Is Archaeology Relevant?

An Examination of the Roles of Archaeology in Education

A Thesis Submitted to the

College of Graduate Studies and Research

in Partial Fulfillment of the Requirements

for the Degree of Master of Arts

in the Department of Anthropology and Archaeology

University of Saskatchewan

Saskatoon

By

Shirley A. Fedorak

Fall 1994

In presenting this thesis in partial fulfillment of the requirements for a Postgraduate degree from the University of Saskatchewan, I agree that the Libraries of this University may make it freely available for inspection. I further agree that permission for copying of this thesis in any manner, in whole or in part, for scholarly purposes may be granted by the professor or professors who supervised my thesis work or, in their absence, by the Head of the Department or the Dean of the College in which my thesis work was done. It is understood that any copying or publication or use of this thesis or parts thereof for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and to the University of Saskatchewan in any scholarly use which may be made of any material in my thesis.

Requests for permission to copy or to make other use of material in this thesis in whole or part should be addressed to:

Head of the Department of Anthropology and Archaeology
University of Saskatchewan
Saskatoon, Saskatchewan S7N OWO

ABSTRACT

The recent re-evaluation of archaeology's *raison d'etre* has opened up the new field of public archaeology, which focuses upon increasing the public's awareness of and appreciation for archaeological research, the value of conserving archaeological resources and ultimately, the richness and diversity of past human cultures. Educational archaeologists have supported this emerging emphasis through development of educational materials and programs which bring archaeology to elementary and secondary students.

As the field of educational archaeology has matured, a gradual evolution of thought has resulted in the initial emphasis on excavation and discovery of artifacts being replaced by an emphasis on conservation of archaeological resources and utilizing archaeology as a vehicle for presenting culture history. Recent educational archaeology programs have espoused a stewardship message and have focused on archaeology's relevance as an educational medium.

Examination of archaeology's roles in education suggests archaeology's integrative, multidisciplinary nature and holistic perspective constitute a discipline well suited to education. Development of educationally, archaeologically and culturally valid educational archaeology programs ensures the continuation of archaeological research in a society which values knowledge of the past and supports a conservation ethic.

ACKNOWLEDGEMENTS

There are a great many people who have unselfishly assisted me in this study. In particular, I wish to thank my committee members, Ms. Marsha Ivany, Dr. Margaret Kennedy and my supervisor, Dr. Ernest G. Walker. Many other faculty members also helped me with this project, notably Dr. Urve Linnamae, Dr. Susan Vincent, Dr. Mary Marino and Dr. David Meyer. I would also like to thank Dr. W. Stephan for kindly agreeing to be a part of my examining committee.

To my colleagues in the department, who have spent many hours listening to me and offering support and advice; Elaine Hulse, Giselle Marcotte, Neil Gerlach, Andrée Blais and Suzanne Kissock, thank you and good luck in your endeavours. Maureen Rollans of Western Heritage Consultants offered me a great deal of sound advice and information for the Wanuskewin edu-kit.

Thank you to the curriculum writers, teachers and students who participated in the curriculum projects; their insights and comments have made this study what it is today. I appreciate the support and consideration offered by The Saskatoon Public School Board, and in particular Superintendent Rene Baxter. Thank you to Phyllis Lodoen, my partner in "Archaeology in the Schools," the archaeology students who served as assistants during the project, and Carol Wakabayashi and Diane Matthews of A-STEP.

And finally, I would like to thank my family, Lisa, Kris and Cory, and especially my husband Rob, for their considerable patience, love and support. Without their encouragement this study would not have been completed.

DEDICATION

I would like to dedicate this thesis to my father, Walter Bear. My father believed an education is the greatest gift anyone can receive. I know he would be proud of my accomplishment.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE

INTRODUCTION

1.1 Public Archaeology

Archaeology is often viewed by the general public as a mysterious, romantic field filled with exotic locales, hidden treasures and dashing heroes. Unfortunately, only a few professional archaeologists have endeavoured to dispel this false image and present a more accurate picture of what archaeology is, what archaeologists do, and why archaeology is important. Until recently, there have been few opportunities for people, other than archaeologists, to become involved in archaeological research. This situation has exacerbated the public's false impressions of archaeology.

Some archaeologists are beginning to recognize the importance of public accessibility and public outreach. Innovative public education programs are being developed that provide opportunities for people from outside the field to actively participate in archaeology. As a result of these initiatives, the new field of public archaeology is gaining more acceptance and respect. The primary goals of public archaeology are to create and maintain a positive interest in archaeology (Smith and McManamon 1991) and, in turn, promote conservation of heritage sites for future generations. To do this, public archaeologists are striving to make archaeology more **relevant** to the public.

1.2 Educational Archaeology

One area where archaeology appears to be particularly relevant is within school systems. This area is known as educational archaeology. Educational archaeology is a specialized or **applied** branch of archaeology that focuses upon the development of educational materials and programs for schools. The major goal of educational archaeology is to encourage the use of archaeology as a presentation of the past and as a vehicle for teaching and learning.

The focus of educational archaeology programs has varied, depending upon the agenda of educators and archaeologists implementing the programs. However, most educational archaeology programs emphasize either 'doing' archaeology or 'learning about' archaeology. Higgins and Holm (1985) suggest that instead of teaching about archaeology, the emphasis should be on teaching with archaeology. To be successful in this endeavour, educational archaeologists need to take a new approach, adopting a more holistic and integrative framework.

1.3 Purpose and Objectives of the Study

To date, there has been little comprehensive investigation and analysis of the roles of archaeology in education. Most educational archaeology programs have been developed by an interested individual or individuals and are usually implemented at a local level. Higgins and Holm (1985) suggest most of these projects tend to focus on a particular objective or learning experience and are fairly self-limiting. Many of these archaeology programs have suffered from a somewhat narrow focus and lack of relevance to the goals of archaeology and education. In order to encourage educators to utilize

archaeology in their classrooms, archaeologists must clearly elucidate the many roles archaeology can play in education. The primary purpose of this study is to develop a comprehensive picture of educational archaeology's roles as a relevant educational resource.

Although there are numerous reasons why archaeology should be incorporated into school curricula, many archaeologists and educators have failed to realize the full potential of archaeology as a teaching subject. In addition, educational archaeologists have failed to communicate, to educators, the adaptability and usefulness of archaeology as a teaching vehicle. As Clarke (1986:9) states: "the teacher must be given the opportunity to become aware of the wide range of skills and approaches [in archaeology] that have direct relevance to work in schools." In order to assess the educational relevance of archaeology, for both students and educators, a major objective of this research was to develop and test archaeology curricula.[1] The relevance of archaeology as a teaching vehicle has been explored with respect to two curriculum projects.

An important consideration in any curriculum package is meeting the needs of the educators so that they, in turn, can meet the needs of their students. This study concentrated on the design of archaeological materials that can be used by teachers to teach. In particular, the process of curriculum development and the effectiveness of a collaborative approach have been examined. The collaborative approach brings subject specialists, such as archaeologists and First Nations peoples, into the writing process,

---

[1] The term 'curriculum' is used fairly loosely in this study, to denote various educational materials rather than a course of study.

alongside professional educators and curriculum writers (Devine 1992).

Educational archaeologists and educators must also be concerned with what kind of message is being presented - is the same message valid for everyone, and how do we ensure the message archaeologists present to students is appropriate? Stone and MacKenzie (1989:113) caution that "what we choose to teach, interpret and present, and equally what we do not choose to teach, interpret and present, is a fundamental dilemma common to all of those empowered to communicate about the past." Archaeologists and educators need to present what is known about the past, and what can be inferred (Stone and MacKenzie 1989). Potter (1990b) suggests archaeologists should not assume that everyone considers archaeology important; rather, one of their duties should be to explain why archaeology is important. These issues are explored through the literature.

Of particular significance to educational archaeologists is the increasing emergence of North American aboriginal peoples[2] into mainstream education. Questions arise concerning the relevance of archaeology to aboriginal students. McManamon (1991:127) believes "it is ironic that the segment of the public most directly connected to the past societies that most American archaeologists study has not been a primary audience for archaeological public education." Educational archaeologists need to publicize what they have to offer North American aboriginal students, as a study of their culture and as an educational vehicle. The relevance of educational archaeology for North American

---

[2] Confusion abounds over choice of terminology when identifying indigenous peoples. I have chosen to use 'North American aboriginal peoples' when referring to indigenous groups throughout North America. 'First Nations peoples' is used to identify indigenous groups in Canada. Within direct quotes, the author's choice is respected.

aboriginal students is examined.

In conclusion, a major objective of the study is to justify archaeology in education and provide recommendations for future development of educational archaeology materials in Saskatchewan elementary schools.

1.4 The Curriculum Projects

Two curriculum projects were developed and tested during the research period. The first curriculum, entitled "People in Their World - A Study of the First Nations Peoples on the Plains" (hereafter identified as the Wanuskewin unit or edu-kit), is a three-week unit created for grade four social studies students. This unit was commissioned by Wanuskewin Heritage Park and the Saskatoon Public and Separate School Boards. The purpose of this unit is to introduce grade four students to First Nations' culture as it is displayed at Wanuskewin Heritage Park. Wanuskewin Heritage Park Interpretive Centre is a newly opened facility, near Saskatoon, designed to present the past 1500 years of First Nations' culture to the general public.

The Wanuskewin unit focuses on the three major themes of First Nations peoples presented at Wanuskewin Heritage Park: People and Plants, People and Animals and People and People. A major component of this unit is an archaeology connection; activities relating to archaeological concepts, and research methods and techniques are integrated into each of the main areas of the unit. Archaeology is introduced as one method of reconstructing and presenting the past lifeways of the First Nations peoples who have occupied the Saskatoon area throughout history.

The second curriculum, entitled "Archaeology in the Schools," was developed for

grade seven and eight science students. This project was sponsored by A-Step (Awareness -Science Technology Education Program) and developed by the Department of Anthropology and Archaeology, University of Saskatchewan. Eight modules were created with the intent of using archaeological methods and techniques to teach science and scientific process. This series of instructional materials emphasizes the scientific, multidisciplinary nature of archaeology and the relevance of using archaeology to reinforce learning skills.

1.5 Scope of the Study

This study endeavours to examine several pertinent questions regarding archaeology's role in education. These questions focus upon the cultural, archaeological and pedagogical relevance of archaeology in education.

This study is not intended to provide a comprehensive assessment of student achievement, retention of material, or skill development; these evaluations are better left up to a qualified teacher. Instead, the focus is on the viability of incorporating archaeology into classrooms and the benefits of doing so. A major assumption of this study is the student's ability to transfer skills used in archaeological activities to other areas of study.

The majority of the data that has been acquired throughout the research is qualitative. Some quantitative analysis is presented; however, for the most part, the research findings are subjective. Although the sample is small, the dedicated involvement of the teachers and students in these projects and their insightful observations present a reliable judgement of the relevancy of the archaeological activities that were developed

and tested.

Chapter two discusses the theoretical perspectives which pertain to the research goals of this study. Specifically, a rationale for educational archaeology programs as credible instructional vehicles is presented. Issues of concern or in need of particular attention when incorporating archaeology into education are also discussed. In order to establish the parameters of this study, archaeology and education are conceptualized.

Chapter three is a literature review of educational archaeology programs and curricula. These programs are discussed and assessed based on their compatibility with archaeological and educational goals.

Chapter four details the methodology employed in this study. Participants associated with the study are also identified.

To justify archaeology's relevance in education, as a social science, chapter five presents qualitative and quantitative evidence from the Wanuskewin curriculum project. Chapter six presents qualitative and quantitative evidence from the "Archaeology in the Schools" project to justify archaeology's educational relevance as a science. The social, cultural, archaeological and educational relevance of these types of projects is discussed.

Chapter seven discusses the interdependence and interconnectedness of the various components of educational archaeology programs. Recommendations for preliminary development of educational archaeology programs in Saskatchewan are presented. These recommendations are based upon the writer's accumulated knowledge and experience gained during the research period.

Chapter eight summarizes the research and presents some general conclusions regarding the relevance of archaeology in education.

CHAPTER TWO

THEORETICAL ORIENTATION

Archaeologists and educators who are actively involved in educational archaeology programs suggest archaeology is an excellent teaching vehicle. M.J. Rice (1985a:i) states that archaeology can be used by teachers to "enliven their teaching, stimulate inquiry, and involve students more actively and responsibly in their own learning." The following discussion elaborates the potential of archaeology in education, as perceived by both archaeologists and educators. In the course of this discussion, a conceptual framework for archaeology and education is presented.

2.1 Conceptualization of Archaeology

In order to cogently present a rationale for inclusion of archaeology in education, archaeologists must clearly define archaeology and delineate the goals of their discipline. The following section presents a brief conceptualization of archaeology as a subdiscipline of anthropology.

2.1.1 Anthropological Archaeology

Archaeology is the scientific study of past cultures through material cultural remains. In essence, archaeologists use material remains as clues to human activities in

order to develop hypotheses about the way people lived in the past (Smardz 1989a). Archaeology is one of five subdisciplines of anthropology, including cultural anthropology, physical anthropology, linguistics and applied anthropology (Peoples and Bailey 1994). These subdisciplines are fairly interrelated, each offering an additional dimension to the corpus of anthropological knowledge. Cultural anthropologists study ways of life in contemporary and recent historical cultures. Physical anthropologists are concerned with humans as biological, evolving organisms. Linguists study human languages, and applied anthropologists employ anthropological concepts, methods and theories to help solve real world problems (Havilland 1993; Peoples and Bailey 1994). In North America, archaeological research is usually divided into historic archaeology and precontact[1] archaeology, using the arrival of Europeans as the temporal division.

Like most scientific disciplines, archaeology is dynamic; and emphasis in archaeological research has changed over the years. Today, archaeological research has evolved beyond description, classification and cultural chronology towards interpretation of past lifeways and culture process - how and why human cultures change through time (Anslinger and Thiel 1984; Devine 1989; Renfrew 1985). Material remains are viewed as "social documents that [are] a source of information about relations and variability within past life-ways" (Gibbons 1984:5), and cultures are viewed holistically, as "aggregations of things and events joined in interaction and interdependence to form integrated wholes" (Gibbons 1984:6).

---

[1] The term 'precontact' is preferred by many First Nations peoples, as the term 'prehistoric' implies a lack of history. Within direct quotes, the author's choice is respected.

As a consequence of this holistic, integrated approach, which emphasizes the interconnectedness of all the systems of culture, archaeological research has become interdisciplinary, attempting to examine the total environment of past cultures (Anslinger and Thiel 1984; Gibbons 1984). To do this, archaeologists enlist the expertise of specialists from many fields to reconstruct activities at a particular site, and archaeology has become multidisciplinary in nature (Smardz 1989a). In order to reconstruct past culture systems, "cultural, geological, sedimentological, zoological, botanical, palynological (pollen), chemical, geographical, mathematical, statistical, and computer applications" disciplines all come into play (Anslinger and Thiel 1984:18).

Although archaeologists use scientific methods and techniques to collect data, archaeological interpretation is inferential by nature (Holman and Burtt 1987). Inferences, based on archaeological evidence, are used to develop generalizations about past cultures. To assist in interpreting archaeological remains, and to lessen the effects of gaps in the archaeological record, archaeologists are also turning to less traditional research methods, such as ethnoarchaeology. Ethnoarchaeologists examine "the relationship between ethnographic observations of living human societies and patterning in the archaeological record" (Hanks and Pokotylo 1988). For example, contemporary First Nations peoples' interpretations of their ancestors' lifestyles are utilized to explain possible patterns of behaviour in the past (Devine 1985; Howard and Dunaif-Hattis 1992; Renfrew 1985).

2.1.2 Archaeological Methodology

The nucleus of archaeological research is an archaeological site. Archaeological sites are spatial concentrations of material evidence representing human activity (Howard

and Dunaif-Hattis 1992). Sites are systematically excavated to obtain data in order to answer specific questions. Since the material evidence is fragmentary, site interpretation is presented as tentative or hypothetical; future testing of the hypotheses may prove or disprove archaeological interpretations (Smardz 1989a). The type of evidence uncovered by archaeologists takes two major forms: 1) material culture remains such as artifacts, features and ecofacts; and, 2) the context in which these remains are found. Although artifacts, features and ecofacts are meaningful sources of evidence for archaeologists, context is also extremely important as archaeologists attempt to identify activity areas (Fox 1986; Smardz 1989a) and consequently patterns of behaviour. Archaeologists recognize that other factors besides human activity play a role in the creation of the archaeological record, such as soil formation, weathering, erosion and bioturbations (Dunnell 1984). Archaeologists also closely examine and record the profile of an excavation unit. These profiles provide a history of the development of soil layers, sediment deposition and the position of occupation levels.

Integrated scientific methodology is a fundamental part of archaeology today. Smardz (1989a) delineates this methodology as: 1) primary research: a review of related literature, such as site reports and any other relevant data; 2) site exploration: surface collection, and test pits; 3) organizational tasks: obtaining an excavation permit, landowner's permission, and hiring staff; 4) surveying and mapping site environs, developing a grid system; and 5) meticulous excavation and record keeping. Since archaeological sites are essentially destroyed by the process of excavation, the only evidence for future researchers is in the records. Therefore, Smardz (1989a) suggests that the most important work of archaeologists is record keeping, such as mapping and

measurement, photographs and field notes.

