions about the problem-solving orientation found in environmental education literature. Bogan (1973) stresses that problem solving is justified as a pedagogical process rather than an aim. He explains his claim using a population education analogy:

> We believe that population education should not approach population as a "problem" to be solved or a point of view to be promoted. The goal of population education is to incorporate concepts and materials related to population into the school curriculum in order to educate future generations,

> enabling them to make more intelligent decisions with regard to population matters. (p. 3)

Here he claims that enabling students to make intelligent decisions is of paramount importance. Disinger (1985-86) also points to difficulties in solving environmental problems:

> The complexity of the problems, a lack of societal consensus as to what the proper, or even acceptable, solutions might be, and disagreement among "experts" as to appropriate methods of seeking solutions contribute to the difficulty facing the educational establishment in attempting to achieve closure on environmental education as a curricular entity. (p. 2)

Disinger correctly raises questions about the nature of problem solving and the difficulties that this creates for the field of environmental education. The appropriateness of aiming to solve problems in environmental education will be discussed in the section "Environmental Education, Problem Solving, and Some Humility Please."

Environmental Education and the Concept of Education

In reviewing the literature, I was struck by the dearth of work concerned with the concept of education. One might expect that the first task of environmental educators ought to be to clarify their understanding of this concept. However, since the emergence of environmental education, educators have been pre-occupied with defining this field of study through statements of aims or goals. To borrow an analogy, "The situation seems to be parallel to someone wanting to be a shoplifter while not knowing what 'shoplifting' means" (Barrow, 1988, p.8).

In this critique I intend to examine ideas presented by Hungerford and Volk (1984) in their paper, "The Challenges of K-12 Environmental Education." This paper appears to be representative of mainstream views in the field of environmental education. It is billed as a definitional paper in a monograph published by the North American Association for

Environmental Education. It claims to be built upon the work of other key figures in the field, and the views espoused are similar in important ways to those in the Tbilisi Declaration (UNESCO, 1978) and the report of the Moscow Congress (UNESCO-UNEP, 1988). I thus intend to examine the weaknesses of this representative attempt at defining the nature and purposes of environmental education. Reference to other papers will be made where required to develop the argument.

The task is twofold. I will first examine the definition itself, trace its origins, and provide some characterization of it. Then, I will assess its adequacy in light of work done on the concept of education described in Chapter Two.

The definition develops. To consider the authority of Hungerford and Volk's (1984) ultimate goal of environmental education, one must begin by reviewing its origins, as described earlier in this chapter. Harvey's (1976) work, the basis for their ultimate goal, was essentially an assimilation of the most prolific elements of existing definitions. These were in turn based largely on assertions and prescriptions (See, for example, Stapp, 1969; Swan, 1969; Roth, 1970; and critique by Hendee, 1972). While Harvey may have established some measure of what environmental education had come to mean, he did little to advance understanding about what it ought to be. His survey of the literature was no more than a distillation of the most abundant words of existing writers. Questions about which of the surveyed definitions made the most sense, or were most adequately justified, were not given prominence. We thus find the first crack in the ultimate goal.

Claims about validation are also suspect. Hungerford and Volk (1984), and Hungerford, Peyton, and Wilke (1980) report that their goal

statements compared favourably with the Tbilisi Declaration and opinions of a panel of distinguished environmental educators. Notably, this panel was asked to assume that the superordinate goal was conceptually correct. Apparently they did not, and a question was asked of this ultimate goal. However, the revised and validated goals presented in the 1984 paper remain essentially the same. Aside from trying to sidestep scrutiny of the superordinate goal, other difficulties arise.

First, since the Harvey (1976) goal was developed from the work of the environmental education community, it should not be a surprise for Hungerford and his associates to find members of the same community in agreement with their adaptation. Second, in light of the unmistakable similarity between the Tbilisi aims and the Stapp (1969) definition, one recognizes that the Harvey (1976) work and the Declaration both stem from the same origins and tradition. It appears that by having one body of work compared with its historical cousins, Hungerford and his associates have used a validation process that might be likened to intellectual incest. A second crack appears.

The 1983 article by Hungerford, Peyton and Wilke raises questions, and helps to characterize their agenda. These writers support their claim by attacking the editor, appealing to authority (derived through flawed methodology and validation,) and simple assertion. It appears that by 1984, Hungerford and his colleagues have gained some measure of authority by brute force.

Further, there is evidence that the Hungerford group wishes to continue promoting this programmatic agenda but cannot or will not do so by providing adequate reasons. Language manipulation has become a

replacement for good argument. The Hungerford, Peyton, and Wilke article (1983) provides the first evidence of their attempts to co-opt the discourse on environmental education goals (see Robottom, 1987b). Subsequent promises to "hawk" goals (Hungerford & Volk, 1984, p. 25) and assertions that their agenda "has long been recognized" (Sia, Hungerford, & Tomera, 1985-86, p. 31), or "grown to such an extent" (Hines, Hungerford, & Tomera, 1986-87, p. 1) are further examples of attempts to internalize support.

It is clear that there is little in the development of the so called ultimate goal of environmental education that commends it. It seems to rest on unsupported premises, lacks conceptual clarification, and it appears to be promoted by illegitimate means. The substance of this goal must be inspected next.

Adequacy of the definition. Hungerford and Volk (1984) state their ultimate goal as follows:

> ... to provide an education which results in environmentally-affirmative citizenship. (p. 6)
>
> ... to aid citizens in becoming environmentally knowledgeable and, above all, skilled and dedicated citizens who are willing to work, individually and collectively, toward achieving and/or maintaining a dynamic equilibrium between quality of life and quality of the environment. (p. 6)

Some clarification of this meaning is provided by referring to a quote (from Ramsey, Hungerford, &Tomera, 1981) describing pedagogical strategies designed to develop environmentally active individuals who seek: "to achieve the goal of citizen participation in environmental issue remediation" (p. 7). It is thus implied that the goal includes producing "environmentally active individuals" and participation in "environmental issue remediation."

One of the functions of programmatic definitions, such as these, can be to emphasize a particular educational excellence or achievement. To the extent that environmental education enables citizens to think intelligently about environmental issues, assertions about environmental education will fall within the rubric of education. However, not all programmatic definitions are exclusively educational. In some instances, aims will be stated such that education will be construed as a means of realizing external ends.

To the extent that Hungerford and Volk (1984), and others, give importance to helping students become knowledgeable about their environment, they are concerned with matters considered a necessary part of education. However, is the balance of the espoused goal directed towards enabling students to think clearly and critically about their environment?

It is not difficult to imagine a well educated person being an active and involved citizen who makes attempts to mediate environmental conflicts, or who forcefully advocates a particular environmental viewpoint. It is less certain that the production of such citizens or "environmentally-affirmative citizenship" (Hungerford and Volk, 1984, p. 6) should be a necessary or sufficient condition of educating. As discussed in Chapter Two, we do not apply the term "education" to the achievement of some specific, or instrumental end. We normally reserve the term "training" for the development of such specific behaviours. Thus we may train a person as an activist, advocate, or as an environmentally-affirmative citizen. If we push this point further, we will recognize that the term "environmentally affirmative" has evaluative connotations. We are implored to provide an education which results in environmentally affirmative, rather than

environmentally negative students. The thrust of the ultimate goal for education is now clearly seen to encourage the modification of individual behaviour in a prescribed direction.

Similarly the alternate goal statement, which is concerned with aiding citizens in becoming environmentally knowledgeable, skilled, dedicated, and willing to work toward achieving and/or maintaining a dynamic equilibrium between quality of life and quality of environment, fails to describe education. First, the concept of "skill," is tied up with notions of training and perfection through practice, and minimally involved with understanding. Again the scope of the enterprise is limited to narrowly defined achievements which are much less comprehensive that the expectations that we have for education. The authors appear, through both goal statements, to be consistently conceptualizing their task in terms which would not normally fall within the criteria bounding the concept of education.

Aside from the instrumental connotations, the object of their intentions remains unclear. What, for example, is environmentally-affirmative citizenship? Evidently this has something to do with striving to achieve and/or maintain a dynamic equilibrium between quality of life and quality of the environment though one can hardly say that this qualification greatly assists our understanding of the authors' intent. In the first place, all dynamic systems will move towards a state of equilibrium. This is not something that we must strive to bring about - it happens naturally. If, for example, a British Columbia orchardist drained a portion of wetland in order to grow more apple trees, there would undoubtedly be a disruption to the natural environment. There would be a loss of habitat available for the

breeding of water fowl while, at the same time, the farmer would earn an additional amount of disposable income. However, in time an equilibrium of sorts would again be established. The farmer would have more money, possibly judged to improve his or her quality of life, while the nearby environment will adjust towards a new equilibrium albeit less rich than before. The ducks would, of course, have a different assessment. Though this example is illustrative of a dynamic equilibrium, it shows that this concept is of little use in deciding what ought to be done.

Alternatively, there are those who believe that quality of life will be determined, in part, by the quality of the environment in which they live. In this case, it makes no sense at all to speak of achieving an equilibrium between the two concepts when such a dichotomy does not exist. In either instance, it strikes me as particularly odd that education should be conceived as an enterprise subservient to such notions.

It should be clear that the Hungerford and Volk (1984) interpretation of environmental education is at considerable variance with the concept of education and our understanding of what it means to be educated. Surely our task as educators is not, as Hungerford and Volk (1984) suggest: to produce "environmentally-affirmative citizenship" (p. 6), or "environmentally active individuals" (p. 7), or to simply "develop problem-solving skills" (p. 6.), or to encourage 'independent overt environmental behaviour' (p. 7), or to achieve "overt citizenship action" (p. 8). Our task is clearly to educate. This, as we have seen, is inextricably linked to knowledge and understanding. The educated person will pursue his or her inquiry into an environmental issue with a commitment to understanding the "reason why" of things. As Peters (1973c) says, he or she will be committed to, and

care about, the use or reason. He or she must care about "finding out how things are, about getting things right, about tracking down what is the case" (p.75). This caring for truth, justification, and evidence are what Peters refers to as the "rational passions." Further, Peters observes that a person with such passionate thoughts about a situation will, in fact, often feel compelled to do something about it. The educated person is transformed by what he or she knows. However, specific overt action cannot necessarily be expected of the educated person. He or she may not feel adequately informed, may perceive irresolvable conflicts, or identify greater priorities elsewhere. Similarly, we cannot expect overt action to follow a prescribed course to take a pre-determined direction. Aside from the vagueness of the term, we cannot necessarily expect the educated person to display environmentally-affirmative citizenship. Educational achievement should enable individuals to act intelligently. People will not act intelligently if they have been trained, brainwashed, conditioned, indoctrinated, cajoled, coerced, bribed, or otherwise manipulated to behave in a certain way.

Hungerford and his colleagues appear to want their students to take action yet recognize that they cannot insist that they do so. It would be, they state, "both unfair and unethical to demand that students take some kind of citizen action" (Hungerford, Litherland, Peyton, Ramsey, Tomera, and Volk, 1985, p. VI-3). This effectively puts their position in a double bind. Their goal is to develop environmentally affirmative citizens, yet they admit that it is ethically unacceptable to insist on the realization of this ultimate achievement. Thus, they cannot reasonably expect students to participate in citizen action. In contrast, given the high value placed upon education in our society, it is reasonable for students to acquire knowledge and

understanding. Clearly the same cannot be said of citizen action. Consequently, the ultimate goal of environmental education, as stated by Hungerford and Volk (1984), is untenable.

Pursuit of the Hungerford and Volk (1984) goals must not be considered educational. We do not want to train our students to behave in a prescribed way. Nor is it acceptable to promote a particular, and largely personal, perspective of the world, and human conduct under the guise of education. I believe that the force of this point is illustrated by considering similarities between the work of Hungerford and associates, and remarks made by the Soviet educator Zverev (1982). According to this Soviet's view, all forms of formal education have the responsibility of "infusing school youth with an ecological culture" (p. 19). In a refreshingly honest and unabashed fashion, Zverev argues that this should be accomplished through the propagandization of nature conservation ideas. One can attempt to build a case for training, socializing, or propagandizing particular environmental views; however, we must not allow proponents to pursue these concepts in the name of education. The now conventional behaviourist approach is, in fact, not educational.

Environmental Education, Problem Solving, and Some Humility Please

Recently Schoenfeld (1989) reported that the birth of environmental education coincided with a rise in public awareness about such problems as pollution, pesticides, population, and people's habits and that this field of study mirrored concern for those "problems." The importance given to their solution was reflected in objectives for environmental education identified by Stapp, the Tbilisi Declaration, and the Hungerford group. Most recently we read that:

> We are no longer debating whether real-life problem solving and action have places in our goals, curriculum materials, and school programs. (Marcinkowski, 1988-89)

Marcinkowski is correct in his observation that there is little meaningful debate. However, there should be.

Consider the implications of establishing problem solving as a goal of environmental education. Such talk implies first, that there is a solution, and second, that the students are expected to find it. Inability to do so would constitute failure on the part of the child to succeed at a prescribed aim for the activity in which he or she is engaged. While it makes sense to talk about problem solving in mathematics, I do not believe that the same can be said for environmental education. For example, an algebraic question requires the manipulation of a number of known factors so that the value of an unknown variable can be determined. The answer to such questions are characteristically precise and these problems have discrete solutions. It is certainly disputable whether environmental problems have such discrete or solvable solutions. In fact, it appears more likely that environmental educators have misappropriated a term which finds its natural home in mathematics. Problem solving denotes a level of precision, exactness, and plausibility alien to the careful investigation of environmental issues. Expecting a child to solve environmental problems without proper regard for their infinite complexities, is setting the child up for potential failure. One can speculate how the resulting failure might be devastating for children. To urge action which is unattainable is a disservice to persons and serious thought. Perhaps we are not sufficiently humble about our understanding of complex environmental phenomena and the limitations of our mission. The inevitable failure, either immediate or masked by a

false sense of accomplishment, will be discussed in more depth later. First, however, it is important to consider inherent characteristics of the word "problem."

Use of the word problem is normative; by applying this term to a situation, an evaluation has been made. A circumstance may be contentious, but, if we decide that it constitutes a problem, we have made a judgement and decided that it is not to our liking. It follows that the identification of a problem, a necessary condition for its resolution, will in itself be problematic. Consider the difficulties this can pose.

A teacher can cast about, identify problems, and advance these as suggestions for student investigations. This is, of course, unsatisfactory. As the suggestions are judged by the teacher, they will not necessarily reflect the concerns of the students; further, they advance the ethical and political position of the teacher; and, finally, their pre-selection bypasses the critical step of evaluating the issue.

Alternatively, students can select their own problems. Intelligent evaluations will be based on careful consideration of the premises of the competing positions, the logical consistency of the arguments, and the quality of evidence. At least two difficulties face aspiring problem solvers. First, they may select problems with inadequate encouragements to carefully evaluate the issue, and perhaps the inability to do so. On the other hand, they may find that after considerable investigation, their problem is something other that what it once seemed. Indeed they might find that they have nothing left to solve, or that they have been barking up the wrong tree. In this case, their education and pursuit of truth might get in the way of problem solving. At any rate, it should be clear that evaluation of an issue is

a rigorous process which must precede any attempts to resolve conditions judged problematic. Further, there is no certainty that the issue investigated will yield a resolvable problem. This could result in the absurd situation where a student has carried out a thorough investigation, engaged in sophisticated analysis of the available data, rigorously debated the assumptions, and arrived at an intelligent conclusion about the issue, yet remains unable to fulfill one of the stated aims of environmental education.

Notwithstanding the above difficulties, an environmental problem can be intelligently selected. Indeed, there are issues which we can broadly agree are problematic, such as pollution. However, as I suggested earlier, these do not appear to offer the promise of concrete or definitive solutions in the same manner that mathematical problems do. This, I will argue, is due to fundamental differences in their inherent natures.

Australian philosopher John Passmore put the distinction succinctly: "an ecological problem is not, in the first place, the same thing as a problem in ecology" (1974, p. 43). By this he means that a problem in ecology is a scientific problem arising out of the fact that scientists do not understand a particular phenomenon. Having identified a gap in their knowledge, they can then employ their various techniques in an attempt to solve the puzzle. On the other hand, an ecological problem (Passmore uses "ecological" here in a way that would be interchangeable with "environmental") is in fact a type of social problem. It is deemed a problem, not because of a gap in knowledge or our failure to understand a phenomenon, but because the environmental problem describes a phenomenon which we do not like and have judged socially unacceptable. Problems of this kind are not resolved.

Rather, they cease to exist when steps are taken to reduce the irritation to socially acceptable levels of tolerance.

I think most would agree that it would be impractical, if not impossible, to completely eliminate pollution; production of waste is a condition of our survival. Though this kind of problem may appear to go away under certain circumstances, it is not ultimately solvable.

Some might argue that one can work to reduce pollution to particular levels or standards. This, however, may be no solution at all. First, consider the arbitrary nature of the standards; there are not absolute values of acceptable pollution. They only have meaning in a specific context. Standards require constant re-evaluation in light of new evidence and argument as various interests advance competing claims. To simply aspire to reduce pollution to some such standard of acceptability would, at best, constitute a partial solution and, at worst, a pseudo-solution. Satisfaction with such results overlooks important questions about the appropriateness of the compromise inevitably involved in the establishment of standards. It should be clear that at the heart of the issue are questions about what is, or should be, socially acceptable. Critical reflection about those values which determine social acceptability is essential to clear thinking about an issue. Perpetuating the "problem solving" myth is antithetical to the notion of such clear thinking. Ethical positions are not static and do not provide concrete solutions; they are constantly being re-examined, re-evaluated, and re-defined. Surely this sort of activity is more consistent with the educational enterprise. Unfortunately, concentrating on the idea of problem resolution often distracts from these more fundamental issues. Because the

ultimate issues are not resolvable in a way which is satisfactory to the scientific mind, pseudo-problems are created.

Pseudo-problems, or problems which are narrowly defined without regard to basic questions, allow people to address immediate concerns though underlying difficulties are over-looked or ignored. In reality, proponents are often simply managing the symptoms of a much more complex and difficult issue. This tinkering with symptoms can be likened to applying patches to a conceptually leaky boat. Immediate treatment of symptoms can be very important, but the idea that this constitutes problem solving overstates the nature of the accomplishment. As such, it tends to be self-congratulatory, intellectually dishonest, and dangerous.

Another issue concerns the development of problem solving skills. What is at issue here is the use of the word "skills." Others have argued extensively about the inappropriateness of trying to reduce complex intellectual activities to a set of skills (McPeck, 1981, 1990, & Barrow, 1987.) I will not attempt to recreate their arguments here. However, given the previous discussion, environmental problem solving, or more correctly, issue investigation, is a complex intellectual activity. Therefore, talk about a discrete set of environmental problem solving skills is facile. Attempts to reduce the study of environmental issues to problem solving exercises, and talk of problem solving skills appear to be symptomatic of a much larger problem in the education community. Through attempts to simplify difficult matters for the easy consumption of unwilling clients, we often trivialize them.

Having been critical of one of the institutions of environmental education, I must now state that I have no alternative blueprint.

Furthermore, I think that to attempt to provide a recipe would be antithetical to the nature of educational debate. However, I do see directions for inquiry which require more attention. First, our task as educators is not to train students to necessarily solve environmental problems; it is to educate them. This is inextricably linked to acquisition of knowledge and understanding, clear and critical thinking, and care about the use of reason.

Education will not only help students to understand normal science, but also the limits of this discipline. We must resist inappropriate attempts to cast complex social issues into the language and methodologies of science; science will not solve many so-called environmental problems. Fundamental to these issues are questions about who we are, our attitudes to non-human components of the environment, and what premises will enable us to build a better society. Having argued about our premises, there will be questions about how these should be logically interpreted and implemented in specific instances. It follows that we must prepare students to participate in ethical debate and metaphysical discussion. This does not mean that we should abandon the investigation of environmental issues. These preparations can only take place in some context, with content and issues to examine. Critical and intelligent pursuit of current issues should be central to an educator's efforts, and should justifiably occupy an important place in environmental education.

While investigation of issues is important, we must be more humble in our aspirations. We must curtail our zeal to solve environmental problems. We must pursue our investigations with passion, and encourage passion in our students. But, let us be passionate about pursuit of truth, rightness, and humility. Indeed, let us work with humility, that sense of

being small, ever diminutive, in a large complex world. Humility does not mean paralysis. We must allow students to think about things which are important to them. They must be able to participate in issue investigation, and permitted to act, if they wish, on the best available evidence and argument. However, intellectual integrity dictates that they, too, pursue actions with humility. Students will not be solving problems, they will simply be participating as intelligent individuals in the constant re-examination and re-casting of society.

Education for Sustainable Development

References to education and training in Our Common Future (1987), and inclusion of talk about sustainable development in the report of the Moscow Congress (UNESCO-UNEP, 1988), provides a context in which to critically examine inappropriate applications of environmental education. The UNESCO-UNEP document advocates training of personnel needed for rational management of the environment in view of achieving sustainable development. Our Common Future (1987) seeks to make people act in the common interest, implies that sustainable development is in the common interest, and suggests that education among other things can help to bring this about. It also advocates the skill improvement required for pursuing sustainable development.

First, it should be noted that training and rational management, as reported in the UNESCO-UNEP (1988) document, are logically inconsistent concepts. Training is contributory to skill development while education contributes to rational abilities. It is thus unclear as to whether the authors of this document are talking about training or education in pursuit of sustainable development. Second, as we have seen, the pursuit of a

particular end, such as sustainable development would be external to education. We do not properly say that we are educating for sustainable development. Similar criticisms can be leveled against the comments from Our Common Future (1987). The idea that education can be employed to attain sustainable development is again floated, and skill improvement is advocated in pursuit of the same end.

In the same way we would object to the idea of educating for sustainable development, so would we reject educating for activism. Equally offensive would be mooting the modification of behaviour to something like that of Sierra Club members (Sia, Hungerford, & Tomera, 1985-86). In even suggesting that we might, we find evidence of the missionary zeal that Hendee (1972) alerted us to.

As the Moscow document speaks of training, and Our Common Future speaks of skill development, it is important to comment further about the importance of these concepts. As discussed in Chapter Two, training is a justifiable component of a person's schooling. It is appropriate to identify time to engage students in activities designed to train them in the skills required to meet their immediate needs. Training in effective agricultural techniques might be one good example of an important schooling activity in some contexts. However, education should enable a person's thinking to transcend particular circumstances and immediate needs. Education should enable a person to think clearly and carefully about issues rather than merely reacting to them, or learning the best method for coping. While training will undoubtedly be important, education will be essential to intelligent mediation of more fundamental issues.

Another way of looking at this is to consider that the appropriateness of sustainable development, and Sierra Club approaches to environmental issues are contested concepts (Manes, 1990). While as citizens we may be predisposed towards a particular course of action, we must remember that our job is not to inculcate our preferment, but to enable students to think clearly and critically. It is possible that our own view will not be correct or definitive, as hard as that may be to accept. The insurance that students will be able to do better than ourselves will lie in how well educated that are.

What this means to us, as concerned citizens and as educators, is that we must make clear and proper distinctions between our various roles in society. As educators we must be sure that we are in fact educating. If the arguments we support as citizens are sound, our students may accept them. If they are unacceptable, our students will have the ability to evaluate them as such, and the freedom to reject them.

I do not expect that as teachers we will be educational saints. Indeed, our preferences may be exposed by our actions or solicited by our students. Furthermore, selection of content and pedagogical methods will not be completely objective nor free of bias. We will have to argue and give good reasons for selecting those things that we feel should be covered in a course of study. Still there will be implicit values projected. Education is not a perfect nor precise business. However, by clarifying the nature of this enterprise, we can be more even-handed, and broad in the range of ideas that we expose students to. And, perhaps this will enable us to pursue our work with both dignity and the requisite humility.

On Action

I have argued against aiming towards student action. This is not a dismissal of discussion about action, its proper place, and its relationship to the educated person. We do have the expectation that educated persons will be transformed by their experience; we expect them to act in a way consistent with their education, judgement and rational capacity. For example, when persons fall short, we frequently will say that they should have known better. Part of the difficulty in this apparent contradiction turns on our use of the word "expect." In the preceding discussion I have used expect in a way which is meant to indicate that the expected behaviour will be a logical consequence of the person's education. The alternate usage would be to communicate a demand. For example, "I expect you to do X, and don't come home until you have." It is this second usage that I have argued against.

Rational behaviour and good judgement, or environmentally responsible behaviour, are correctly seen as logical consequences of education rather than aims in themselves. A person's disposition to act in certain circumstances will range from an expression of free will, to a response to some form of coercion. As educators, our task is to enable students to act as intelligent, rational, and autonomous moral agents. In the final analysis a decision to act should be an expression of will.

The question remains: Can we assist and nurture this will? I expect we can, and do. First, schools are charged with the task of developing generally accepted patterns of behaviour. We might engage students in cleaning up the school grounds, recycling paper and pop cans, or we might discourage cruel behaviour towards animals and reckless destruction of the environment. While this may be an important part of schooling, it is not

education. We would call this socialization or training. While these activities may be minimally concerned with intellectual abilities, they do carry a message. Persons are expected to behave in accordance with what is judged to be right. It does not follow, however, that the same approach can be taken with more complex issues. It is not at all clear, nor generally agreed, what would constitute appropriate responses towards activities like trapping, mining development, and creating parks. In all of these instances, there are competing claims vying for our attention. They raise questions about appropriate relationships between humans and their environment. It will take an educated person to think intelligently about these issues.

The second approach to nurturing willingness to act, is to allow investigation of important social issues. While it would be wrong to expect action as an outcome in the demanding sense, we expect that a person may act if they find sufficient reasons for doing so. To discourage or thwart that opportunity would be to deter development of independent moral agents. School programs can thus rightly allow this completion experience. However, we must not forget that this is a logical extension of education, not part of it. This is what happens after we finish our work as educators, though the school may retain a facilitating role. While learning circumstances may nurture a desire to act in intelligently, and in accordance with one's beliefs, we must proceed with care and humility. We must curtail our tendency to exhibit missionary zeal and shape the nature of these responses.

CHAPTER FOUR
THINKING ENVIRONMENTALLY

Central to environmental education is the task of enabling students to think clearly and critically about the environment - to think environmentally. In attempting to identify the central elements of "thinking environmentally" it will be instructive to consider observations made by several writers who have, at least in part, made a career of thinking about the environment. Their concerns and arguments often converge with those of educators and can shed light on the nature of critical and intelligent reflections on environmental issues. The task here will be to place their critical deliberations within a framework for education.

E. F. Schumacher, in his widely read book Small Is Beautiful (1973), raises some doubt about the efficacy of Western education. He observes that in spite of our widespread belief that education is the key to the resolution of all our problems, Western civilization remains in a state of permanent crisis. The common answer, he suggests is that we must provide more and better education though, in spite of this rhetoric, the quality of the education provided remains suspect.

Elsewhere Schumacher (1977) reflects upon his own schooling: "All through school and university I had been given maps of life and knowledge on which there was hardly a trace of many of the things that I most cared about". This gave rise to a complete perplexity until he "ceased to suspect the sanity of [his] perceptions and began, instead, to suspect the soundness of the maps" (p. 1). While not speaking specifically about environmental issues Schumacher's comments parallel the unease of many who do. As

Neil Evernden (1985), Canadian professor of environmental studies argues, neither Schumacher nor many environmentalists have been able to place their concerns on those social maps which define the nature and scope of the dominant forms of knowledge. Evernden concludes, in his book The Natural Alien, that the environmental movement must participate in the re-examination and re-drafting of those maps.

What is of interest to educators is that Schumacher and Evernden both raise questions about the breadth of our educational efforts. We cannot expect persons to think clearly about the environment if they are restricted in their instruments of cognition (Evernden, 1985). This is, of course, a matter of great concern to educators. As discussed earlier, it is the educator's responsibility to maintain opportunities and not to limit them. We must, therefore, not deprive anyone of access to forms of understanding which enable broader opportunities for thinking about environmental issues. In what follows I will examine those forms of knowledge and understanding which appear central to the task of thinking environmentally.

Ecology

The study of science, particularly ecology, has dramatically changed the way that we think about the environment. Rachel Carson's book, Silent Spring (1962), stunned the world with its revelations about the ecological implications of pesticide use. Her work describing how toxic materials are concentrated in food chains was criticised before the public in Time (1962) as inaccurate and emotional; the journalist assuring the readership that while

some pesticides may be dangerous, many are "roughly as harmless as DDT". Ironically, DDT is now banned in most industrial countries. The major concern expressed by the Time writer was that Carson's outburst in Silent Spring would do little good for the things that she loves while risking considerable harm by alarming the "nontechnical public," the implication being that the public is best left in the dark while technical questions are handled by experts. Fortunately, the nontechnical public was capable of understanding the ecological concepts examined in Silent Spring and the book went on to become a prize winning best seller.

Carson's work gave renewed and very public meaning to the study of ecology. This was, perhaps, the first dramatic evidence of the usefulness of ecology in examining environmental issues (Evernden, 1985). The Time article, on the other hand, seemed to express contentment with the notion that the general public should be left uninformed, assuming that they would be incapable of understanding. The implicit message is an argument which favours ignorance and is profoundly anti-educational. The extension of such assumptions would result in the limiting of persons' ability to understand issues important to them and thus to limit their ability to think clearly and critically about environmental issues. This is, of course, unjustifiable from an educational point of view, and preparing students to think environmentally will include the study of science, particularly ecology.

By the study of science I do not mean that all students should be trained in a manner of preparation for being scientists. Rather I mean that they should become sufficiently literate to function effectively and critically in a society which constantly appeals to the sciences for guidance. This will

entail two tasks. First, students must understand the fundamental concepts central to ecology. They must learn about ecosystems, niches, adaptation, ecological interdependence, succession, food webs and energy chains, predator-prey relationships, carrying capacity, and so on. Such knowledge and understanding will enable students to read and understand the arguments presented to the public. Increasingly, popular literature is devoting attention to environmental issues. In September 1988 Maclean's devoted an issue to the theme "Our Threatened Planet," in December 1988 National Geographic devoted an issue to the question "Can Man Save This Fragile Planet?" and, in step with the changing mood, Time devoted a January 1989 issue to "Planet of the Year: Endangered Earth." These, and various public forums, will require a significant level of ecological literacy to be meaningful and informative to the public.

Second, environmental arguments often appeal to scientific research as a means of supporting a claim. For the audience to evaluate the claim and judge the merit of the argument it must have some understanding of the nature and purpose of science. Students should know that there are often competing claims in the scientific community about a given question. These differences may arise out of differences in scientific pre-suppositions or in research methodologies. Students should be prepared to reflect upon these pre-suppositions and to critically examine research findings. While it is not the intention to make everyone into scientists, students should be able to, in general terms, question the veracity of scientific reporting. They should know: that a single study would not normally provide conclusive evidence, something about the confounding nature of uncontrolled

variables, and that scientific reporting presents probabilities of occurrences rather than proofs.

Students should also understand the limitations of science. While it is true that Rachel Carson's ecology breathed new life into the environmental movement, and the emergent study of ecology brought great hope to those who had concerns about the environment, it is also true that recent writers have questioned the adequacy of ecology, on its own, to enable us the think intelligently about the environment (Livingston, 1981; Evernden, 1985). Thinking environmentally requires broader understandings than science alone can provide.

At the very least we must ensure that students can distinguish between empirical and philosophical questions, a point lost in much environmental education literature. As Australian philosopher, John Passmore (1974) points out: "An ecological problem is not, in the first place, the same thing as a problem in ecology". By this he means that environmental problems are, by their very nature, different from problems of science. A problem in ecology is a purely scientific problem which, he suggests, arises out of the fact that scientists do not understand some particular ecological phenomenon. Observations of natural phenomenon and manipulation of influential variables through experimentation can tell us what the popuiation of the Porcupine caribou herd is, or what might be the consequences of mineral development at the Windy Craggy mine site. As such, science can, through empirical investigations, tell us what <u>is</u>, or project what <u>might be</u>, the case.

While ecology and other branches of science can inform our thinking about an issue, it is important to realize the limitations of this mode of

inquiry; science alone cannot enable us to decide what we ought to do. Science can provide us with means but not ends. Questions of this sort ultimately involve ideas about the way life should be lived and about the ways in which persons should conduct themselves. Evaluations of decisions are based on the coherence of the arguments presented and the acceptability and justification of the pre-suppositions, or ideas, upon which the arguments are based. It does not necessarily follow that, because mining activity in a particular area threatens a wildlife population, we ought not to proceed with the development of a mine. Many would argue that the jobs created and the resulting products produced are of greater value. The resulting ecological issue is not a scientific concern, but a special type of social problem of a philosophic nature. There must, therefore, be distinct opportunities in environmental education for students to learn to think scientifically and philosophically. History, to be discussed next, will be examined as a vehicle for addressing this need for greater breadth of inquiry.

History

Essential to intelligent rational thinking about social problems is the ability to reflect critically upon the values held by one's society and to achieve the knowledge and understanding required to consider options and arguments which lie outside of that society. An understanding of one's culture gleaned through historical study is integral to the development of this ability. Environmental history can also enable students to examine the impacts of societies and cultures upon the environment. Thinking environmentally is thus inclusive of the study of history; what we have

believed and what we have done can inform our decisions about where we may go as a society and what we shall do.

Lynn White (1967), in his classic paper "The Historical Roots of our Ecological Crisis", argues that understanding current problems will require an historical examination of the presuppositions that underlie modern technology and science. White describes how the union of science and technology in the Middle Ages increasingly enabled humankind to change the face of the earth in ecologically disastrous ways. He contends, however, that roots of the emergent problems were not technological. Our daily actions and human behaviours in general are dominated by our beliefs about our nature and destiny. Dominant Western attitudes have, he claims, been moulded by Christian dogma which has inculcated belief that man is separate from, and superior to, nature. The Chri tian doctrines professing man's dominion over Creation has given rise to: the most anthropocentric religion the world has seen, contemptuous attitudes towards nature, and faith in perpetual progress.

For Lynn White, the development and deployment of Western technologies have been propelled by Christian arrogance toward nature. Science and technology can provide no solutions to what are essentially metaphysical problems. We must, he claims, find a new religion or re-think the old one.

John Passmore (1974) allows that we can legitimately argue for a more prudent deployment of technological innovations, less wastefulness, and more awareness of our dependence on the biosphere. It is quite another matter, however, to suggest that solutions to ecological problems will be found by abandoning our analytical traditions in favour of a search for new

ethics, a new metaphysics, or a new religion. Passmore contends that traditions of the West are far richer and more diversified than critics have allowed. Through historical analysis he argues that a "new ethic" is already inherent, if only a minor theme, in Western thought.

Passmore (1974) allows that critics of Western tradition are justified in claiming, through historical diagnosis, that Christianity has encouraged arrogant despotic attitudes towards nature. They are wrong, however to lay blame for this attitude on Genesis and the Old Testament. Passmore claims, that there have been two historic interpretations of the Old Testament, one anthropocentric and responsible for what the critics have called Christian arrogance, and the other theocentric and tending towards fostering attitudes concerned with wise stewardship. Though critics are correct in identifying the dominance of the former interpretation, it is not true that this metaphysic represents Western tradition and thought in its entirety. It is Passmore's view, supported by historical analysis, that the West has never been wholly committed to the view that humankind has no responsibility to nature. To him reform can best be achieved by appealing to existing, though not necessarily strong, traditions. What the West needs, according to Passmore, is not so much a new ethic but a more general adherence to a perfectly familiar ethic.

It is important to stress that what is of most importance to thinking environmentally is not the rightness or correctness of White, Passmore, or other historical interpretations. Rather, these arguments provide us with information about our society, a vehicle for the philosophical examination of social values and the presuppositions upon which this society is built, as well as an opportunity to engage in the act of assessing and judging the

quality and coherence in the arguments presented. What we wish for our students is not that they necessarily side with White, Passmore, or others, but that they are enabled to think more clearly and critically about the environment, and human/environment relationships.

In a similar way the history and traditions of other societies, including indigenous cultures can provide a window through which we can view our own. Again the purpose should not be to encourage students to emulate Zen Buddhists, Tlingit Indians, or white Anglo-Saxon protestants, but to enable one to reflect upon one's own cultural values. For Tlingit Indians living in a Western dominated society it will, of course, be important to learn about their own culture, but it will also be important for them to learn to scrutinize Western beliefs and values as they think about environmental issues.

If failure to think intelligently about the environment has been at least in part due to a lack of ecological knowledge and understanding then the study of study of historically documented modifications of the environment, or ecological shifts caused by human actions can inform our thinking today. Studying the ruins of civilizations and their impact on the natural environment can develop an awareness of our need for a protective as well as productive environment (Cherif, 1988). Current thinking can be informed through the examination and understanding of past actions. The deforestation and subsequent desertification of North Africa through wood gathering and cultivation of domestic livestock can, for example, provide worthwhile historical case studies. Similarly, the introduction of rabbits to Australia, the nuclear disasters at Chernobyl in the Soviet Union and Three Mile Island in the United States, and the mass gassing of Indians living near

Union Carbide's Bhopal plant could all provide the student with material to ponder the impacts of science, technology, and civilizations upon the natural environment. Understanding of current environmental issues can surely be enhanced through study and critical assessment of similar issues in the past.

Finally, current issues will be more fully understood if they are examined within the context of the historical developments which have surrounded them. We frequently observe that the persons who can most clearly think about an issue are often those with the most information about it. If, for example, we are to fully understand the issues surrounding fur trapping, it is important to know about the history of the fur trade and indigenous cultures. Students will need to appreciate the significance of past events in their understanding of current issues.

Aesthetic Experiences

In further attempts to understand the limitations of science, distinctions have been made between natural history and ecology (Livingston, 1981; Evernden, 1985). Authors such as Neil Evernden have argued that natural history promotes an understanding or appreciation for the natural world which is different from that gleaned through the sciences. To a scientist, understanding implies prediction with implications for controlling, whereas natural history is an experience or way of perceiving the world which involves personal involvement and emotional or empathetic understanding of nature. In this sense natural history is like a form of aesthetics - environmental aesthetics.

This form of understanding is not merely sentimental, nor can it be dismissed as a mystical attachment to the balance of nature. It is important to realize that there are uses of the words "knowledge" and "understanding" where notions of feeling, emotion, and empathy are involved (Barrow and Woods, 1988). We can know what it is to experience, beauty, sadness, joy, frustration, fulfilment, wonder, ecstasy, and various other emotions. Associations of such emotions with experiences in a particular context or situation will certainly inform us, or allow us to know more, about that particular context or situation than would have been known in the absence of the experience. We come to know that it can have the capacity to illicit various emotions to which we may attach varying degrees of value and concern. We might rightfully claim to know that city traffic distresses us; our knowledge based on personal exposure has informed us that this is not an aesthetically pleasing experience.

Furthermore, mutual understanding is dependent upon shared experiences. To say that we understand someone else's emotional response will be dependent upon our having shared a common or similar experience and shared in the same knowledge. For example, one might claim to not understand the sadness felt by a friend whose wife had left him. In this sense, understanding refers not to the comprehension of some impersonal body of knowledge, but to a set of personal experiences. If one had never experienced an emotional relationship, then this same person might well find it impossible to understand the grief felt by another at the loss of his wife. Similarly, if one had never witnessed the splendour of mountain scenery, of the solitude of remote wilderness, or animals in their natural environment, this person may not understand the emotions, and associated

values inherent in these experiences for the recipients. There is, in this sense, a form of understanding which can only be shared by persons have shared similar feeling experiences.

Accumulation of knowledge, according to the view of aesthetics described above, occurs as a result of the direct personal, or aesthetic experiences themselves. Such a personal experience can illuminate situations, heighten sensitivity, disclose new possibilities, and increase understanding. Environmental thinking will require knowledge of the aesthetic pleasures, and perhaps despairs gleaned through direct first hand experiences. As John Passmore said in his book Man's Responsibility For Nature:

> Only if men can first learn to look sensuously at the world will they learn to care for it. Not only to look at it, but to touch it, smell it, taste it. As we said, Plato - like every other authoritarian... severely condemns the sensuous man, the lover of sights and sounds. And one must grant to him that a purely sensuous life, in which sensuousness is never kindled into love, love with the responsibility and care it brings in its train, is impoverished, sub-human and incapable by itself of solving ecological, or any other problems. But, on the other side, the attempt to be 'super-human' by rising totally above sensuousness issues... [is] no less impoverished, no less sub-human, and is utterly destructive, into the bargain, of man-nature relationships. (p. 189)

In the above passage Passmore does more than assert support for the need to attend to direct personal, or sensuous experiences. He echoes the educational need for breadth of learning experiences and an institutionally balanced presentation of the different dimensions of knowledge and understanding available in our modern Western world. How we think will be determined by the nature of the possibilities, the forms of thinking, available to us.

Ethics

I argued in the third chapter that we must resist inappropriate attempts to cast complex environmental issues into the language and methodologies of science. Fundamental to these issues are questions about who we are, our attitudes to non-human components of the environment, and premises that enable us to build a better society. Having argued about premises, we must address questions about how these should be logically interpreted and implemented in specific instances. In short, we must enable students to develop clear, careful, and logically coherent arguments about what we ought to do in response to specific instances and how we should behave in general. This is the task of ethics.

I have also argued that while science can contribute to environmental understanding, it is limited in its capacity to enable students to think clearly and clearly about how one should behave. Similarly, history and aesthetics are also fields of study which can contribute to environmental understanding. However, they too will fall short in enabling students to develop arguments about how one should act.

It follows that a curriculum to enable students to "think environmentally" should include provisions for students to consider, and practice making moral judgements. If our educational objective is to enable students to think clearly and critically about the environment and related issues, then environmental ethics must be included. It is the study of ethics which is the alternative to the inculcation of particular environmental behaviours, propagandization, and other forms of coercion.

It is important to note that moral judgements are not merely matters of subjective opinion. While establishing ultimate truths of certain claims may be difficult if not impossible, moral reasoning can certainly bring clarity to arguments of this type. We can, in many instances, distinguish between acceptable and unacceptable, and between plausible and implausible. Acquiring the ability to make these distinctions will require students to gain understanding of what constitutes a moral argument. At the least, students must understand the nature of assumptions or the premises upon which arguments are built. They must have practice identifying them. The must understand that premises, to be rationally acceptable, must be supported by justifications. They must engage in the critical scrutiny of these supporting arguments. They must also understand that sensible arguments must be logically consistent, and they must understand the relationship between moral assumptions and the concept of generalizability.

While the study of environmental ethics must enable the student to understand the nature of the discipline as described above, and while the essence of moral philosophy is concerned with criticizing and developing arguments, this field of study is not devoid of content. Though environmental ethics has been described as a relatively recent field of studies (Hargrove, 1989), it represents much lively debate. Understanding this debate will require knowledge about the language of its discourse, and the terminology given to the requisite philosophical concepts. Knowing about this debate is also important. A breadth of environmental perspectives are currently being advanced and supported by differing, often competing, premises. Introduction to these perspectives will allow students to be conversant in the field of environmental ethics; it will enable them to

know the territory. In being exposed to the sometimes disparate ideas of well thinking people, students will see where others have tread as they seek clarity for the future. Further, teaching students to think critically, cannot take place in a vacuum, some content will be required and this can be drawn from the literature in environmental ethics.

Finally, the study environmental ethics must allow students to do philosophy. They must be given the opportunity to apply philosophical knowledge, understanding, and technique in order to understand contemporary issues of importance to them. Ultimately environmental ethics should aspire to enable students to make intelligent choices about what they ought to do in particular instances, to be morally autonomous individuals. This will entail practice in making intelligent, justified, and logically coherent choices.

The elements that I have outlined as essential to thinking environmentally do not convey just four disciplines; ecology, history, aesthetics, and ethics but four distinctly different ways of knowing about the environment. Of course other fields of inquiry will have a bearing upon how we think about environmental problems. However, the common core curriculum for all students who are to think environmentally will be most concerned with enabling students to understand what it means to think scientifically, philosophically, and aesthetically, to be able to distinguish between questions which are essentially scientific, philosophical, and aesthetic.

CHAPTER FIVE
EMPIRICAL CONSIDERATIONS

In the previous three chapters I have used conceptual analysis to examine ideas about the nature of "schooling," "education" and "environmental education" with the aim of establishing a coherent understanding of the congruency between environmental education and schooling in general and, more specifically, education. In light of these conceptual considerations, one can infer some principles from which sensible curriculum planning can proceed. While such considerations are necessary, I maintain that they are not necessarily sufficient. This form of analysis is important in clarifying our understanding of the concepts central to our enterprise, but it cannot settle many of the substantive matters. It cannot determine, for instance, how much of the school resources should be allotted to education rather than training or socialization, nor can it determine what content, in a given context, will best support those conceptual principles. It must also be acknowledged that those responsible for the implementation of a curriculum have a perspective on what it should look like; one cannot presuppose that they will agree about, or accept, the results of such an analysis. Further, in a democratic society the public will ultimately have the last say about the relative weight given to the various schooling concepts and the content selected to support those functions. They, too, have an important perspective on curriculum decisions and in the final analysis will make their presence felt. The development of sensible and usable curricula will require not only

conceptual clarity, but also an understanding of the context in which the initiative will be implemented.

This chapter is concerned with addressing the second research question: What contextual considerations can have a significant bearing on education in the Yukon as it pertains to the environment? Though curriculum planing decisions, derived from social assessments, have been criticized, the arguments against consideration of contextual concerns are by no means conclusive. Sensitivity to local interests and needs, content, and implementation concerns are discussed in the following section. This discussion will further serve to clarify the purpose, scope, and nature of the descriptive research central to this study.

Needs and Interests

I recognize that interests and perceived needs can be of limited usefulness in determining the aims and objectives of curricula, even though this process is viewed by some as one of the principle starting points for curriculum development. The well known Canadian curriculum developer David Pratt (1980) tells us that needs assessment involves the collection of opinion and factual data for the purpose of determining what human needs the school should endeavour to meet. It is important to ask, however, if a whole system of schooling can justifiably be predicated upon a process of opinion polling? Unfortunately such a system, however sophisticated, cannot make adequate distinctions between needs and wants, public good and self interest, and informed opinion and uninformed belief. Additionally Barrow (1984), in his criticism of needs assessment, as

exemplified by Pratt's work, identified a further error. He argues that a need presupposes reference to some objective; the importance of attaining some objective creates the need in the first place. If we are to talk about educational needs we must have some pre-existing understanding about education and other schooling objectives. Thus, as Barrow points out, in the context of school curricula the important question is: What are our educational needs? Thus, needs assessments are threatened by the fallibility of attempts to distinguish general from educational needs.

Talk of basing curricula on interests is also ambiguous. There is no reason to believe that interests will be consistent with educational needs; what interests one, may not be in one's interest. Barrow (1984) points out that pre-eminence of interests in curriculum development leads to two possible assumptions: what interests teachers, children, and parents happens to be worthwhile; or, that the criterion of worth in an activity is that people have an interest in it. I think that Barrow is correct in pointing out problems associated with giving pre-eminence to interests, and these problems are illustrated using two examples. In the first place, while learning how to poach wild game may interest a child, the educational worth of this activity is clearly not supported. Second, while interest in classical Greek literature may not be great in rural Yukon communities, the inherent worthiness of this topic for study is in no way diminished.

While arguing that needs assessment should not determine the aims of curricula, Barrow (1984) does acknowledge that occasions where interest is aroused, or a need is correctly perceived, can be good times to introduce appropriate material. However, he maintains that conditions of interest and perceived need are neither necessary nor sufficient pre-requisites for the

introduction of new material. On the second point he is surely correct for reasons outlined above; need and interest are not sufficient criteria for curriculum determination. However, I am less convinced than he about the wisdom of the first point. It may well prove desirable, if not necessary, to consider interests and perceived needs in the development of effective curricula.

In The Republic, Plato advises us to heed the importance of interests in his observation that compulsory learning never sticks in mind. He is making an empirical claim for which unequivocal verification would be difficult to provide. However, while an empirical solution to the question of the necessity of interest may be elusive, Plato's skepticism does lead us to a logical point. If we accept, following Scheffler (1965) that to "know" something requires adequate evidence of the truth and the belief that it is true, it becomes easy to see that compulsory learning, whatever its veracity, might well reflect the acquisition of information masquerading as knowledge. For example, a student might not care about evidence or justification if required to learn against his or her will. The object of the exercise simply becomes the memorization of enough information to satisfy the teacher's expectation regardless of whether he or she believed it to be true. It would thus seem that the efficacy of learning would be inversely related to the degree to which the students' perceptions of need, and interests are violated. Similarly, when teachers are presented new curricula the effectiveness of their implementation will be affected by the degree to which they understand it, find it practically usable, and perceive it to meet the educational needs of their students. While the force of this argument might not be sufficiently powerful to settle the dispute, it is clearly

advantageous to motivate students by taking advantage of their present interests or seeking to cultivate new ones. Additionally, a sense of having one's needs met is likely to be motivating.

Ignoring students' needs and interests also raises moral questions. For example, Plato questions the propriety of requiring students to learn under duress in a free society. In a society, such as ours, which values individual freedom, it does seem repugnant to entertain notions of force and compulsion in matters of learning. However, the issue becomes less clear when we attempt to determine distinctions between firm guidance and force. What is more certain is that the hardheaded or insensitive educator, unfamiliar with the context in which he or she is working, runs a far greater risk of transcending the boundaries of moral acceptability.

Acknowledging the advantage in attending to perceived needs and interests raises questions for the curriculum developer as to how best incorporate such knowledge into the planning of curricula. Stenhouse (1975) staked out the territory by identifying two opposing options. He suggests that at one extreme a curriculum developer can follow the principle of perceived relevance or interest and try, so far as possible within that principle, to guide the students toward that which is educationally worthwhile. Alternatively, the developer can judge that which is worthwhile and attempt to teach it so well that it evokes interest. The usefulness of stating the range of possibilities as starkly as Stenhouse does is that difficulties with the extreme positions are exposed. At one end of the spectrum, there can be no guarantee of any consensus of interest or perception of relevance. Further, there is no assurance that teachers, students, or parents, following this principle, allow themselves to be

directed toward that which is deemed to be educationally worthwhile. At the other end of the spectrum it would be difficult, if not implausible, for even the best teachers to consistently evoke sufficient interest in an unpopular or insensitive curriculum to create a good learning environment. A useful curriculum, it would seem, is one which is conceptually coherent and interesting, and perceived to be meeting the needs of its students.

Clearly what is needed is the sensitive juxtaposition of interests, and perceptions of need, and a clear and coherent conception of education. Kieran Egan (1982) captured the essence of this need in claiming that what we require is:

> ... is some sensitivity to the kinds of things that most interest the students, some analysis of why those things interest students, and practice at using the principles abstracted from their interests to organize the content teachers think of most educational value to them. (p. 164)

Here Egan speaks of teachers though I believe that the same will apply to curriculum planners. It is precisely in the spirit of Egan's comments that this analysis will proceed.

Content

While education is about developing breadth of understanding, as opposed to the accumulation of mere information, it is also about the "stuff of life." This point is captured well by Barrow who says:

> What life involves, and where good thinking would therefore be useful, is exactly where for the most part it is not to be found: human relationships, complex actual moral issues, political problems, coping with complex bureaucracies, ... these are the sorts of problems that people need to think well about. (Barrow, 1985, Westminster Studies in Education Vol. 8)

He continues to argue that schooling requires the development of concepts suited to thinking about topical issues, and rational teaching practices which will engage students with these concepts and issues. So what is this stuff of life? What underlying concepts will be central to thinking about important issues? What teaching practices will engage students with these concepts and issues? Investigating these questions in the Yukon context is an important task.

The idea of including local content in curricula is supported by reference to the arguments developed by McPeck (1981). He argues that thinking critically is not a skill but a more complex process inextricably linked with content. The most astute judgements of complex human problems, he argues, are often dependent upon the amount of knowledge that can be brought to bear. The more a person knows about a problem, the more competent he or she will be to assess it. The point of this line of argument is this: If a curriculum is to include context specific issues as has been advocated above, then knowledge and understanding of that context stand to be enhanced. While it is not possible to know what future issues will be, it does seem reasonable to suggest that the acquisition of a certain amount of knowledge and understanding, though not necessarily sufficient, will augur well for clear thinking about future problems in the same context.