When the excavation is complete, archaeologists turn to laboratory analysis. This stage of the scientific process involves cleaning, cataloguing, identification and classification of all materials collected at the site. This data is used to develop hypotheses about possible activities that took place at the site. At the conclusion of a project, the analysis and interpretation of the data is synthesized and a site report is written. The site report is considered an informational source for future testing and re-evaluation of archaeological interpretations (Smardz 1989a).

2.1.3 Cultural Resource Management

In recent years, Cultural Resource Management (CRM) of heritage sites has taken on a more prominent role in the discipline of archaeology, in part because looting and commercial development are destroying archaeological sites at an alarming rate (Bense 1991; McManamon 1991; Messenger 1990). CRM archaeologists need to take into consideration the public's right to archaeological information, the need for continued scientific research into the past, and protection and conservation of archaeological resources (Bense 1991; Cleere 1989; McManamon 1991; Rogers 1988). As a consequence of these sometimes conflicting concerns, cultural resource managers and public archaeologists are raising questions about the responsibilities of archaeologists. In particular, the so-called "Ivory Tower Syndrome," which tends to belittle public outreach, needs to be addressed (Brown 1991:2). Young (1991) urges archaeologists to "temper their obsession with research" and become more involved with the development of educational resources. Devine (1991:16-17) advises archaeologists to begin the

"lengthy process of transforming [archaeology] from a closed fraternity of researchers dedicated to serving narrowly defined academic goals to a profession that acknowledges its social responsibilities." The dichotomy between academic and public archaeologists is not irreparable as Carlson (1979:143) notes: "public archaeology is the end product of what archaeologists do, whereas academic archaeology is the means." Indeed, recent efforts to create projects compatible with research and education, such as Head Smashed-In and Wanuskewin Heritage Park indicate some archaeologists are aware of the importance of combining these two focuses into successful public programs.

Smith and McManamon (1991) justify a more concentrated effort towards public archaeology by emphasizing the "need to teach the public the value of archaeology, the problems with pot hunting, and the merits of cultural resource management." Bense (1991) feels public education is the approach to take; making the public aware of why heritage resources need to be conserved and protected. Public archaeologists suggest that demonstrating why archaeology is important, by encouraging people to become involved, is one way to ensure the continuation of archaeological research (Messenger 1990, 1993; Smith and McManamon 1991; Stone 1989). Alderton (1977) believes a more educated public will have an increased appreciation for the past, an awareness of how humans alter their environment and the consequences of not protecting heritage sites. As Mayer-Oakes (1989:57) states,

> responsible popular archaeology, based on solid research and thorough dissemination of results, is a major contributor to the development of a general interest in human heritage, beyond national and ethnic heritage. This interest can lead to greater respect for other (in both time and space) societies, to greater willingness to share with members of other societies, and to greater concern for the future of all humankind.

2.1.4 Involvement of North American Aboriginal Peoples

As the field of public archaeology has evolved, archaeologists have become more responsive to the needs of different groups, in particular, North American aboriginal peoples. Calls for partnerships between First Nations groups and archaeologists have increased dramatically (Anawak 1989; Devine 1985, 1992), along with the view that "native people are the best interpreters of their own cultures" (Conaty 1989:408). First Nations involvement in the interpretation of their past provides an added dimension and authenticity to archaeological research which is demonstrated in the development of Wanuskewin Heritage Park in Saskatoon (Conaty 1989). Trigger (1980:673) points out,

> as native people come to value archaeological research as a source of information concerning their own history, they may begin to pose questions that will alter and expand the focus of archaeological interpretation in new and exciting directions.

Devine (1992:16) states, "if we hope to see Native history and archaeology interpreted from a First Nation's point of view, then Native involvement is essential."

In conclusion, archaeology is a multidisciplinary science, with the goal of reconstructing patterns of behaviour in cultures of the past, and examining the process of culture change. As the discipline has matured and broadened its horizons, archaeology has moved away from a focus upon artifacts and their temporal chronology, towards a more holistic interpretation and presentation of the past to the present. In addition, public archaeologists and cultural resource managers have taken on increasing responsibilities for the protection and stewardship of cultural resources (Mayer-Oakes 1989).

2.2 Conceptualization of Education in Saskatchewan

The processes of teaching and learning are multifaceted and very broad in scope. Therefore, the following discussion will be limited to current educational trends that directly relate to educational archaeology. Smith (1990) identifies current trends in education as scientific inquiry, problem-solving, holistic thinking, cooperative learning and citizenship [values]. Erickson and Rice (1990) state that educational teaching strategies are dynamic, changing with the needs of students and society. As a consequence, new themes in education have emerged, emphasizing skills for life-long learning.

2.2.1 Common Essential Learnings

The Common Essential Learnings (CELs) have been identified by Saskatchewan Education (Sask. Ed. 1988:11) as the foundation of understandings, values, skills and processes of learning, with the potential to "enrich students' present learning and future lives." These CELs, identified as Communication, Numeracy, Critical and Creative Thinking, Technological Literacy, Personal and Social Values and Skills, and Independent Learning (Sask. Ed. 1988) are not viewed as isolated subjects, but rather, are used as vehicles through which concepts and subject matter are taught. The CELs emphasize the integrative nature of learning and attempt to enhance learning by promoting "active, self-motivated and increasingly independent learners" (Sask. Ed. 1988:10). Saskatchewan Education (1988:10) suggests the CELs will "provide students with an integrated and meaningful knowledge base" and equip the students with skills useful both within and outside the classroom. The following section examines aspects of the CELs that are particularly relevant to educational archaeology in order to set the stage for the

educational and participatory connections between education and archaeology.

Communication emphasizes improvement of students' ability in oral and written communication skills. Saskatchewan Education (1988:13) states, "methods of inquiry, recording, reporting and theorizing are linguistic processes, sensitive to the context in which they take place." The goal is to promote

> learning in all school subjects through improving their language abilities within each subject. What is desired are students who can bring order and meaning to facts and experiences and communicate that understanding effectively to others (Sask. Ed. 1988:12).

Some activities that encourage further development of communication skills include discussions in large and small groups; organizing written material - sorting, selecting, summarizing, taking notes, reviewing and reporting; analysis and categorization of material; and researching resources (Sask. Ed. 1988).

Numeracy concentrates on students' acquisition of "knowledge, skills and appreciation of mathematical ideas, techniques and applications" (Sask. Ed. 1988:8). Students learn "how to compute, measure, estimate and interpret mathematical data, when to apply these same skills and techniques and understand why these particular processes apply" (Sask. Ed. 1988:20). Activities which enhance numeracy skills include data analysis and interpretation, calculation, measurement and graphing, understanding space and form concepts, problem-solving, and using charts, tables, time lines and surveys (Sask. Ed. 1988).

Critical and creative thinking processes assist in developing students who,

> value knowledge, learning and the creative process, who can and will think for themselves, yet recognize the limits of individual reflection and the need to contribute to and build upon mutual understandings of social situations (Sask. Ed. 1988:29).

An important goal of this CEL is to develop students' understanding of the concepts, skills and processes associated with different disciplines, the methods and techniques used in data acquisition and the ability to evaluate information. Activities that encourage further development of critical and creative thinking skills include observing, classifying, comparing, developing analysis, identifying relationships and patterns, predicting, inferring, and identifying assumptions (Sask. Ed. 1988).

Technological literacy entails an understanding of "how technology and society influence one another," and the ability to analyze technological influences on society and recognize their own responsibilities when shaping public policy (Sask. Ed. 1988:36). The holistic nature of all the systems of culture and their relationship with technology are investigated. Possessing technological literacy means a student can critically examine such concepts as technological change and innovation. Intellectual processes associated with technological literacy include collection, critical analysis and synthesis of data, inquiry, debating, valuing, problem solving, and decision making (Sask. Ed. 1988).

The CEL identified as Personal and Social Values and Skills aims to develop compassionate, fair-minded individuals who want to make a positive contribution to their society. This CEL encompasses respect for the environment, the rights and property of others and preservation, cooperation and harmony between social and cultural groups. Saskatchewan Education (1988:43) states, "when we respect other people we acknowledge their language, their history and their culture as important aspects of their personal identity."

The major goal of Independent Learning is to avail students of the opportunity and experiences which will assist them in becoming "capable, self-reliant, self-motivated and

life-long learners" (Sask. Ed. 1988:50). Examples of independent learning strategies include inquiry, independent research, cooperative groups, divergent thinking, and resource-based learning (Sask. Ed. 1988). An important component of independent learning is involvement in interesting activities that motivate learning.

Saskatchewan Education (1988) recognizes that learning is influenced by students' interests in a subject, the methods employed to teach the content, and the students' perception of the relevance of the material. In particular, Saskatchewan Education (1988) acknowledges the need for various methods of teaching to accommodate different ways of learning. Saskatchewan Education (1988) suggests that some activities should be designed for active participation by the learner.

2.2.2 Experiential Education

Experiential education, or the opportunity to participate in active discovery, is identified as an important approach, consistent with current educational trends. Experiential learning techniques allow students to "discover how to learn from their own experience and how to use their experiential learning capability to shape their own development...of learning skills" (Kolb & Lewis 1986:100). Hence, active or hands-on learning teaches students how to acquire, use, and evaluate information.

The benefits of hands-on activities have been addressed by several educators. Students tend to find hands-on activities more interesting than passive approaches to learning; this increased interest may motivate students to become more involved in school projects (Enloe 1991). Kolb and Lewis (1986) also suggest involvement in hands-on activities assists in developing social skills and social sensitivity. Allen (1991:47)

believes a hands-on approach guides "students toward development of higher level thinking skills, while strengthening their manipulatory skills through active involvement." Using hands-on activities in science enables students to 'discover' science themselves, as well as increase their scientific and problem-solving skills (Allen 1991). In addition, young students require concrete experiences before they can manage abstract thinking which is necessary to formulate and test hypotheses (Shaw 1983 from Gagne 1963). In summary, experiential activities allow students to become actively involved in the learning process. As Beyer (1968:17) comments, "we still learn best by doing."

An extension of experiential education is the development of modular[2] activities. Craeger and Murray (1971:11) state modules can be used "to enable a student to master skills, to comprehend concepts, or to change attitudes." Modules can be used for individual instruction or group interaction; as a series of modules to choose from within a traditional course; or as a whole curriculum or interdisciplinary program. Further discussion of modules can be found in chapter six.

2.2.3 Inquiry Approach

Closely linked to experiential education is the inquiry approach to learning, or, in other words, "finding out for oneself" (Beyer 1968:6). Inquiry is often described as "reflective thinking, problem solving, critical thinking, ...inductive, discovery and guided discovery" (Beyer 1968:6). The inquiry approach is "a highly organized strategy which

---

[2] The term 'modules' is used in this study to refer to independent sets of activities which include clearly defined educational and archaeological objectives and which can stand alone or fit into a larger sequence of activities.

closely corresponds to the scientific research method of conclusions" (Reed-Sanders and Flores 1983:147). Higgins (1981) suggests the inquiry approach takes into consideration posing hypotheses, collecting and analyzing data, and drawing the fact that knowledge or content is changing very rapidly, therefore educators should emphasize skills such as independent, rational thinking rather than only content. Beyer (1968:14) suggests that inquiry teaching should be used "to develop knowledge, intellectual skills and attitudes and values of a higher level than can be developed by rote memorization or mere listening."

An important component of inquiry learning is scientific process (Gilbert 1984; Reed-Sanders and Flores 1983). Shaw (1983 from Gagne 1970) identifies the basic scientific processes as observing, measuring, inferring, predicting, classifying, collecting and recording data, and integrating processes which include formulating hypotheses, experimenting and interpreting data. Interpreting data is a vehicle for developing higher levels of knowledge such as generalizations (Erickson 1990). "Generalizations are considered by many to represent the ultimate cognitive objectives of learning" (Beyer 1968:13). In sum, the inquiry approach to learning challenges students to become involved in active learning through investigation and discovery (Barnett 1989; Devine 1985).

2.2.4 Interdisciplinary/Multidisciplinary Approach

An important trend in education today is to encourage a holistic perspective (Smith 1990). Allen (1991) suggests that presenting an interdisciplinary[3], integrated approach in teaching and learning causes subject boundaries to disappear and a holistic picture to be presented. As Allen (1991:115) notes,

> activities that focus on just the science content or just the science skills and processes do not provide meaningful learning experiences for students in the middle grades... science activities involving other disciplines should be included as well.

This interdisciplinary approach is also praised by Barnett (1989). Barnett (1989:28) suggests that an interdisciplinary approach to learning can result in an "integrated conceptualization of the whole" instead of separate components of knowledge.

To conclude, the focus of education appears to be emphasizing the acquisition of skills that enable students to actively participate in decision making and dealing with issues and problems throughout their lives. This discussion has touched upon several teaching strategies that are particulary relevant to educational archaeology. To further elaborate the link between educational and archaeological goals, the following section will provide a synopsis of educators' and archaeologists' perceptions of archaeology's educational value and its place within education.

---

[3] The terms 'interdisciplinary' and 'multidisciplinary' appear to be used interchangebly and inconsistently by many authors. For the purpose of this study, 'interdisciplinary' is used to signify an integration of cognate disciplines (e.g. scientific disciplines) employed in archaeological research; 'multidisciplinary' is used to indicate integration of other disciplines, such as the humanities, into archaeological research.

2.3 Conceptualization of Archaeology in Education

McManamon (1991) and Selig (1991) urge all archaeologists to become active in public archaeology programs in order to increase the public's awareness of, and appreciation for archaeology. Carlson (1979:145) states, "the relevance of archaeology to the public sector and to society at large is public education." Therefore, the public's perception of the past, and their desire to learn about the past need to be considered (Stone 1989). Phagan and Pilles (1988:16) suggest that public education is as much an archaeologist's responsibility as "publishing papers and training graduate students." The Canadian Archaeological Association (CAA) recognizes the importance of public education by identifying the goal of the CAA Education Committee "to promote both public awareness of archaeology and education throughout Canada" (Stimmell 1991:4-5).

Stone (1987:131) asks some pertinent questions for educational archaeology: 1) are the interpretations of the past valid or do they present an outdated or unrealistic view of the past; 2) do archaeologists stress to students that they can never fully reconstruct the past and that they are looking at the past through the eyes of the present; 3) how can archaeologists control the quality of information presented to students; 4) are archaeologists the best judge of quality; 5) is it more dangerous to present a little information rather than none at all; 6) do educational archaeologists and educators tend to overemphasize the importance of "the artifact" rather than the past behaviours associated with the artifacts? These questions are essential when conceptualizing archaeology's role in education.

2.3.1 Roles of Archaeology in Education

The potential for archaeology in education is almost limitless. Pretty (1987:117) suggests that archaeology should be presented "as a multi-layered educational experience with something to offer at each stage." The following discussion will elaborate the roles of archaeology in education from two perspectives: the archaeologist and the educator.

2.3.1.1 Archaeology's Objectives in Education

Lowenthal (1981:63) suggests "there is...often a real gap between archaeology as expected on the one hand, and archaeology as it really is on the other." Educational archaeologists attempt to develop attitudinal concepts which focus upon what archaeology is, what archaeologists do, and why archaeology is important (MacDonald 1993).

A primary objective of educational archaeology is to develop a 'conservation ethic' in students; an awareness of the fragility of non-renewable cultural resources (Fox 1986; Mayer-Oakes 1989) and the importance of protecting and conserving archaeological sites (Mathis 1986; McManamon 1991; Potter 1990a; Rogge and Bell 1989). MacDonald (1993) suggests educators and archaeologists must assist the public in understanding that archaeological or heritage sites are the property of everyone and, therefore, looting or destruction of these sites is legally and ethically wrong. Mayer-Oakes (1989) believes instilling a sense of stewardship in young people will have a definite impact on heritage site protection in the future. These students will grow up to be the developers and policy makers responsible for making decisions concerning the use of environmental and cultural resources.

The general public, particularly young people, associate archaeology with digging for artifacts or 'treasures', while devaluing or ignoring archaeology's attempts to

reconstruct past lifeways. Therefore, a second important objective of educational archaeology is to eliminate misconceptions about the goals of archaeology. To develop this attitudinal concept, MacDonald (1993) suggests the process of archaeological investigation should be emphasized over the artifacts uncovered, and concepts such as context, provenience and scientific methodology should be stressed. Providing a thorough understanding of the importance of interpreting artifacts in context and stressing that artifacts are really only intrinsically valuable for reconstructing the past, may also discourage pot hunting (Devine 1985; Rogge and Bell 1988).

Archaeological excavation destroys the integrity of archaeological sites by the very nature of its methodology (Devine 1985; MacDonald 1993; Smardz 1989a). The perception that archaeologists are always eagerly looking for sites to excavate is common (Corbishley 1986b). Educational programs are designed to teach students that archaeological investigation, through excavation, is only undertaken if there is a scientific or mitigating reason to do so. Specifically, archaeologists only excavate sites when they believe there is important scientific information to be gained or when the site is in imminent danger of destruction as a result of impending construction projects.