The Relationship Between Planning And Implementation Of Curricula

Planning presupposes need for change. In the face of an existing school curriculum, any attempts to develop curriculum materials implies

an inadequacy of existing structures to achieve some schooling goal. New directions realized through curriculum change must be consistent with the nature and purposes of schooling, and sound curriculum planning must be based on a clear articulation of some schooling need. Having said this, however, we must ask if this is sufficient for successful curriculum planning. There are some curriculum theorists, such as Barrow, who are inclined to believe that it is.

Barrow (1984) is wary of collusion between curriculum planners and those responsible for implementation. He clearly objects to the idea of implementation being used as a criterion for adopting a curriculum proposal. Justifiably wary of such a possibility, he argues against the persuasiveness of implementation concerns, allowing that only rational implementation techniques deserve any place in the planning of curriculum. Consulting with teachers (and others) and involving them in the planning with a view to bringing them "onside" should be confined to the actual implementation process and not to the planning stage. A curriculum proposal, according to Barrow, should be clear and logically coherent, unfettered by persuasive constraints. While Barrow is correct as far as he goes in arguing that a curriculum, predicated upon implementation concerns, is not necessarily a good one, and that a curriculum is not necessarily bad if it fails to readily gain acceptance, the adequacy of the purely rational approach is questioned and it is at this point that I find myself at variance with his work. For example, Barrow does not add that an unaccepted curriculum is also a useless curriculum. While I agree that curricula should be clear and logically coherent, they should also

be useful and effective. Curricula cannot be effective if they are rejected by teachers or impossible to implement.

My point has been underscored by a number of researchers concerned with curriculum effectiveness. They have argued that the rational assumptions, abstraction, and descriptions, or in short the "hyperrationalization of change," simply does not make sense to the teacher (Fullan, 1982; Wise, 1977, 1979). Furthermore, proposals for change often strike teachers as frivolous and fail to address issues of central concern to them (Lortie, 1975). This doubt is put more directly by Sarason (1971), who claims that rational solutions to curriculum planning have backfired when they ignored the culture of the school. Similarly, Fullan (1982) claims that a lack of sensitivity on the part of planners to the situations which the potential implementers are facing is one of the basic reasons for innovation failure. Changes are often introduced which do not consider the situational constraints, values, ideas, and experiences of those who are essential for implementation of changes. "The fallacy of rationalism is the assumption that the social world can be altered by seemingly logical argument" (Fullan, 1982, p. 83). "Reformers," as George Bernard Shaw captures it so well, "have the idea that change can be achieved by brute sanity" (reported in Fullan, 1982, p. 83). Consideration of the implementation context will be instructive.

Though perhaps not conclusive, this argument suggests that, if not necessary, it can certainly be advantageous to have some sensitivity to the implementation context during the planning of curricula. This is not to say that sensible curriculum decisions should be supplanted by the whims of teachers, parents, or administrators, but rather they should be augmented by

sensitivity to their concerns and constraints, and understanding of the educational needs of their students. In a way that parallels the earlier section on needs and interests, I believe that what is required is some analysis of the concerns of teachers, parents, and administrators and practice at using principles abstracted from these concerns to organize the content that curriculum planners think to be useful in meeting schooling objectives.

Summary

It has been argued that a sound conceptual basis is necessary for sensible curriculum development, though this in itself may not be sufficient. It is clearly advantageous, if not necessary, to also plan curricula with some sensitivity to the perceived needs and interests of teachers, students, and parents, local issues and concerns, and the concerns and constraints of those responsible for the implementation of the curricula.

Child rearing, teaching, and running schools are more than rational activities. They are also dependent upon an enormous body of practical wisdom. While I have argued that a curriculum must be conceptually coherent, particularly at a general level, it will benefit from the influence of this practical wisdom. Considering practical wisdom does not necessarily undermine conceptual clarity. Rather, effective curriculum development will achieve a carefully considered blend of these two notions. It follows, therefore, that curriculum planning will be enhanced through consideration of sensitivities, or practical wisdom, gleaned through a context evaluation, or description of the implementation context. This discussion leads to the

research question: What contextual considerations can have a significant bearing on education in the Yukon as it pertains to the environment?

For the purposes of this study, I solicited views of those who are concerned with curriculum matters, have a voice in effecting change, and can contribute to the development process: teachers, administrators and parents. Based on arguments developed in this chapter, this research gathered information about what these participants believed in each of four areas affecting curriculum planning. These included:

1. Motivations, perceptions of need, and readiness for changes in the amount and form of environmental education programming were gauged by asking questions about the existing perceptions of environmental education.

2. Perceived needs for environmental education in schools were examined by asking questions about the conceptual requirements developed in chapter four.

3. Views were solicited regarding content and pedagogy suitable for inclusion in Yukon environmental education.

4. Views were solicited concerning problems or feelings of constraint about the implementation of environmental education in Yukon schools.

CHAPTER SIX

DESCRIPTIVE METHODOLOGY

In the preceding chapter I argued for sensitivity to the implementation context during curriculum planning. The work of the curriculum developer, I believe, will be enhanced through an understanding of local perceptions, interests, issues, and constraints. Central to the success of assessing such understandings will be a process which enables the respondents, as much as possible, to express their own thoughts in their own terms with minimal disruption or manipulation of the research context. For such a task naturalistic inquiry, as argued by Guba and Lincon (1982), offers a contextual relevance and richness unmatched by any other research tradition.

For naturalistic inquiry qualitative methodologies are attractive. Miles and Huberman (1984) explain: "They are a source of well-grounded, rich descriptions and explanations of processes occurring in local contexts" (p. 15). Given the complexity of any implementation context one goal of this research was to collect the richest possible data, containing a wide and diverse range of information. While such methods generally involve fewer settings, researchers argue that purposeful selection of a smaller sample allows the investigator to earn a more "intimate familiarity" with that sector of social life under investigation (Miles and Huberman, 1984, Loftland and Loftland, 1984). This was consistent with the goal of this study which was more concerned with gaining significant insights than a superficial survey.

In this case, semi-structured, open-ended interviews were the most advantageous research instrument. This format enabled: the focussing of

data collection to ensure careful use of interview time, data analysis, and the minimizing of interviewer effects by asking the same questions of each person.

Realizing that the semi-structured framework can limit the interviewer's flexibility in pursuing unanticipated issues care was taken to structure the questions such that they moved from general impressions via relatively unstructured questions, to more detailed examinations of specific observations and concerns, through the use of semistructured questions (Merton and Kendall, 1946). This relatively unstructured beginning provided the advantages of first, inviting the participants from the outset to refer to virtually any aspect of the theme, thus encouraging the generation of a range of responses relatively unfettered by concerns and predilections of the researcher. Second, it allowed them to speak first about that which they are most comfortable and articulate. Third, the initial responses provided a crude guide to the relative importance of various issues in the study context. The more in-depth and structured questions which followed, focussed on more specific concerns and issues. Following research procedures described by Loftland and Loftland (1984), additional probes, or further specific questions were added to the interview guide which were used at the interviewer's discretion, to stimulate or focus discussion.

The Interview

The principle concern of the interview was to gain understanding of the social considerations which can, and should, have a significant bearing on curriculum decisions in the Yukon as they pertain to environmental

studies. The preceding chapter identified four themes, or foci, which provided a framework for this investigation and are summarized as follows:

1. Perceptions of need and interest.
2. Conceptual considerations.
3. Concerns about content and pedagogy.
4. Concerns about implementation.

Questions were designed to elicit responses to matters of concern within each of the four areas and were then organized, by type, into four groups. The first three of these reflected the increasingly detailed nature of the questions as the interview developed while the fourth dealt specifically with implementation concerns.

The first group of questions served several functions. Having been given to the participants prior to the interview, these questions were relatively friendly and minimally threatening as openers. They were general in nature and asked informants about their perceptions of the environment and what they felt schools in the Yukon were doing, and should be doing, in a climate of rising public concern for the environment. Probes encouraged participants to comment further on what students should learn about, how it should be organized for teaching, and what the learning outcome of environmental education should be. These questions were, as such, minimally structured and gave the participants considerable scope to say what was on their minds with minimal researcher bias.

Having been encouraged to freely express themselves, the participants were next asked to react to topics derived from the conceptual framework detailed in chapters three and four. These topics included ecology, experience, environmental issues and ethics, aesthetics, and history.

Number four, a typical question from this second group, illustrates a number of principles which directed their development. It said, "Discuss the importance of teaching about relationships between organisms and their environment." First, the question still allows considerable scope for interpretation; the participants are being guided to react to a concept, but may do so in an individualistic way. Second, every effort was made to phrase the question in plain language. Technical words and environmental education jargon were avoided at this stage. In subsequent probes, however, respondents were asked to react to increasingly specific terms and concepts. In this example, the later probe referred to ecology. Other probes in this group asked respondents to talk about content, materials and teaching methods appropriate to the topics.

The third set of questions asked participants to respond to specific teaching activities related to the topics introduced in the second group of questions. Activities which illustrated topics, contents, and teaching methods, provided concrete examples to stimulate reaction and discussion. Where activities illustrating these topics were found in contemporary curriculum materials they were paraphrased and used as examples. Where suitable examples were not found to illustrate a topic, statements about potential activities were developed.

The development of curricula, and the prospect of its implementation, inevitably brings concerns. Assessment of the nature of concerns should assist the researcher in judging whether they are of a type that should affect curriculum decisions, and to what extent. For example these concerns may point to operational constraints which a curriculum innovation might experience. The fourth group of questions, therefore,

sought understanding of participants' perceptions about implementation of increased environmental education in the Yukon. The topics included, mandating of environmental education, organization of environmental education in schools, time and professional constraints, the role of resource persons, importance of student feedback, and concerns about special interest groups.

Interview Development

Interview questions were constructed with reference to the themes described at the beginning of this chapter and the conceptual work described in chapters three and four. In addition to simple editing, refinements to the questions were made with the assistance of two processes: content analysis of the questions, and pilot testing.

Content analysis involved a careful inspection of each question with a view to answering the two questions: What kind of data will this question provide? and Of what use will this data be? Failure to arrive at relevant and coherent answers indicated the need for either rejection of the question, or its revision. This content analysis is reported in Appendix A.

A pilot interview was field tested on four volunteers; subsequent revisions further refined the research instrument. Participants in this pilot stage were not be re-interviewed during final interviews.

Interview Administration

Eighteen interviews were completed during the spring and summer of 1989. The interviews were conducted at the convenience of the participants in a quiet location familiar to them. Interviews averaged ninety to one hundred minutes in length.

Prior to interviewing, participants were given the first three questions. These asked about their conception of the word "environment," what Yukon schools are doing in response to rising public concern for the environment, and what schools should be doing in response to rising public concern for the environment. These questions thus prepared participants in a general way for the interview. Though they were told that questions about specific topics, activities, and implementation would follow, further details were not advanced, in order to minimize the persuasive effect that they could have. Following the interview, a complete guide was left with the participant who was invited to record any further thoughts that he or she might have. Later, individual transcriptions were sent to respective participants to review and verify the accuracy and intent of their comments.

Demographic information was collected after the interview on a separate guide.

Research Subjects

Curriculum decisions have impact throughout a community: with the students who receive instruction, with parents concerned about the content and quality of instruction, with administrators who are responsible for what goes on in schools, with teachers who are required to teach. There is not, however, an equal voice for each of these groups as to how curriculum decisions are made. For the purposes of this study I limited the data collection to those groups most influential in the curriculum planning process. Administrators, and teachers clearly have a great deal to say about curriculum matters; they have a large stake in these issues. Parents too have

a vested interest in educational matters, but not all of them are equally vociferous or motivated. There are, nonetheless, significant avenues for parental participation in schooling decisions, particularly through membership on parental advisory groups called school committees, or by using these school committees as vehicles to express their concerns.

Subject Selection

To ensure breadth of representation, the research sample was stratified to include participation by both urban and rural populations in the Yukon. Whitehorse, an urban center with a population in excess of 18,000, accounts for about 70% of the Territory's population (Yukon Data Book 1986-87, 1986). The balance of the population is, for the most part, distributed amongst fifteen small rural communities. Given potential differences between these constituencies, participation from both was considered desirable. I therefore interviewed selected individuals from six different populations: rural teachers, urban teachers, rural administrators, urban administrators, rural parents, and urban parents. Also, given the objective of obtaining in depth and insightful understandings about the Yukon context, interviews were administered to a selection of "key informants," chosen for their ability to insightfully, and clearly, articulate the views of the community group to which they belong. The following matrix (Fig. 1), indicating three respondents in each cell, describes the model for sampling key informants.

	Rural	Urban
Teachers	3 participants	3 participants
Administrators	3 participants	3 participants
Parents	3 participants	3 participants

Figure 1. Sampling Matrix

To ensure non-biased sampling of study participants. Nominations for knowledgeable subjects were solicited from educational professionals, school committees, and the Yukon Education Council. Each person contacted for this purpose was asked to submit five names of appropriate candidates.

In some instances nominators were knowledgeable central figures in Yukon education. These included: the director of curriculum, school superintendents, the president of the principals' association, the president the Yukon Education Council. In other instances important figures were chosen from a larger pool of possible nominators. For example, rather than soliciting input from all rural principals, a sample of 6 members of this group was chosen. Randomized selection was employed in each instance where multiple candidates existed: rural principals, urban principals,

presidents of rural school committees, and presidents of urban school committees.

Principals, rural and urban, were asked to nominate candidates from populations of both teachers and parents. The nominating principals were selected twice; once for each of these study populations. Figure 2 indicates the proposed nominators and the populations which they will be requested to select from.

In instances where a number of candidates were nominated equally, final selection was made randomly. In the case of rural parents, nominators demonstrated little inter-community overlap and clear nominee choices did not emerge. Final selection was, therefore, made by randomly selecting three of communities represented by nominator data, with the nominators' first choice selected and interviewed.

Teachers (Rural)	Teachers (Urban)
Director of Curriculum Superintendents (Areas 1, 2, & 3) Rural Principals (6)	Director of Curriculum Superintendents (Areas 1, & 2) Urban Principals (6)
Administrators (Rural)	**Administrators (Urban)**
Director of Curriculum Superintendents (Areas 1, 2, & 3) President, Principals' Association	Director of Curriculum Superintendents (Areas 1, & 2) President, Principals' Association
Parents (Rural)	**Parents (Urban)**
President Yukon Education Council Presidents, Rural School Committees (6) Rural principals (6)	President Yukon Education Council Presidents, Urban School Committees (6) Urban principals (6)

Figure 2. Model for selection of "Key Informants"

Data Recording and Analysis

Interviews were audio-taped, in all but one instance, and transcribed using a word processor. This enabled close inspection as well as data sorting and analysis. In one exceptional case, the preferred interview site did not lend itself to taping and detailed notes were taken and later transcribed.

The first step in the data analysis, following the work of Miles and Huberman (1984), entailed general familiarization with the data by reading and summarizing each interview. The resulting "contact summaries" contained a brief description of the most salient points in each interview and emerging themes. This enabled the researcher to get an overall feel for the data in preparation for more methodical analysis.

The second step of the analysis entailed the sorting of data from all of the participants according to themes which reflected the structure and content of the interview guide. For example, all of the comments that discussed the word "environment" and its meaning were gathered together into one file; another file contained all the comments which discussed what schools are now doing in response to rising concerns for the environment.

This was achieved by a process which began with the embedding of codes, which described the interview topics, into the text of the transcribed interviews. In the above example, for instance, comments about environment and its meaning were coded "EN" and comments about what schools are doing were coded "SCA." A complete itemization of the interview themes and codes with accompanying definitions is presented in Appendix B.

At the same time as codes were embedded, the interview was divided into manageable sized segments, and copied (with codes) into a data base file. The particular data base used allowed the researcher to collect all of the text segments which contained any given code, or selection of codes. These collections were stored in separate files and subsequently printed to aid analysis.

The next step involved inspection of each file, sorted by code, and relating to a particular interview theme. Key words and phrases from comments recorded in these files were identified and copied to yet another new file. Inspection and sorting of these new files enabled the researcher to inspect participant responses to the interview themes, and frequently it was possible to identify recurring patterns of response, or emergent themes, shared by various participants. These patterns of responses, or themes, have been reported and discussed in chapter seven. The broader implications of these responses, in the context of schools, are discussed in chapter eight.

Verification

To ensure that the comments accurately reflected participant beliefs, two precautions were taken. First, a copy of the interview guide was left with each member of the study group. They were encouraged to record any second thoughts they might have had or points which they wished to reconsider. Second, a copy of the transcribed interview was sent to each participant. They were again encouraged to read it and identify second thoughts or omissions. Changes were duly recorded in the interview transcripts. In this way the accuracy of the beliefs expressed in the interview was verified by the participants themselves.

To ensure that the codes used were adequately defined, and consistently applied, two colleagues were asked to assist with the verification of the coding process. Both were asked to code key phrases in a sample interview. Their results compared satisfactorily with those of the researcher.

CHAPTER SEVEN

PRESENTATION AND DISCUSSION OF DATA

The data reported in this chapter are related to the second research question: What contextual considerations can have a bearing on education in the Yukon as it pertains to the environment? Participants' responses described what they believed to be environmental education needs for the Yukon, and the constraints they felt upon their ability to meet those needs. These beliefs thus described some context derived considerations which can have a bearing on environmental education.

Presented alongside these data are discussions about curriculum planning which respond to the third research question: What considerations should be made when developing environmental education curricula for the Yukon? Answering this question required a thoughtful synthesis of considerations arising from the participant data, and the work of chapters two, three, and four which were directed at answering the first research question: What educational purposes should environmental education seek to attain?

The data and discussions are organized into four categories: perceptions of need and interest, conceptual considerations, concerns about content and pedagogy, and concerns about implementation.

Perceptions Of Need And Interest

The participants received questions related to perceptions of need and interest in advance. Minimally structured, the questions sought to give

participants the opportunity to respond freely about their perceptions of the word "environment", how they felt schools were doing in response to rising concerns for the environment, and about what they felt schools should be doing in response to these concerns.

These responses enabled me to describe meaning given to the term "environment" within the study context. The task of description involved identification of essential elements contributing to this meaning for participants of this study. Questions about what schools are doing were intended to identify motivations and predispositions upon which future initiatives could be built. Similarly, analysis of questions about what schools should be doing, identified beliefs requiring sensitivity and consideration during a curriculum development process.

Environment

When asked to describe the meaning which came to mind upon hearing the word "environment," comments from participants reflected three conceptions: the pristine, the physical elements of their surroundings, and humans and their influence on the other two.

The majority of participants indicated that wilderness was implicit in their conception of environment. For example, the following statement illustrates this emphasis:

> I think for me environment ... is the world we live in in its natural state as natural as what you can expect.

For most participants images of places relatively untouched by human hands were associated with the word "environment." For them, thinking about the environment included contemplation of wild and pristine places,

their inherent value, and the contrast between them and other parts of the world more affected by the presence of people.

The second element evoked by the word "environment" recognized the various constituents of one's physical surroundings. The following quotation illustrates this view:

> Well, the environment means the world around us, all the world around us, the living world, the organic world, the water, the living animals, the wildlife, the air, all of those sorts of things.

This view, representing that of a number of participants, indicates that thinking about the environment will require understanding of the elements which comprise one's physical surroundings.

Several participants also associated the word "environment" with human actions, their impact on surroundings, and environmental issues. They spoke about "interactions with each other and also with the land," "looking after what nature's provided for us," and "the ozone layer ... acid rain, and oil spills." The following quotation describes this view further and introduces a belief about human relationships with the non-human world:

> I guess the thing that I always try and get across to kids is the fact that we're not separate, you know we're part of this earth. Because we happen to be so populous we have a tremendous effect on it.

This comment suggests that some participants perceive what they believe to be an inappropriate dichotomy between humans and their surroundings. This point was underscored by another participant who said: "we're not separate you know, we're part of this earth." Further, there has been a shift of emphasis which gives importance to consideration of human actions as part of environmental thinking.

The word "environment" is not easily defined nor necessarily static over time; "the idea of the environment is ... changed so often." However,

while meaning and usage can change, it is important to have some appreciation for current understanding of the word. The preceding discussion does not provide a definitive statement about the meaning of "environment," but it does provide some understanding of the elements which give it meaning for participants in this study. It now becomes important to consider these perceptions of "environment" in light of other conceptualizations of this word and its application in various contexts, including environmental education.

The Concise Oxford Dictionary defines environment as a surrounding; surrounding objects; or circumstances. This description is, of course, very broad and could include all of one's physical surroundings including the physical objects and their social, political, and psychological circumstances. This poses some problems for environmental educators. First, if "environment" is interpreted this broadly, one could argue that virtually everything taught in schools could be subsumed under this field of study. In this case, "environmental education" would be roughly equivalent to "education" in meaning and would be nothing more than a redundancy. Second, such a broad definition does not in fact capture the essence of "environment" when it is the root for words like "environmentalist," "environmentalism," or "environmental education." In these instances, it seems that something more specific is intended. Insight into this more particular meaning given to environment can be gleaned from the literature on environmental education.

The third chapter describes how environmental education initially emerged as a reaction to problems of environmental planning, pesticides, community blight, air and water pollution, and traffic congestion. Such

concerns remain central to this field of study. Similarly, in general usage we tend to associate the words "environmentalism" and "environmentalist" with issues of public concern. In both instances, proponents are fundamentally seeking to understand how one ought to act in response to either particular, or general, social issues, and to examine appropriate attitudes towards the non-human components of their surroundings. Participants of this study also associated "environment" with these more specific usages of the word. They, too, associated "environment" with issues brought about by human actions. Further, it is implied in all of these cases that an important social requirement is the ability to think clearly about humans' interaction with their surroundings. This should be fundamental to future conceptions of environmental education.

While the dictionary definition of "environment" does not capture the essence of the more specific meaning given to "environment" discussed above, elements of this more ranging notion were identified by participants of this study. This warrants consideration. When evaluating educational alternatives, it will be important to understand how general knowledge about the physical environment will affect one's ability to think about environmental issues. For example, some participants did associate all of their surroundings with the word "environment" while others associated it with wilderness and the pristine. It will be important not to diminish the role of general knowledge about the environment, including that gained through experiencing relatively untouched places, when enabling students to think about environmental issues.

It should be clear from participants' comments, discussion about usage, and inspection of environmental education literature, that the

meaning given to the word "environment" is not precise. However, while the term is normally broad, new uses imply a narrower view. The significant central feature that we understand from its usage, particularly in the context of "environmental education," "environmentalism," and "environmentalist," is concern about what humans ought to do in light of particular circumstances. The environmentalist and the environmental educator are concerned with conflicting human values, appropriate attitudes, and actions towards non-human surroundings in light of environmental issues. The educator wishing to think clearly about environmental education, would appear to be pursuing important work if he or she is concerned with questions about what students need to know in order to think clearly about, and understand, environmental issues. To this end, the importance of broad understandings about one's physical surroundings and the role that wilderness plays in thinking about the environment will be examined in subsequent sections.

What Schools Are Doing

When asked to talk about what Yukon schools are doing in response to concerns about the environment, those interviewed identified several initiatives: some teachers were including environmental topics in their discussions, assignments, and courses, some schools have made allowances for field trip activities, and a few alternative programs have been established. However, while they acknowledged individual and collective initiatives, participants also perceived a need for more environmental education and a more cohesive and coherent approach to this field of study.

In discussing existing initiatives one participant summed up this perspective:

> Well I think there are a number of initiatives that, over the years, have been in place. You know here and there, and kind of everywhere. Obviously our science program has a lot of contributing factors and our social studies program has a lot of aspects that look at the social component, people and how they live and where they live. ... A Yukon conservation group of years ago had a very basic initiative in the area of grade five and six, looking at making science more relevant to the Yukon and I think that initiative was well done and very well put together.

This comment illustrates a widespread belief that efforts have been made to include environmental topics and projects within the scope of existing curricular structures. Reference to science and socials studies identifies program areas amenable to including environmental content. This person also told us that educators have found locally produced resource material helpful. According to this view, environmental education can be fostered by infusing appropriate content and themes into existing school programs.

Some elementary schools, particularly those in Whitehorse, have implemented spring camping trips. Through hard work and nurturing, these have become regular occurrences. One participant described the nature of these initiatives:

> Oh I guess it varies tremendously from school to school but certainly there's been an increase just in the idea of the spring and early summer outdoor ed camps. There's been an increase in the use of that by all the schools in Whitehorse anyhow and I'm certainly aware of some the schools in the outlying areas getting involved in some ... People are getting kids out of the classroom.

To some extent, the traditional teaching and learning environment is being modified to include alternative forms of content and instruction; teachers "are getting kids out" into field trip settings. Some participants also reported curriculum adaptations in the form of alternative programs:

> I think they're going to a number of alternate ed type of programs. We've had equivalency ed. programs in the past which have had a strong environmental ed. component to them. Now they are going to the PASS program, the wilderness ed. program, and any number of areas like that have a strong emphasis on that.

These last two statements represent a belief that program innovation can also occur in schools. These examples illustrate possibilities for innovation ranging from the inclusion of relatively short field experiences to alternative programs lasting a semester and longer. Collectively, all these responses describe efforts to include environmental education in school programs. They include those which use existing mandates and structures to address concerns about environmental knowledge, and others which describe alternative structures and programs which accommodate environmental content.

While participants acknowledged individual and collective initiatives, many believed that schools were not doing enough. As one person put it:

> I see projects in science, the studying environmental issues pertaining to the physical sciences. I see social studies, which you see on our walls here, addressing some of the social issues involved with environment. ... There is some movement, I don't see enough of it.

This participant perceived a need for greater efforts in spite of already increasing attention given to environmental education. Others suggested that while environmental education was increasing, it was not doing so within a coherent, well developed framework; much of it was perceived as being ad hoc and dependent upon the motivation, expertise, and initiative of individual teachers. The following quote summarizes this view:

> I think we are improving but I think it's spotty and I think rather than any overall design ... it's if a teacher would like to do something.

While some participants argued that environmental education in the Yukon was "spotty," many acknowledged movement towards increased instruction in this area. First, they reported that there has been an infusion of environment related topics into existing courses, study of environmental

issues has been included in subjects like science, social studies and language arts. Some teachers have been assisted in this task by the development of instructional aids. Second, they noted that field studies and multi-day outdoor experiences have become a regular part of school programming. To this extent, the traditional teaching and learning environment has been modified to include alternative forms of content and instruction, including "getting kids out" into field trip settings. Third, participants noted that schools have accommodated alternative programs. There is, therefore, room for program innovation which extends beyond the existing organizational structures of schools, and precedents for doing so. It appears, therefore, that initiatives to address concerns about the environment have covered a broad range. They also appear, in the minds of the participants, to be individually meritorious but collectively inadequate and spotty. Environmental education may lack sufficient attention in overall planning and delivery of educational programs.

What Schools Should Be Doing

Nearly all participants stated or implied that environmental education was important and needed to be enhanced. When asked to elaborate on their views, participants' comments fell into three areas: identification of topics for inclusion, suggestions for implementation, and beliefs about learning outcomes.

What Should Be Included. When considering what should be included in future developments, participants described concerns in each of three areas: gaining knowledge, examining contemporary issues, and having direct experiences in the environment.

A number of participants stated that knowledge and understanding is requisite to evaluating information and making decisions. For example, one individual identified a need to increase knowledge acquisition right from the primary grades to lessen the burden on students when advanced concepts are taught. This participant describes how these concepts could be pursued within a previously established context of background information:

> I think there should be a knowledge component every year so in grade one they learn the difference between a spruce tree and pine tree and then at grade eleven I don't ever have to teach them what the difference between a spruce tree and a pine tree is ever again. ... So then at grade eleven we could deal with mathematical modelling which we do anyway. So I mean it wouldn't be a major jump, it would be just some of the natural history type stuff would already be built in so that the kids wouldn't be burdened with that as well.

According to this view, the ability to teach increasingly difficult concepts rests on the acquisition of a body of general knowledge about the environment. However, there was some suggestion that acquisition of general information is not enough. One person who illustrated this view said:

> We need all the information. First ... we can pass them a lot of information out quite easily, knowledge-type stuff. This is what's happening: this is the pollution, this is acid rain, this is ... but I think we have to, especially in the higher grades, junior high and high school as well, there has to be room in the curriculum for them to start evaluating what they have, forming decisions about the environment.

This quotation reflects a belief that curricula must also enable students to take information and evaluate it in order to make informed decisions; being able to think intelligently about acquired knowledge is important.

Several participants spoke about a need to examine environmental issues in school. Through the study of such issues, they felt that students could learn about the complexities of human/environment relationships and the consequences of lifestyles. Further, a number of participants

described two key features of such investigations. First, considerable importance was given to the need to study current issues, and second, these issues must be seen within a global context. In the first case, one participant said:

> Well, I think you have to look at some of the real examples already in our environment. The most classic one, of course, is Valdez.

While the Valdez oil spill was fresh in the minds of the participants, other topics such as pollution and harmful domestic products, were also cited as current concerns. However a broader view was also expressed. For example, one person said, "the course should have some global aspect to it rather than just emphasizing strictly ... the local community." This comment reflected a belief held by a number of participants that the study of immediate concerns is not enough; issues must be placed within a global context.

A consistently expressed theme was the importance of direct experience in the natural environment; the learning that occurs as a result of direct contact with the environment should be part of environmental education. In addition to identifying their belief that outside experiences should be provided, a number of participants elaborated on the nature of such experiences. Some identified a need to go into the environment with minimally structured intent, while others advocated greater structure and direction. As an example of the first instance, one participant said:

> Going out and just feel, look and smell and get an experience of the environment with some guidance. I mean we can all go out and feel and look and smell and not get a thing out of it but if there can be some questions, like: 'What are you seeing now?'

This person, as with a number of others, perceived a need to get students outside of the classrooms and to engage them in activities unique to outdoor experiences. In this example, the minimally structured activity examined

sensory experiences and the foci of attention were elements of the environment itself.

Several other participants projected strong links between the outside experiences and classroom or laboratory lessons. Put succinctly, one participant said:

> The classroom work should support and be a preparation for the out studies, if you like. Field activities should be more than just field activities.

Implicit in this view is the belief that outside experiences can, and should, be used to illustrate ideas developed in the classroom. Field activities should be more than encounters with the environment.

Suggestions For Implementation. Participants spoke about requirements for the implementation of increased environmental education. Two ideas were most frequently advanced. These included the need for preparation of resource materials for teachers, at least some of which would be sensitive to local content, and the need to nurture teachers. As one participant summarized it, teachers are enthusiastic but often lack the knowledge required to get started:

> A lot of teachers are really keen to do something but they don't know where to start and they don't know how to get going.

While some individuals felt that better use could be made of existing materials, "some of the things just [like] Project WILD," others wanted to see more program development and production of small units, booklets, and activities for teachers:

> They should all have their own units and somebody to work on those units and help bring those things to fruition. ... K-3 should have units--local units, not just Whitehorse units for Yukon people but Destruction Bay units, like there are neat things at Destruction Bay too.

However, common to advocates of both approaches, was a perceived need for coordination of efforts to provide teachers with resource materials. This general view was illustrated by one participant who said:

> So there has to be drawing, a pooling together of curriculum in that area that is ready, available to use.

Collectively, participants in this study saw a need to provide teachers with materials which would support efforts to enhance the instruction of environmental education. They claimed that continued use could be made of existing supplemental packages, and that additional materials should be developed. Further, at least some newly developed materials should include local content. Finally, realization of the initiatives proposed will require coordination and direction, possibly by the Department of Education.

Participants stated that teachers are pivotal in curriculum implementation; successful enhancement of environmental education was linked to their nurturing. These participants believed that teachers would need to be motivated, encouraged, given confidence, and inspired by useful ideas. For example, one participant said:

> Well I think there has to be a teacher awareness [workshop.] ... Letting teachers know that even if they have never walked in the woods, they can do it. And they can do it with the kids. And providing them with some ideas and information and letting them say, you know, letting them say to themselves that I can do it! ... As you place more emphasis on it, say in the following year, you build that until you have something that is just automatic, you don't even worry about it.

In this quotation motivation is linked to assurance, self-confidence and provision of inspirational ideas and suggests that one cannot assume that teachers have the inclination or ability to take children out of the classroom. There is also some suggestion that the process could not be sudden, but would need to be incremental. If direct experience in the environment is

important, then teachers will need to be prepared for the task of taking children outside.

Learning Outcomes. When asked to talk about learning outcomes, participants were generally convinced that environmental education should make a difference in the lives of the students. At one level, a number of participants expected students to be more aware of the environment, understand its fragility, care about it, and respect it. The following comment represents these views:

> I think what we want to do is produce a student leaving here, leaving the institution like this, with a wide-based good feeling about what's around them and respect for the environment more than anything else.

While developing attitudes which would predispose students to think and care about the environment may be important, a number of other participants perceived the environmentally-educated student to be broadly knowledgeable. For example, the following quotation strongly advances this need:

> Hopefully they're more knowledgeable, number one. ... I would really hope that their information base increases each year and if you had a K to 12 type program, then I think we could have a pretty sophisticated society in terms of environmental concerns.

In this instance it was felt that considerable knowledge could be accumulated during the years of public schooling and this would comprise the foundation upon which an environmentally sophisticated society could be built. However, for many participants the acquisition of knowledge was just part of a process which should enable students to evaluate material and make intelligent decisions. For example, one participant said:

> the student can look at the material and make some evaluative judgement about his/her own place in the world, his/her own influence in the world, on the environment, and where ... where they become aware of their place and they feel a part of it and they can make some evaluation for the future.

The importance of enabling students to act upon their environmental beliefs, introduced here, was developed further in later comments.

Many expected environmental education to influence students' actions. Some participants believed that environmental education should produce responsible citizens, and "being a responsible citizen means a stewardship of our environment." Others saw students becoming "almost activists." However, a representative bottom line for many participants was best expressed by one respondent who felt that the children had to decide for themselves if they wanted to act. She said:

> I'd like to have the children decide that, whether they want to be an activist. You know they have to decide that themselves, but I'd [like] them to have the ability to make that decision instead of just sitting there passively accepting things.

This last comment is particularly intriguing as it points to issues central to environmental education. First, this person acknowledges that action should be predicated upon an acquired ability to make reasoned decisions. Second, her comments raise the important question: Should action be the aim of environmental education or should it be the logical outcome of this ability acquired through a program of education? In this instance, the onus is left with the student.

A collective vision of environmentally educated citizens saw persons who were positively disposed towards the environment, respectful of it, and caring for it. They were also perceived to be broadly knowledgeable and capable of analyzing and understanding this information in an environmentally sophisticated society. Finally, it was expected that education would make a difference in their lives. For some this meant producing responsible citizens and stewards of the environment, implying a

particular behavioural outcome. Others saw the resultant persons capable of making decisions about environmental actions instead of passively accepting things, implying that the students should decide about the appropriateness of their ultimate actions.

Summary

The first portion of the interview was minimally structured to encourage participants of the study group to respond freely to the concerns most significant to them. Though these concerns were not equally widely endorsed, themes or patterns of responses were observed. These represented issues that were of importance to a number of participants at any one time and have been summarized in the preceding pages.

While these themes may be important in conceptualizing environmental education, or what it means to think environmentally, they do give rise to further questions. Discussion of environmental issues, for example, is central to participant interpretation of environment environment and has been foundational in the development of environmental education. However, to more fully understand what schools should be doing, one must examine the relationship between the study of issues and schooling functions such as education and socialization. Further, it seems sensible to enhance environmental education by providing opportunities for students to acquire knowledge and understanding. Few would dispute this important consideration. However, questions remain about what kinds of knowledge are most worthwhile in the pursuit of environmental thinking. Finally, considerable importance was given to learning through personal experiences in the environment. A place for this form of knowledge acquisition should be considered.

Nevertheless, the relationship between knowledge, understanding, and personal experience needs to be examined further. Subsequent questions enabled participants to clarify their beliefs about these initial ideas.

The next section reports data gathered in response to more specific questions. Participants were asked to evaluate a number of possibilities which can contribute to a framework for environmental education. They were also questioned about content and pedagogical techniques which would support these possibilities, and their concerns about the implementation of increased environmental education. Many themes, emergent from the initial questions, were revisited and participants invited to develop their thoughts. Thus, the following data will augment the initial responses and develop a more comprehensive understanding of the views held by the study group.

Comments About Selected Conceptual Considerations

This section describes responses to questions about how environmental education might be conceptualized. Having been encouraged to freely express themselves in the first part of the interview, participants were asked to react to questions about particular issues . Although designed in advance, interview questions were such that a number of ideas identified by participants in the first part of the study were examined further. For example, having talked about the importance of knowledge, participants were here asked to consider what sort of things students need to know. Participants were thus asked to respond to questions about ecology, history, aesthetics and experience, environmental issues and

ethics, and environmental issues and student action. Similarly, participants who spoke earlier about the importance of direct experiences, were here asked to consider relationships between experience, aesthetics and knowledge. Participants were also asked to talk about what would be involved in the study of value laden topics such as contemporary issues and the extent to which this may involve ethics and student action.

These questions were designed to alert the researcher to beliefs and predispositions requiring consideration in the development of curricula. In particular, they provided information about how participants interpreted and evaluated the conceptual issues identified above. Their answers enabled the researcher to reflect further on these issues and their educative nature and worth. The results, together with the researcher's reflections, are organized under five headings: ecology, history, aesthetics and experience, environmental issues and ethics, and environmental issues and student action.

Ecology

The importance of teaching about relationships between organisms and their environment was affirmed by all. Words such as "important," "bottom line," "essential," and "paramount" were used to describe its significance. This general view was encapsulated in the following comment:

> Other than the fact that I think that's the bottom line. I think that comes a very, very important factor and I don't think very many students have a very good grasp of that factor. ... Yes, it's essential.

What is of more interest, however, was a divergence in opinion about which essential qualities are inherent in the study of ecology. On one hand, a number of participants focused on the relationship between organisms and

the larger system of which they are a part. For these persons, ecology is concerned with enabling students to understand ecological concepts, and the way in which aspects of organisms contribute to larger systems. On the other hand, several participants acknowledged a human role in ecological relationships; humans are not separate from ecological relationships and environmental systems are affected by human actions. For these participants, the more narrow conceptualizations of ecology are not adequate to enable intelligent thinking about environmental issues. Their solution was to broaden ecology to include examination of human impacts on their surroundings, the type of society we live in, and acceptable actions.

The first of these two themes is illustrated in the following representative quotation:

> I think, as I said earlier, that understanding both the micro and the macro level ... I understand something that happens at the cellular level, something at the system level of that particular creature and something of how that [creature] fits into a food chain or it's life cycle and so forth. I'll have a much better sense of what I am--of what is an environment.

This participant, and others, believed that ecology should introduce students to ecological concepts at varying levels of complexity; students should not only learn details about particular organisms, but also how these details contribute to the organisms functioning in larger systems. The second theme, the human role in ecological equations, was illustrated by comments about human involvement in environmental relationships; environmental systems are impacted upon by human actions and these impacts will in turn affect us. For instance, one respondent suggested:

> They [the students] miss the issue of conservation, they miss the issue of limited resources, they miss the issue on disposal of sometimes very lethal wastes and the by-products of the type of civilization that we have. ... I think we've been too narrow in our concept of ecology. ... [We need to be] asking more fundamental questions.

Implicit in this example is the opinion that traditional conceptualizations of ecology are not, in themselves, adequate in allowing us to think about environmental issues. According to these participants, ecology should be conceived in broad terms which include examination of ecological relationships and the ways in which they are impacted upon by society. The example above even suggests that fundamental questions about social actions should be considered.

Discussions about the limits of ecology are not exclusive to participants of this study. Authors such as Passmore (1974) and Evernden (1985) (see Chapter Four) have gone to considerable pains to describe how ecology is scientific in nature. They maintain that we should not be fooled into thinking otherwise. Evernden adds that in reality ecology has become increasingly like a branch of classical physics in spirit, if not in exact content. However in a recent study, Abour Cherif (1989) contests this limited view, arguing that ecology is more than just a scientific discipline. For him, this field of study is not only interested in ecosystems, but also in the human role within the environment. Cherif claims that ecology education must not be solely concerned with science; it must also be an effective mechanism for producing individual and social change. Ecology education should, he feels, play an important role in steering society. Given the contrasting views described above, it is important to weigh the merits of a scientific conceptualization of ecology curricula against broader ecology curricula which would examine social values.

It must be remembered that the primary purpose of school programs, as discussed in the fourth chapter, is not to train ecologists but to enable students to learn <u>about</u> science. This in itself provides justification for

broadening the study of ecology. To understand science and its limitations, students must not only learn to do science, but they must also learn about science. They should understand that competing claims can result from differences in scientific pre-suppositions or research methodologies. They should also know about the importance of validation of research findings, the confounding nature of uncontrolled variables, and the probabalistic nature of scientific justifications. To understand these things implies that teaching cannot proceed with a "business as usual" approach to ecology; even if it is conceived of as essentially scientific, a second order philosophical reflection must be included. Students should consider philosophical dimensions to scientific understanding.

We must also consider that some socially interesting questions are, in part, scientific in nature. In many instances it is important to know what human impact is or what it might be and making predictions such as these is the work of science. While answers to questions like these do not provide prescriptions for action, they certainly inform discussion about what we ought to do in particular instances. It is not only topical, but logically sensible to broaden our conception of ecology to include examination of environmental issues. Further, this sort of study tends to lead naturally to questions about what one ought to do in the face of particular ecological evidence. It seems natural for ecology teachers to extend their lessons to include discussions about how humans ought to respond to environmental issues. This is particularly so given that there is currently no other formal place in most school curricula for handling these philosophical questions.

However, having just argued for a broadened usage of ecology, one must also consider the limitations of this course of action. If one extended

the range of ecology to the extent that Cherif (1989) advocates, much of education would fall under its rubric. This range would include traditional ecology as well as some history, human ecology, evolution, ethics, and urban ecology. Ecological education, according to this conception, is moving in the direction of becoming a rough equivalent to education and the adjective "ecological" becomes increasingly redundant. Such a position presents both logical and practical difficulties.

First, in trying to be all things ecology could lose that which is particular, special, and important - its essence. The study of ecology can enable students to understand something about science and what constitutes scientific knowledge as well as what makes it distinct from other kinds of knowledge. Understanding these distinctions is important as students come to realize that all questions cannot be solved by the same means, and that there are logical differences between various questions. Second, in practical terms, an ecology course cannot address all of the important environmental questions and must not try to do so. Given its limited time allotment, there is too much to be done in teaching the science of ecology. If students are to become ecologically literate and understand something about science, a significant commitment must be made to achieving these ends. We must not trivialize the science of ecology by having ecology teachers try to be all things to all people. Further, questions about what society ought to look like, and how citizens ought to act, are of a distinctly different type from questions of science. Here we are dealing with philosophical matters and arguments about ideas.

We must also recognize that science teachers are not generally schooled in philosophy, and we must consider problems associated with

scientists broadening their interests to include the pursuit of social and philosophical questions. Mumford (1966) once captured the essence of this problem by suggesting that we are in much greater danger from specialists who try to generalize than we are from generalists who decide to specialize. By this he means there is a danger that a disproportionate amount of prestige gained through the pursuit of science will give undue influence to scientists speaking about philosophical questions for which they may not be well qualified to answer. These questions find their home in fields of study largely outside the scientist's realm of education and training. We must prepare students to consider carefully and critically social and philosophical questions (and the work of scientists who deliver social prescriptions,) but this work may be best achieved by persons other than scientists, though not necessarily.

It should be clear from comments in this section that conceptions of ecology are not uncontentious. Participants' comments and the literature both indicate a range of interpretation. For the time being, however, some considerations sensibly follow. First, it seems appropriate to expand the range of content included in ecology curricula beyond that which is properly science. Students need to learn about science - about the limits of science and about what science is not. Further, discussion of environmental issues will often be a logical extension of ecological study. To exclude such discussions will frustrate efforts of students to understand the contribution of ecological understanding to matters of great importance to them. However, for the reasons given, ecology cannot be expected to shoulder the entire burden. Second, if ecology teachers are to lead discussion about environmental issues, it stands to reason that their efforts will be greatly

assisted by carefully produced resource material. Many environmental questions, at a fundamental level, are philosophical in nature and outside of their training. Additionally, much discussion about environmental philosophy is recent and thus new for many teachers.

History

Participants generally agreed that history is important though they differed in interpreting its role. Two themes recur in their conceptions of historical study of environmental topics. Some thought of history as a learning tool; a pedagogical aid for supplementing or introducing other studies. Other practically minded respondents associated historical study with the understanding of current environmental problems.

At least one respondent acknowledged the importance of history but did not ascribe a central role for this subject matter. This person preferred to describe a role for history which was supplemental to his primary task:

> I think the historical perspectives of environment degradation or enhancement are really important. The above average student will finish his things in a quarter of the time that other kids do. I provide [them] with all sorts of extra reading material. ... to get a bit of a historical perspective of, a lot of reading assignments that have the historical perspective component in them. Even though I think it's important I don't do very much.

Though endorsing historical study, this participant limited implementation to above average students who finished their work quickly. In effect history was treated as a pedagogical aid. Other participants maintained that the proper role for the historical/philosophical perspective was in introducing other topics. For example:

> It's important, but they don't need to take a majority of the time. It is important to touch on them, to bring them up as part of an introduction to a new topic, but not to beleaguer them too far.

This comment, though indicative of support for historical examination, was qualified; history was not believed to be central to environmental understanding and thinking.

Other participants suggested that historical understanding is a pre-requisite to understanding contemporary environmental issues; "it is essential to understanding any problem." Some held that history could provide essential background information about environmental problems. This view is illustrated in the following example:

> **Well, it's hard to give a rating on importance, but it would have to be included. I mean, you used a good example [deforestation of North Africa]. That's an excellent example. Burning down all the forest land in Brazil apparently is having a severe consequences. All the pollutants we've used to apparently destroy the ozone layer and lead to a green house effect. I think that kind of background information is pretty vital. I'm not able to stack it up in terms of importance, but to me it's part of the progression of what's caused the problem and where it can lead to. ... Well, you know, who likes to study history. ... Well, the industrial revolution, I suppose, started all kinds of problems. Rather boring stuff to discuss.**

For this participant it was important that students should know what has led to the development of particular environmental problems. Interestingly, there is also an implied preference for the investigation of historical factors which have a bearing on contemporary issues; the more abstract insights gleaned, and ideas examined, through study of the industrial revolution, for example, clearly hold less appeal. Similarly, other respondents believed environmental history could enable students to learn from previous mistakes. One representative of this group said:

> **I think it's easier for people to see where they're headed if they know where they came from. ... You have to give examples to people of those kinds of disasters before they can gain an insight as to what can happen. If they don't know what can happen, for example, in a situation like that, then they may make the same mistakes. We all learn from our mistakes.**

In this sense, history can be seen as a source of experiences from which understanding can be gleaned. It is projected that past experiences will have contemporary parallels and comparisons between these can lead to wiser decisions.

When participants were later asked specifically about pursuing philosophical examinations of contemporary society through history, they responded with enthusiasm; however, several caveats were raised. One participant expressed doubt about the general ability of teachers to lead these investigations; another suggested that students would not have the extensive knowledge required; and, a third questioned the ability of schools, themselves an embodiment of Western civilization, to effectively provide means for the kind of self-evaluation proposed.

The general importance of examining the history of values and human attitudes was reflected in the following comment:

> Pretty damned important. You can't know where you're going unless you know where you came from to some extent. ... You want to be able to say, well hold on a second, how do you initiate an internal questioning process? ... And the way you do that, I think, is by exploring how you came to hold the positions you hold. You may simply affirm the positions you hold or you may question them and say, oh, and refute them. Or you may end up looking for some compromise, nobody lives without contradiction. But understanding the nature of those--of how you came to hold positions are important.

For a number of participants, historical understanding is associated with a process of internal questioning. Further, this introspection is aided by understanding the evolution of positions and ideas; understanding how one comes to hold a particular position is important in evaluating its merit.

Some participants acknowledged the importance of philosophical examination, but felt that it was beyond the scope of schools. One person questioned the ability of schools to deliver effective instruction, and another

held that students are not sufficiently knowledgeable to understand philosophical issues. In the first instance the participant said:

> I think it's probably important. I quite honestly think maybe its beyond the scope of certainly most classrooms. Nowadays those are the kinds of concepts that if you pass through them in a cursory manner, then all of a sudden they're construed as fact by a lot of the kids. ... I think that's really dangerous. ... I really do think that that's something you're either going to have to do well or you're probably wasting whatever time you're putting into it. Okay. I don't think everybody can do that. I think that would take a specially talented individual to do that particular kind of concept well.

This person not only identified dangers inherent in inadequate instruction, but raised questions about the ability of teachers to lead this kind of investigation. This person believed that only "specially talented" individuals would be capable. In the second instance the participant attributed difficulties in pursuing philosophical issues to lack of preparedness on the part of the students:

> Sometimes these issues are a bit too philosophical for kids. Even in the high school level. ... Some of those things require fairly extensive knowledge and I don't really think kids have. I would almost stay away from those kinds of issues. I think those are some things that I think kids could learn at maybe a higher level.

Additionally, there was the suggestion that philosophy is too advanced for school students. These comments raise the question: "Are students in public schools incapable of handling philosophy or are they simply too ill prepared to do so?"

One participant responded to the question with some hostility:

> Your example of the paper, "The Historical Roots of our Ecological Crisis" and it's reference to Christians as being 'superior to nature, contemptuous of it, willing to use it for our slightest whim' is in poor taste. To say that our ecological problems today derive from Christian attitudes is wrong. While Christians believe that man has a moral obligation to obey the laws of the land, including laws protecting nature and the environment. Perhaps you could consider using an example in the future that does not reflect a bias against religious origin. In my humble opinion, today's ecological crisis stems from global population growth combined with man's insatiable desires for material things and monetary wealth.

This individual appeared to interpret the example, used to illustrate the question, as a literal statement of belief rather than as a vehicle for reflection. While the objection raised is clearly specific to the example chosen for illustrative purposes, it does point to the kind of strong reaction which may occur when passionately held beliefs are the object of potential criticism; examining social perspectives will be acceptable to some only when the examples chosen are consistent with their own world view. Care will be required, but controversy may not be avoidable.

When considering implications for curricula, it will be sensible to include historical background to environmental topics, particularly those which reflect contemporary issues. This much appears clear. In addition to general acceptance for this application of history, there is logical support for this idea. It was argued in the fourth chapter that an awareness of historical events contributing to contemporary issues will be essential to thinking clearly and critically about the environment and environmental concerns. At a fairly practical level, this means that a particular contemporary issue such as fur trapping will exist within a historical context, and knowledge of this history will contribute to one's understanding of the issue, what it is about, and how it developed. Beyond this, one might argue that history tends to repeat itself, and that current thinking can be informed by examining case studies illustrating past problems and mistaken judgements. For example, studying deforestation in Europe and Africa can provide insights into issues concerned with destruction of rain forests and clear cutting of British Columbia forests.

There are, however, several dangers inherent in allowing historical study to be driven by the study of contemporary topics. First, it has been

argued (Barrow, 1990) that there may be some doubt about whether students and teachers can maintain the necessary detachment from particular topics. This point was raised by one participant, who said that there may be too much personal involvement and emotion associated with some local issues to allow for reasonable discussion and argument. This is not to say that emotive local issues should always be avoided. Rather, it suggests that if the object of the exercise is to enable students to understand the nature of historical investigation, an abundance of less emotive content will also be required. Later, when some understanding of this process has occurred, more contentious issues can be drawn upon. Second, if one is always dealing with issues, there is considerable opportunity for confusion and misunderstanding about the nature of the questions at stake. The first task in an intelligent investigation will be to understand these questions; students must understand that there are differences between scientific, historical, aesthetic, and ethical questions, and be able to differentiate between them. As many issues involve questions of more than one type, students will need to acquire this ability to make these distinctions prior to assessing those questions inherent in a particular issue. Third, there is the danger that a steady focus on the historical background to contemporary issues will not push students to investigate the fundamental beliefs and assumptions at the root of a particular issue. There is the temptation to be consumed with immediate and obvious applications of new found knowledge which may be more concerned with the symptoms of much larger problems. History can be, and should be, more than a pedagogical aid, source of practical examples, or provider of background information. History is also a great "conversation" about who we are, the values we hold,

and how these developed. Clear thinking about many environmental issues will require some understanding of this conversation. By examining the roots of widely held social values and the presuppositions upon which current society is built, we can come to know ourselves better and critically reflect upon the appropriateness of normally unquestioned assumptions. This will involve consideration of topics like the evolution of human conceptions of nature and attitudes towards the non-human environment. In responding to specific questions about this conception of historical study, many participants recognized its value. They did, however, also identify difficulties to be encountered when teaching these topics in schools.