Archaeologists are often asked why their discipline is important. Justifying archaeological research in a manner which will satisfy the general public is perhaps the most difficult task of educational archaeologists. Generally, archaeology is seen as a tool for explaining the past, especially beyond recorded history (Pretty 1987). Clarke (1986:9) states "archaeology presents real evidence and artifacts relating to real people from the past." MacDonald (1993) feels that the information archaeologists gather about past lifeways also provides us with insights into the present. Erickson and Rice (1990) suggest

anthropology [including archaeology] is the study of 'us' whether in the past or in the present. Kissock (1987:126) suggests "archaeological research can demonstrate the unity of humankind..." and human solidarity. Perhaps Mayer-Oakes (1989:57) presents the loftiest aspirations when he states archaeology can:

> remind and reassure people of their humanity. Knowledge and understanding of our long, continuous and ever-changing human development - our heritage - is one of our most precious assets.

This discussion focused on attitudinal concepts which, when understood, can benefit the discipline of archaeology and efforts to protect and conserve heritage sites. These attitudinal concepts are the basis for an accurate depiction of archaeology and provide strong justifications for including archaeology in the curricula, from an archaeological perspective. Incorporating archaeology into school curricula also results in several educational and societal benefits.

2.3.1.2 Education's Objectives in Archaeology

If children are interested in the subjects they are taught in school, they may be more motivated to learn. Many people, including students, are very interested in archaeology (Bense 1991; Clarke 1986; Devine 1989; Higgins and Holm 1985; Selig 1991). This interest, and the sense of discovery which is attached to archaeology, serve to increase the educational impact of archaeological activities (Adams 1986; Erickson and Rice 1990; Farbregd 1988; Munro 1980; Potter 1990a; Smardz 1989a). Archaeology also serves to fire students' imagination about the past.

> Archaeology appeals to the imagination very specifically, in that its objective is to help in recreating prehistory and filling in some of the gaps in recorded history. Archaeology stimulates an interest in geography in the fullest sense of that term, developing an awareness of place and of everything that living in a defined area implies (Dale 1986:5 from Clarke 1957:253).

Young students often have difficulty understanding the concepts of time and history. Adams (1986) suggests that one way to overcome this problem is to focus on the way people lived in the past rather than when they lived. Using material remains found at archaeological sites gives students tangible, concrete evidence that can assist them in conceptualizing the passage of time (Kissock 1987). Archaeological evidence is also ideal for approaching the concept of change; observing and working with artifacts from the past that reflect change through time make it easier for students to understand how changes take place through time (Kissock 1987). Therefore, archaeology can remove some of the abstractness from historical concepts and give students a 'sense of the past'.

Using archaeological evidence to present the past lifeways of people expands students' horizons and exposes them to the validity and viability of different lifestyles (Dale 1986; Devine 1985, 1989; Erickson and Rice 1990; Holm 1985; Messenger 1993; Onderdonk, 1986; Potter 1990a; Stuart 1993). Educational archaeology can present the past to students in a relaxed, non-threatening manner (Danes 1989; Hartman 1985; Johnson 1991). As Devine (1985:11) states, "a knowledge and appreciation of the varied lifeways that have contributed to our cultural heritage is essential to the promotion of societal cohesiveness."

In Canada, studying cultural systems from an archaeological perspective may assist in bridging the gap between First Nations students and other students. Since all Canadian

students study First Nations history in social studies classes, archaeology is an excellent transmission mode for the history of First Nations peoples. Utilizing archaeology to teach First Nations' culture presents an additional dimension to social studies curricula.

Environmental education has become increasingly important in our society. Educational archaeology programs augment environmental and ecological awareness by presenting the interconnectedness of the environment, technology and culture (Corbishley 1986a; Cracknell 1986; Council for British Archaeology 1989; Devine 1989; Higgins and Holm 1985; Messenger 1993; Selig 1991). Tirrell (1983:44) suggests students involved in archaeology "learn how people, separated from themselves in time, technology, and world view, shaped and were shaped by the environment, and they achieve a deeper understanding of cultural variation."

Archaeology is an extremely versatile discipline which enables educators to utilize archaeology as a teaching vehicle or instructional tool for a variety of subjects and through a variety of media. Higgins (Selig 1991 from Higgins and Holm 1986) summarizes several reasons why archaeology appeals to students and teachers alike: 1) hands-on activities; 2) combining classroom exercises with out-of-school activities at archaeological labs, exhibits and sites 3) compatibility with activities that develop higher level thinking skills and scientific reasoning; 4) [multi]interdisciplinary nature, enabling many other disciplines to be taught through archaeology; and, 5) integrative nature, incorporating other school subjects such as mathematics, reading and communication within archaeological activities. Onderdonk (1986:80) praises

> the educational value of archaeology inherent within the process of its application. By merely participating in archaeology one is actively involved in a variety of learning processes that reinforce, verify, and establish educational skills and may also promote cognitive development.

Rogge and Bell (1988) recommend that archaeology be taught, not so much as a subject itself, but as an integrated teaching tool for conveying knowledge and skills. Archaeology is most often identified with social studies and science, however, archaeology can be incorporated into most areas of the core curriculum such as language arts, mathematics and fine arts (Devine 1989; Higgins and Holm 1985; Potter 1990a; Watts 1985). For example, when discussing the process of decomposition, teachers may use a case study of an archaeological site to illustrate how soils and other elements work to decay various artifacts and ecofacts left at a site. In other words, the teachers use archaeology to augment their curriculum.

Archaeology is multidisciplinary, drawing upon at least twenty-five other disciplines in archaeological research (Smith 1991b). Scholars from these disciplines collaborate with archaeologists to answer archaeological questions (Smardz 1989a). This multidisciplinary approach to social investigation enables archaeology to be incorporated into a myriad of school subjects to teach the natural and physical sciences such as geology, biology, botany, zoology and chemistry. Social sciences such as history, anthropology, geography, linguistics and literary analysis add a human dimension to the cultures being studied (Allen and Felton 1980; Carroll 1987; Cotter 1979; Devine 1989; Donahue and Adovasio 1985; Faught and Gittings 1991; Higgins and Holm 1985; McManamon 1991; Smith 1991b).

Archaeology employs scientific process (Devine 1985, 1989; Ellick 1991a, 1991b;

Hartman 1985; Onderdonk 1986; Passe and Passe 1985; Rice 1990; Watts 1985). Smardz (1989a: 148) suggests archaeology is a new way to "introduce students to the thrill of scientific discovery." Scientific process requires the use of higher mental processes such as creative and critical thinking, scientific reasoning and the ability to interpret and analyze raw data, as well as draw inferences from the data (Cotter 1979; Danes 1989; Erickson and Rice 1990; Passe and Passe 1985; Potter 1990a; Rogge and Bell 1988; Shaw 1983 from Gagne 1979; Smith 1991a and Watts 1985). Onderdonk (1986:80) notes that

> while participating in the excavation the student is thinking about what s/he is finding, interpreting data, and drawing inferences. The thought processes may include deductive and inductive reasoning, inferential and interpretational analysis, and hypothesis formulation.

In essence, scientific methods and techniques employed by archaeologists can serve to teach science process to students.

Educators are interested in meaningful activities that stimulate student inquiry (Devine 1989). Allen and Felton (1980:1) feel artifact analysis is very useful as an inquiry-based learning strategy: "students are given a tangible reality to which they apply heuristic skills of inquiry and their existing knowledge." According to Allen and Felton (1980) convergent analytical questions such as "what is it?" and "how was it used?" enable students to examine the utility and value roles of an artifact. However, artifact analysis' greatest asset is the ability to carry analysis past convergent thinking to divergent thinking or a higher level of reality; to "find the place" of an artifact in a person's or a culture's lifestyle. Allen and Felton (1980:16) see utilizing artifacts in classroom activities as a means to move from "generating skills and identifying objects to the discernment of personal and cultural meaning."

Onderdonk (1986:80) states, "one of the primary motivational aspects of archaeology is the student's quick realization that he will actually be doing something." Adams (1986:6) suggests that archaeology (collections) should stimulate "not only knowledge but experience - visual, tactile, analytical." Archaeology is an ideal discipline for development of experiential programs. Higgins and Holm (1985) and Onderdonk (1986) recognize the compatibility of archaeological methods and techniques with hands-on or experiential education. Hands-on experiences stimulate interest in a subject and are especially valuable to students who are not interested in dry text materials (Gettings 1970; Higgins and Holm 1985; Smith 1991a). Smardz (1989a:155) points out that artifacts are tangible, since students have the opportunity to put their "hands on the past" in active learning situations.

Experiential archaeology programs are usually identified with excavations or 'digs'. Mandell and Allison (1984) perceive the purposes of an archaeology dig as: 1) providing a learning opportunity in an outdoor laboratory setting; 2) practising archaeological methods and techniques; 3) encouraging use of critical thinking skills, divergent thinking, and developing scientific reasoning.

Excavations for educational purposes can be at real or simulated sites. Simulated sites are artificially-created sites that have been 'seeded' with artifacts to reflect an actual or imaginary culture. These sites vary in design, from glorified sand boxes (Rice 1985b) to multicomponent field sites (Ellick 1991b).

Smardz (1989a) and Devine (1985) advocate the use of real archaeological sites for excavation because of the intrinsic rewards provided students when they are involved in actual research. Sentelle (1986) points out that students participating in a real dig have

the opportunity to take part in original inquiry, develop their skills in scientific methodology and have an opportunity to enjoy a unique learning experience. As a participatory activity, students must work cooperatively with their colleagues and the professionals on the project (Devine 1989).

However, some archaeologists (Adams 1986; Devine 1985 from Dyers 1983; Mathis 1986) have expressed concerns about the dangers of allowing inexperienced students into a real site. These archaeologists express concerns about students ruining the excavation through inexperience, working too slowly, and occupying most of the archaeologist's time with student supervision. Commitment to the project is also important; students must be extremely patient, persevering and extremely precise in their work (Adams 1986; Devine 1989). Proponents of using real archaeological sites strongly suggest that participatory programs will not harm archaeological sites if a controlled research environment is maintained (Smardz 1989a). In fact, Smardz (1989a) suggests that these educational programs increase public awareness of the sensitivity and fragility of archaeology sites and the importance of heritage site protection.

In response to these concerns, some educational archaeologists (Carroll 1987; Ellick 1991a; Smith 1991a) have suggested the use of simulated sites to avoid any possibility of site destruction by students. Simulations, including simulated sites, are not necessarily less pertinent to educational needs. Barnett (1989:254) suggests simulation games "encourage and require higher levels of thinking," create analogues between the simulation and the real world, and encourage a positive attitude toward learning, decision making and involvement in school activities. Joyce and Weil (1986) feel simulations bring the real world into the classroom. The major problem with simulated digs is the

lack of real research, which is perceived by Smardz (1989a, 1990) as an important asset of using real sites. In Smardz's (personal communication, 1991) experience, students' enthusiasm does not reach the same level in a simulated dig as it does in a real dig; their sense of adventure and feeling of pride in their work is missing. In addition, some archaeologists and educators fear that simulated digs may send out a poor message and actually encourage pot hunting (Smith 1991a). The whole concept of 'finding an artifact' while digging a site may be over-emphasized at a simulated dig. Mathis (1982) suggests artifacts are good visual tools, but emphasis should be placed on the meaning of artifacts, their uses and relationship to the people who made them, rather than the objects themselves. In defense, employing a well-developed simulated site as a teaching tool can be an excellent educational approach. Webber and Fiske (1983:133) recommend "simulations as a valuable tool in experiential teaching" because "simulation is a pre-selected and pre-organized experience which focuses the attention of the students on particular concepts."

The educational benefits of archaeology have been discussed from a theoretical perspective. Further elaboration of these principles can be found in the literature review. The following section focuses on archaeological curriculum development and the factors that must be considered when creating archaeological resources and materials for educational use.

2.4 Development of Educational Archaeology Curricula

In order for teachers to incorporate archaeology into their teaching, appropriate curricula must be developed to meet the needs of the teachers (Alderton and Manning

1977; Corbishley 1986a; Cracknell 1986; Dale 1986; Devine 1985; Holm 1985; McManamon 1991; Rogge and Bell 1988; Selig 1991; Smith 1990). Bailey and Clune (1968:8) suggest "any general acceptance of anthropology units depends on their being usable by any qualified elementary school teacher." Educational archaeologists have the responsibility to ensure that high quality programs, with accurate, up-to-date materials are developed (Clarke 1986; Cracknell 1986; Dale 1986; Hartman 1985). In essence, if educational archaeology programs meet the needs of the teachers they are relevant and useful to education (Selig 1991). Close partnership between educators and archaeologists should help alleviate a serious criticism of educational archaeology programs - unscrupulous excavation for the sake of an educational experience (Higgins and Holm 1985).

Secondly, teacher workshops and introductory courses that acquaint teachers with the usefulness of archaeology in their classrooms also need to be developed (Corbishley 1986a; Devine 1985; Hill 1987; Smith 1991a). Properly preparing teachers to teach with and about archaeology is very important, otherwise they may hesitate to attempt the programs or, even worse, present a less than accurate account of archaeology (Hartman 1985; Higgins and Holm 1985). In particular, Dale (1986) suggests that university archaeology departments need to become more active, using their facilities and collections to present archaeology to school groups, educators and the general public. Archaeologists must be willing to develop, implement, and assist in teaching these workshops to ensure teachers understand the goals and methods of archaeology (Cotter 1979).

Educational archaeology materials and programs can not be created in a vacuum; stakeholders in the project must have equal opportunities for input, assessment and

feedback in order to "produce instructional materials that reflect a thorough understanding of subject matter, methodology, teacher needs, and curriculum requirements" (Devine 1985:2). In order to ensure that the curriculum materials are academically accurate and educationally valid, both archaeologists and educators should collaborate in the writing process (Adams 1986; Dale 1986; Selig 1991). The goal of the collaborative process is to create 'user-friendly', factually accurate teaching materials (Devine 1985).

Archaeologists, although experienced in practical work, may not be equipped to present information to students in the best manner. Therefore, teacher assistance is needed to develop appropriate curriculum materials (Benge and Miller 1988; Smith 1991a). Devine (1985:43) states,

> because the success of any curriculum is dependent upon its delivery at the classroom level, it is imperative that teachers be consulted as to what they perceive the needs of the curriculum to be in the area of archaeology and native prehistory.

In turn, most teachers have little experience with archaeology and its methodology (Smith 1991a). Consequently, the two groups need to work together to create innovative programs that reinforce classroom learning in a 'unique and dynamic way' (Benge and Miller 1988; Kissock 1987; Smith 1991a, 1991b).

In addition to educators and archaeologists, the study group (e.g. First Nations peoples), must also be involved in the writing process. Devine (1991:11) suggests this new sensitivity to First Nations peoples' roles in archaeological research has opened up "new opportunities for Natives and archaeologists to collaborate in the creation of culturally and pedagogically sound school programs in Native history and prehistory." This type of collaborative approach helps ensure the accuracy and credibility of

information presented in a curriculum. In addition, presenting a collaborative perspective assists in recognizing the validity of both traditional and contemporary approaches and increases the educational potential of these curriculum materials (Bielawski 1986).

Although educationally, culturally and archaeologically sound curriculum materials are the goal of this collaborative approach, there are several fundamental issues which need to be addressed when curriculum materials are developed. These concerns focus upon the hypothetical nature of archaeological interpretation, difficulties with presenting an unbiased interpretation of the past by archaeologists and educators who live in the present, and the temptation to universally apply these interpretations to all people within a temporal and spatial framework.

2.4.1 Issues Related to Archaeological Curriculum Development

During the development of educational archaeology programs archaeologists need to reflect upon the messages the public should receive and the reasons behind these messages (Leone 1981; Messenger 1990). The nature of any archaeological interpretations must be clearly presented in curriculum materials in order that teachers and students understand that interpretations of the past are hypothetical. Burtt (1987 from Shanks and Tilley 1987:12)) suggests "the past, ... is not 'absolute': the 'truth' of the past can never be known for certain: objects are locked into their time, archaeologists into theirs." This message is integral to any archaeology curriculum in order to avoid misleading teachers and students about the capabilities of archaeological investigation, and the degree of accuracy that can be achieved when reconstructing the past (Clarke 1986; Corbishley 1986a; Holman and Burtt 1987; Reece 1987).

A second area of concern relates to archaeologists attempting to present an objective, unbiased perspective about the past. Leone (1983a:45) points out "the past is a function of the present, and thus not neutral." Although archaeologists make every attempt to present objective interpretations, archaeology is in reality a subjective discipline and a product of present-day society (Hill 1987). Johnson and Holman (1986:106) note that "the gaps in the evidence are filled with values and preconceptions derived from the present."

Stone (1987:2) also cautions educators and archaeologists to never forget that "archaeology and the study of the distant past lends itself to misuse and abuse more easily and readily than almost any other subject." Political agendas (even justified ones) permeate many archaeological curricula. Archaeologists must be aware that archaeological findings "are likely to be used by someone wishing to legitimize something" (Ucko 1986). Archaeologists are not alone in regarding the past as a valuable commodity; archaeology is not immune to the politics which surround the control of this resource (Layton 1989). Whether the reasoning behind the agenda is to right previous wrongs, gain independence and respect, or simply to present a certain point of view, the danger lies in presenting any of this information as the absolute truth.

Selectivity in presentation of the past, or excluding all but the preconceived and accepted attitudes about how people lived in the past, perpetuates stereotypes. Long standing biases and stereotypes about the past are still being written into archaeology books, for example, "Man the Hunter" images (Burtt 1987). This androcentric attitude permeates many books about the past and is particularly harmful when presented to teachers and students as "the way things were in the past" (Burtt 1987). Instead,

archaeology should present the opportunity to attack prevailing "anachronisms and stereotypes which characterize visions of the past" (Hill 1987:151).