Though this specific conception of history was described as important, comments suggested that developing curricula will not be without difficulties. First, doubts were raised about the knowledge and ability of teachers to lead the kind of philosophical investigation proposed. Second, it was acknowledged that students may not have the background knowledge required to pursue difficult historical and philosophical questions. As for the first point, it would seem that if philosophical study through history or other appropriate subjects is important, then there is some responsibility on the part of schools and teacher training institutions to ensure that adequately prepared teachers are available. As there is some doubt that these objectives have been achieved care will be required when proposing curriculum innovations and producing resource materials; teachers cannot be expected to respond well to an unfathomable instructional task. Development will need to proceed with the assistance of teachers to ensure that proposals are comprehensible and commensurate with professional development. While this may seem overstated to senior history teachers, it

must be remembered that relatively recent concerns about the environment can be expected to demand new content (or perhaps a new look at old content) for an established discipline. Further, given the multidisciplinary nature of many environmental issues, teachers of subjects other than history may wish to have access to resource material from outside of their domain.

The second point, that students may not have the background knowledge to pursue the more difficult philosophical questions, is not surprising when one considers recent trends in schooling which have often put the development of processes and skills ahead of the acquisition of content. Still, important questions should not be dismissed. As secondary school marks the end of formal education for most students, accepting the possibility that students are incapable of handling philosophy would truncate this learning opportunity for many of them. Given the gravity of this option, it seems that every effort must be made to ensure that students are not denied the opportunity. Further, efforts to ensure adequate preparedness are necessary. In developing new materials, consideration should be given to assessing the content required at lower grades, and ensuring that topics are developed with sufficient care to ensure their coherence.

Participants were also asked to discuss the role that studying traditional values and cultures might play in the examination of contemporary society. Most participants interpreted the question as being directed towards aboriginal cultures and, as such, believed that including content of this sort would be of educational value. A number of them saw in this an opportunity to enlighten thinking and examine values and

attitudes held in contemporary cultures. Several saw merit in examining values, relationships with the environment, and moral issues through the study of traditional legends.

The following example illustrates the view, held by several participants, that the study of traditional cultures can provide a vehicle for cultural self-examination:

> Oh yes, I definitely think so because it just adds a whole new dimension to our way of thinking no matter which colour you are. ... we just can't live in isolation with our own ideas. We have to be open to others to appreciate them and in order to appreciate the land. ... it helps to see how others in a very different way have adapted to their resources, as well. Because anything that we learn about another way of life or culture or people, helps us evaluate our own.

This view holds that cultural self-evaluation can be assisted by examination of beliefs held by persons from other cultures; potential contrasts enable students to critically reflect on their own attitudes towards the environment.

Support for including content about traditional cultures was not unqualified. Two participants, who affirmed the value of these studies, did so with the proviso that they be taught in an even handed way, without glorifying, romanticizing, or belittling the native culture. The following summarizes this view:

> Yes. I would really like to stress that I would like to see studied the traditional attitudes towards environmental education as opposed to a modern way interpretation of what traditional attitudes were. ... I would be interested in getting a clear historical perspective of traditional values towards land and the natural world, and the educational emphasis that is put on it for the kids, without glorifying it and without belittling it.

While acknowledging the importance of examining traditional attitudes, these participants did imply concern about potential misrepresentations of the nature of these attitudes and their educational purpose.

There was a generally high level of support for inclusion of content about traditional, and in particular aboriginal, cultures and a number of participants acknowledged the educational value in using this kind of content as a vehicle for reflection. However, further research augmenting these perceptions should be pursued. An in depth articulation of the native perception of the role of traditional cultures in the study of environmental education would be valuable. Specifically questions are raised about what, in the native education perspective, is concerned with cultural transmission, or socialization processes appropriate to a particular cultural group, and what is more broadly educative and of great use to all students (It is conceivable that these concepts may not be mutually exclusive in many activities.) It will be particularly interesting to learn more about the contributions that aboriginal traditions can make in enabling students of all origins, to look outside of Western traditions. As one participant said, "our school is like a western civilization" and is, as such, the embodiment of western culture. It is, he claimed, difficult to be suitably reflective in that environment. For this participant, study of traditional cultures offered the promise of a different and useful perspective which may enable students to look at environmental issues reflectively.

Aesthetics and Experience

All participants felt that aesthetic considerations were important; most felt that they were of "real great importance." Further, in talking about the nature of aesthetic learning, a number of them described it as something intensely personal which involved personal experience. One participant illustrated this view in the following quotation:

> I think there is a beauty that cannot be described even as you go out and just sit and meditate, if you like, on the side of the hill on a sunny day, or to stand in a grove of trees on a frosty cold winter night and listen to the hoot of an owl. There's undescribable stuff in there that you will only experience.

Similarly, a number of participants identified an intrinsic quality found in experiential activities. They pointed to dimensions in learning which can be achieved through experiences in the environment; "there's an appreciation built through that exposure." These representative remarks point to a belief that some learning can only be achieved through direct contact with, and experience in, the natural environment; it is referred to as "another dimension."

Several participants volunteered reasons to justify aesthetic learning experiences. One suggested that their inclusion was supported by the need to provide a breadth of opportunities to acquire understanding:

> Because that's all part of, to be a well-rounded person you have to have all of these different things and then you can't live by bread alone.

This participant, and others, believed that learning should not be solely concerned with instrumental values; there are other dimensions to a well-rounded person that should be addressed in schools. Another person argued that the aesthetic qualities are fundamental to persons' abilities to think about the environment:

> I think it's important that ... kids get the aesthetic side of life ... people need that connection with the wild, I mean, internally they need that sense of beauty and sometimes they need that sense of awe to keep themselves in perspective. ... Quite frankly, one of the first things that people relate to in the environment is the aesthetic kind of quality.

According to this view, introspection and critical thinking will be enriched by aesthetic considerations, or a sense of awe found in the natural environment. Like a number of others, this participant saw a fundamental

quality in aesthetics; it is "one of the first things that people relate to in the environment."

A couple of persons associated aesthetic experiences in the natural environment with the acquisition of an ethic. For example:

> Aesthetic is not just physical attractiveness, it's a perception of the value in a situation or a scene or whatever as is ethics. Ethics would dictate a way of behaving, and not just a way of behaving but also the attitude to be held towards a particular situation. Yeah, it seems to be some fair parallels if not overlap.

This participant recognized that aesthetic interpretation is evaluative and as such can provide at least a partial basis for guiding behaviour. To this extent he projected a relationship between aesthetics and ethics. Another participant pursued this point further:

> I can't distinguish that [the joy of seeing things] from the roots of ethics, environmental ethics.

Here experiences were thought to provide a basis for the development of environmental ethics and a relationship between aesthetic learning and ethics was predicted.

Two participants felt that experience should be augmented. The first held that teachers should challenge students to evaluate their positions:

> I think beauty is in the eye of the beholder ... you have to, without judging, ask them what qualities they see as being beautiful in that ... you're bringing out their consciousness without putting a value judgement on it. ... feeding them questions upon questions and making accountable for what they're saying, then they really do come out with what they really feel.

The second held that acquisition of knowledge could enhance aesthetic inspired emotions:

> There's a feeling and I don't know how you teach the feeling. ... You may, you're, I think, more prone to find beautiful because you know what's out there. If you don't have that knowledge, you just go by feeling, you either like or you don't like. I think knowledge can enhance feeling.

It was thus speculated that aesthetic learning could be enhanced through critical approaches and knowledge acquisition.

These comments about aesthetic and experiential learning were consistent with those expressed during the first phase of the interview. Participants were, from the outset, convinced of the value of direct experiences in their surroundings. Here, they all attested to its importance and many linked aesthetic understanding to these direct experiences. Similar arguments were developed in the fourth chapter where it was there argued that aesthetic experiences can provide the learner with a unique form of understanding. It was further argued that education should include a breadth of learning opportunities, including those provided by aesthetic experiences. It seems, therefore, reasonable to give an important place to experiential knowing and understanding in Yukon curricula.

Relationships between aesthetics and ethics are interesting to consider and worthy of further investigation in their own right. For example, it has been argued elsewhere, that aesthetics are foundational in the development of environmental ethics (Hargrove, 1989). For educational purposes, however, the ultimate truth of this argument is not important. Critical to education is the importance of providing opportunities to acquire breadth of knowledge and understanding. Whether this understanding is fundamental to ethical development, or whether it simply contributes to broader understanding and alternative perspectives, is of less educational importance than simply ensuring that it is not denied.

Environmental Issues And Ethics

There appears to be considerable agreement about the importance of ethics in the study of environmental issues. As one representative participant put it:

> I think it's really important. ... It would be nice to think we would all be responsible and would protect our environment but the fact is we all aren't. And so finally, you have to start legislating it. To me that brings in the ethical issue to some extent, too. That's got to be part and parcel of your whole education program ,is it not? In my mind. Absolutely.

Reflecting beliefs of the majority, this person felt that ethics and ethical issues were important and deserved a place in school curricula. However, in spite of agreement on the importance of environmental ethics, there is less agreement about what it is.

One view described ethics in terms of standards, or a moral base, by which appropriate actions can be determined. Words such as "care," and "respect" were used in association with such an ethic. The following example illustrates this belief:

> A moral base supplies environmental care and issues and everything else, respect for the environment ... somehow we want to plant, not just our own ideals, but ... a good stable groundwork of ethics and morals and I think that's what you work from. ... that positive feeling of knowing right from wrong. ... a foundation to work from. I think that is the whole foundation of environmental ed in a lot of ways.

Here environmental ethics is perceived as the basis, or set of beliefs, which guides personal conduct or decision making. Teaching this conception of environmental ethics will involve instilling respect for the environment and phrases such as: "Being a role model," and "bonding with animals," are characteristic of the processes described to achieve this respect.

The alternate view held that ethics is associated with a process for investigating and evaluating issues. For example, one participant said:

> I've thought about it in more medical context, but ethics still supplies a framework for thinking about issues. And I think that it's that framework, that it would be very useful to have course on ethics and whether you call it environmental or whatever kind of ethics it is, there are some certain guiding principles. ... There are some principles in there and I think that those things have to be discussed. We can discuss it in a principled fashion even - rather than a case by case fashion, then it's easier to apply that kind of thinking to other issues so I can see the discussion of environmental ethics being very valuable in a method of looking at issues.

Here environmental ethics was held to be a "framework for thinking about issues;" it was more than just a basis, or set of principles, but a process for careful examination of issues. While guiding principles do exist, they should be discussed, and presumably evaluated.

An interesting tension between these two perspectives was expressed by one respondent who felt that while the school's job was to reflect the views of the community, there also had to be room for the well educated and informed teacher to challenge these views:

> I did say that we should reflect the views of the community with certain exceptions. Now there are teachers who do tend to be better educated, they tend to keep up more with current events. As a result, they tend to, I would say as a group, adopt values before the community does. ... I think that [teachers are] professionally bound, ethically bound to pursue those if we've got ... [Q: If the community's got it wrong?] Yeah.

In the context of this discussion it became evident that reflecting the views of the community meant reflecting those fundamental beliefs held by the majority. This appears to have placed this participant in a bind. He believed that the primary task of the school is to promote the ethical beliefs of its community, however, he also feels that there must also be room to challenge those beliefs.

Other participants raised further points which have a bearing on this problem. They cautioned that one should neither dictate, nor preach one's environmental ethics or ideas. For example:

> I think you have to watch your own mandate. I think that you can start preaching your own ideas and I don't think that's right either.

These participants clearly believed that instruction in ethics must not be confused with the transmission of one's own beliefs.

A final view speculates that ethics are something that extend beyond knowledge and understanding, and become a matter of personal choice and are part of the human character; "it's just a human characteristic I think." This comment is interesting in that it hints at instructional limitations which might be experienced. In spite of our best efforts, perhaps the individual possesses personal traits, beyond the grasp or influence of teachers, which will ultimately determine whether a person will become a moral agent.

As noted above, participants in this study advanced two contesting visions of environmental ethics, and these visions require some interpretation. According to the the first, ethics is concerned with standards or a moral base, from which people can operate. In this case words such as "care" and "respect" were used to describe desirable outcomes, and role modelling and bonding with animals described techniques that might be used to produce caring and respectful students. An ethic, in this instance, is something that one can have which serves as a guide or set of rules governing behaviour. According to the second view, environmental ethics is associated with a process for investigating and evaluating issues. It is not a particular body of knowledge or pattern of behaviour which a student aspires to attain or a teacher aspires to inculcate, but rather an intellectual process, or as one participant put it, "a framework for thinking about issues." In this instance environmental ethics was associated with more theoretical discussion about principles for moral behaviour and how those principles

might be applied in particular instances. The following discussion probes the contradictions arising from these differing views.

These two perceptions of ethics appear to parallel other observations. It has been said (Speake, 1984) that "ethics" has connotations for the lay person which are different from the meaning given to the word when it is used as a philosophical term. In the lay usage, "ethics" suggests a set of standards by which a particular group or community decides how to regulate its behaviour. This usage implies that ethics serves as a practical guide and is consistent with the first participant interpretation reported above. On the other hand, as a philosophical term, "ethics" is concerned with the study of the fundamental principles and basic concepts that are, or ought to be, found in a given field of thought. Like the second participant interpretation, this conception is theoretical.

It is important to note that "ethics" and its branch "environmental ethics," in the philosophical sense, should not, and indeed must not, be left exclusively in the domain of the moral philosopher qua philosopher. To the extent that students can be encouraged to think critically about their own views and those of others, evaluate justifications, and judge the logical coherence of arguments, they will be doing ethics. Further, instruction in environmental ethics, in this philosophical sense of the word, is precisely that which is argued for in the fourth chapter. We must be clear that our task in schools is not necessarily to train philosophers in a formal or professional sense. However, we should introduce students to the language of philosophy in general, and environmental ethics in particular. We must enable them to understand what constitutes an acceptable ethical argument.

Finally, we must engage students in the practice of making ethical judgements; they will need to do ethics.

While there is a sense amongst participants of this study that teaching students about environmental ethics in the philosophical sense is important, the discussion thus far does not help us to understand the alternative conception of ethics. Many of these people want schools to produce students who are caring and respectful stewards of the environment. The status of this position is, however, complicated by the belief that teachers should not preach their ethics nor attempt to indoctrinate students; it is not good enough to simply train students to follow a particular type of behaviour. Given these competing claims one might wonder what status activities such as recycling projects and garbage clean-ups should have. Further difficulties were expressed by the participant who claimed that the job of the school is to reflect the views of the community while at the same time making room for the well educated and informed teacher to challenge these views. We have here the makings of a practical and conceptual conundrum.

One vehicle for thinking about the differing, and potentially contesting, conceptions of environmental ethics is to consider the schooling functions discussed in the second chapter. It will be remembered that, while there are many worthwhile activities which take place in schools, they are not all educational. It was argued that education is different from training, or the acquisition of trained skills, and socialization, or the inculcation of social attitudes and functions. Education, it was argued, transcends the kinds of immediate utility attained through training and socialization. Education should, in a more general way, enable people to think clearly,

critically, and reflectively. In this way people are prepared to think about their particular social context and empowered to liberate their thinking from constraints imposed by this context.

With these distinctions in mind, beliefs held by various members of the study group can be examined. For some participants, environmental ethics was suggestive of desirable attitudes towards the environment. These participants saw schools producing students who were caring, respectful, and responsible in matters pertaining to the environment. In short they expressed a desire to initiate students into those generally accepted beliefs which have become part of our social fabric. This can be likened to socialization. Taken a step further, it might be said that some of these participants see school as a vehicle for the reinforcement and acceleration of changing social norms.

In a general sense, it is hard to imagine many who would object to the development of care, respect, and responsibility towards the environment. In this broad sense the socialization of students will find some justification. However, when these concepts are applied to specific, and sometimes contentious matters, their limitations become apparent. When faced with competing moral claims, one should ask: What constitutes responsibility? and, What priorities for caring should one hold? These are clearly questions that cannot be answered by processes which tend to socialize the student.

Some participants associated environmental ethics with producing responsible citizens and training behavioural attributes. By engaging students in activities such as garbage clean ups, recycling, and energy conservation, teachers are nurturing particular responses. They are in fact training students to turn out lights, clean up after themselves, and return

recyclable materials to available depots. Again, in cases such as these, where there is general agreement about what constitutes good behaviour, most of us would judge them to be of some worth.

We should also consider broader ramifications of the type of training just described. By requiring students to engage in activities considered good, a pre-disposition to do that which is considered to be good is nurtured. It has been argued that this form of moral training may, in fact, be important in preparation for, or part of, what may be called moral education (Barrow, 1986; and Hamm, 1989.) However, there is an obvious danger in training, as that which constitutes good is not evaluated, nor is the capacity for this sort of evaluating developed.

Socialization and training activities can be important schooling functions. There can be some justification for encouraging the development of caring, respectful, citizens who will participate in activities such as garbage clean-ups, recycling projects, community composting activities, tree planting events, energy conservation initiatives, and species saving campaigns. It would be a mistake, however, to think of these activities as being necessarily educative. This point can be illustrated using an example appropriate to the Yukon.

It may be possible to justify a school sanctioned moose hunt, within a community which has a largely subsistence based economy, as either an expression of cultural transmission, or as a training activity important to survival and well being. For residents of many Yukon communities these will be important considerations. However, the activity may be minimally concerned with education. Alternatively, one can use the concept of hunting to examine human/environment relationships. This might be

done by probing questions like: Under what conditions can the hunting of moose be morally justified? And, is it reasonable to make distinctions between subsistence, sport, and trophy hunting? In the first example we were concerned with the acquisition of habits and skills. In this second case we are concerned with ideas about what is good, right, and morally acceptable. This example can also serve as a metaphor for considering broader relationships between humans and their environment - how we treat the atmosphere, lakes, rivers and oceans. This is, of course, more consistent with education.

Making distinctions between socialization, training, and education enables us to more clearly analyze the nature of the activities included in school programs. We must not simply habituate particular behaviours and attitudes. We must enable students to reflect critically on the commonly accepted social behaviours and attitudes and we must enable them to engage intelligently in discussion about contentious issues. We must also enable them to judge for themselves which behaviours will be responsible, and require them to justify their choices. Appealing to distinctions between socialization, training, and education should enable educators to ensure that environmental education is not defined by activities which are not educative.

While a case has been made for distinguishing education from socialization and training, it is less clear what the relative proportions of these activities should be at any particular stage in the schooling process. However, several points should be considered. First, education should be concerned with the development of intelligent, independent moral agents. We are not in the business of trying to produce automatons trained to

dutifully comply with the dictates of environmental fads or dominant tendencies. Second, the task of fostering moral autonomy will require a predominance of that which can properly be called education. Third, the relative proportion of educative content should increase as students proceed chronologically through schools. Younger students may be more consumed by socialization and training while older students should devote more of their attention to educational activities. Fourth, environmental education should include the study of environmental ethics in the philosophical sense as argued in the fourth chapter and advocated by some study group participants. Ethics is in this sense an intellectual process and provides an framework for thinking about issues. Only by enabling students to think clearly, critically, and freely about contentious issues can we minimize the pitfalls of preaching, indoctrination, and propagandizing. This will not be easy, however, and difficulties may be exacerbated by varying conceptions of ethics. It follows that developing educational programs will need to proceed with care and sensitivity to this point.

Environmental Issues And Student Action

The comments about student action were varied, perceptive, and in many cases went right to the nub of the teachers' understanding of the aims of education and its limitations. A majority spoke about the importance of allowing students to follow through on their studies to the actual step of taking some action on an issue. Two respondents dissented, both feeling that there was plenty of time after school in which to become involved.

General support for enabling student action on an environmental issue was reflected in the following representative comment:

> You know, do you write letters to people and invite them in and you discuss this? You raise questions, you find out facts and you discuss it. And I think that's a legitimate kind of thing that kids have to learn. The element of citizen action. You know, the idea that they are not powerless and I think that they have to be able to realize that they have a measure of power, that they have the politicians, the decision makers, who are accountable to them. I think it's a very legitimate kind of thing.

This participant linked student action with citizen responsibilities in a democratic society; participation can be part of their preparation to become responsible citizens. In a democracy the people are supposed to ask questions and demand accountability; students should be expected to do the same. They should learn that they "have a measure of power." A number of participant responses suggested that students should be encouraged to become involved in citizen actions, and provided with the background required to do so. However, these participants fell short of insisting that students should take part in such action.

In spite of endorsement for the idea that students should be allowed to follow through on their studies to the step of taking some action, a commonly expressed sentiment was that the students must not lack substance. The idea that students should act in an informed and responsible way was frequently discussed. A typical response is encapsulated in the words of the following participant:

> I think if the students have a legitimate concern and they've done their research and they know how to present, I think they should be encourage to follow through with it.

According to this view, students require understanding of the issues and the ability to present views in an appropriate way. The appropriateness of students participating in citizen action was thus qualified.

When asked if students should be expected or required to carry their studies through to the point of action the response was decidedly less

enthusiastic. A few felt that such action could be expected, but none felt it should be required. Several comments reflected factors which could limit the correctness and effectiveness of aiming to have students participate in environmental action. For example, practical limits were raised:

> No, I think if you're forcing people, then you're losing the quality of the action.

In this quotation the participant recognized that students must act out of their own volition. Requiring action could undermine the quality of the action. Further, the results might be more pernicious if they alienated the student who felt pushed to "where they feel they're being railroaded." Additional practical concerns were expressed in the following observation:

> I don't think it can be expected of them. ...because of problems, some existing policies as far as - or maybe some of the - maybe parents disagreeing - they weren't educated on the issues or whatever.

This person argued against expecting students to participate in some actions; students should not be expected to participate in actions which may provoke discord between schools and families and between schools and policy making bodies.

Requiring student action may also be judged inappropriate because of the inherently personal nature of commitments to action. This view was advanced in the following statement:

> We may create an awareness but I don't think we can logically demand that they are then going to take action. I think, hopefully, if we've done our job in raising awareness and raising concern the next logical step for a kid to do would be then to consider, and I think that you have to propose it to them, are there any kinds of things we can do? And they can then come up with suggestions but the decision to do something about it; I think it has to become a very individual one and it has to be based on how keenly they feel that concern.

This person claimed that the impetus spurring a student to the step of acting on an issue will be largely dependent upon the intensity of their concern. A

teacher can create awareness of issues and assist in identifying possibilities for student action, but the final decision will rest with the students. Issues selected for curricular inclusion may not be consistent with their concerns or they may be of low priority.

Enthusiasm for allowing students to take action does not at first appear consistent with the rejection of requiring action. Earlier, the majority of respondents expressed the expectation that educated students would become "responsible citizens," "stewards," and "almost activists," yet here it was clearly held by many that school cannot justifiably be the agent of compulsion in such matters. Perhaps the expectation is best put in the following:

> If you can get a kid who will then sort of, seize what they've taken and use it to sort of transform their own experience, I think that's what you always aim for.

According to this view, the transformed experience is an extension of education rather than the aim itself. We might expect an educated person to act on his or her beliefs but this exercise of will cannot be taught, only nurtured.

At the outset of this section it was reported that two respondents dissented from the rest and did not feel that students should participate in environmental actions. This view is illustrated by one of these participants in the following quotation:

> the issue of the oil spill in Alaska, and all this kind of stuff is natural to get involved with I suppose from a conflict side and resolutions and legislation and going on with it, but there will be plenty of time for people to do that outside of school, I think.

Both of these participants expressed the view that schools should stop short of involving students in environmental actions and that there would be

time to become actively involved after students leave secondary school. Further, the participant quoted was particularly doubtful that students could resolve environmental issues and design appropriate legislation. Though ultimately important, this participant's comments are suggestive of an enormous responsibility which would be inappropriate to burden students with; there would be time after school to wrestle with resolution and legislation.

These comments indicate that participants generally supported the notion of allowing students to follow through with their studies to the point of participating in environmental actions. According to some, these actions could be likened to engaging students in the democratic processes and those participating would be empowered. Others added that participation should be informed and responsible. However, when asked if environmental actions should be expected, the response was decidedly less enthusiastic. Though a few felt that such actions could be expected, none felt that they could be required and it is clear that participants reject the expectation of student actions in the demanding sense described in the third chapter. This rejection appears to be based on both practical concerns and logical misgivings. In practice, a number of participants said that requiring student action could undermine the quality of the action, alienate students, and promote discord between schools and families, and between schools and policy making bodies. Logical concerns were illustrated by participants who asserted that action could not be demanded. This person, and others, argued that impetus for student action is (and presumably should be) dependent upon the intensity of concern felt. In the final analysis they felt that the decision to act should rest with the student.

Participants did talk about nurturing dispositions which may lead to actions. In addition to allowing students to follow through on issues to the point of taking action, some wanted students to be made aware of issues and be given assistance in identifying possible courses of action. These comments do not reflect departures from the discussions about student action developed in the third chapter. It was argued there that student action on environmental issues would rightly arise as a consequence of education.

However, other comments do appear to be potentially inconsistent. Expecting schools to produce caring, respectful, responsible stewards does imply expectations of actions in a demanding sense. We do, for example, expect students to refrain from pulling the ears of a pet rabbit, clean after themselves, turn out lights, and avoid willfully destroying green spaces around schools. Appealing to the concepts of socializing and training can help to assess these inconsistencies. Though the initiation of persons into the generally accepted patterns of behaviour is minimally concerned with intellectual capacities, it does carry a message. Either implicitly or explicitly, people are told that they are expected to behave in accordance with what is believed to be right. It does not seem wrong to nurture this tendency. However, we should not confuse acts of training and socialization with education. Education is enabling, but does not prescribe nor demand particular ends. We expect, in the educated person, action which is consistent with a person's judgement, rational capacity, and moral autonomy.

Given the expectation that educative experiences will be transforming we can justifiably nurture this realization. A learning environment which

will support the development of moral agents must include: investigation of important social issues, provision of the necessary information required to take action, and allowing students to participate in the final step, the action itself. To deter or thwart that final opportunity would be to hinder the ultimate development of independent moral agents.

In the final analysis, however, it must be recognized that the predisposition to act is a quality which remains elusive. One participant characterized this trait as a part of one's personal identity. Another person, referred to a quality beyond knowledge and understanding, a quality that is "just a human characteristic." We must recognize that in spite of our efforts as educators, individuals may possess personal traits, beyond the grasp or influence of teachers, which will ultimately determine whether they will become moral agents.

Environmental Issues and Pedagogical Limitations

A number of participants spoke about pedagogical limitations associated with teaching about environmental issues. A significant theme running through the data is the belief that a teacher's responsibility is to present issues in a balanced even handed way. Participants frequently claimed that teachers must "give both sides." Alternatively stated, a number of participants warned against preaching and indoctrinating. One participant expressed this view as follows:

> I don't want the school system to indoctrinate to the extreme. [Q: Or indoctrinate at all?] Well, good point. Yeah, that's interesting the way you word that. No, they shouldn't indoctrinate at all.

From this it follows that the task of teachers should be to assist or enable students to sort these things out for themselves. This was, in fact, a major theme reflected by participants. As one person said, these processes would

involve pointing out discrepancies in logic and understanding reasons given for decisions:

> Presenting the issues to them and presenting the sides ... as many perspectives that they can give and inviting discussions from the children ... and never saying, that's a dumb idea and always helping the child to through with their thinking. Pointing out discrepancies in the logic of how they're thinking and, you know, what if and just try and be direct with thinking and not to an answer or the perfect answer but at least the thinking is fairly logical.

Interestingly, the process described above would be objective, dispassionate, and solely concerned with the logical analysis of the arguments.

Other participants raised equally interesting questions about the role of teachers and their capacity for impartiality. One remarked:

> That's always a fairly touchy one because we can't put our values on somebody else and yet if things we consider they're really important to us as individuals we can't help but colour it a bit with your values. And that's always--well, I guess you can't preach because that just turns people off. So you've got to be very careful about that kind of [thing.]

The plausibility of teacher neutrality is questioned. The participant that was quoted rightly implies that decisions about what teachers select as content, the issues they raise in classrooms, and the teaching strategies they use will all be influenced by beliefs and personal values. Another participant confronted this dilemma. While he agreed that teachers probably have no right to preach to children, he claims that the persistent striving to be neutral is also unsatisfactory:

> It's almost as though we're [depriving] part of our human environment ... that's the emotional ... I mean we are thinking, feeling creatures and we ought not respond as though we weren't. To some extent there is a case for being passionate ... and I think a teacher has to judge what they can make the impassioned plea upon, and some areas are socially acceptable ... But I think you can make an impassioned plea for [a reasoned argument put forward] for cases. I don't know how you'd build it in.

These comments raise some important questions for discussion. How should a teacher deal with their beliefs, which are at times, natural human

expressions of emotion, and at other times, unsuppressed in spite of their best attempts?

Teachers and curriculum developers can strive, through various intellectual and pedagogical contortions, to minimize bias in their instruction. However, given the implausibility of total success, they should recognize that pursuit of objective, or value-free instruction will be implausibie. Perhaps an alternate approach is to be more candid in exposing one's beliefs and the justifications for those beliefs. There is nothing wrong with having beliefs; teachers must care about values and ideas. Furthermore, students will often want to know how their mentors perceive and evaluate a particular situation. To educate is not to be valueless, devious, deceptive, or reserved. Rather, education is about the fair pursuit of knowledge and understanding, and the following of these pursuits with intellectual integrity. This does not preclude the sharing and discussion of one's beliefs. However, these must be presented as reasoned beliefs rather than revealed truths.

This means, however, that teachers are also charged with the Promethean task of knowing when their beliefs impose rather than inform; they must be sensitive to the fine line that can exist between these two concepts and strive not to cross it. This will require humility. Teachers must allow their positions to be challenged - not in a shallow relativistic atmosphere where everyone's beliefs are seen to be equally correct, but in an intellectual atmosphere where logical consistency and quality of argument and evidence are the criteria used to judge the worth of a position. Of course in an imperfect mortal world the application of such a strategy will also be

imperfect. Mistakes will be made, but they can be honest ones, and this seems preferable to any attempt to act out a valueless charade of objectivity.

Comments About Content And Pedagogy

Data in this section describe responses to questions about what content and methods would best be used in advancing student learning in environmental education. The questions were designed to assist the researcher in identifying pedagogical structures and content elements for consideration in curriculum development.

Content

Participants were asked to talk about content which might be presented to children learning about the environment. Resulting discussions were primarily concerned with the following factors: knowledge, contemporary issues, local content, and coordinated planning.

Knowledge. Participants of this study stressed the importance of knowledge acquisition. They recognized that people cannot think intelligently about an issue without substantive information about the subject in question. Further, it was felt that this knowledge should contribute to students' understanding and their ability to think intelligently about the environment. Knowledge about democratic processes was also identified for inclusion.

Participants clearly believed in learning opportunities which would increase students' knowledge about the environment. One participant succinctly summarized these views in the statement, "We need people, knowledgeable people." Further, participants saw a relationship between

knowledge and students' ability to understand and evaluate environmental issues. For example:

> ... its important for students to know whole truths and not just half truths. So the more information they have about something, the ... better evaluation of, and understand[ing], they'll have for that.

Put another way, participants suggested that educators should not underestimate either the importance of knowledge or the rigour required to attain environmental understanding. In considering questions about knowledge, participants frequently referred to the relative merits of breadth versus depth in a particular area. Though the majority indicated the importance of some detailed study, it was frequently acknowledged that breadth of knowledge was also important.

One person preferred overall basic knowledge to in-depth knowledge in selected areas and expressed his views in the following quotation:

> What I think I would like to see is the overall basic knowledge preferred to an in-depth knowledge of one area. ... Have a good overall knowledge base, that's, I think, the ultimate goal.

While few would dispute the desirability of breadth in knowledge and understanding, some participants also made the claim that all knowledge and understanding cannot be achieved in general terms and some detailed study is required. For example, one person said:

> I think the danger again is, and it's important for the teachers to be aware of the fact, that not all information can be identified in general terms.

The point being made here was that knowledge and information are not gereral or generic types of a commodity. They are linked to specific content.

The importance of detailed, or specific study, was elaborated upon. Participants argued that acquisition of in-depth and specific knowledge can

illustrate concepts and reveal understandings about complexities of environmental relationships. For example:

> I think that's important. I think some of the broad concepts can be looked at by studying a single organism.

Again there is expression of the belief that conceptual understanding cannot take place in a vacuum. Concepts must be given a context in which to be presented and discussed, and that context can be very specific.

As the concepts of breadth and depth are to some extent mutually exclusive, debate over proportions of each approach to content will persist. However, what seemed clearer to one participant was the importance of curricula to accommodate both:

> [from] the cellular level to the spaceship Earth level ... there's a place in which I want to have a person look in tremendous depth ... sometimes that probing curiosity will allow you to go inwards as well as outward. You don't want to miss either direction.

Detailed examination can, according to this participant, sometimes lead one to "go outwards" and gain a better understanding of the larger environment. Further, achieving this broad understanding will require students to study some level of both detailed and broadly presented content.

At a practical level several respondents noted the need for a body of information which could enable people to do things. This included knowledge of how the political system works, the responsibilities of various government agencies, how to approach people for assistance, how to use the library and other sources of information, and how to replicate research. The following example illustrates this belief:

> They need a lot of background information, they need to know - have an idea about process, legislation, how to use a library, which, hopefully they'd know by this, but. How to redo research, how to approach, you know, what people do you approach for assistance, what government agencies are responsible.

According to this view, participation in both the academic and political processes would require the acquisition of requisite information.

Issues. A common view held that environmental education should include the study of environmental issues. One participant summarized the general enthusiasm for this position:

> Personally I like to hit home the problem. You know, say this is what's happening right now. And get the emotions going, get them aware, get them concerned about what's happening and then they start asking questions themselves, why?

This person, in advocating the engagement of students in the study of contemporary environmental issues, acknowledged both the intrinsic importance of this study as well as its motivational value. Similarly, Yukon issues were thought to provide important content. In some instances participants placed value in learning about issues which affected them directly. For Example:

> I think direct exposure to industry. Industry is our biggest complaint when we're talking environment these days and so I think what they have to do is, they have to expose them to the different industries that we, let's say in the Yukon, we rely on and we need to, you know keep our economy up. Also identify areas that are of environmental concern.

For others, using local content was primarily motivational. The following quotation illustrates this point:

> I don't think we have to only focus on Yukon issues, but, again, like I said earlier, it might help generate interest and hold it and if that took place. They have some pretty big issues here in the Yukon.

While acknowledging the importance of local issues, and their ability to generate interest, endorsement of Yukon issues was qualified; it should not be used to the exclusion of other important issues. For example, one participant said:

> If there are local concerns which are fairly high priority, it might be an idea to balance those off. Not exclusively local but the global issues seem to be more important right now.

This observation is indicative of a general belief that contemporary and global environmental issues are interesting, important, and should be studied.

Local content. A majority of participants felt that using local content to illustrate ecological concepts was important and two themes emerged to describe this position. One focused on the practical and motivational aspects of dealing with materials that students could relate to. The other addressed qualities intrinsic to the Yukon, its uniqueness and fragility.

In the first instance, a number of participants said that content should be developed that was specific to the Yukon, "because that's what the kids have access to." One participant provided some justification for this view:

> Well, it's certainly more concrete ...The more alive it is, the more realistic it is.

Presumably, the realism of Yukon content was seen to enhance understanding. Similarly, using local examples could serve to heighten the importance of the study; "if you can do stuff that's outside their back door it becomes much more important." Further, it was predicted that local content would appeal to the student's existing knowledge and experience. The following quotation illustrates this view:

> Well, I think there has to be a lot of specifics, Yukon specific materials filled in ... you often have to relate these things to a kid's own experience.

Collectively there was a belief that the use of local material would enhance the importance of the studies and facilitate understanding.

The other justification for including local content in a course of study in environmental education focused on qualities intrinsic to the Yukon. One participant put it this way:

> Number one, I think it's a rare place, the Yukon, and I think we need to know as much about our local environment as possible. So I'd like it very specific.

Two points are made in this claim. First, thinking clearly about an issue will require knowledge and understanding specific to that issue. Second, it will be particularly important for Yukon students to know about their unique and fragile environment in order to make wise decisions about its future.

Coordinated planning. A number of participants recognized that content and themes in different subject areas can overlap. One secondary school teacher acknowledged this overlap and identified value in the coordinated delivery of content:

> It would be very nice for my Biology eleven students to have also taken Yukon studies.

Here, aspects of content would be similar and thus mutually supportive. Overlapping content was also observed at the elementary level:

> Again you have your science area and you have social studies area and to me they're very closely related.

Presumably, this participant was talking about the content chosen to illustrate the respective ideas, not necessarily the ideas themselves. These observations appear to suggest that content could be selected and organized in such a way that material from various subjects could support and enhance each other. Another participant developed this idea:

> [if] I had a plea to make [it would be] would be to see teachers working together to more effectively integrate their subjects, and the subjects intentionally being designed for all parts to be integrated with each other.

According to these views, the coordination of content between subject areas would be a useful curriculum aid. Many participants felt that complementary themes could be introduced in concert.

Pedagogy

Participants were asked to talk about methods that might be used to present environment related content to their students. The two most persistent themes arising from this request were the importance of experiential learning opportunities and the need for pedagogical support. The data reported here are organized into two categories: experiential opportunities and pedagogical support.

Experiential opportunities. Much general discussion focussed on the importance of participatory, experiential, and active learning opportunities. Reasons given for these beliefs may be grouped according to three themes: experiential activities were motivational and capable of capturing student interest, they were felt to broaden the scope of pedagogical possibilities, and they were effective in illustrating concepts. Active, participatory, and experiential learning activities were not endorsed in an unqualified way, however, and several points were raised concerning their limitations.

In making a case for experiential learning opportunities a number of participants spoke about their motivational qualities; they could provide the "hook" required to capture student interest. For example:

> I think that in order to keep their interest level up, you have to make it fun. [The] learning experience is fun for the kids. If you can almost, I don't really want to play games, but this is what they do on the field trips is they play games that get the end point across.

Like this participant, an number of others believed that learning experiences could be fun while, at the same time, illustrating important points.

Similarly participants claimed that experiential activities and field experiences were important elements in a pedagogical repertoire. One reflection of these views follows:

> I think games or activities like that are incredible learning tools. And definitely should be used, sometimes as an introduction, maybe as a culmination at the end of the unit, I'm not sure, it would depend on the set up.

In this instance they were projected as aids, or "incredible learning tools" for supporting instruction. This view was developed further by another participant who claimed that experiential learning activities were effective in illustrating concepts:

> the more life-like you can make an activity, you find the more long-term learning you're going to find from the children. So I think it's an excellent way of presenting a concept.

While it was a common belief that experiential activities could be effectively used to introduce concepts, some worried that this purpose would be missed if not managed carefully. For example, the following respondent insisted that experiential activities must be carefully prepared and linked to in-school activities:

> I think those activities are great, even in the high school ... But it's really important that the concepts are very overtly presented to the kids before, you know, what's the purpose of this game, then try the game, and then see whether in actual fact our expectations, our original hypotheses were satisfied. And I think with younger children that becomes even more important. So that they know why they're playing the game.

While experiential activities may be valuable for illustrating content, they are not necessarily so. A number of participants stressed the importance of ensuring that the concepts were overtly presented and discussed to ensure understanding. They also saw a need to make the relationships between classroom work and field experiences explicit.

It was also acknowledged that using active learning activities was just one pedagogical approach. One participant stated:

> As much as possible, I like to see combination of indoor and outdoor methods used. Because of the numbers, and the cost, and various things, there are many things like this that have to be done indoors, there's no doubt in my mind about that.

There was frequent recognition, as illustrated in the above quotation, that all requisite learning cannot be accomplished through field study.

Pedagogical Support. An important, and recurring theme, was the need to provide support for teachers. Participants agreed that effective implementation of increased environmental education will require initiatives to assist teachers. Such assistance, might include new curriculum materials, use of resource persons, cross-disciplinary coordination of teaching activities, and the nurturing of teachers' professional abilities.

Participants felt that useful support materials might be of two types. One would augment the content found in standard teaching resources. The other would replace standard teaching materials. In the first instance, development and distribution of supplemental material for curriculum enhancement was frequently called for. One participant summarized the desire for such aids:

> What's really needed is a booklet of these kinds of activities. The winter activities booklet is an excellent start. I'd like to see something done, and sort of expanded. And I guess the only problem that I saw with the winter booklet was, it was pretty daunting. ... Generally, there was one copy in the school and it was kind of daunting. I think just from my experience, what you have to do is produce a book which is manageable for school, a booklet which is designed on the primary level to involve all the kids in a manner designed to cause as little confusion as possible. ... I would really recommend it being an individual kind of supplemental booklet for each teacher.

According to this view, more supplemental print materials would be useful, particularly if teachers could have personal copies. In the second instance participants advocated re-writing portions of curricula to reflect the Yukon context. For example:

> I'd like to see is something akin to what they did with the social studies curriculum where they took, actually took the social studies curriculum and they adapted it for the Yukon.

The locally developed segment of the Yukon social studies curriculum was held up as a model for development, the implication being that future materials should be comprehensive and of high quality.

All participants felt that resource persons from outside the school were helpful, if not necessary, for the enrichment of environmental curricula. These resource persons were seen to be the possessors of a great store of knowledge and sources of alternative perspectives. Further, their visits were considered pedagogical enhancements.

The value of resource persons was seen to be in their ability to provide background information and share their specialized knowledge, including their particular understanding of contemporary or local issues. Further, the knowledge shared by resource persons was seen to be important in a number of ways. First, it could be of direct benefit to students; "it's quite important to have somebody with the knowledge." Second, it could be useful to teachers. One person pointed out that she learned something every time she listened to a resource person:

> Well, you probably know Renewable Resources are just great! ... I think I learn as much as the kids do every time one of them comes.

Third, resource persons bring alternate points of view into the classroom. For example, one person said:

> I think, it is really good for the children to have someone else come and give their point of view other than hearing it all the time from their particular teacher. It's refreshing and it's exciting.

Providing students with exposure to a variety of perspectives, was important to a number of participants.

Resource persons are not generally teachers. They need assistance and a clear idea of what is expected of them:

> All of them are very, very important. As long as they're prepped on what they should be doing. Sometimes a lot of these people come in and they're not sure what they should be doing and where they should be going and you end up wasting a lot of time. As long as you know what you want as a teacher and you can provide them with that, and get together ahead of time.

This comment suggests that resource persons are not always, nor necessarily, helpful. Care must be taken to ensure that presentations are consistent with the teacher's educational purpose, and are in some way useful.

Enthusiasm for employing the talents of resource persons was tempered by two participants. One simply said: "I don't think you need all of the experts all of the time." The other felt that he almost preferred less utilization of resource persons as overuse could inhibit the professional initiative and development of teachers:

> Well to be honest with you, I mean in some respects I'd like to see [use of resource people decreased] not increased. The reason I say that is because I'd like to see teachers step out more frequently. ... There's a place for the expert, the knowledgeable person but there's also a place for the teacher to step out and give it a try himself. ... So there's a balance there.

Both participants cautioned against unfettered use of resource persons. In the first place, teachers should be sufficiently able to do their work that reliance on outside persons would not be required. In the second place, development of teachers' professional capabilities and sense of responsibility could be diminished by a dependence on resource persons.

Participants often spoke about the need to nurture and support teachers. There were an number of complimentary remarks made about Yukon teachers, but there was also a feeling that on-going professional development in environmental education was important, if not urgent. It was clearly stated that if environmental education were to increase, then professional development would also be required. This view is summarized in the following comment:

> Well, because it hasn't been an important part of our curriculum there hasn't been much professional development and the department hasn't put much money forth for resource people to come in to discuss ... to teach teachers ... So there's clearly a shortfall in that area of professional development. ... if the department decides to take the direction on more importance of environmental education, that means we have to motor - you know, we'll have to provide more resources to go ahead.

This participant identifies a perceived problem which will be exacerbated by more emphasis on environmental education. Another view held that professional development needs are particularly acute among new teachers in the Yukon. One participant said:

> I would really like to see some kind of setting established for teachers to go into for short training sessions on a combination of outdoor education and environmental education. Because, let's face it, a lot of our teachers especially in the primary are one or two year people, they come up often from the south, with very different opinions of what the north is like. They generally have very little knowledge of the environment, they frequently have less knowledge of the people and they're up here and they're trying to survive themselves in a new environment. ... I would almost suggest for newer teachers and teachers new to the territory there's maybe a two-day kind of in-service.

It was clear in the minds of study group participants that the on-going professional development of teachers would be required to improve and expand environmental education.

Key dimensions for professional development were said to include the fostering of interest and motivation, the acquisition of environmental

information, and the introduction to new teaching strategies. Frequently motivating teachers meant overcoming a lack of awareness, knowledge, and confidence. As one participant stated:

> I think they have to feel confident. I think that's number one. So if they need to be given the confidence builder, you know, that they can do it. Then they need information. That information has to come through workshops, in-services, Yukon College, whatever, experiences and so on. ... But I think they need, you know, confidence, they need experiences, they need information and I think the packets have to be easily digestible and even if it means that spoon-fed kinds of materials, I think that's what it should be.

Consistent with the above comments, a number of participants identified the importance of information dissemination during professional development. According to the study group, this would include natural history, up-to-date or new information made available by experts, background information about Yukon issues, and opportunities to reflect on these issues. Teachers should have "exposure to experts in certain things," and "if people are not really comfortable with environmental issues, then how can you expect them to incorporate these kinds of studies." It was also felt that teachers needed some direct experience in the Yukon environment and opportunities to consider the importance of providing experiential opportunities for their students: "You can't teach without having been there."

Participants of this study expressed a clear need for professional development. A variety of formats and venues were also suggested. Some participants felt that professional development would be enhanced by giving greater attention to environmental education at forums and conferences. Workshops, in-services, and courses at Yukon College were also mentioned as possible formats, with wilderness trips and the College identified as possible venues. Some participants spoke about the importance of including

practicing teachers in the planning and delivery of professional development. For example, while talking about a particular individual one participant said "that's the kind of person we need to start building and start giving opportunities to infect the other teachers."

Concerns About Implementation

Mandating Environmental Education

Participants were asked to judge the desirability of mandating environmental education, a task which generated some interesting discussion. There was almost unanimous support for enhanced environmental studies in the schools, and considerable agreement about the need to mandate it. According to many, the Yukon Department of Education must show leadership to ensure effective implementation of increased environmental education. However, a number of concerns were raised and one participant objected to the notion of a centrally mandated curriculum.

The majority of respondents felt that environmental education should be mandated. Several advocates were unequivocal in their support for this option and words like "absolutely" and "unqualified ... it's urgent" were frequently used to emphasize their position. In an elaboration of this view, one participant said:

> [U]nless there's a mandate and the philosophy and reasons for a mandate, then the individuals coming in will do things on a piecemeal basis, adhoc basis, and I think that that's what's happening now and that's what will continue to happen. ... There has to be push, it has to be political. It has to come down from the top.

According to this view, the Department of Education must take an active role in seeing that more environmental education happens.

Some participants expressed more qualified attitudes, and worried that top down implementing would be a perceived or real imposition on teachers. The following quotation illustrates this view:

> The quick answer to that question is yes. The slow answer to that question is a very, very qualified yes. It depends on where the direction is going to come from. I would hate to have the Minister stand up in the House and say, "next year we're going to have an environmental component from K to 12 and the teachers are going to produce the curriculum." I think that would be an absolute fiasco and within two years environmental education would be totally out of the schools and it would never be introduced again.

This statement reflected the sentiments of many who felt that success could only occur when teachers are prepared to implement increased environmental education, curriculum materials are prepared, and supporting services are in place. Mandates must not impose unrealistic burdens. For example, one participant said:

> If you say we believe in environmental education, and every teacher has environmental education, then you better be prepared to commit resources in terms of materials, in terms of instruction of people, and so on.

Another participant gave additional emphasis to professional development and suggested that environmental education might be considered in recruitment requirements:

> Certainly it should be mandated but it has to have professional development opportunities and recruitment requirements.

These comments clearly suggest that while it may be one thing to issue a mandate, it is quite another to ensure that the infrastructure required to support the mandate is provided. According to many participants, successful mandating will be dependent upon supporting conditions such as

the provision of program materials, professional development for teachers, and targeted teacher recruitment.

In light of these comments, the extent and nature of Departmental involvement should be considered. There is clearly doubt that grass-roots initiatives will, by themselves, be enough to get beyond a "piecemeal" or "adhoc" implementation. Conversely, while generally acknowledged as essential, there is suspicion about mandates and high level initiatives. The optimum circumstance will involve a political mandate combined with moral and financial commitment. The Department will need to work with teachers to develop their abilities and the support materials required for effective education. Further, the parents, teachers, and school administrators represented here understand this.

Implementation Format

When asked how increased environmental education could be best implemented in Yukon schools, the majority of participants favoured integration of environmental content into existing curricular structures. The reasons given were partly logical, but largely pragmatic. Most saw practical merit in integration as opposed to developing additional courses of study. For example, one participant simply predicted that development of a comprehensive environmental education curriculum for the range K-12 would be impractical; the more feasible option would be to "slide" bits of environmental education into the existing curricula:

> It would be difficult, I think, to offer a complete course in the area K to 12 in environmental education, a separate complete course, but I think that there's an area or the possibility exists to slide little bits of this environmental education throughout the entire curriculum right through from K to 12. I think that's probably the best bet, have it integrated into the regular curriculum all through their school years.

Others speculated about difficulties that could arise if packaged supplements were superimposed upon the existing curricular demands. Burdening teachers with extra units or courses to teach could only heighten the resistance of teachers and, when under duress, the "add-ons are the parts that get taken off." As another participant said:

> I think it has to be integrated into existing curricula. Just on a practical basis of time concerns. Teachers are so loaded right now and I guess one of the things you have to overcome in dealing with teachers is the resistance to having another thing dumped on them. ... You can't overload teachers by putting in separate units or separate course, will overload teachers.

Participants favouring integration of environmental topics into existing subjects, as opposed to developing discrete courses, were asked how issues requiring broad understanding from more than one subject area could be investigated. In response, they suggested three strategies for dealing with multifaceted topics: broadening traditional conceptions of subject areas, use of field camps, and coordinated planning. First, some participants held that the boundaries of subjects could be broadened to include perspectives from other fields of study. For example, one person said:

> As a biology teacher I've got to teach more than biology. I still have to teach math and I still have to teach chemistry and I still have to teach history and I still have to teach English. [Q: You would broaden your conception of your science to include more than simply that which is in quotes "science?"] Absolutely.

According to this view, issues requiring multi-disciplinary understanding could be discussed within existing structures. Second, one participant suggested inclusion of thematic field camps as part of overall planning:

> Back to my idea of flying them into a camp and, it hurts no subject to be out of it for two weeks. And you can take what we call a thematic approach. In fact, it is needed at the higher grades. Right now everything is a separate issue. Oh, you're doing science, I'm doing social studies. No connection, well that's bullshit.

This comment adds to earlier discussions about the use of outdoor centres and field camps. Not only do these facilities enable teachers to introduce students to a field setting, they also can address some organizational difficulties. Thematic field camps could, for a period of time, allow for the consideration of multifaceted issues without institutional barriers between subject areas. Third, several participants felt that there could be greater efforts to coordinate curriculum content and teaching. For example, one person commented:

> People are just going to have to work in teams and set some goals.

Collaborative planning was thus seen as a means whereby content areas and issues of simultaneous importance could be aligned in a mutually supportive fashion.

Though integration of environmental content into existing curricular structures was generally preferred by members of the study group, some participants did allow a place for special courses. One participant illustrated this view:

> I think when you get into the high school then you can start looking at a more separate program ... they've had ten years of preparation and information, now I can maybe really apply it and pull it together. I wouldn't have any problems with that.

It is interesting to note that this person stressed the need for preparation through the preceding ten years in order to have the requisite background required to "pull it together." For this individual, rigourous thinking about environmental issues would be possible only after a considerable period of preparation.

Thus, many participants favoured integration of environmental content into existing structures because to do otherwise would be

impractical. Developing a comprehensive K-12 curriculum for environmental education was seen to be a formidable task, and superimposing supplements on the existing curriculum, was seen to be too great a burden. These participants' remarks provide some justification for an integrative approach when, as in the above discussion, integration is taken to mean the infusion of environmentally pertinent content into existing fields of study.