The assumption that all groups of people living in the same temporal and spatial framework exhibited identical cultural practices is a prevalent attitude. Archaeologists have to clearly explain that, like contemporary cultures, people in the past displayed a great deal of variability (Layton 1989).

Credible educational archaeology curriculum materials should deal with the inevitability of bias, inter- and intracultural variability, as well as the tenuousness of archaeological interpretation. Sound educational archaeology programs may be one method of alleviating these problems. Students who have been introduced to the processes of archaeological investigation and interpretation are more equipped to understand the strengths and weaknesses of the discipline. In turn, these students will be able to offer their own interpretations of the past, based on the evidence, as well as critique traditionally-accepted interpretations (Hill 1987; Leone 1983b). Kissock (187:120) notes "pupils must be encouraged to form their own opinion about the past," while understanding that the past is speculative, and interpretations are not value-free. This critical approach to archaeological interpretation can stress "different possible pasts, or an incomplete past" and allow comparing and contrasting of possible pasts (Leone 1981).

The problem of decontextualization in presentation of archaeological evidence of the past has far-reaching consequences when developing educational archaeology curricula (Devine 1992). Activities and programs that are taken out of the context of archaeological research may mislead or negatively influence students' attitudes towards

past lifeways. Devine (1992) uses the example of 'the museum approach' where educators adopt various activities and present portions of information about a culture without developing a holistic picture of the culture and cultural processes. Bewley (1983) recommends archaeologists teach the public that it is not the artifacts that are important but the knowledge learned from these objects.

2.5 Summary

This discussion has focused upon a conceptual framework for archaeology and education. These conceptualizations show that the goals and methods of archaeology are compatible with the goals and methods of education. This compatibility lends itself to integrative educational archaeology projects. Clarke (1986:9) suggests,

> archaeology presents real evidence and artifacts relating to real people from the past, it fuels the natural inquisitive instinct of many young people, and it provides a unique mixture of scientific method, practical work, and imaginative conjecture based on the evidence of real things.

However, rudimentary development of archaeological activities is a narrow conceptualization of archaeology's role in education. Attention must be paid to the many considerations at issue here, the ultimate purposes of placing archaeology in the realm of education and the messages that are presented to the audience.

CHAPTER THREE

REVIEW OF THE LITERATURE

3.1 Introduction

To demonstrate the roles of archaeology in education, the literature reviewed for this study focuses on three main areas: 1) existing programs and their educational value; 2) teacher training; and, 3) development of educational archaeology curricula.

This review investigates selective educational archaeology programs, their goals and objectives, and strengths and weaknesses, in order to evaluate their educational relevance. Literature discussing the development and implementation of educational archaeology curricula, and the ingredients required for successful educational archaeology curricula is explored. Several areas of consideration when creating and implementing educational archaeology programs are also examined through the literature. The underlying theme of the review is to justify archaeology in education through discussions of the benefits of educational archaeology programs.

The depth and complexity of educational archaeology programs vary a great deal. These programs may include relatively passive experiences such as tours of archaeology exhibits, sites and laboratories, and lectures by professional archaeologists, to more experientially-focused activities such as hands-on classroom activities, simulated site excavations or involvement in actual field excavations and laboratory analysis. In

addition, materials developed for educational archaeology programs can range from books, videos, edu-kits and guides, to complete units of study.

3.2 Experiential Archaeology Programs

The preponderance of literature relating to educational archaeology programs concentrates on students excavating real archaeological sites (see Alderton 1977; Andel 1990; Bense 1991; Cook 1985; Delaney 1977; Diers and LoGiudice 1982; Dyche 1985; Farbregd 1988; Faught and Gittings 1991; Frink and Allen 1993; Head 1993; Holm 1985; Kling 1984; MacDonald 1993; McNutt 1991a; Sanders 1990; Smith 1994; Smith and Piateck 1993; Stuart 1993; and Watts 1985) or simulated archaeological sites (see Brooks 1991; Corbin 1985; Doi 1975; Haas, 1978; Jaus 1975; McNutt 1990; Passe and Passe 1985; Rice 1990; Samford 1992; Stone 1978; Tirrell 1983; Vantilburg 1981; Williamson 1991). The educational value and justification for these programs centers on the perceived benefits of hands-on educational experiences.

3.2.1 Student Excavations at Real Sites

One of the largest and most successful educational archaeology programs is the Toronto Archaeological Resource Centre (ARC) which is sponsored by the Toronto Board of Education (Smardz 1989a). The centre's mandate is to provide experiential educational opportunities for students in the Toronto School Board jurisdiction. In the summer (May-October) students in Grade four and up, have the opportunity to participate in an actual 'dig' for a half-day. The students are introduced to basic archaeological methods and techniques prior to working on the site and they are closely supervised by trained

archaeologists and technologists at all times. The dig is 'activity oriented'; students use the tools and methods of professional archaeologists, they have the opportunity to interact with real archaeologists, and they are encouraged to interpret the site as they excavate.

An intensive six-week field school for grade 11 and 12 students is offered in the summer (July-August) months. This course incorporates archaeological research and analysis techniques with classroom study of archaeology and the history of Toronto (Smardz 1989a). Besides excavations these students participate in laboratory analysis, produce a detailed site report and write an examination at the end of the project. They are also expected to take an active role in interpreting their units, and the entire site, for visitors.

During the winter months (November-April) classes visit the centre for special programs and projects related to archaeology. These winter programs may include courses on Precontact Pottery Making, Ontario Rock Art, scientific dating techniques and Native foodways (Smardz 1990). Teachers who bring their classes to the ARC are very enthusiastic about the centre's integrative approach; science, mathematics, geography, mapping, geography, art, industrial and cultural history are all combined in the activities at the centre (Sobol and Sobol 1993).

Although the ARC obviously emphasizes the educational benefits of archaeology, there is also an important research component to the project. Carole Stimmell, public archaeologist for the ARC states, "the centre's archaeological mandate is to uncover the early history of the City of Toronto" (Sobol and Sobol 1993:48). The ARC staff have been excavating the Gore Vale mansion site at Trinity-Bellwoods Park in Toronto since 1989 (Sobol and Sobol 1993:48). All the excavations are fully licensed as archaeological

research projects, and a site report is filed at the end of each season (personal communication, Stimmell 1991).

Smardz (1989a, 1990) emphasizes the importance of involving students in real research, research that will add to archaeological knowledge. Smardz (1989a:150-151) states,

> There are few opportunities for students in our public education system to contribute to the larger corpus of human knowledge. Participation in archaeological excavation and laboratory analysis is one way in which students' care, dedication and hard work can produce information which will be part of school textbooks of the future. Our experience both on Toronto sites and in the centre laboratories bears graphic witness to students' ability to make a positive contribution to heritage research and conservation.

Smardz (1989a) feels the students who participate in ARC programs come away from the activities with an enhanced awareness of the fragility of archaeological resources and the need to conserve and protect heritage sites.

There is little doubt that the ARC provides an excellent educational opportunity for students. However, the scale of this project, and the amount of financial and political support necessary to implement and maintain such a program, make it difficult to recommend this type of project to school boards. The logistical problems are also overwhelming; finding appropriate sites, with research and educational value, within easy access to schools, is unlikely.

The success and educational validity of programs such as the ARC offers is dependent upon several factors which are closely linked to educational continuity. First of all, the students must be adequately prepared by their classroom teacher before the 'dig-day' in order to avoid a 'field trip' atmosphere. The students should be familiar with

the interpretation and history of the site, material evidence that has been uncovered, and the goals and methodologies employed by archaeologists (Devine 1989). In other words, the excavation activity must be integrated with classroom learning.

Secondly, the quality of this preparation is directly related to the teacher's understanding of archaeology (Cotter 1979) and teacher initiative, interest and commitment to archaeology as an educational experience. A key element to a successful learning experience is the provision of adequate educational materials and resources for the teachers (Bailey and Clune 1968; Holm 1985; Selig 1991). Therefore, teacher inservice workshops should be developed in conjunction with any student archaeology programs (Devine 1985). These inservices must be organized to meet the needs of teachers, and be detailed enough to provide an adequate amount of information for teachers.

Thirdly, supplementary classroom activities, following the visit to the centre, are very important in order to provide an integrative, holistic educational experience. Follow-up activities should include discussions of the importance of scientific archaeological methods and techniques, goals of archaeology and the importance of heritage site preservation. The total length of such a mini-course must fit into the busy academic schedule of most schools. Again, teacher resources need to be developed to provide this educational continuity. The ARC staff are actively involved in creating the materials and resources that make this project a valuable educational experience. Although the ARC staff work as a cohesive unit, they are also in close contact with experienced educators to ensure the programs they develop meet the needs of teachers and students.

An excellent model of an holistic experiential archaeology program is described

by Carroll (1987). This project involved grade six students at Phoebe Hearst Elementary School in Washington, D.C. in a 14-week historical archaeology project. The students chose to excavate beside a stone cottage built in the 1870s following the Civil War. The cottage was situated in one area of their school grounds. A major focus of this entire project was to "emphasize clues that tell how, why and when people lived rather than show what people had" (Carroll 1987:71). Although this project was developed and implemented by the students' teacher, the five day excavation was controlled and closely supervised by an archaeologist who ensured that each group shared the tasks and responsibilities associated with archaeological research.

Carroll (1987) stresses the importance of fully preparing students through archival searches and interviews with elders in the area; the students can then develop preliminary hypotheses based on this background information. The students were acquainted with archaeological methodology and techniques by professional archaeologists and surveyors, through audio visual aids and visits to active archaeology sites. During this portion of the project, without realizing it, the students strengthened their listening, writing and organizational skills.

The multidisciplinary and integrative nature of archaeology became obvious as the students used,

> mathematics, for plotting artifacts on graph paper and squaring each excavation unit; botany, for recognizing plant remains; zoology, biology, and palaeotology, for recognizing bones, fossils, teeth, and skulls; geology for identifying soils and rocks; and anthropology, for identifying remains used or made for man (Carroll 1987:70).

In the laboratory stage, the students participated in artifact analysis (observation, classification, labelling, description, identification, and reconstruction). They were

prepared for laboratory analysis by visiting a real archaeology laboratory at a nearby university where an archaeologist explained artifact classification and identification procedures. In the final stage of the project, the students produced a professional museum display and slide show. This activity enabled the students to present their interpretation of the site, and archaeology as a scientific discipline, to their parents and the general public.

From the student's perspective, the program was a huge success; "learning by doing did not seem like school" (Carroll 1987:74). From the teachers' perspective, this program produced "multi-level activities that encouraged students with varying abilities to participate and excel" (Carroll 1987:74). As Carroll (1987) points out, this type of comprehensive hands-on educational experience serves to enhance manual and intellectual skills as well as interdependence between class members.

In this project, the emphasis appears to be on educational benefits, rather than archaeological research. However, the students' overall objective in the project was to research the historical past of a building in their schoolyard, and as such, they did add to the total historical knowledge of the area. The teacher and students were very conscious of their responsibilities; an experienced archaeologist was hired to conduct the excavation and all state heritage protection laws were followed.

This integrative, multidisciplinary approach is the optimum in educational archaeology programs. The students were involved in real research, with a clearly stated archaeological objective, while also increasing their exposure to cognate sciences and opportunities to discover and utilize scientific research skills. The project presented a valuable opportunity for students to be involved in a large-scale educational program that

reinforced their skills as well as piqued their curiosity enough to make learning an interesting experience. An obvious strength of this project is the teacher's incredible commitment, organizational skills and background knowledge. Without these strengths a project such as this one could never be accomplished.

A major criticism of using real sites for educational purposes stems from the fear that educational goals will take precedence over archaeological goals. The Koster Expedition at Kampsville, Illinois, sponsored by Northwestern University (Devine 1985; Henkoff 1978; Holm 1984; Kling 1984; Struever 1975), is an example of successfully combining archaeological research with educational goals. This precontact site is composed of multiple occupation levels dating back 8500 years (Struever 1975). The Koster Expedition is particularly relevant to education in light of the interdisciplinary nature of the research. The mandate of the interdisciplinary team of scientists, including archaeologists, botanists, biologists, zoologists, geologists and environmentalists is to determine the "functional relationships between the ancient cultural systems, the human beings who made and used them, and the environments to which they were adapted" (Struever 1975:27). The students learn about site formation processes, geological and cultural deposition, and precontact technology (Holm 1984). They also work at ceramic production, stone-tool technology, zooarchaeology, botany, weaving and thatching (Devine 1985).

The educational programs are designed for elementary students from grade six to university graduate students. The archaeologists operate four programs where the students directly participate in archaeological research. Briefly, these programs include: 1) a three-week excavation for grade six, seven, and eight students; 2) a one-week field school

for junior and senior high school students; 3) a five-week high school field school; and, 4) an eleven-week course for students from grade 11 to graduate school. Schools which send their junior and senior high school students to the camp for one-week of field work must also be willing to integrate the excavation unit into their social studies or earth science curricula (Struever 1975).

Struever (1975:30) describes the project as a rare educational experience; the students are not labourers, rather they are considered valuable "primary data recoverers." The students are responsible for their own excavation area, and recovering the data. "The students do not study "about" archaeology - they work as archaeologists" (Struever 1975:30). Holm (1984:49) states "students enjoy this opportunity to experience the excitement of discovery side-by-side with researchers, to do actual fieldwork, and to be part of a large, scientific project." Struever likens the Koster Expedition with an "evolving experiment in archaeology;" the program has undergone many changes over the years, with additions to the curriculum, theoretical orientation, and comparative archaeology (Henkoff 1978:15).

Although the authors who describe this program (Devine 1985; Henkoff 1978; Holm 1984; Struever 1975) do not specifically mention educators participating in the development of the programs, there is obviously some contact with schools for recruits and supplementary curricula. Henkoff (1978) also mentions 'teachers-turned-archaeologists' on the staff. Therefore, it is reasonable to assume educators are involved in the program.

Unlike the ARC (Smardz 1989a) or Phoebe Hearst (Carroll 1987) projects, the Koster project explores precontact cultures. Involving students in a precontact research

project can introduce a further complexity into the design of educational archaeology programs. The nature of the evidence is much more tenuous (ash deposits representing a precontact hearth as compared to stone foundations from an historic building), requiring increased care and attention when excavating. Secondly, the cultural sensitivity of precontact sites requires archaeologists and educators to tread carefully when developing an educational component for young students. However, the Koster Expedition has maintained these successful archaeology programs since 1971 (Devine 1985).

The advantages of involving students in precontact archaeology outweigh the disadvantages. The exacting work of uncovering material remains that are not as obvious as building foundations, and which do not have documentary evidence to back them up, encourages students to be extra careful, and to practice keen observation and interpretive skills. According to the majority of the educators and archaeologists cited in this review, this added responsibility is educationally and socially valuable and almost always results in students working carefully and diligently.

Secondly, the age of the remains places a greater emphasis on the antiquity of humanity; students tend to be in awe of anything that is very old. As Devine (1985:44) suggests, working with ancient cultural systems develops cultural relativism which promotes the ideology that "all cultures are equally valid and none are superior or inferior to any other." Excavating the evidence of precontact patterns of behaviour enables students to "understand that Native people successfully adapted to, and exploited, their environment for thousands of years before the arrival of Europeans" (Devine 1985:45).

The "Total Involvement Program" (TIP) at Raymer Junior High in Toledo, Ohio (Gettings 1970) is an example of a fully integrated educational archaeology program. The

project involved mitigation of a North American aboriginal settlement due to be destroyed by construction of an expressway. The teachers at Raymer Junior High set about to develop an integrated program which involved all school departments. Art classes revolved around traditional pottery manufacture; students practised record keeping skills in language arts classes; and surveying and field mapping were learned in the mathematics department. In science classes the students learned how to perform chemical analysis of soil samples, seeds and other plant materials and how to identify and catalog faunal remains. In industrial arts classes the students built tripods, screens and stakes, and sharpened shovels. In social studies the students studied early North American aboriginal cultures.

The science and social studies departments developed a student guide on the techniques and methods of scientific archaeological investigation. Before the actual excavation, students received a three week course on excavation procedures, using the guide as their major source. The students chose their own field of expertise (e.g. test pit crew, site mapping, photography, chemical analysis of soil samples, etc.), which they practised in a laboratory situation. During excavation, the students were closely supervised by teachers and parent volunteers. The students kept careful records of the excavation, including a master catalog which contained photographs, written records and sketches of the floor plan. After the excavation was completed, the students worked in the lab, cleaning pot sherds, animal bones, numbering and cataloguing artifacts, and reconstructing projectile point fragments.