Some participants argued that environmental content needed to become "part of our entire thinking." While this comment reflects a sense of urgency and importance given to environmental thinking, it also hints at an epistemological point. Here, as argued in the fourth chapter, thinking environmentally is broadly conceived and will require intelligent consideration of a breadth of knowledge types. In this sense, inclusion of environmental content into subjects across the curriculum spectrum will be requisite to clear thinking about the environment.

In spite of the general preference for an integrated approach, some limitations were identified. Questions were raised about dealing with issues which require understanding from more than one subject area. In response to this issue, which is concerned with the multifaceted nature of environmental education, several possibilities were suggested. One option, coordinated instructional planning appears to be a sensible suggestion which offers some promise of addressing this question; careful planning could foster linkages between different fields of thought, though it is not likely to provide a panacea. Additionally the scope of various fields of study could be broadened to include some multidisciplinary discussion. This possibility is discussed earlier in this chapter's section on ecology and warrants

consideration. One teacher also observed that "thematically" organized field camps could provide a forum for discussing multidisciplinary issues. Finally, there was some indication that an special course in environmental studies could be justified at the secondary level.

Interest Groups

Participants were asked what role interest groups might play in the field of environmental education. Several responses were observed: some objected to any role for interest groups, others were more accepting and ascribed a role for these groups, yet others welcomed the participation of interest groups if certain conditions could be met.

One participant who clearly objected to the idea said:

> I can't see how that would be allowed in the educational system. How would Greenpeace, for example, fit in with environmental ed in the school or Friends Of Wolves or other fanatical interest groups. ... if a person like that was given a contract to talk to Yukon students about environmental ed., I would be very upset. I don't see how it can fit in.

Other participants responded more favourably. For example, one of them said:

> I think every opinion and philosophy should be respected. I think they are entitled to give their opinion or their philosophy or their point of view as long as they don't take over.

These two comments represented a range of positions held by participants in the study group. The first participant quoted above appeared to have very little tolerance for views which differ, or challenge his own. In contrast, the second participant claims to be tolerant to the point of respecting all other opinions. There are clearly disparate views between participants on the issue of involving interest groups in schooling.

Many participants expressed a more qualified position. They believed presentations by interest groups would be acceptable provided that: students

would have the freedom and opportunity "to disagree," and that they be exposed to "the other side so that students still get that balance." Additionally, the following quotation asserts the importance of giving even handed and balanced treatment of issues:

> Yes, and I think we have to be very careful. There again, presenting both sides. ... I mean, if Greenpeace want to come in a talk to F.H. Collins' students or something, that's fine, but they should be listening to Yukon Trappers Association, too.

Others felt that the presentations by, or about, interest groups could be seen as educational opportunities. One participant illustrates this view:

> I think what you have to leave with the children is the ability to look; teach them the ability to look at something, to study it, to make a decision for themselves as to which is right.

Critical investigation of particular views could, according to this view, provide an opportunity to teach students to evaluate arguments.

Participants appeared to be wary about the involvement of interest groups; education would not be served by attempts to inculcate particular views within schools. However, if students are not exposed to the variety of perspectives held across society, they will not have the opportunity to evaluate the merits of these positions. A part of our social reality will be denied to them. A educationally honest approach to this problem has to allow for perspectives which might differ radically from our own; in time it might become clear that we are not right in our views. However, in presenting these perspectives the goal has to be educative, we must aim to have students understand the various perspectives, their premises, and their logic. We must enable students to assess these perspectives with a critical eye.

Student Feedback

Participants were asked to judge the importance of student feedback in identifying and meeting their educational needs. Most participants allowed that student feedback is important, though the the overall role was not clearly stated. For example one participant said:

> I guess its hard to stack it up against the whole process, but I would want student input all right.

A further comment illustrated the difficulty experienced by some participants in trying to identify the amount of student feedback required, and the extent to which this feedback should be implemented:

> Students aren't always going to like what they are being taught, but I think they have to be listened to and have that opportunity to have an opinion.

Some identified what they perceived to be limitations to student participation. It was said that their perspectives were sometimes narrow, that they were sometimes ambiguous, and that they didn't always know what was good for them:

> Well, I think to some degree, kid's feedback is important in letting you know if you're on the right track or not. But sometimes the perspective of kids is very narrow in terms of their own immediate experience.

Others gave greater importance to student perspectives, suggesting that teacher and students' perspectives about what is important may be at variance:

> Well, I think that's tremendously important because my perspective of what a student needs and what a student's perspective is can often be quite different ... so we need to have input.

While it can be argued that various forms of knowledge are important, and that students should understand particular concepts, we should also allow that education also includes learning about those things which are important to us. Given this claim, some role for students to provide input

should be considered. What will be needed is sensitivity to those issues of importance to students and analysis of why those things are important, followed by the organization of content, inclusive of these issues, in such a way that it will be of most educational value (see Egan, 1982).

Summary

The preceding discussions have presented descriptions of various beliefs and perceptions held by members of the study group. In some cases, these perceptions raised perplexing conundrums. However, many comments appeared to be well rooted in years of practical wisdom gained through the experience of teaching. The resulting data are presented for the benefit and consideration of educators and curriculum planners in the Yukon. In addition, these beliefs and perceptions have been discussed in light of the logical points developed in the chapters two to four. Arising from these discussions are an number of further considerations for curriculum planning and practice.

The next chapter provides a general summary of this study. Also presented is a summary of the key considerations for curriculum planning which arise from this research, and in particular, discussions presented in this seventh chapter. Finally, chapter eight provides a discussion about implications, arising from this study, for curriculum theory.

CHAPTER EIGHT

SUMMARY AND IMPLICATIONS FOR CURRICULUM PLANNING

This study deals with questions that arose from various documents about environmental issues. Reports such as Our Common Future (1987) and the Report of the Task Force on Northern Conservation (1984) discuss a need to examine environmental issues in light of cultural values. They call for more education to enable this examination, though they do not clarify what is meant by "education" or what education ought to look like. Unfortunately, these documents appear to reflect a wider malaise which includes much work in the field of environmental education. In particular, distinctions between manipulating social behaviours and improving education are often confused. Clarifying these distinctions requires an understanding of the nature of education. An examination of the environmental education literature reveals several attempts to define the field; however, none appears to have been made in light of the body of literature concerned with educational foundations. Thus, I offered an analysis of education which took account of the literature in educational philosophy and then reviewed environmental education in light of this analysis.

The literature critique in the third chapter exposed the weak philosophical foundations of environmental education. I contend that the various interpretations of the concept "environmental education" fail to harmonize with an adequate concept of education. Further, the literature in this field lacks clarity with respect to various central concepts. For example, I argued that true education involves more than the behaviourist

intervention strategies commonly promoted in the environmental education literature. Environmental education cannot justifiably aim to produce "environmentally-affirmative citizens" or "overt citizenship action." I also claimed that notions of "environmental problem solving," "educating for sustainable development," and "student action" are flawed. These discussions about environmental education also fail teachers in at least two further ways. Talk of mandatory teacher training, and the "hawking" of environmental education goals until "the message is internalized" diminishes the professional status of teachers to that of technicians whose tasks become the implementation of unquestioned goals. Second, much research in this field is directed towards the identification of effective variables or "intervention strategies" which produce "desired" results. This again implies that the teacher's role would be one of unquestioning obedience. Their task would be to simply introduce the "right" variables and implement the "chosen" strategies.

In response to the inadequacies of environmental education as it is presently conceived, I presented an alternative framework which might re-direct emphasis within this field. This work, in the fourth chapter, clarifies concepts central to this field of study and describes factors which will enable students to think clearly and critically about the environment, or to "think environmentally." However, as important as this is in clarifying our understanding, it must be recognized that the analysis employed is also limited. There is no guarantee that all of the stakeholders will find it sensible. Further, this type of analysis cannot settle contingent questions about allocation of resources, educational priorities, and selection of content. Effective curriculum planning will require sensitivity to the

implementation context when deciding about these matters; those stakeholders affected by new initiatives have beliefs about what should be done. It would be presumptuous to assume that they will agree about, or accept, the results of external analysis and planning. With these points in mind, I believe that approaches to curriculum planning which rely on external planning and logical argument, begin to falter. Some say that purely rational solutions to curriculum planning have not worked.

The concept of needs assessment, the process by which public involvement in curriculum decisions is frequently solicited, has received justifiably tough scrutiny. This type of assessment is challenged for its inability to distinguish between needs and wants, public good and self interest, informed opinion and uninformed belief, and general needs and educational needs. In rejecting needs assessment, some claim that curriculum planning must be conducted with greater consideration for the purposes of schooling, the nature of education, and the clarity of central concepts. Failure to do so can lead to lack of coherence and confusion. It would seem that they have a point. The difficulties within environmental education discussed in the third chapter illustrate problems associated with this kind of conceptual neglect. However, involving teachers and others in curriculum planning need not be defined by conceptual vapidness and superficial needs assessments. Avoiding the criticisms leveled at needs assessments will, nonetheless, require careful thought with respect to the types of questions posed and the nature of the interactions between researchers and practitioners.

With this thinking in mind, a sample group of Yukon teachers, parents, and administrators was selected and asked to talk about

environmental education. They were asked questions about educational needs of Yukon students. They were asked to respond to questions about the elements constituting the alternative framework for environmental education discussed in the fourth chapter, and they were also asked to comment on other concepts frequently considered to be important in environmental education. Finally they were asked questions about content and pedagogy, and questions about implementation of new initiatives. Their responses enabled me to examine considerations which should have a bearing on environmental education in the Yukon.

The concluding sections of this chapter identify some of the patterns that emerged from the data and implications which arise for curriculum planning. I first review these patterns drawing heavily on results and discussions reported in the seventh chapter. I also hold these findings up against the environmental education literature and beliefs about rational curriculum planning, then critique some of the positions found within these bodies of thought. Second, I attempt to show that meaningful curriculum considerations can arise from research involving participants from within a particular study context. These in turn give rise to more general considerations for curriculum theory.

Considerations Arising From The Research

Issues that participants found important gave rise to observable patterns which can be traced in the data. These patterns, or themes, describing collective responses can have an important bearing on curriculum decisions pertaining to the planning of environmental

education initiatives in the Yukon. Consideration of participant responses to questions concerning curriculum planning, as embodied by these themes, can also shed light on theorizing about curricular issues. The discussion now considers these patterns and their implications for curriculum planning.

What Is Required

The participants in this study supported the idea of increasing environmental education in Yukon schools. They acknowledged that environmental education initiatives exist within the current mandate and framework for Yukon schools. They also noted that some structures, alternative to traditional classroom teaching, had been created. These included spring camping trips and some special programs. However, they judged all of these initiatives to be inadequate. Participants doubted that grass roots initiatives can get beyond a piecemeal and ad hoc implementation of environmental education. However, they also expressed suspicion about mandates, or high level initiatives. Though many argued that a clear mandate was necessary, they did not regard this as sufficient. Also necessary, they argued, are the supporting initiatives required to translate directives into workable programs in schools. While participants of this study appear motivated and favourably disposed towards increases in environmental education, planners should consider their advice: new curriculum initiatives will need to be complemented by the development of resource materials, programs of professional development, and a sufficient commitment of funds to ensure that these can be realized.

Conceptualizing Environmental Education

When participants in this study were asked to talk about what Yukon schools should be doing and to elaborate on the ideal content and learning outcomes for environmental education, their responses were grouped according to three emergent themes. These themes placed emphasis on enabling students to: acquire knowledge, think about environmental issues, and have direct experiences in the natural environment. Several people suggested that knowledge implied more than an accumulation of information. They claimed that it also contributed to understanding and evaluating information which in turn contributed to informed decision making. Additionally, they pointed out that the ability to teach increasingly difficult concepts rests upon the acquisition of a body of general knowledge.

A large number of participants were convinced of the value of "field activities" and "getting kids out." They claimed that a special, and particularly valuable, kind of learning occurs as a result of direct contact with the natural environment, and this learning should be a part of environmental education. Some of these participants also identified a particular quality inherent in experiential activities; a uniqueness in learning which is achieved only through direct contact with, and experience in, the natural environment. Several more of them justified its inclusion by appealing to the educational need for breadth of understanding.

A number of participants spoke about a need to examine environmental issues; schools should enable students to think about such matters of general importance. They felt that students could learn about the complexities of human/environment relationships and the consequences of lifestyles through the study of issues. Further, while considerable

importance was attached to inclusion of local issues in curricula, participants also perceived a need to discuss these issues in a global context, and to include global examples.

Participants believed that environmental education should enable students to become broadly knowledgeable and aware of the environment, to understand the fragility of the environment, to care for it, and to respect it. Some of them also claimed that education should make a difference in the lives of students. A few were more specific: the environmentally educated student would be a responsible steward or "almost" an activist. However, while they felt that students' actions may be transformed by their educational experiences, they all felt that the final decision must be left with the children. These children should be prepared to make informed decisions, but that they had to decide for themselves if an action was appropriate. These remarks were particularly interesting as they challenged issues central to discussions about environmental education. Should, for example, environmental action be the aim of education or its logical consequence?

These comments suggest two considerations for curriculum planners. First, participants in this study describe environmental education priorities. At the outset, they identify acquisition of knowledge, study of issues, and provision of environmental experiences as key items for consideration in future environmental education initiatives. The importance that was attached to these items was reinforced throughout the interview. Perhaps, therefore, they should be seriously considered in future curriculum planning. Second, these collective responses do appear to be mindful of the educational needs of the students. There does not appear to be a confusion

between general and educational needs; the priorities do not appear to be at any significant odds with the concept of education. Further, in providing justification for the inclusion of experience, a number of participants appealed to knowledge, understanding, and the criterion of breadth in education. These ideas which they appealed to seem to have a fairly obvious connection with the idea of education. The observations reported here do not support the view that teachers, administrators, and parents should be excluded from the curriculum planning process.

Interestingly, the priorities identified seem more closely related to the educational enterprise than the behaviourist aims, described in the third chapter, and which are currently popular in environmental education. Here, individuals were more interested in knowledge, understanding, and the ability to discuss issues and make informed decisions than in achieving aims external to education. Thus, their ability to think about environmental education compares favourably when considered alongside literature in environmental education.

Environmental education, like education from which it is properly derived, is a normative concept which will require on-going clarification, interpretation and defence. Practitioners and parents are contributors to these social norms and have perspectives which will have an impact on schooling. Further, the participants' comments about environmental education do not seem to suggest any reasons for not inviting these persons to participate in discussions about fundamental conceptualizations. There is also some evidence to suggest that these participants can contribute to discussions about the conceptualization of environmental education and identification of educational needs. Contrary to the worst fears of critics of

needs assessment techniques, the comments reported here were generally of a type appropriate to educational discourse.

Ecology, History and Subject Breadth

Participants' comments about ecology and history were instructive; they were unequivocal in affirming the importance of these areas. Interesting questions did arise, however, about how these subjects were to be conceived, where boundaries around them should be drawn, and how far individual teachers should probe difficult themes.

Conceptualizations of ecology did not appear uncontentious. Participants' comments point to a breadth of interpretation ranging from pure science to a field of study with responsibility for critiquing society. Literature presented in the seventh chapter reflects similar breadth. In the seventh chapter I also discuss educational considerations in the light of participant views and the literature cited. The possibilities outlined in chapter seven can serve as a compass of sorts to point the curriculum planner or teacher. However, while this discussion is informed by regard for logical concerns, the appropriate scope for ecology instruction cannot be defined by this method alone. Some important curriculum questions are not resolvable by a detached appeal to logical techniques. Final decisions about what is included in ecology curricula, and how broadly conceived this field should be, will also be informed by the practical wisdom of practitioners and parents. In the final analysis, they will be required to respond to the social readiness of the community, judge the preparedness of students to engage in challenging and more broadly based conceptions of ecology curricula, and evaluate the appropriateness and effectiveness of content. These dynamic variables will influence shifting conceptions of

ecology as a field of study, and these conceptions will need to be assessed on an ongoing basis. Participants in this study indicated that they are prepared to discuss ecology and contemplate the scope for this field to accommodate important educational questions. Practitioners and parents must be allowed to experiment with these possibilities; their experience with students and knowledge of their community can assist in defining and evaluating the possibilities.

Like ecology, conceptualizations of history also varied. Many participants agreed about the importance of studying historical background for an understanding of contemporary issues. There were also some who felt that history could contribute to understanding of evolving conceptions of nature and human attitudes toward the non-human environment. However, participants agreed less about the function that history should play in discussing important, yet controversial, topics such as the role of Judeo-Christian traditions in shaping environmental values. While some favoured this approach, others worried about how provocative schools should be in challenging fundamental beliefs. These concerns reflect two potential dangers. First, citizens, if pushed too far, might respond more emotionally and less rationally. This point was illustrated by one participant who reacted with hostility to the possibility of critiquing Judeo-Christian traditions. Second, as another participant said, these more difficult tasks could be managed well by exceptional teachers, but should not be attempted by those likely to do less. This individual preferred to delete the most difficult topics believing that they would be better left alone than taught poorly; superficial knowledge could be dangerous. In both cases practical limits to the scope for history instruction are described. Further, it was

suggested that disregarding them could be educationally counterproductive. Again, participants' comments expose potential weaknesses in exclusive reliance on detached rational curriculum planning.

The importance of critical social examination through history was discussed in the seventh chapter and its importance is not contested by the above remarks. However, the scope for selecting content and issues suitable for inclusion is. The educative value and efficacy of introducing difficult and controversial topics will be influenced by the readiness of the community to engage in them and teachers' ability to deal with them. Sensitivity to these contextual factors can assist curriculum planners in developing effective curricula which are consistent with broader educational aims. Further, as interpretations of the scope for history instruction vary, planning should provide allowances for teachers to probe practical limitations and experiment with issues and topics of high educational potential. Thus individual teachers of exceptional ability can excel, participate in defining their subject area, and foster constructive innovation.

Associated with comments about ecology and history were discussions about the multi-disciplinary nature of environmental issues, or the recognition that issues often involve questions of more than one type. For example, while a question may be fundamentally ethical, it may also be informed by history, ecology, and aesthetic considerations. There was also recognition that traditional structures are not always adequate to deal with questions of such breadth. However, participants proposed three possible strategies to alleviate these difficulties: field camps organized around a theme, could serve as a forum for investigating complex topics; teachers from different subjects could do more collaborative planning; and, subject

areas could be broadened somewhat to include discussion of multi-faceted topics. Further, when asked to talk about the format that implementation of environmental education might take, the general preference was for an integrative approach. By this, participants meant that environmental content should be increasingly included within existing curricular structures and subject areas. Some scope for new courses, and alternative semesters was allowed for in their discussion, but these were secondary conditions for most participants. The important point to glean from these suggestions is that they appear to have practical merit, while at the same time, they support educational purposes.

One reason given for not teaching the more philosophical aspects of history was doubt that students would have the requisite background. Similarly, participants pointed out that teaching advanced topics in ecology is dependent upon the accumulation of background knowledge. Together these comments point to the necessity of longitudinal planning in subject areas. Curricula from kindergarten through grade twelve must be coherent and incremental. Though a logically straight forward point, these comments provide some evidence which suggests that the collaborative planning required may not have been sufficient to date. This is consistent with earlier comments about collaborative planning between subject areas, and should encourage curriculum planners to take a more coordinated approach to their task.

Ethics and Education

While participants agreed that the study of ethics is important, there was less agreement about what it is. According to some, ethics is about establishing standards, or a moral base, and transmitting models of

behaviour. For others, ethics concerns theoretical discussion about frameworks for evaluating issues, and principles for applying such frameworks in particular instances. Any initiative in this area must consider these differences, and new curricula must be complemented by efforts to clarify conceptualizations of ethics. Discussing curriculum implications for the study of ethics will be difficult, if not impossible, when people do not come to some common understanding of the term and its relationships to schooling and education. Failure to identify conceptual difficulties, or to ignore them, can result in violated expectations, confusion, and alienation, all of which would undermine the efficacy of curriculum initiatives. Implications for planning are twofold. First, identification of such difficulties is an empirical matter which requires examination of beliefs held by various stakeholders in the study context. Second, having identified conceptual differences, such as those reported in this study, curriculum planners can call upon philosophical techniques to assist participants in making distinctions between contesting conceptions such that light can be shed on appropriate educational responses. For example, teaching some conceptions of "ethics" would appear to resemble training and socialization, while teaching an alternative conception of "ethics" would appear to be more educative. While there is some merit to each of these schooling activities, it is important that they are understood for what they are. There will be, therefore, cases where philosophical techniques for concept clarification and context evaluations can be mutually supportive research strategies.

In light of discussions in this chapter about the importance of environmental issues, tolerance in delineating traditional subjects and

selecting content to support them, and ethics, a number of themes converge. First, there has been a persistent observation that environmental issues are frequently multi-disciplinary in nature. No single subject area covers sufficient breadth to fully examine many such topics. Second, fundamental to studying issues are questions concerned with environmental ethics. However, the formal study of ethics, in the philosophical sense as described in the fourth chapter, is not a curricular entity in most contemporary schools; there is not a subject called ethics and no designated place for environmental ethics. This is not necessarily a problem. Discussions concerning environmental ethics can take place at appropriate times during instruction in various subjects as the topics arise, providing that teachers have adequate resources and ability to lead these discussions. Third, participants in this study saw that the organization of boundaries dividing traditional subject areas could be flexible. By interpreting, adapting, and broadening their roles as subject specialists, investigation of environmental issues could be accommodated and ethical questions examined.

Allowing for these accommodations will make certain demands upon teachers which should be considered during the development of resource materials and planning of professional development. In many, if not most, cases these broad discussions will take teachers outside their areas of expertise; the ecology teacher, for example, does not normally have an extensive history background. Further, most teachers have little or no formal training in ethics, and much environmental discussion and literature is new. Means will thus be needed to disseminate information and engage teachers in contemporary debate about environmental ethics.

Given this discussion, it seems important to acknowledge that throughout this study participants argued strongly for the production of supplemental material and professional development opportunities to enable teachers to lead discussions which travel outside their traditional areas of expertise. Teachers and students will need material which will introduce them to the language and techniques of ethics. Teachers of physical sciences will need access to materials which link their work to ecology. Ecology teachers will need materials which provide a historical perspective to problems. The work of history teachers investigating the history of science can be informed by an understanding of the nature of science. Together the relationships between historical trends and science can be examined. Further, many disciplines can be enriched by the philosophical, aesthetic, and historical insights gleaned through literature. Making links and facilitating understanding which transcends the bounds of traditional subjects will be aided by provision of supplemental materials and professional development opportunities which will enable teachers to experiment with the scope of their teaching subjects.

Curriculum planners should consider the impact of these observations and discussions. Educators and parents who participated in this study recognized three important points. First, teachers and schools will need to do things that have not generally been done before. Second, teachers respond differingly to the challenges of deviating from traditional teaching structures and techniques. Third, they realize that teachers will need help. Curriculum planning which attends to implementation concerns, such as those identified in this section, does not necessarily diminish the integrity of the curriculum plans. Rather, these observations have supported much

curriculum reasoning. There has, however, been an additional benefit. Sensitivity to concerns and observations arising from the implementation context can alert curriculum planners to conditions which will enhance the efficacy of their work, identify preferences to questions which are practical in nature, and alert planners to circumstances likely to be educationally counterproductive.

Summary

Insights gleaned from participants' comments and arguments presented in the first four chapters point to a need to enable students to think about environmental issues. This task will require enabling students to become broadly knowledgeable. This much appears to be clear. These comments do, however, give rise to questions about what kinds of knowledge and understanding are essential to thinking about environmental issues, or "thinking environmentally."

In the fourth chapter a framework for environmental education was presented which outlined elements essential to the task of thinking environmentally. I argued that while ecology, history, aesthetic experiences, and ethics can be organized as broad subject areas, their disciplinary essences represent four distinctly different ways of knowing about the environment. These, I argued, should be core elements in curricula which respond to the needs of environmental education. When asked to talk about the importance of each of these four ways of knowing, participants were broadly in agreement with all of them. This commitment in principle to these ideas supports the possibility that this alternative framework can re-direct thinking within environmental education.

However, participants also identified a number of points that will require consideration during any serious attempt to implement such a shift in emphasis. First, while participants all believed that study of ethics is important, conceptions about what "ethics" is varied. Some work will be required to distinguish between these competing conceptions prior to effective implementation of curricula. Further, ethics has no distinct home, or subject designation, in the organization of the Yukon curriculum. Means will be needed to enable students to study ethics within the organizational frameworks of existing subject areas. Second, participants all agreed that ecology and history are important areas for study. The tolerance for broadening the curricular organization of ecology was discussed and the sensitivity required when choosing content for historical study was described. Ongoing clarification of these concepts and evaluation of the content best able to support them will be required. Curriculum planners and practitioners (they may be one and the same) must continue to ensure clarity of meaning by responding to questions like: What is ethics? What should the study of history be taken to be? What is ecology and what might be appropriately included within the organizational structure of ecology curricula?

In conclusion, I believe that the alternative framework for thinking about environmental education presented in the fourth chapter can provide a vehicle for posing and investigating many questions of vital importance to the field of environmental education. It responds to questions about what students must know and understand if they are to be enabled to transcend their present and particular circumstances and become morally autonomous. Ultimately these questions direct us to be more concerned

with our epistemological responsibilities. Enabling students to understand ecology, environmental history, environmental ethics and to achieve further understanding through aesthetic experiences can provide a basis from which their experiences can be transformed. Participants of this study generally agreed that these ways of knowing must be taught. However, inspection of their comments suggests that much work is yet to be done to refine our understanding of how curriculum planning can facilitate the development of these ways of thinking. To my mind these problems are worthy of much greater emphasis in environmental education.

Implications For Curriculum Theory

This study has attempted to establish two points important for curriculum planning. First, curricula must be logically persuasive and central concepts must be clear. The importance of this point was illustrated by my critique of current conceptions of environmental education which was presented in the third chapter. I found that the conceptions put forward in the environmental education literature are flawed: Important questions about education were simply not addressed. Further, conceptual scrutiny of environmental education is long overdue and will be required for sensible curriculum planning in this field. Second, effective curriculum planning will require participation by the various stakeholders to be affected by new initiatives. However, curriculum planning decisions derived from social assessments have been criticized. Some worry that such assessments are threatened by an inability to distinguish general from educational needs, and that implementation concerns can compromise educational

requirements. While many important objections are raised, it is not certain that these arguments are conclusive. There is a danger that such critics may adopt an extreme position and fail to recognize the knowledge and understanding that the various stakeholders can bring to curriculum planning. Participants' comments were discussed in light of these concerns.