This educational archaeology project exemplifies the integrative nature of archaeology and provided an excellent educational experience for the students of Raymer

Junior High. However, there are several problems inherent in this project. Of primary concern is the apparent lack of any professional archaeologists at the site. In addition, the site was on city land; however, there was no indication in the article that they received permission from the city, North American aboriginal groups, or heritage boards to proceed with the excavation. According to Gettings (1970), precontact occupation of this area is mentioned in the journals of French explorer, Peter Navarre, which indicates the site is culturally and archaeologically important. Although the teachers developed an excellent educational program, archaeological information was likely lost in this exercise. This fact is of particular concern since very few archaeological sites have been found in this area of Ohio (Gettings 1970). Although the students kept records, Gettings (1970) does not mention whether a site report was written. In addition to the above mentioned problems, a recurring theme in the article by Gettings (1970) was the eagerness of the students to work with human bones and the disappointment felt by students and teachers when none were found. Negatively evaluating a program such as this is difficult since the educational merits of the program are so obvious. In addition, this project was ahead of its time, originating in 1970 when very few educational archaeology programs were operating and little critical analysis of these types of programs had taken place. Therefore, educators (and archaeologists) were not as aware of the ethical ramifications of these types of programs. This project illustrates the problems that were encountered in the early stages of educational archaeology. As the field of educational archaeology has developed, archaeologists have moved to ensure that educators are more aware of the ethics involved in archaeological research.

Until recently, many archaeologists have been guilty of excluding aboriginal

people from archaeological research. This situation is being rectified as archaeologists are beginning to reach out to aboriginal groups, to consult and collaborate, and to include aboriginal people in archaeological research projects. An early, innovative program was developed in 1978 at Oxford House, Manitoba (Smith 1980). Ten Swampy Cree student teachers became involved in an archaeological dig. There were several objectives in this archaeology project. The first objective was to offer these students the opportunity to write their own lost history, using scientific processes and research techniques. Smith (1980:3) states "the scientific format of archaeology provided the native student with a cultural background and an understanding of the scientific process." These processes are identified by the Manitoba Department of Education's Interim Guide for Elementary School Science 1976, as "observation, classification, communication, measuring, space/time relationship, inferring, and predicting" (Smith 1980:3).

The second objective was to find a common base of interest between the students, their community and their educational requirements. This project presented an excellent opportunity to demonstrate how archaeologists can work with First Nations peoples and educators to meet the needs of all three groups. More specifically, the archaeological research was culturally relevant to the First Nations students, and therefore, educationally relevant. Since no archaeological activity had previously taken place in this area, this project also allowed archaeologists to conduct important archaeological research.

Archaeology's interdisciplinary nature enabled these students to gain a broad base of knowledge; they were exposed to geology, the soil sciences, osteology and pottery analysis during the project (Smith 1980). They also received practical experience in scientific research techniques and developed skills applicable to their own classroom

teaching.

Smith (1980) states that teachers working in cross-cultural situations must approach their lessons from a cultural, as well as scientific perspective. Through archaeological research, these students learned about the cultural adaptations of their ancestors. This knowledge, in turn, allowed the students to more closely identify with, and acknowledge the validity of their ancestors' past lifeways. The third objective of the project was to foster an interest in preserving the community's cultural history and to start a museum in the community (Smith 1980).

This project had cultural, archaeological and educational significance; a partnership that benefitted all parties. Archaeology was the cohesive bond between First Nations students' culture and their education. The students, as future teachers, will provide a connection between their culture and the education of their students.

In summary, the justification for these types of experiential educational archaeology projects is certainly well-founded. However, given the ethical considerations and the cultural and scientific sensitivity of many archaeological sites, opportunities for these types of activities are limited. Simulated sites are one alternative for alleviating concerns about possible loss or distortion of archaeological information.

3.2.2 Simulated Archaeological Excavations

Several excellent simulated archaeological programs have been developed (see Passe and Passe 1985; Rice 1990; Stone 1978; Vantilburg 1981). Simulated activities can be offered in a school setting, which is an advantage for teachers who are often short of financial resources. These programs tend to have somewhat different focuses but very

similar goals: to use archaeology as an integrative teaching vehicle. Vantilburg (1981:264) describes a simulated archaeological project as "a humanistic vehicle for teaching both scientific and social studies material."

Smith (1991b) describes a Museum of Florida history summer camp, entitled "Archaeology: Can You Dig It?" This simulated excavation offers a substantive educational experience for nine to twelve year olds. The site is comprised of one meter square units, with two occupation levels, one precontact and one historic. Each level contains food and tool production activity areas and evidence of a domicile (Smith 1991b). In a three-day excavation the students have the opportunity to practice excavation, recording and interpretation of data. The students also take other field trips and participate in programs related to the history of the area. At the end of the week, the students prepare an exhibit about archaeology for public display.

This project enables students to gain a good grasp of archaeological methodology, and auxiliary activities round out a good educational experience. However, there is little educational continuity and integration with other school subjects since the camp is only three days long and is not offered in conjunction with school based programs. On the other hand, the developers did collaborate with teachers and school system planners to familiarize themselves with county curriculum requirements. The objective of this consultative process was to incorporate concepts and facts into the program in order to augment classroom learning (Smith 1991b).

There is always the danger, particularly in simulated exercises, that the emphasis on digging and finding artifacts overrides any other considerations. Heritage protection and conservation ethics do not appear to have been included in this program. A simulated

program such as this can also be an excellent training field for later participation in real excavations.

An example of using a simulated site for training in field methods is described by Rice (1985b). Rice (1985b) suggests that a simulated site is excellent for teaching archaeological methods and technique, as well as interdisciplinary data analysis. Although this simulation progressed from excavation to site report writing, the emphasis during the activity was laboratory analysis.

The simulated site was a 4 x 2 x 1 meter box with nine strata signifying an Upper Palaeolithic rock shelter (Rice 1985b). Upon completion of the excavation, each member of the team was assigned an area of analysis (e.g. bone tools, soils/geology, lithics, etc.). The students were required to do background reading on the Upper Palaeolithic and their field of specialization, as well as search out experts in their field. Data analysis included "technological analysis (food, tools, housing, clothing, containers); social analysis (demographics, social structure, social groups); ideological analysis (ritual and art objects); ecofact analysis (environmental context)" (Rice 1985b:304).

Through this comprehensive, interdisciplinary project students had the opportunity to work cooperatively as a team, and as individual experts in the field, as well as synthesize their findings into a site report. This unique opportunity to work as a professional was enjoyed by the students; most reported an increased appreciation for archaeology. Rice (1985b) reports many of the students involved in these projects have served as lab assistants in later years, and others have gone on to work at real archaeological sites around the world. These students cite their work on the simulated project as valuable experience in preparing them for real archaeological work. However,

it should be noted, educational archaeology programs are developed to provide an educational experience for students, not to train future archaeologists.

Jeanne Miller (Benge and Miller 1988) discusses her experiences as a resource teacher for an Extended Learning Program (ELP) for gifted students in grade three to six in Mesa, Arizona. Miller developed a curriculum around Dig 2, "a unit that emphasizes the concept of cultural universals, which are the common elements of all cultures" (Benge and Miller 1988: 81). This 26-week curriculum was divided into three sections. The first eight weeks focused on investigating precontact and historic cultures, chronology, excavation methodology and the concept of stratigraphy. The next six weeks focused on research projects about ancient civilizations or precontact cultures, and creating projects such as a scale model of a Pompeiian village. In the final 12 weeks, the students participated in the multidisciplinary simulation, Dig 2, created by Lipetzky in 1982 (Benge and Miller 1988). This simulation involved creation, excavation and interpretation of a vanished civilization. The students were broken into two teams to create a secret culture, make the relevant artifacts and bury them. Each team then scientifically excavated the other site, analyzed the evidence and reconstructed the culture. The students had the opportunity to experience archaeology rather than only read about it (Benge and Miller 1988). The classroom became a laboratory, and the students participated in observing, measuring, interpreting and discussing their findings.

The curriculum also included field trips to archaeology sites and a culminating trip to Mesa Verde National Park in Colorado to hear from archaeologists and park rangers about the history of the Anasazi. "The everyday lives of a prehistoric culture were recreated for the students, and they began to understand the how's and why's of

archaeology as the pieces of the puzzle came together" (Benge and Miller 1988:81). Aside from the educational benefits of a project such as this one, Miller felt the students developed a deeper understanding of the science of archaeology and how difficult it is to interpret a culture's past through material remains. This project provided an excellent, well-developed educational opportunity for students. Of particular note is the attempt to inculcate a relativistic outlook in the students through hands-on activities rather than a lecture format.

Devine (1985) has reviewed the Dig 2 simulation game. The simulation includes a 'teacher-friendly' edu-kit, complete with a detailed teacher guide, an overview of the activities, a time chart, lesson plans, optional activities, student forms and instructions (Devine 1985). Because the kit is complete, teachers need only a minimum of preparation time before they are confident enough to teach archaeology. The kit is also inexpensive ($55.00 Cdn.), enabling school boards to purchase several kits. This edu-kit requires a relatively short period of time to complete (15-20 hours) and the flexibility of the program enables teachers to incorporate the simulation into different projects (e.g. Miller's project) (Devine 1985).

Another excellent example of a large simulated archaeological project is Camp Cooper, an environmental camp owned by Tucson, Arizona Unified School District (Ellick 1991a; Kling 1984; Urban 1988). Volunteers, amateur and professional archaeologists, along with the Arizona State Museum cooperated to create this educational experience. The simulated site represents a "Hohokam rancheria-style house cluster and associated ramada, wasting pit, and trash areas" (Urban 1988:77). The archaeologists scatter appropriate artifacts over the site and cover the site with 10 centimetres of dirt;

a permanent grid of two meter square is superimposed over the site (Urban 1988). To avoid the label of "just another field trip" the educational components of this experience were taken very seriously. Teachers, who have previously taken a teacher archaeology workshop, present proposals for a dig; 10 to 20 classes are eventually chosen to dig at Camp Cooper (Ellick 1991b). A manual, entitled "Archaeology is More than a Dig" prepares the students for their visit to Camp Cooper. This manual introduces teachers and students to archaeological methods and techniques, the culture of the Southwest, and archaeological activities they will participate in at Camp Cooper (Urban 1988:76). The major components of the program include: 1) pre-camp activities: lectures by professional archaeologists on precontact history of Arizona and archaeological field methods, stressing context; work with an artifact kit that contains artifacts, information cards, game ideas, and a glossary; 2) camp orientation: lessons on technological changes, archaeological interpretations and cultural inferences; 3) excavation and record keeping, and collection of artifacts; 4) laboratory analysis: review of excavation, orientation to laboratory work, and cleaning and processing of materials; 5) closure: discussions of dilemmas and ethical considerations in archaeological research; and, 6) a final visit to the site where responsibilities for protection and conservation of archaeological sites are reiterated. Ellick (1991b:27) describes the program as "a hands-on, non-destructive interdisciplinary archaeology program" for students in grades three to six.

Ellick (1991b) reports the success of the program is evident; students have identified and reported sites on their parents' land; one child realized that his collection of artifacts was unethical and donated it to the community; a North American aboriginal student became more appreciative of his heritage and became a better student in school.

To summarize, simulated excavations can provide a solid educational experience for students. In particular, the integrative multidisciplinary nature of archaeology can benefit classroom learning. Although simulated archaeology projects do not present the same problems as using real archaeology sites, collaboration between educators and educational archaeologists is still very important. For example, some of these simulation projects tended to over-emphasize finding artifacts or 'treasures'; it is difficult to measure the educational benefits against possibly encouraging a 'collectors' mentality. Again, the importance of site conservation and protection must be a key element of these projects to avoid sending the wrong message.

3.2.3 Classroom Activities

Although most educational archaeology projects focus around fairly complex excavations and laboratory analysis, there are many small-scale activities that can be incorporated into the classroom (also see Brilliant 1991; Christensen 1993; Dick and Woburn 1984; Ellick 1990; Jaus 1975).

Cotter (1979) describes a small project developed for kindergarten students in Philadelphia, Pennsylvania. These students built a sandbox site. They became familiar with concepts of stratigraphic deposition and artifact recognition and retrieval, recording of data and site conservation (Cotter 1979). Although Smardz (personal communication 1991) feels students younger than nine years old are incapable of understanding concepts such as provenience, E. Kramer, developer of this project, suggests students can quickly understand the relationship between context and artifacts (Cotter 1979). Cotter (1979:229) feels this success proves "archaeology is a natural education tool whatever the age."

Gronemann (1988) has also developed archaeology activities for very young students; for example, the "Let's Go On a Dig" kit which introduces archaeology as a scientific study of the past to kindergarten to grade three students. The students became familiar with the methods used by archaeologists to study the past through hands-on, sensory activities. Resources in these kits include stories, pictures, tapes, art, tactile materials and resource books.

A feature of this particular kit is a story, 'Diggingest Dog.' This analogical story relates the actions of a dog who digs up an entire town before understanding he is destroying the town with his careless digging. Discussions with the students illustrate an archaeologist's responsibilities when excavating at a site and how protecting and conserving archaeological sites is everyone's duty. This is an excellent approach for introducing students to the importance of archaeological conservation.

The actual activity revolved around McDonald's refuse buried by the teacher. Before excavating the simulated site the students were familiarized with the tools, methods and techniques employed by archaeologists. After tagging and bagging the artifacts, the rest of the activity was completed in the 'lab' classroom. The students then discussed the meaning of the material evidence they found.

In essence, this activity served to introduce the students to basic techniques and concepts of archaeology through hands-on participation in a very simplified simulated excavation. Unfortunately, it appears the emphasis in this activity was on discovering artifacts rather than interpretation or contextual analysis. However, as stated by Smardz (1989a, 1990) the age of the students may preclude any in-depth conceptual development.

In bringing closure to this activity the over-emphasis on digging and finding

artifacts is further reiterated. The students were given a shell from the Gulf of California as an "artifact." These shells are the same as might be found in association with Hohokam Indians who used these shells to make jewellery. Again, the emphasis seems to be on the artifact rather than on context. Giving the students an artifact may reinforce the idea that artifacts are rewards or precious objects to collect. This type of problem can be avoided, while still using artifacts as the focus of a classroom activity, as is illustrated in the following activity.

Allen and Felton (1980:1) suggest artifact analysis is an excellent media "to stimulate and provoke student inquiry." Inquiry processes used in artifact analysis include: 1) raw materials and their relationship to spatial and temporal factors; 2) manufacturing techniques, and; 3) form, function and organization of the artifacts (Allen and Felton 1980). Tirrell (1983) describes an artifact analysis activity created by museum staff at the Stovall Museum of Science and History, University of Oklahoma, Norman, Oklahoma with cooperation and assistance from local schools and the Office of the State Archaeologist (Tirrell 1983). Grade six students excavated a sandbox seeded with real and replicated artifacts representing several of Oklahoma's precontact cultures (Tirrell 1983). The excavation was the core activity of a week-long unit on Oklahoma archaeology which was integrated with their social studies curricula. Although the students excavated the sandbox, the focus of the activity was on laboratory analysis of an assemblage of artifacts found at the hypothetical site. The students identified the artifacts by comparing them to sketches of artifacts in the museum's reference department. The students developed hypotheses concerning the possible functions of the artifacts based on analysis of the physical characteristics. This identification exercise enabled the students

to analyze the site and develop a description of the culture represented in the material evidence. In follow-up activities the students invited local resource people into their class to teach precontact food processing and tool making. This program became so popular with Oklahoma elementary schools that a similar program was developed for secondary students. In addition, teacher workshops were presented at the university, and several public schools piloted and evaluated the programs. This project is an excellent example of a collaborative effort by educators and archaeologists, as well as drawing local resource people into the project.

Experimental archaeology activities, such as those undertaken by the Oklahoma students, are innovative programs which allow students to make artifacts using traditional methods. A major objective of experimental archaeology projects is to inculcate a sense of respect and empathy for crafts people of the past (Kissock 1987). McNutt (1991a) describes seventh grade students participating in flintknapping activities in Petersburg, Alaska. These students used traditional antler awls to pressure flake obsidian arrow points. Other students straightened arrow shafts by pulling the shafts across whetstones. This particular activity is part of the "Project Archaeology: Saving Tradition" (P.A.S.T.) curriculum created by Nan McNutt (McNutt 1991a; Smith 1991a). The purpose of this activity is to introduce students, through practical application, to the complexity of stone technology. Virtually everyone who has the opportunity to participate in experimental archaeology projects, such as flintknapping and pottery making, comes away with an increased respect for these technologies and the people who practised these crafts (Delaney 1977; Kissock 1987).

The activities discussed in this section have, for the most part, been educationally

sound. However, there is a very real danger that classroom activities can lose their potency when taken out of the context of archaeological research. Dick and Woburn (1984) describe a garbage box exercise in archaeology which emphasizes artifacts to the exclusion of any contextual reference. The students were given a box of artifacts, containing unusual, broken, and malformed objects. The activity began with an introduction to archaeology, and the role of artifacts as archaeological evidence. Each student chose one artifact to analyze and then completed a research report form. The students used several skills in this activity: sketching, description and deduction (use, cultural values and levels of technology). The objective of this activity was to "help explain how we attempt to understand pre-history and to arouse interest in the topic of archaeology" (Dick and Woburn 1984:44).

There are several fundamental problems with the messages presented in this activity. As with many simulated activities, there appears to be an over-emphasis on artifacts as the focal point of archaeology. In addition, the artifacts were out of context. Out-of-context artifacts have limited value in archaeological research or education; students are unable to progress from convergent to divergent analysis. The choice of "strange and unusual" artifacts may also be sending a mixed message. Culturally relative archaeologists view cultures of the past as valid, not strange or unusual, regardless of how different their patterns of behaviour.

Classroom activities, such as those just discussed, can present some valuable lessons about peoples of the past, as well as allowing students to learn through a hands-on approach. As with all educational archaeology activities, the quality of the program is directly dependent upon the level of archaeological knowledge and understanding of

archaeological concepts possessed by the teacher and the educational and archaeological resources available to the teacher.

Educational archaeologists and educators must consider many issues beyond providing an interesting educational experience for students. Although the previously reviewed projects, both real and simulated, represent the epitome in educational archaeology programs, this is not the case with all projects. The following programs do not appear to recognize the dangers in indiscriminate excavation by enthusiastic but inexperienced and unauthorized educators. The programs to be discussed are educationally valid, however, the ethical issues preclude any positive elements of the programs.

3.2.4 Ethical Considerations

The educational value of archaeology has been touted in this study. However, enthusiasm for these programs has meant the ethical issues related to archaeological research have been neglected to a certain extent. These issues tend to focus upon: 1) unauthorized excavation at archaeological sites, 2) excavation and examination of precontact burials and/or sensitive sites; and, 3) collection of artifacts (looting sites) for educational purposes. The following section illustrates some of the problems associated with educational archaeology projects carried out by educators who are unaware of the ethics involved.

Barden (1984) combined a simulated activity with a real excavation program. In the first stage of the project, high school students at Morris Central in Morris, New York developed a simulated Phoenician dig. The major goal of this project was "to have

students use the correct scientific methods of excavating artifacts" (Barden 1984:5). The students practised archaeological retrieval, mapping, measuring and laboratory analysis of all the artifacts. The project was successful in its educational goals, although the goals do not appear to have moved beyond rather simplified activities into the realm of synthesis and interpretation of archaeological data.

After the successful completion of the simulated dig, the teachers decided to develop a real archaeological dig for their students. This attempt to involve students in real scientific archaeological research, although credible, incurred several problems. The first concern relates to the focus of the project, as an educational exercise, rather than as archaeological research. The purpose of this project appears to be to provide students with the opportunity to dig for real artifacts with no consideration for context or possible destruction of valuable archaeological information. This deficit may be directly related to the avoidance of any introduction to archaeological interpretation during the simulated activity. Cotter (1979) stresses the importance of understanding the differences between archaeological research and pot hunting.

A second major concern is the cultural sensitivity of the site; these students were digging for relics in a precontact site. The excitement the teacher felt in the unexpected discovery of a human skeleton and the additional educational opportunities he foresaw in this situation are irrelevant considering the serious consequences of desecrating aboriginal ancestral burials. Archaeologists have recently begun to understand and empathize with North American aboriginal concerns about indiscriminate excavation and analysis of human remains. Therefore, this type of activity should be avoided. Again, education of the public, and in this case teachers and students, about the ethics involved in

archaeological research and the need for displaying respect for cultural remains is a crucial part of educational archaeology.

The question of ethics is also at issue at an archaeological dig for high school students near Logan County, West Virginia (Sentelle 1986). Again, the motives are laudable, however, when teachers actively seek out a site for their students to dig, there are serious questions about ethics. Sentelle (1986) relates the activities of a teacher who was very interested in archaeology and enthusiastic about opportunities to provide special educational experiences for his students. Sentelle (1986) does not discuss whether this teacher was granted (or even applied for) an excavation permit. However, from the information in the article it appears the teacher went ahead with the dig after receiving permission from the school board. Nor is there any indication that a qualified archaeologist was ever present at the dig. This teacher was an experienced amateur archaeologist, however, amateur archaeologists without an archaeology permit are not qualified to run archaeological excavations.

Soon after the dig began, two complete skeletons, in a flexed position, were uncovered; one skeleton had an arrowhead in the body cavity (Sentelle 1986). These skeletons were removed from the graves and taken to the Marshall University Medical School for further examination. Conaty (1989:410) states, "it is no longer acceptable to Natives that whites - and especially anthropologists - study and interpret their culture as if it were just another specimen for scientific research." Although the damage was already done, at this time the dig should have been closed, North American aboriginal leaders contacted and real archaeologists brought in to examine the site. This project exemplifies archaeologists' concerns about unqualified excavation for educational

purposes.

There also appears to be a dichotomy in teaching with archaeology. Archaeologists seek to teach students not to loot sites, and yet most archaeological activities revolve around real or simulated sites where students dig for artifacts. Rutherford (1992/93) relates an experience he had while implementing an educational archaeology curriculum. The teacher did not appear interested in preparing her students for the excavation activity by discussing the goals of archaeology. Instead, the whole focus of the project was to let the students dig. This situation is sending a mixed message. As Rutherford (1992/93: 2-3) states, "the ethical propriety of any activity that abets site destruction is questionable." Rutherford (1992/93) feels the basic problem is the tendency to be too casual about archaeology, viewing educational archaeology projects as merely field trip opportunities. Rutherford (1992/93:2) emphatically states "it is time to consider the merits of teaching precollege archaeology with only minimal coverage of field methodology and without the practical experience of digging." Instead archaeology should be taught as part of the anthropological study of cultures of the past (Rutherford 1992/93).

On the other hand, Hartman (1985) suggests that scientific methodology and contextual importance be emphasized to avoid the 'treasure hunt' mentality, and Devine (1985:40) cautions that,

> a simulated dig is a complex undertaking requiring a great deal of preparation of both materials and procedures. If the simulation is not planned and executed correctly, it will degenerate into a 'treasure-hunt' where the main objective is to uncover artifacts rather than to interpret the nature of the artifacts in the context within which they were found.

Blanchard (1991) echoes these concerns, particularly in simulated sites, where

archaeological programs can degenerate into entertainment or pot hunting activities. Educational archaeology programs without clear educational goals and high ethical standards can send the wrong message to students and actually encourage looting of sites.

Plants (1984), an educator in Louisiana, reports his participation in the development of an archaeological project revolving around the collection and analysis of projectile points. Even though Plants (1984) mentions seeking permission from the landowner and checking state laws on antiquities, the focus of the activity is taking students on a field trip to surface collect artifacts. Encouraging students to participate in artifact collection is sending a dangerous message; these students will likely assume it is acceptable (and legal) to pot hunt. This perception directly contradicts heritage preservation and conservation of sites. In addition, by removing evidence from a site, this activity has robbed society of valuable information about the culture history of the area.

In the second part of Plants' (1984) activity, the students classified the artifacts based on shape, hypothesized about use, and made inferences about the site, the people and the time period. Although this was an activity of some educational value, these artifacts were taken out of context, therefore, any true educational value from their interpretation was missing.

The problems associated with the previously discussed projects can be avoided if educators and archaeologists work together to adequately prepare teachers to teach with archaeology.

3.3 Teacher Preparation

An effective means of demystifying archaeology for students lies in educating the educators (Smith 1991). "The key to successfully introducing archaeology into the classroom rests on well-informed teachers who are backed by up-to-date resources and who are assured that support is readily and economically available" (Christensen 1993:5, 8). Messenger (1993) suggests that educational archaeologists should focus their efforts on training teachers in the educational value of archaeology in order to encourage teachers to use archaeology in their classrooms (Selig 1991).

Gronemann (1992) feels that conscientious teachers will not attempt to teach material they are not comfortable with. Therefore, archaeologists must offer teachers educational opportunities to gather the knowledge they need to feel confident teaching archaeology. This teacher training can take many innovative paths, including workshops, inservices, university archaeology classes and field schools (see Christensen 1993; Ellick 1991b; Head 1993; Holm 1985; McNutt 1991b; Riley 1992; Rogge and Bell 1989; Smith 1991a).

Selig (1991) outlines several ingredients for successfully introducing teachers to educational archaeology: 1) archaeologists must be aware of teacher needs in order to develop programs that are useful and relevant to teachers; 2) courses and workshops must be designed specifically for teachers; 3) these courses must include viable classroom hands-on activities and an in depth focus on particular topics. Chilcott (1977) cautions against development of 'crash courses' which present archaeology at a superficial level.

Smith (1991b) describes a six-week workshop developed for teachers interested in teaching with archaeology. The developers of the inservice had to choose from two

alternatives for their approach to the teacher workshop. The first alternative was to focus upon archaeological concepts and processes, and create a mini-excavation. The second choice was to integrate archaeological activities into core subjects. They chose the latter, multidisciplinary, integrative approach, for several reasons. First of all, teachers are extremely busy and receive a great deal of new material that they would like to incorporate into their teaching. Time and financial restraints make creating an actual dig a daunting prospect to all but the most enthusiastic teachers (Smith 1991a). Secondly, an integrative approach to learning appears to be a favoured approach to teaching at the moment (Smardz 1990). The archaeological activities were integrated into four basic curriculum areas: social studies, science, mathematics and language arts (Smith 1991b: 16). The workshop included lectures, tours, hands-on activities, and developing lesson plans (Smith 1991b). The teachers then tested their lesson plans with a group of girl scouts. Smith (1991b) reports the experiment was very successful. The girl scouts received an introduction to archaeology from a qualified archaeologist, then the teachers conducted their lessons. Some of the lessons included "excavating stratigraphic boxes, making coil pots, reconstructing clay pots, making Indian adornments, drawing artifacts, and making plaster molds" (Smith 1991b:16). In the future, the developers of this workshop hope to combine both alternatives into a more comprehensive program which still keeps in mind the realities of a classroom.

Selig (1991) describes The Anthropology for Teachers Program in Washington, D.C. which had four major objectives: 1) present teachers with background information in anthropology and archaeology; 2) assist teachers with integrating anthropology and archaeology into classroom subjects; 3) connect teachers with community resources, and

4) create a support network of teachers, anthropologists and museum educators. In addition, a tri-yearly newsletter for teachers entitled, AnthroNotes is published to facilitate a network of interested teachers, anthropologists and museum educators (Selig 1991).

The teacher training program focused on a 'topic approach', which enabled the teachers to become very familiar with these topics. Some of the topics included "human evolution, archaeology and ecology, civilizations of the past, Native American cultures, and anthropological fieldwork" (Selig 1991:4). Each of the topics involved introductory lectures which focused on recent research, workshops with experiential teaching activities, a seminar session with museum and university scholars and a workshop where teachers could view materials and films, and share curriculum units they had developed (Selig 1991).

This training project was quite unique in that the program was university-based, taking advantage of the wealth of professional and educational expertise that exists in universities. This program was successful because the developers conducted a teachers' needs assessment to ensure that the programs would be relevant and useful to teachers. In addition, the participatory activities and teaching strategies were tested in classrooms to ensure their utility.

Rogge and Bell (1988, 1989), as part of the Arizona Archaeology for the Schools committee, developed a weekend workshop for teachers interested in archaeology's educational utility. Features of the workshop included a slide presentation introducing archaeology as a subdiscipline of anthropology, and an overview of the precontact period in the area. Four to five hours were spent in sessions developed to teach archaeological concepts and activities. Some of these sessions included: 1) introduction to relative and

chronometric dating techniques; 2) simulating ceramic production and variability; 3) "garbage can archaeology" activities to present concepts of stratigraphy and artifact interpretation; 4) anthropological universals such as the concept of culture; and, 5) a dig-in-a-box activity. The teachers and archaeologists also toured a museum and viewed a slide presentation which discussed the importance of conservation and protection of heritage sites. To add substance to the first part of the workshop, the second day involved working on a real archaeological site, laboratory or survey team for a day.

These workshops were successful, in part, due to collaboration between professional archaeologists and classroom teachers to create a format familiar to teachers, and which met the needs of the teachers (Rogge and Bell 1989). The purpose of these workshops was to familiarize the teachers with archaeology as a discipline and as an educational vehicle.

Although this study has examined several educational archaeology curricula, the following section will further elaborate on the development of archaeology curricula, in particular, focusing on ingredients of a successful archaeology program. Devine (1985) summarizes the ingredients for a successful educational archaeology program: teacher training or inservice; support from administrators, teachers, and parents; flexible, reasonably short, inexpensive, easy to organize programs; inclusion of real experiences in excavating or experimental archaeology; professional archaeologists and anthropologists as resource people, and access to facilities where hands-on activities can be presented.

3.4 Development of Archaeology Curricula

An innovative curriculum, entitled Intrigue of the Past: Investigating Archaeology, was developed for grade four to seven students in Salt Lake City, Utah (Smith 1990). The major objective of the curriculum is "to instill in school children an understanding of, and appreciation for cultural resources and their preservation" (Smith 1990:4). Because this objective is so important to Cultural Resource Management (CRM), the developers realized they must produce a curriculum that appeals to, and meets the needs of all teachers, not just teachers who are already familiar with and interested in archaeology. Smith (1990) also reiterated the importance of creating 'teacher friendly' materials. Teacher friendly materials are complete within themselves; busy teachers do not have time to search out missing information. These materials must also be clear and concise, with stated educational goals and objectives.

The development of this curriculum was a collaborative process, with educators, North American aboriginal peoples and archaeologists working together to produce educationally, archaeologically and culturally valid materials. Before using the curriculum, teachers attended a workshop where they received a teacher's guide with lessons, quizzes, work sheets and illustrations (Smith 1990). Some of the characteristics of this program include: 1) a variety of teaching and learning styles, including active participation; 2) integration and infusion with the core curriculum of Utah; 3) North American aboriginal peoples' perspective; 4) flexible and adaptable lesson plans with clearly stated objectives; 5) a values component; and, 6) activities that reflect educational trends - scientific inquiry, problem-solving, holistic thinking, cooperative learning and citizenship [values] (Smith 1990).

Bailey and Clune (1968) suggest anthropology [including archaeology] fits well within a "spiral curriculum." In this type of curriculum, anthropology topics are introduced in the early grades, followed by more advanced presentation of the material in later grades. For example, a curriculum project was prepared by the University of Georgia for elementary students. The developers of this curriculum wanted to design a sequence of instructional materials that were factually and conceptually sound (Bailey and Clune 1968). One of the units entitled "The Development of Man and Culture," introduces archaeological methods and New World history of the Hopi to grade two students. In the fifth grade the materials on archaeological methods are elaborated; evolution, fossil humans, and Old World prehistory are introduced (Bailey and Clune 1968). This unit was designed to fit into existing social studies programs. The curriculum developers designed a teachers' workshop; during the summer teachers took formal course work in anthropology. These teachers were also supplied with a teacher's guide and materials to augment the curriculum.

This project involved a cooperative or collaborative approach between anthropologists, and faculty at the College of Education (Bailey and Clune 1968). The anthropologists were responsible for writing the background information for the teachers, however, the educators evaluated the materials for their teachability. The educators were responsible for preparing guides, texts and tests which the anthropologists assessed for accuracy. Teachers and anthropologists also worked together on choosing the best strategies for teaching the anthropology units (Bailey and Clune 1968). The fundamental principle behind this collaborative approach is the need for anthropologists and archaeologists to learn more about formal education, teacher needs and perspectives. In

this way anthropologists and educators can work together to develop anthropologically and pedagogically sound programs (Bailey and Clune 1968:9).

Thus far, this review has focused upon development of short archaeology units and classroom activities. Although most teachers use a variety of resources in their teaching, textbooks are a major source of information and evaluation activities. A recent attempt to use local resources and expertise to write an archaeology segment in a textbook is worthy of closer examination. The textbook, Roots of Society (Hayden et al. 1992:preface) was developed to "present an interesting and accurate story of how the society of present-day Saskatchewan came to be." A short section on archaeology is included in the introductory unit on Time. Although the emphasis in the archaeology unit is still focused upon classical archaeology and civilization, a unique element of this unit is the utilization of local resources, in particular, a case study of Bushfield West. Bushfield West is an archaeological site adjacent to the Saskatchewan River, near Nipawin, Saskatchewan, which was excavated by Saskatchewan professional archaeologists. The descriptive materials and diagrams of the site, and the inferential skills and activities sections in the text are very well done. Including local resources in a textbook is an excellent strategy; teachers and students can identify with this site because it is close to home, resource personnel (e.g. archaeologists who have worked on the site), are nearby, and the cultural information has more relevance because the precontact peoples lived in this area.

The educational and archaeological validity of this endeavour are not in question; hopefully this type of initiative is only the first of many similar projects. However, upon closer examination of the textual material (excluding the section on Bushfield West), there

are several problems or oversights. In the section on archaeology, the term 'prehistory' is used, although First Nations groups have specifically stated the word implies lack of history before Europeans arrived in North America. The emphasis on archaeologists "digging up likely sites" (p.20) is a disturbing message to present to students. No mention is made of the concerted efforts by archaeologists to protect sites and conserve them for future generations. These inadequacies, plus the incorrect definition of an 'artifact' (p.21) indicate that educational archaeologists were not involved in writing this section. The difference in quality of information between this section and the Bushfield West case study, which was written by archaeologists, is obvious.

Supplementary materials include an activity guide and curriculum guide. Several activities which focus upon case studies and analysis of in situ artifact collections are included in the activity guide. These activities reach beyond simple classification and analysis to more complex inferential exercises. One enrichment activity focuses on building a mock (simulated) archaeology dig to demonstrate archaeological excavation methods and techniques. These activities are well done, although the emphasis is on ancient civilizations. The curriculum guide does not include any supplementary information or guidance for the archaeology unit.

In conclusion, the attempt to include archaeology in this textbook is laudable; in particular, inserting a section on Saskatchewan precontact archaeology is an important step. Discussions with teachers who teach grade nine social studies indicated additional sources of information, guidance (in the curriculum guide) and human resources would make them feel more comfortable and more willing to use the materials.