When asked to talk about environmental education, these participants indicated their priorities for this field of study. In so doing, they appeared mindful of the educational needs of their students. There did not appear to be confusion between general and educational needs; nor did participants' priorities appear at significant odds with the concept of education I have outlined. Further, the understanding of environmental education provided by these participants appeared to be more consistent with that concept of education than that which is usually found in the literature. Their thinking about environmental education certainly compared favourably when considered against the established experts within this field. Based on these observations, there is no reason to believe that participants in this study cannot participate in the conceptualization of environmental education.

In this study, participants shed light on social readiness to engage in particular topics. They also spoke about difficulties associated with violating emotional expectations and exceeding teachers' capabilities, and they predicted that insensitivity to these difficulties would be educationally counterproductive. Similarly, these participants provided practical suggestions about how educators might accommodate the study of complex issues of the sort found in environmental education. They also alerted potential planners to the need for more coherence between subjects at each

grade level and within subjects across the range of grades. Acknowledging context derived issues and concerns need not diminish the educational ideal, but considering them while planning curricula can enable better selection of routes to achieve this end. As such, they play an important role in evaluating curricular possibilities.

I do not make these points in an attempt to establish the existence of two separate approaches to curriculum planning. Rather, I have intended to illustrate requirements of a more unified approach to curriculum planning. I contend that curriculum planners who are wary about empirical assessments of the beliefs and concerns of those affected by curriculum planning decisions need to recognize the stubbornness of reality. Sensible curriculum planning cannot take place without understanding of, and sensitivity, to the context for implementation of new curricula. Once this is recognized, gains can be made towards sensible curriculum planning when practitioners, parents, and others who live in the context of this reality are seen by curriculum planners as critical colleagues with an important perception of this reality, rather than as mere consumers.

On the other hand, we should expect that these colleagues will provide increasingly clear conceptions of the various aspects of their work, and better justification of their choices. In short, they should continue to ask and answer important curriculum questions, and they must be encouraged to do so with ever increasing acumen. Like students who must think clearly and critically in order to have an intelligent grasp of environmental matters, all participants in curriculum planning must also think clearly and critically in order to have an intelligent grasp of educational matters. Further, they have a responsibility to do so. Educational philosophers can assist these

colleagues and contribute a great deal to the work of participatory and action oriented approaches to curriculum planning. This will be achieved when they agree to relinquish some of their authority, both intellectual and political, in exchange for a role in helping to frame curriculum questions and discuss the findings.

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APPENDIX A

INTERVIEW GUIDE WITH ANALYSIS

What Kind Of Data?	Questions	What Use?
Questions 1 - 3 serve several functions. The participants were given these questions prior to the interview and had the opportunity to consider them in advance. Thus, they were relatively friendly and provided the participant with quite a bit of room to describe his or her point of view. As such they were minimally threatening openers. It was also important to enable the participants to respond freely, minimally constrained by the researcher. These questions, therefore, enabled the researcher to collect data about the study group's level of interest, expectations, and perceptions about the nature and purpose of environmental education with minimal researcher bias.		
Descriptive data indicating the breadth of interpretations that Yukoners have for the word "environment".	***1. What meaning comes to mind when you hear the word 'environment'?***	**Assist the researcher to understand the context in which this study is placed.**
	Probes ***"Wilderness?*** ***"The total of all our physical surroundings?*** ***"Inclusive of the human social environment?***	**Assist in delineating the scope of possible curriculum initiatives (ie. conceptual and practical constraints.**
Descriptive data about existing initiatives.	***2. Talk about what you feel Yukon schools are now doing to respond to this rising concern for the environment.***	**Assists researcher in understanding the research context.** **Identifies motivations and pre-dispositions upon which initiatives can be built.**

What Kind Of Data?	Questions	What Use?
Description of perceived needs and expectations.	*3. Talk about what you feel Yukon schools should be doing to respond to this concern for the environment.* Probes **What should students learn about?* **How should this be organized for teaching?* **What should be the learning outcome of environmental education?*	An examination of perceived needs and expectations can: Serve as a catalyst for further reflection on a conceptual framework. Identify contextual elements which will require sensitivity during the curriculum development process. Identify contextual elements which should be considered in the development of a curriculum (ie. what is important to the people?)

Questions 4 - 9. Having been encouraged to freely express themselves, unfettered by concerns of the researcher, participants are here asked to react to elements of a conceptual framework proposed by the researcher. The questions and probes are designed to elicit participant views on the importance of teaching these elements and what material and methods they think would be effective in the teaching of them to Yukon students. The questions begin with a general description of a theme (free from labels.) In some cases probes lead to questions about specific concepts.

Descriptive data pertaining to participants' reactions, the importance of teaching about relationships between organisms and their environment, and the concept "ecology". Descriptive data indicating pedagogical and content priorities of the participants as they pertain to teaching about relationships between organisms and their environment, and the concept "ecology".	*4. Discuss the importance of teaching about relationships between organisms and their environment.* Probes **How would teachers present this material?* **What materials? What Method?* **What else would be involved in the teaching of ecology?*	Alert researcher to contextual sensitivities and predispositions requiring consideration in the development of curricula. In light of the above, enable researcher to reflect further on the soundness of conceptual framework. Aid in the identification of pedagogical structure and content elements for curriculum development.

What Kind Of Data?	Questions	What Use?
Descriptive data pertaining to participants' reactions, the importance of teaching through the use of field, or outside of classroom experiences. Descriptive data indicating pedagogical and content priorities of the participants as they pertain to teaching through the use of field, or outside of classroom experiences. Descriptive data indicating some field trip priorities in the Yukon.	*5. Discuss the importance of providing direct experience in the natural environment such as schoolyard activities or field trips.* *Probes* **What kind of experiences would be the most important?* **What kind of teaching activities would teachers find appropriate and useful?* **Are there some key field trip sites in the Yukon that students should visit?*	Alert researcher to contextual sensitivities and predispositions requiring consideration in the development of curricula. In light of the above, enable researcher to reflect further on the soundness of conceptual framework. Aid in the identification of pedagogical structure and content elements for curriculum development.
Descriptive data pertaining to participants' reactions, the importance of teaching about value laden issues, and the concept "environmental ethics". Descriptive data indicating pedagogical and content priorities of the participants as they pertain to teaching about value laden issues, and the concept "environmental ethics". Descriptive data indicating predispositions towards topics suitable for Yukon Schools.	*6. When considering the value of actions, such as preserving the Porcupine caribou herd, should we: a) assume that these actions are important? b) Preach their importance? c) Enable students to consider the implications and responsibilities of such actions?* *Probes* **What examples of value laden topics should we consider for Yukon schools?* **How should teachers present these materials?* **What role does environmental ethics have in understanding value laden topics?*	Alert researcher to contextual sensitivities and predispositions requiring consideration in the development of curricula. In light of the above, enable researcher to reflect further on the soundness of conceptual framework. Aid in the identification of pedagogical structure and content elements for curriculum development.

What Kind Of Data?	Questions	What Use?
Descriptive data pertaining to participants' reactions, the importance of enabling students to evaluate the beauty of their surroundings, and their understanding of the concept "aesthetics". Descriptive data indicating pedagogical and content priorities of the participants as they pertain to enabling students to evaluate the beauty of their surroundings.	*7. What importance would you give to having students evaluate the beauty of their surroundings?* ***Probes*** *"How should the consideration of beauty be taught? What activities?* *"Would aesthetic learning in the environmental context involve more than you have already mentioned?*	Alert researcher to contextual sensitivities and predispositions requiring consideration in the development of curricula. In light of the above, enable researcher to reflect further on the soundness of conceptual framework. Aid in the identification of pedagogical structure and content elements for curriculum development.
Descriptive data pertaining to participants' reactions, and the importance of teaching about environmental history. Descriptive data indicating pedagogical and content priorities of the participants as they pertain to teaching about environmental history.	*8. How important is it for students to study the history of environmental problems such as the deforestation of North Africa leading to the formation of the Sahara desert?* ***Probes*** *"Give me some other examples of historical material that should be taught.* *"How would you organize this material for effective learning? What would students do?* *"Do you have anything else to add about the place of environmental history in school curricula?*	Alert researcher to contextual sensitivities and predispositions requiring consideration in the development of curricula. In light of the above, enable researcher to reflect further on the soundness of conceptual framework. Aid in the identification of pedagogical structure and content elements for curriculum development.
Descriptive data. Identify topics of importance to the participant but which he or she perceives to be overlooked in questions 4 -7.	*9. Are there other topics you would like to talk about?*	Aid in assessing the veracity of conceptual framework.

What Kind Of Data?	Questions	What Use?

The previous questions asked participants to react to themes and concepts and thus assisted the researcher in developing a understanding of the study context. Questions 10 - 21, more specific than the last, require participants to react to specific activities. Descriptions of these activities served as a stimulus for further discussion about conceptions of environmental education and appropriate inclusions, and pedagogical pre-dispositions and priorities. Such information will assist the researcher to further understand the context in which potential curriculum innovations might be situated.

	Deadly Links	
Descriptive data illustrating participants' predispositions towards a particular pedagogical strategy. Descriptive data illustrating other pedagogical preferences held by participants for the teaching of ecology.	***10. In this example the lesson is presented in the form of a highly involving physical activity, followed by discussion. To what extent will teachers find this type of activity useful for presenting information and concepts?*** ***Probe*** ****What other teaching techniques or methods do you think are useful for the teaching of ecological concepts?***	Consideration of pedagogical preferences will assist curriculum developers construct curricula.
Descriptive data identifying predispositions of participants for use of Yukon specific content to illustrate ecological concepts.	***11. The species in this activity could be substituted. An alternative food chain of importance to Yukoners might involve peregrine falcons, a Yukon species affected by pesticides in its food chain. (brine shrimp eaten by shorebirds eaten by peregrine falcons) Tell me your feelings about the importance of building Yukon specific content into activities such as this.***	Consideration of predispositions (How important is it to include Yukon content?) will assist curriculum developers in constructing curricula.

What Kind Of Data?	Questions	What Use?
Descriptive data illustrating specific content suggestions.	*12. Give an example of Yukon material that could be be used to teach each of the following ecological concepts: Adaptation, food chains, habitat, predator/prey relationships.*	Consideration of content suggestions will assist curriculum developers in constructing curricula.
	Key Mangrove: A Conflict of Interests	
Descriptive data illustrating participants' predispositions towards a particular pedagogical strategy.	*13. In your opinion will teachers find this type of simulation activity useful?*	Consideration of pedagogical preferences will assist curriculum developers in constructing curricula.
Descriptive data illustrating participants', predispositions towards the study of environmental conflict management and/or resolution.	*Probe* *"Is the study of environmental conflict management and/or resolution important?* *"What alternative methods could be used to teach students about environmental conflict management and/or resolution?*	Alert researcher to contextual sensitivities and predispositions requiring consideration in the development of curricula.
Descriptive data illustrating other pedagogical preferences held by participants for the teaching about environmental conflict management and/or resolution.		Enable researcher to reflect further on the educative worth of such activities and concepts.
		Aid in the identification of pedagogical structure and content elements for curriculum development.
Descriptive data illustrating perceptions of content requirements for the participation in development and planning activities.	*14. What will students need to know in order to participate effectively in a development and planning activity like this?*	Aid in the identification of content elements for curriculum development.
Descriptive data identifying predispositions of participants for the study of Yukon specific issues.	*15. Should activities like this focus on Yukon issues? For example, the issue might have been 'Development of the North Slope'.*	Consideration of predispositions and content suggestions will assist curriculum developers in constructing curricula.
Descriptive data illustrating specific content suggestions.	*Probe* *"Can you name at least three other Yukon issues which should be considered?*	

What Kind Of Data?	Questions	What Use?
Descriptive data illustrating the participants' predispositions toward engaging students in philosophical analysis using history as a medium. Descriptive data illustrating predispositions toward engaging in the examination of societal values. Descriptive data illustrating the nature and degree of understanding of the philosophic process in the study context. Descriptive data illustrating pedagogical preferences held by the participants for teaching about societal values.	*16. How important is it to provide historical/philosophical perspectives such as these as a means to examine the values of our society?* *Probes* *"How should this kind of material be organized for teaching?* *"Do you have any further comments about the historical content that should be considered for an environmental education curriculum in the Yukon?*	Alert researcher to contextual sensitivities and predispositions requiring consideration in the development of curricula. Understanding the nature and degree of understanding of the philosophic processes in the study context will enable the researcher to identify approaches which will require consideration in the development of curricula. The above will also enable the researcher to reflective further on the educative nature and worth of these philosophic concepts. Aid in the identification of pedagogical structure and content items for curriculum development.

What Kind Of Data?	Questions	What Use?
Descriptive data illustrating the participants' predispositions toward engaging students in philosophical analysis using values of traditional Yukon cultures as a medium. Descriptive data illustrating the nature and degree of understanding of the philosophic process in the study group. Descriptive data illustrating content preferences held by the participants with regard to the inclusion of traditional Yukon cultures.	*17. Do you feel that it is important to study traditional values and cultures in environmental education?* *<u>Probe</u>* *"What cultural aspects or values? Examples?*	Alert researcher to contextual sensitivities and predispositions requiring consideration in the development of curricula. Understanding the nature and degree of understanding of the philosophic processes in the study context will enable the researcher to suggest approaches which will require consideration in the development of curricula. The above will also enable the researcher to reflect further on the educative nature and worth of these philosophic concepts. Aid in the identification of content items for curriculum development.
This question is different from the previous few in that it describes a relatively traditional teaching activity. As it in this way breaks the pattern set in the earlier questions, it will allow participants to describe their reaction to a contrasting activity and style of presentation.	*18. Tell me about the importance of studying some selected aspects of the environment in considerable detail.* *<u>Probes</u>* *What topics would be suitable for such detailed study in the Yukon?* *How should this material be organized for teaching?*	Aid in the identification of pedagogical structure and content items for curriculum development in the Yukon.

What Kind Of Data?	Questions	What Use?
	Activity Card #9	
Descriptive data illustrating the participants' predispositions towards engaging students in considering aesthetic dimensions in nature.	***19. Should environmental education include activities such as this which aim to foster consideration of aesthetic dimensions in nature?***	Aid in the identification of pedagogical structure and content items for curriculum development in the Yukon.
	Make Your Views Known to Decision Makers	
Descriptive data illustrating participants' expectations concerning the role of student action.	***20. Is it important to allow students to follow through on their studies to the actual step of taking some action on an issue?*** ***Probes*** **Should we expect them to? Require them to?*	Alert researcher to contextual sensitivities and predispositions concerning student action which will require consideration in the development of curricula. The above will also enable the researcher to reflect further on the educative nature and worth of the concept of student action.
Descriptive data illustrating predispositions toward specific content suitable for Yukon students concerning student action in the context of environmental education.	***21. What projects would be suitable for Yukon students to investigate with the possibility of student action?***	Aid in the identification of content items for curriculum development in the Yukon.

Implementation Concerns, questions 22 - 29. The development of curricula is a precursor to implementation. Such change inevitably brings concerns. Assessment of the nature of concerns will enable the researcher to judge whether they are of a type that should affect curriculum decision, and to what extent. For example, these concerns may point to operational constraints which a curriculum innovation might experience.

What Kind Of Data?	Questions	What Use?
Descriptive data illustrating motivations for the implementation of environmental education. Data describing perceptions of environmental education within the broader structure of schooling.	22. *Tell me whether you believe more environmental education should be mandated now.*	The degree and nature of motivation may affect the scope of curriculum decisions. Alert researcher to other contextual sensitivities which may require consideration in the development of curricula. Environmental Education curricula might be structured within the schooling context such that implementation will be facilitated.
Descriptive data indicating predispositions towards theoretical preferences for the organization of environmental education materials. Descriptive data indicating perceptions of pedagogical efficacy of alternate ways of organizing curricular materials for environmental education.	23. *Should environmental topics be presented as a separate subject or integrated into existing curricula?* *Probes* *If integrated into existing courses--How would you deal with issues which require understanding from more than one subject area?* **If it is taught as a separate subject--How would you justify it over other activities which compete for curricular time? (peace education, consumer education, development education, family life education, etc.)*	Aid in the identification of pedagogical and structural elements which should be considered in the organization of curricular materials.

What Kind Of Data?	Questions	What Use?
Descriptive data indicating predispositions towards theoretical preferences for the organization of environmental education materials. Descriptive data indicating perceptions of pedagogical efficacy of alternate ways of organizing curricular materials for environmental education.	*24. Discuss organizational or time management concerns that might arise by trying to fit more environmental education into the curriculum?*	Aid in the identification of pedagogical and structural elements which should be considered in the organization of curricular materials.
Descriptive insights indicating perceptions of initiatives which should accompany the development of new curricula. Descriptive insights which may indicate practical limits to the range and scope of immediate curriculum decisions.	*25. Discuss ongoing professional development needs in environmental education.* *Probes* *"Is expertise of teachers a factor which will limit effective implementation of more environmental education?* *"What aspects of environmental education should receive professional development priority?*	Knowledge of practical limitations in the implementation context may effect immediate curriculum decisions. Provide suggestions for long term decisions which might be undertaken when accompanied by professional development initiatives. Identify required initiatives which will be pre-requisite to the development and implementation of curriculum initiatives.
Descriptive data indicating the importance of considering resources from outside the schools to augment the resources from within.	*26. How important will it be to incorporate the use of resource persons, or local experts, in future teaching of environmental education?*	Consideration of the resources available for illustrating concepts central to environmental education may affect some details in the planning of content and pedagogy.
Descriptive data indicating perceptions of the importance of the assessment of students' views with respect to an assessment of educational needs in environmental education.	*27. How important will feedback from students be, in identifying and meeting their educational needs?*	Understanding the practical importance of attending to the perceived needs of the study group will be important when making curriculum decisions.

What Kind Of Data?	Questions	What Use?
Descriptive data indicating predispositions towards the possible effects of special interest groups.	*28. Are you concerned that special interest groups might try to use environmental education to promote their own views?*	Alert the researcher to contextual sensitivities and predispositions requiring consideration in the development of curricula.
Descriptive data indicating any overlooked concepts.	*29. Do you have any other concerns or question that you would like to talk about?*	Could broaden the range of the investigation.

APPENDIX B

DEFINITIONS OF CODES

environment/meaning **EN**	**Statements indicating what meaning the word 'environment' has for the participants.**
Schools/Are doing **SCA**	**Statements indicating what the participants perceive the Yukon schools are doing to respond to a rising concern for the environment.**
Schools/Should be doing **SCS**	**Statements indicating what the participants perceive the Yukon schools should be doing to respond to a rising concern for the environment.**
Schools/Should be doing/Content **SCSC**	**Statements indicating what content items the participants believe Yukon schools should be teaching in response to a rising concern for the environment. What Yukon students should learn about.**
Schools/Should be doing/Organized for teaching **SCSO**	**Statements indicating how the participants feel that environmental education should be organized for teaching in Yukon school. This is to be interpreted broadly and participants may speak about structural organization in the curriculum or pedagogical concerns.**
Schools/Should be doing/Learning outcome **SCSLO**	**Statements indicating what the participants believe the final learning outcomes for environmental education to be. Its aim.**
Ecology/Importance **ECI**	**Statements indicating the perceived importance of teaching about the relationships between organisms and their environment, interrelationships, interdependences between organisms, or ecology.**
Ecology/Content **ECC**	**Statements suggesting what content might be used to teach about the relationships between organisms and their environment, interrelationships or interdependences between organisms, or ecology.**

Ecology/Yukon content **ECY**	**Statements indicating beliefs about the importance of building Yukon specific content into materials for teaching ecology.** **Examples of Yukon specific content that could be used to illustrate ecological concepts. These may be generic examples (water/rivers) or specific (sheep on Sheep Mountain).**
Ecology/Pedagogy **ECP**	**Statements discussing preferences and dispositions toward the art and practice of teaching as it pertains to ecology.**
Experience/Importance **EXI**	**Statements indicating the perceived importance of direct experiences in the environment. These may be expressed in the form of schoolyard activities or field trips away from the school setting.**
Experience/Pedagogy **EXP**	**Statements discussing preferences and dispositions toward the art and practice of teaching as it pertains to providing direct experiences.**
Experience/Yukon/Key sites **EXY**	**Examples of Yukon specific content that could be used to as a basis for providing field experiences. These may be generic examples (water/rivers) or specific (sheep on Sheep Mountain).**
Issues/Importance **ISSI**	**Statements indicating the perceived importance of teaching about environmentally related issues.**
Issues/content **ISSC**	**Statements suggesting what content might be used to teach about environmentally related issues.**
Issues/Examples for Yukon **ISSY**	**Examples of Yukon specific issues that would be suitable or important to include in environmental curricula. These may be generic examples (placer mining) or specific (Curragh Resources mine).**
Issues/Pedagogy **ISSP**	**Statements discussing preferences and dispositions toward the art and practice of teaching as it pertains to teaching about environmentally related issues.**

Issues/Role of environmental ethics **ISSE**	**Statements indicating the degree and nature of understanding of the concept "environmental ethics", perceptions of the importance of teaching about environmental ethics, and the role of environmental ethics in enabling students to understand and evaluate value laden issues.**
Issues Action/Importance **ISSAC**	**Statements indicating the perceived importance of allowing/encouraging/requiring students to follow through on their studies to the actual step of taking some action on an environmental issue.**
Issues Action/Yukon content **ISSACY**	**Examples of Yukon specific issues which might be suitable for Yukon students to investigate with the possibility of student action. These may be generic examples (placer mining) or specific (Curragh Resources mine).**
Aesthetics/Importance **AEI**	**Statements suggesting the perceived importance of teaching about beauty, the evaluation of beauty in one's surroundings, and the concept of "aesthetics" in the environmental context.**
Aesthetics/Pedagogy **AEP**	**Statements discussing preferences and dispositions toward the art and practice of teaching about beauty, the evaluation of beauty in one's surroundings, and the concept of "aesthetics" in the environmental context.**
Aesthetics/content **AEC**	**Statements suggesting what content might be used to teach about beauty in one's surroundings, and the concept of "aesthetics" in the environmental context.**
History/Importance **HI**	**Statements suggesting the perceived importance of teaching about the history of environmental problems, and/or the historical examination of societal values.**
History/Content **HC**	**Statements suggesting what content might be used to teach about the history of environmental problems, and/or the historical examination of societal values.**

History/Pedagogy **HP**	**Statements discussing preferences and dispositions toward the art and practice of teaching about the history of environmental problems, and/or the historical examination of societal values.**
History/Philosophical perspective/Importance **HPHI**	**Statements suggesting the perceived importance of providing historical/philosophical perspectives as a means of teaching about and examining the values of our society.**
Other/Unclassified topics **OT**	**Statements suggesting the perceived importance of topics other than those to which participants were requested to respond.**
Detailed study/Importance **DSI**	**Statements suggesting the perceived importance of studying some selected aspects of the environment in considerable detail.**
Detailed study/Content **DSC**	**Statements suggesting what content, or aspects of the environment, might be suitable to pursue in considerable detail.**
Detailed study/Pedagogy **DSP**	**Statements discussing preferences and dispositions toward the art and practice of teaching about some selected aspects of the environment in considerable detail.**
Implementation/Environmental education mandated **IM**	**Statements concerning the importance of mandating environmental education in Yukon curricula.**
Implementation/Format **IF**	**Statements indicating the predispositions and preferences of the participants about the merits of presenting environmental education as a separate subject vs. the integration of it into existing curricula.**
Implementation/Time management **ITM**	**Statements identifying and discussing organizational or time management concerns that might arise by trying to fit more environmental education into the curricula.**
Implementation/Professional development **IPD**	**Statements concerning perceptions of ongoing professional development needs in environmental education. Including existing limitations of teachers, and professional development priorities.**

Implementation/Resource persons **IRP**	**Statements concerning the role for, and importance of, local resource persons in the development and implementation of environmental education curricula.**
Implementation/Student feedback **ISF**	**Statements indicating perceptions of the role for student feedback and its importance in the development of environmental education curricula.**
Implementation/Special interest groups **IIG**	**Statements indicating perceptions of concern for attempts made by special interest groups to (mis)use environmental education to promote their own views.**
Implementation/Other **IO**	**Final statements which enable participants to stress any point concerning the implementation of environmental education which they feel is particularly important, or that has been overlooked.**

APPENDIX C

DEMOGRAPHIC DATA

	Years Living in Whse.	Years Living Rural	Years Teacher in Yukon	Years Teacher Total	School. Admin. Yukon	School. Admin. Total
Urban Admin. 1	24	0	23	24	21	21
Urban Admin. 2	12	9	15	15	18	20
Urban Admin. 3	7	3	10	12	10	10
Average	14.33	4.00	16	17	16.33	17.00
Urban Teacher 1	4	4	8	9	0	0
Urban Teacher 2	18	0	17	18	0	0
Urban Teacher 3	19	20	19	19	0	0
Average	13.67	8.00	14.67	15.33	0	0
Urban Parent 1	7	0	0	0	0	0
Urban Parent 2	20	0	0	0	0	0
Urban Parent 3	2	0	0	0	0	0
Average	9.67	0	0	0	0	0
Urban Average	12.56	4.00	10.22	10.78	5.44	5.67
Rural Admin. 1	0	2	1	20	2	15
Rural Admin. 2	0	2.5	2.5	9	2.5	6
Rural Admin. 3	0	14.5	10	15	9	9
Average	0	4.83	4.50	14.67	4.50	12.00
Rural Teacher 1	0	4	4	15	0	0
Rural Teacher 2	0	3	3	8	2	6
Rural Teacher 3	0	18	14	18	0	0
Average	0	4.83	7.00	13.67	0.67	2.00
Rural Parent 1	0.75	15	0	0	0	0
Rural Parent 2	0	2.5	0	0	0	0
Rural Parent 3	0	50	0	0	0	0
Average	0.25	22.5	0	0	0	0
Rural Average	0.08	11.89	3.83	8.44	1.72	3.33
Grand Average	6.32	7.94	7.03	9.61	3.58	4.50