Valuable resources for teachers include local archaeology sites, museums and

facilities that can bring history alive. Blancke and Cjigkitoonuppa's (1990) research has found that educators commonly choose museum programs and visiting archaeological sites to augment standard curriculum materials. In addition, there is an increasing tendency to develop curriculum materials that present an accurate picture of precontact history using local resources. Wanuskewin Heritage Park Interpretive Centre is an excellent example of a local cultural, archaeological and educational resource for teachers in Saskatoon and Saskatchewan.

Wanuskewin Heritage Park opened in 1991, near Saskatoon, Saskatchewan, after years of collaboration and consultation between archaeologists, First Nations peoples, government officials and educators. Walker (1987:127) describes this project:

> The goal of this project is to promote and establish an internationally recognized heritage park dealing with prehistory that serves as a major tourist attraction and contributes to increasing public awareness and understanding of the cultural legacy of the Northern Plains Indians.

Wanuskewin Heritage Park was designed with scientific research, public education, tourism and promotion of First Nations cultural heritage as the primary objectives (Walker 1987).

From the initial planning stages, First Nations peoples were involved in the project, to ensure that the needs and aspirations of First Nations peoples were met. This active participation can be directly linked to a resurgence in cultural pride and an emphasis on reclaiming their own culture history (Walker 1987). Walker (1987) suggests this type of interpretive centre can go a long way towards dispelling misconceptions and stereotypes associated with First Nations peoples in the past, and serve as a link to the present.

As mentioned, an important component of Wanuskewin Heritage Park is education. The entire interpretive centre serves as an educational facility. However, additional efforts, such as development of a specialized Wanuskewin edu-kit and teacher's guide, were commissioned to ensure students and teachers have the necessary background information to utilize the resources at Wanuskewin Heritage Park. Further discussion of the Wanuskewin Heritage Park edu-kit can be found in chapter five.

3.5 Summary

Experiential archaeology programs undoubtedly have educational value. A well-developed program provides students with a hands-on learning experience. The students are involved in research which attempts to reconstruct past lifeways, using scientific methods and techniques. These projects encompass social, cultural, scientific and educational benefits. Social and cultural benefits include exposure to different, but equally valid lifestyles. Students learn about unique and successful means of survival that have existed in the past, and of technological changes that have occurred to meet the needs of people in changing environments. Students involved in these types of programs may develop a deepened respect for peoples of the past and an expanded horizon that enables them to appreciate contemporary cultures that practice lifestyles different from western society.

Archaeology is a multidisciplinary science which employs scientific methods and techniques. Students involved in archaeology projects benefit from exposure to the many disciplines that are used in archaeological research. They also have the opportunity to practice the scientific processes involved in answering questions about the past. The

educational benefits of these programs have been elaborated elsewhere in this study, however, it is important to reiterate the educational value of involving students in hands-on learning.

The literature reviewed in this chapter dealt with various educational archaeology programs that are in existence at present; the positive and negative features of these projects and the underlying philosophy upon which choices were based. The need for collaboration between educators and archaeologists in developing educationally valid programs is a recurring theme throughout the literature review.

This review indicated that there are a wide variety of options available to educators and archaeologists when developing educational programs. However, the review also indicated there are obvious risks associated with some of these programs. A very important future task for archaeologists is to ensure that educators and administrators are aware of these dangers and the ensuing harm that may be caused from incautious development and presentation of archaeological programs.

CHAPTER FOUR

METHODOLOGY

4.1 Introduction

This study focused primarily on fieldwork in curriculum development. Two curriculum projects were developed and evaluated during the course of the study. In the first project, the Wanuskewin edu-kit, the curriculum development process and the relevance of using archaeology as a social science teaching vehicle were examined. In the second project, "Archaeology in the Schools", research focused on the educational relevance of archaeology as a science. The study sample was limited to elementary school students and teachers although, to a large extent, the conclusions can be applied to secondary schools as well.

A number of research methods were used to examine the various components of the study. These methods include participant observation, semi-structured interviews, and questionnaires. The interviews and questionnaires served to augment the author's observations of the curriculum projects.

Participant observation assisted in understanding the processes involved in creating and implementing educational curricula and developing an initial perspective about archaeology's roles in education. Observational techniques were relatively informal, consisting of observing while participating in the project. The major participant

observation situations included the curriculum writing sessions during development of the Wanuskewin edu-kit; testing the "Archaeology in the Schools" modules with student volunteers at Wanuskewin; and the team-teaching sessions in a regular classroom. Due to the pace of these activities, field notes were completed following the sessions. Field notes were divided into three main categories: 1) a daily log with logistics, comments, questions and reminders; 2) a diary recalling most incidents of the sessions; and, 3) actual field notes including procedural, descriptive and analytical notes.

Rather than provide statistical data, the intent of the interviews with the curriculum writers and pilot teachers was to provide a human dimension and individual perspective to the research. These interviews were carried out privately with each teacher, using a tape recorder. An identical set of questions was administered to each teacher, however, the interviews were allowed to diverge into areas the teachers felt important to the topic.

The student questionnaires were used to gather their opinions about the project they participated in, and their overall perceptions of educational archaeology. The public questionnaire was also used to gather information about public awareness and perception of archaeology as an educational vehicle.

4.2 Wanuskewin Curriculum Project

The Wanuskewin curriculum project included five major stages: 1) developing the curriculum unit, 2) presenting a workshop for the pilot teachers, 3) piloting the unit in six grade four classes, 4) visits to Wanuskewin Heritage Park by the pilot classes, and 5) pilot teacher feedback regarding the unit.

This study examined archaeology's relevance in a curriculum presenting First

Nations peoples' culture. In particular, the way archaeologists can work with educators and First Nations peoples to develop an accurate, valid picture of the past was investigated. Teachers' and students' response to this type of approach was also examined.

4.2.1 Wanuskewin Curriculum Writers

Composition of the writing team was somewhat unique since efforts were made to ensure that some of the writers were of First Nations' ancestry and that a subject specialist (archaeologist) was included on the team. This cross-cultural writing team was composed of three elementary school teachers, one of First Nations' ancestry, and a Native Studies consultant. The team was chaired by a curriculum development specialist. The writing team members were chosen by superintendents of the Saskatoon Public and Separate School Boards. The author of this study joined the writing team, representing the Department of Anthropology and Archaeology, University of Saskatchewan as an archaeological consultant.

The support group included the Saskatoon Public School Board Superintendent of Program and Staff Development, and the Saskatoon Separate School Board Superintendent of Education, as well as Wanuskewin Indian Heritage Inc. (W.I.H.I.) elders. These individuals, representing their organizations, provided feedback and final approval of the various components of the unit. A strong emphasis was placed on receiving guidance and assistance from the First Nations community.

This portion of the study centered on the cooperative nature of professional archaeologists and educators collaborating in developing curricula. Research methodology

was qualitative in nature, aimed at substantiating initial perceptions of the collaborative approach of writing curricula. The attributes and components of successful curriculum packages were also examined. Participant observation included actively working as a member of the team and observing the writing process.

A semi-structured interview was conducted with three of the five members of the writing team. The fourth member of the writing team was unavailable for an interview and the chairperson is a member of my advisory committee. The three interviewed members of the writing team were all experienced teachers, ranging from eight to 20 years teaching experience in elementary schools. One of the members was of First Nations heritage. Two of the three teachers had experience in curriculum development, however, none of the team members had any previous exposure or involvement in archaeology projects.

The interviews were an opportunity for the writers to present their opinions concerning the usefulness of the collaborative approach used to write this unit. They were also asked to express their opinions about the validity of educational archaeology in meeting the curriculum needs of educators and students. In addition, the responsibilities of the members of the writing team and any problems associated with this type of endeavour were investigated.

4.2.2 Wanuskewin Pilot Teachers and Students

After completion, the Wanuskewin curriculum unit was piloted by five grade four classes from Saskatoon and the surrounding area. The pilot teachers and classes were chosen by superintendents of the Saskatoon Public and Separate School Boards with

recommendations from principals and the curriculum writing team. Important considerations for these choices included geographic and population demographics, previous experience and willingness of the teachers to participate in this type of project.

The pilot groups represented typical schools and classes in Saskatchewan. Two of the classes were from inner city schools with a large First Nations' population, the other three classes were chosen from a Saskatoon suburban school, a rural school and a reserve school. This broad spectrum of schools ensured a representative sample of students and teachers for piloting the unit. All of the pilot teachers were experienced classroom teachers, with little or no previous contact with archaeology.

Before the teachers began piloting the curriculum unit they participated in a workshop presented by the chair of the curriculum team. The purpose of this workshop was to familiarize the teachers with the components of the unit, our expectations during piloting, and to present a brief introduction to Wanuskewin Heritage Park.

The study group consisted of four of the five pilot teachers and their students. One of the pilot teachers was of First Nations heritage. These four classes were from the two Saskatoon inner city schools, the rural school and the Saskatoon suburban school. Logistical problems prevented a meeting with the teacher and class from the reserve school.

Semi-structured interviews were conducted with these teachers. The interview questions focused on the curriculum needs of the teachers and their assessment of the educational relevance of the material. More specifically, investigations focused on the teachers' perceptions and enthusiasm about archaeology's educational value; teacher needs and objectives in using a curriculum with unfamiliar material (e.g. archaeology); criteria

for teacher-friendly curriculum material; student response to the unit; and, influence the unit had on students' perceptions of the past, and their level of understanding and comprehension regarding archaeology and First Nations peoples' culture.

The teachers piloted the unit in June, a time when classrooms are especially busy. Therefore, it was impossible to observe the classes while they participated in the activities since the teachers attempted to fit the new unit into any available time. Instead, the classes were accompanied on their visit to Wanuskewin Heritage Park in order to observe their reactions to the cultural exhibits, archaeology laboratory and sites they had studied in the unit. Three of the classes that visited Wanuskewin following the piloting of the curriculum were observed during their visit; one of the inner city classes was missed because two of the classes toured the Park at the same time.

The four classes in the study group were also administered a brief questionnaire by their teachers. This questionnaire focused on the students' perceptions about First Nations' culture and the importance of archaeology in studying First Nations people. Responses to the questionnaire were dependent upon the students' communication skills and the teachers' willingness to spend time on the questionnaires. Therefore, the statistical validity of the questionnaires is called into question. However, general themes and opinions still emerged.

4.3 "Archaeology in the Schools" Project

The "Archaeology in the Schools" project included six major steps: 1) designing the modules; 2) testing the modules on a select group of student volunteers at Wanuskewin Park (a contrived situation); 3) receiving feedback from the students in the

form of a questionnaire and informal discussions; 4) testing the modules in a regular classroom (normal situation); 5) informal evaluation of the modules based on observations in the classroom; and, 6) the classroom teacher's evaluation of the modules and educational archaeology. This study focused on the scientific nature of archaeology and its appropriateness as a multidisciplinary teaching vehicle.

4.3.1 Student Volunteers for Initial Evaluation of the Modules

Sixteen grade seven and eight students were selected from six schools in the Saskatoon Public School District and Saskatoon Separate School District to participate in the initial testing of the modules. The schools and teachers were chosen by the science consultants from each school board, and the student volunteers were selected by the classroom teachers. All students were enthusiastic participants in the project.

These students spent eight half-day sessions at Wanuskewin Heritage Park laboratory, participating in, and informally evaluating the modules. The modules were also evaluated according to a set of criteria. The first set of criteria included: educational relevance of each module; the multidisciplinary nature of the modules; and exposure to scientific methodology. Student enthusiasm, including willingness to participate in the activities, their grasp of the concepts presented in the activities, and general stimulation of interest in science were the second set of criteria used to evaluate the modules. The success of any curriculum is closely tied to the learning environment; cooperative learning opportunities, including discussions and interaction; and, hands-on experiences, were the third set of evaluation criteria. The need for any modifications or enhancements of the modules were also noted.

Throughout the program, the module organization emphasized integrated processes rather than content. The modules were designed to familiarize the students with the interconnectedness of the scientific disciplines and their relevance to archaeology.

Individual demonstration of the various activities in order to evaluate the level of comprehension were not possible due to time constraints and difficulties in controlling the test situation. However, the students did have the opportunity to re-create and present the modules during an Open House for school officials, educators and media on the last day of the sessions. Ten of the sixteen students completed a questionnaire which provided them with a more formal opportunity to evaluate the project and present their opinions about the value of educational archaeology in general.

4.3.2 Classroom Piloting and Evaluation of the Modules

To increase the validity of the pilot project at Wanuskewin Heritage Park, further evaluation of the modules was carried out in a regular classroom situation. A team-teaching situation in a typical grade seven-eight classroom in Saskatoon was organized. The 33 students were informally observed throughout the nine-week period. My observations focused on: 1) student participation in, and enthusiasm for, the activities, and 2) applicability of the modules in a regular classroom. Additional attention was paid to problems associated with classroom logistics, such as level and range of student abilities, class size and the availability of adequate facilities.

A semi-structured interview was conducted with the classroom teacher at the conclusion of the project. The purpose of this interview was to discuss the teacher's evaluation of the modules with respect to: 1) the relevancy of these modules in the

classroom; 2) relevancy of classroom archaeology to teachers' educational goals; 3) benefits of using archaeology as a teaching vehicle, to teach science and enhance higher level thinking skills; 4) resources necessary for 'teacher-friendly' curriculum; and, 5) considerations when incorporating hands-on activities into a regular classroom. The modules were also assessed by the classroom teacher with respect to students' participation and interest in the activities.

To further augment classroom observations, the teacher was questioned about the students' responsiveness to activities; students' grasp of scientific concepts, methods and techniques employed by archaeologists; students' knowledge of associated scientific disciplines, such as soil sciences; students' understanding and acceptance of the need to protect heritage sites; and their grasp of the importance of archaeological research to reconstruct the past.

4.4 Public Perception

Since the general public funds education and has a vested interest in quality education for young people, their opinions are important. A questionnaire on public archaeology was designed and administered to all visitors to the public archaeology program at Fort Battleford Provincial Park during a four day period. The purpose of this questionnaire was to investigate the public's opinions about archaeology, its importance as an educational discipline and their desire to see archaeology more accessible to students and the general public.

4.5 Summary

Although the research emphasis in the two curriculum projects differed, the overall goal was to elucidate the roles of archaeology in educational programs. Heavy reliance on the perceptions of the individuals involved in these projects is justified by the philosophy that people who use educational materials are the best judges of their efficacy. Through participant observation, semi-structured interviews and student questionnaires, this research assisted in the development of a comprehensive picture of the value of these educational archaeology projects and educational archaeology in general.

CHAPTER FIVE

EDUCATIONAL RELEVANCE OF ARCHAEOLOGY AS A SOCIAL SCIENCE: WANUSKEWIN HERITAGE PARK EDU-KIT

5.1 Introduction

Although multidisciplinary in nature, archaeology is usually identified as a social science. Examination of the educational relevance of archaeology as a social science is based on the development and testing of a grade four social studies curriculum unit or **edu-kit**, entitled "People in Their World - A Study of the First Nations Peoples on the Plains." The purpose of this edu-kit is to "provide materials and activities which will enrich the student's cultural and historical knowledge of the First Nations Peoples of Saskatchewan" (Wanuskewin Heritage Park 1992:1). The strength of archaeology as a vehicle for introducing the history of First Nations peoples is explored.

Archaeology's relevance in education is dependent upon the calibre of educational materials and resources available to educators. As stated by Adams (1986), creating a curriculum that is educationally valid and academically accurate is of paramount importance. To this end, a team of experts from several fields were brought together to collaborate on producing a curriculum unit which reflects a synthesis of First Nations' culture and archaeological methods and techniques through educationally valid activities.

The efficacy of this collaborative approach, when developing educational archaeology resources, is examined.

5.2 Archaeology's Visibility and Relevance in Education

Archaeology is not a discipline which is readily included in core curriculum subjects (Dyche 1985; Higgins and Holm 1985; Selig 1991). Most teachers have not taken any archaeology courses in university, nor is archaeology considered a 'teaching subject' in most education colleges (Erickson 1985). As a consequence, teachers are unlikely to feel comfortable teaching with archaeology, and they are unlikely to become involved in archaeological curriculum writing projects.

Prior to the Wanuskewin curriculum project, awareness of archaeology varied amongst the writing team and classroom teachers, as it does throughout the general population. Of the three curriculum writers who were interviewed, one admitted holding some stereotyped ideas about archaeology (e.g. digging for dinosaur bones), while the second writer had never given archaeology much thought. The third team member was aware of how archaeological evidence influences other disciplines, including Native Studies. Only one of the four pilot teachers had ever had any contact with archaeology. This teacher was working at a school that became involved in a nearby archaeological excavation. As shown by this sample of teachers and curriculum writers (also teachers), archaeology is not a common area of study for education majors, nor do they often receive opportunities as teachers to become involved in educational archaeology. This lack of exposure is indicative of a failure to inform teachers and school systems of the educational value of archaeology. The curriculum writers felt that if the local school

boards had ever stressed archaeology as a means to teach culture history, they would have become involved much earlier. They agreed that media coverage of Wanuskewin Heritage Park has probably made many teachers aware of archaeology's educational possibilities.

The educational value of archaeology took the curriculum writers by surprise. They admitted not really thinking about the possibility of using archaeology in their teaching or formally placing archaeology into a curriculum unit. Before the project began, two of the three writers were not even aware that archaeology was to be included in the Wanuskewin edu-kit. One of the writers was aware that archaeology would be a part of the unit; she considered it a challenge and a new opportunity.

Once the writing process was under way, the writers began to see archaeology as a valuable part of the unit and they quickly recognized archaeology's potential as a teaching vehicle. Interpreting and presenting the past was identified as the most relevant aspect of archaeology in education. One writer specifically identified archaeology's non-threatening presentation of the past as a valuable asset. She noted that teachers often fear non-native children may develop a guilt complex when studying the past of First Nations cultures. Looking at the history and culture of First Nations peoples from an archaeological perspective allows a neutral starting point, with less emphasis on injustice or value judgements.

This comment may provide some controversy concerning the role archaeology should take in presenting an **accurate** depiction of the real events of history. Certainly, archaeological evidence indicates major conflicts and atrocities occurred prior to contact with Europeans. However, the teachers are correct in pointing out that archaeological

evidence can provide students with a great deal of information about the past, other than the standard examination of First Nations history during the time of dislocation which resulted from European contact. In effect, the writers viewed archaeology as an interesting and educationally valid method of presenting information about the cultural past of First Nations peoples.

The hypothetical nature of archaeological interpretations of the past was identified as a valuable lesson for students to learn. The writers felt teachers and students can use archaeological evidence to hypothesize about the past. They suggested integrating archaeology's point of view with other interpretations teaches students there can be more than one answer to any problem, and answers often result in more questions. Therefore, by studying archaeology, students can gain an appreciation of the difficulties faced by archaeologists and other scientists who are trying to reconstruct the past.

Archaeology's integrative nature also became obvious as the team began to assemble materials and activities. Archaeology can be integrated into most subject areas and virtually all grade levels. They agreed that most teachers today use a thematic, or multidisciplinary approach in their teaching to avoid isolated compartments of learning. One writer was particularly appreciative of the way archaeology became the basis for the whole project, and how the other themes sprang out of the archaeology connection.

As the edu-kit was developed, the writers also recognized the educational value of teaching with archaeology rather than only about archaeology. Archaeology was seen as useful in reinforcing Common Essential Learning goals (Sask. Ed. 1988). Further elaboration of these issues can be found in section 5.4 which evaluates the Wanuskewin edu-kit's archaeology components.

5.3 Responsibilities of the Curriculum Team

The credibility of any curriculum unit is closely tied to the commitment and expertise of the people who develop the materials (Holm 1985; Rogge and Bell 1988). In a curriculum devoted to presenting the culture of First Nations peoples, the writers felt it was very important for members of the team to have some experience in cross-cultural education, (e.g. Native Studies and cultural anthropology classes at the university, teaching First Nations students). They also suggested team members needed to be aware of the issues and sensitive to the material in order to avoid stereotypes and misinformation in the curriculum. Although this comment could be construed to suggest that only First Nations' people are suitable members of a curriculum team presenting information about their ancestors, this is not the case. The members of the Wanuskewin curriculum writing team complemented each other, bringing a range of perspectives, specializations and knowledge to the writing team. This diversity enhanced the finished product and, in turn, strengthened the dedication and enthusiasm of the people working on the project.

Members of the writing team were responsible for representing their respective groups (e.g. teachers and students, First Nations community, school boards, and archaeologists) and ensuring the concerns and needs of these groups were met in the finished product. The following discussion will focus upon the curriculum writing team's perceptions of these needs, the team's roles in meeting these needs, and the elements of the edu-kit that were designed to fulfil these requirements.

As pointed out by numerous educators and educational archaeologists (see Alderton and Manning 1977; Corbishley 1986a; Devine 1985) curriculum packages must

meet the needs of the teachers so that they can meet the needs of the students. The curriculum writers overwhelmingly responded that all teachers are very busy people, therefore, they need a product that is well organized and easily incorporated into their teaching. A major responsibility of the writers was to develop a teachable curriculum unit, with educationally relevant lesson plans. The emphasis was on making the unit 'teacher-friendly'.

Accuracy was identified as an extremely important component of a teacher-friendly curriculum. Teachers need to trust the material; they must feel confident that the information is as accurate as possible, while keeping in mind that any information about the past is an interpretation from the present. The writers felt they would have had an extremely difficult time developing accurate archaeological materials and activities without an archaeologist on the team.

The curriculum writers also identified hands-on educational materials, such as those available in the Wanuskewin edu-kit, as a priority. They agreed that experiential activities are very important at the younger grade levels when concrete support is needed to aid in the transition to abstract thinking. The writers felt most teachers appreciate learning aids which enable students to learn with all their senses; the more aids and hands-on activities, the better the learning experience for the students.

All the writers reiterated the importance of a curriculum package that is complete, with the support resources and background information necessary to facilitate teachers in using the curriculum. They felt that teachers need to feel comfortable with a subject they are going to teach. Because the archaeology portion of the curriculum is fairly extensive, and because archaeology is an unfamiliar area for most teachers, it was very important

for the background information on archaeology to be complete and suitable for the teachers' needs. The availability of a resource person (archaeologist) and archaeological sites (Wanuskewin Heritage Park) in close proximity were also identified as factors that encourage teachers to include archaeology in their teaching. The information must also seem relevant to the teachers and students. Specifically, the background material should tell the teacher why this subject is important and why this information is worth knowing.

Teacher information sessions and hands-on workshops are an important method of informing teachers about the educational value of archaeology and the methods of teaching with archaeology (Smith 1991a). However, the writers pointed out that there are so many professional development courses being offered at present that teachers are restricted in the amount of time they can spend on inservice. The writers felt the Wanuskewin curriculum package is complete and self-explanatory and teachers can use it, even without inservice. On the other hand, Alderton and Manning (1977) suggest archaeologists must make a concerted effort to convince teachers that inservice is important and worth their time.

The writers stressed the need for a curriculum which is adaptable to the different levels of achievement within a regular classroom. In other words, teachers need to be able to modify or expand the lessons to meet the differing needs of some students. The Wanuskewin edu-kit can be modified for younger grades and expanded for higher grades. In addition, the curriculum writers suggested curriculum units must be interesting to both the teachers and students. The activities and teaching strategies must be varied enough to hold the students' attention.

Although archaeological interpretation was an important component of the

curriculum unit, the need to present the First Nations peoples' point of view or perspective about their past, instead of interpretations by outsiders, was identified as very important. First Nations members of the writing team were responsible for bringing the feelings and traditions of their culture into the curriculum. By ensuring that the First Nations' viewpoint was included in the Wanuskewin unit, as well as the archaeological explanation, the unit provided a more holistic perspective.

First Nations peoples were identified as valuable sources of information and assistance. During the writing process all the written and hands-on materials were taken to the Wanuskewin elders for approval. This process lessened the writing team's concerns about accuracy and authenticity. If the elders accepted the information it was presumed to be appropriate. The edu-kit was also examined and approved by superintendents of education from the Saskatoon Public and Separate School Boards. Approval of these materials through the various stages of the process was seen as extremely valuable, especially in light of the cultural sensitivity of First Nations' history.

An education curriculum is an excellent opportunity for archaeologists to present their discipline to the public, in this case teachers, students and perhaps their parents. The curriculum writers felt the archaeologist's responsibilities focused on accuracy and a clear presentation of archaeology. The presence of a subject specialist and, in particular, a specialist from an unfamiliar discipline such as archaeology, created some wariness in the beginning. Initially, the writers needed to understand how archaeology fits into the curriculum unit. The writers appreciated the presentation of archaeological material in a manner that was understandable and non-threatening. All members stressed how important it was for the archaeologist to act as a resource person, bringing concrete visual

materials and activities to the group's attention and to critically examine any lessons developed for archaeology.

The role of the subject specialist focused upon compiling high quality, accurate archaeological information, activities and materials. The goal was to provide teachers with comprehensive background information which defined the discipline of archaeology, the methods and techniques employed by archaeologists and the importance of archaeological research. In addition, the roles of archaeology in reconstructing and presenting First Nations' culture through practical demonstrations and discussions were defined.

Every attempt was made to present an honest message concerning archaeology as a scientific discipline which interprets material cultural remains in order to reconstruct past lifeways. The curriculum writers recognized that archaeological interpretations are not absolute, new research is constantly redefining archaeological conceptualizations of the past. In addition, the fact that archaeological interpretations of past lifeways are influenced by our present was identified as an important lesson for students to learn.

A very positive aspect of this collaborative process was resource sharing. Each team member brought information to the group meetings to share with other members in order to receive feedback, suggestions and criticisms. The teachers were very generous in explaining educator needs and perspectives; this approach enabled the archaeologist to develop a more thorough understanding of curriculum development, the needs of classroom teachers, and the possible roles of archaeology in education. In turn, the collaborative approach presented the opportunity to introduce archaeology to the team; the educators then took this information and molded it into useful lesson plans for

teachers and students. All team members felt the meetings of the entire group to discuss what had been accomplished were a beneficial collaborative strategy. Working within a collaborative group enhanced the potential for greater interdisciplinary understanding and a new, more holistic perspective.

Overall, the curriculum writing team felt the collaborative approach to writing curriculum was a very positive, worthwhile experience. Bringing a subject specialist (archaeologist) into the process lent credibility to the archaeological component of the project, which is very important to teachers assessing a curriculum. Including representatives of First Nations peoples on the curriculum writing team was also seen as the appropriate direction to take in developing curriculum. The importance of organizing a curriculum writing team with the relevant expertise was reiterated by one writer who stated she always inspects a new curriculum to determine the composition of the writing team, year of development, and where the curriculum originated when deciding whether to use the materials in her classroom.

The theme of the interviews with the curriculum writers appears to be a determination to present an accurate, well-balanced picture of First Nations peoples' culture. The success of any curriculum is dependent upon its feasibility. Therefore, the importance of creating a package that is 'teacher-friendly' was repeatedly stressed. The following section will demonstrate the successfulness of this endeavour by briefly discussing the Wanuskewin unit's archaeological activities and materials.

5.4 Wanuskewin Curriculum Unit

The Wanuskewin edu-kit was developed around the three main themes which are featured at Wanuskewin Heritage Park: People and Plants, People and Animals and People and People. The entry points for the edu-kit in the grade four social studies curriculum include Technology and Culture (Wanuskewin Heritage Park 1992:1). With regards to archaeology, much of the material culture that appears in the archaeological record is associated with cultural and particularly technological adaptations. Therefore, these entry points provide an excellent connection between archaeological investigation and reconstructing cultural activities. The temporal framework used in the edu-kit dates from 1500 years ago to present day. The study of First Nations peoples during this time line is from a holistic perspective, examining the interdependence and interrelatedness of the three themes (see figure 5.1). Archaeological information and activities have been integrated into the three themes of Wanuskewin Heritage Park.

A variety of teaching strategies were employed in the edu-kit to instill an awareness of differing social and cultural values and enhance cognitive skills (Wanuskewin Heritage Park 1992:1). These strategies include use of audio, visual and tactile materials for inquiry-oriented learning, where students participate in process skills such as "gathering, organizing and communicating" (Wanuskewin Heritage Park 1992:3). This edu-kit emphasizes resource-based learning which focuses on teaching skills for life-long learning.

The archaeology section endeavours to familiarize students with the discipline of archaeology, the importance of archaeology and the methods employed to reconstruct human activities of the past through material culture. The archaeological activities

include "Piecing Together the Past," "Archaeological Methods," "Create a Stratigraphic Profile," and "Site in a Bag." These activities will be examined in relation to archaeological attitudinal concepts; meeting educational goals such as the Common Essential Learnings; employing hands-on activities and inquiry; integration of materials and the multidisciplinary nature of the edu-kit. The needs of representative groups, including teachers and students, First Nations peoples and archaeologists are also discussed.

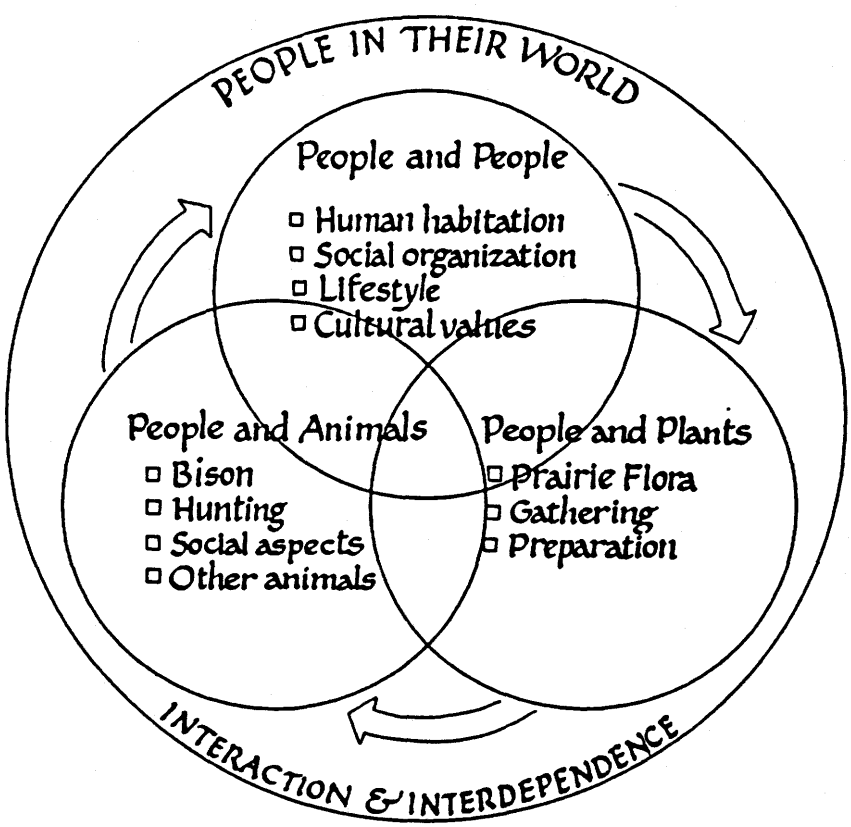


Figure 5.1. People in Their World Interaction and Interdependence (Wanuskewin Heritage Park 1992:2).

The archaeology section of the teacher's guide begins with an introduction to archaeology (see Appendix B for People in Their World Archaeology Teacher Information). The purpose of this section is to acquaint the teachers with archaeology at a level that is easily understood and easily transferred to their students. Professional jargon is kept to a minimum and all archaeological terms are defined and explained in their context. This background information outlines the roles of archaeology in reconstructing past lifeways through four main areas: archaeological concepts, scientific methods and techniques; importance of archaeological interpretations; and Saskatchewan material culture. In addition, the scientific and cultural importance of protecting and conserving archaeological sites, deterring artifact looting, and practising responsible archaeological investigation is stressed. The archaeology section attempts to instill in teachers and students the value of archaeological sites in learning about people who have lived in Saskatchewan in the past. The background material is designed to meet the informational needs of teachers and enable them to proceed with the five archaeological activities. These activities range from fairly straightforward activities such as puzzles, to complex stratigraphic mapping.

The "Piecing Together the Past" activity consists of several black on white cut-out puzzles. This activity requires teacher-directed questioning and small group participation (Wanuskewin Heritage Park 1992:20). As the pieces are presented, the students ask questions and propose hypotheses about the identity of the puzzle. The educational objective of this activity is to involve the students in scientific processes such as observation, questioning and hypothesis formulation exercises similar to those used in archaeological investigation. Common Essential Learnings include communication and

Creative and Critical Thinking. The archaeological goals of this activity are to facilitate student understanding of concepts such as context and interpretational problems that arise when artifacts are removed from a site.

The "Archaeological Methods" activity focuses upon the archaeological methods and techniques employed by archaeologists during excavation. This activity uses a teacher guided, stations approach (Wanuskewin Heritage Park 1992:22). At the beginning of this activity the students view and then discuss a video of archaeological methods to prepare for activities which simulate archaeological investigation. The four stations include: an excavated bone pit, archaeological photos, casts of projectile points and a site profile. These hands-on stations were designed to acquaint students with the tasks carried out by archaeologists during excavation. Simulation of these tasks in the classroom include mapping the excavated bone pit, describing the archaeological photos using archaeological terms and concepts, drawing artifacts to scale, and measuring and recording soil layers of the excavation profile.

The educational objectives of these stations include using scientific processes - observation and description, building hypotheses, measurement, mapping and recording through audio, visual and tactile experiences. Common Essential Learnings associated with this activity include Communication, Creative and Critical Thinking and Personal and Social Values and Skills. These activities are designed to reinforce the importance of leaving archaeological sites and materials intact. In addition, students should develop an appreciation for the scientific nature of archaeology. The multidisciplinary, integrative features of archaeology are very evident in these stations; teachers can integrate these activities into several subject areas, including science, mathematics, language arts and fine

arts.

Students working on the "Create a Stratigraphic Profile" activity practise cooperative learning strategies (Wanuskewin Heritage Park 1992:26). The educational goals of this activity are to familiarize students with chronological ordering, and the principles of stratigraphy. This sequenced activity consists of arranging artifact descriptions in chronological order; checking their accuracy, and then pasting them on a stratigraphic profile. In addition, reiteration of archaeological concepts should present a more accurate picture of archaeology as a science, attempting to reconstruct the past, rather than as a hunt for artifacts. Common Essential Learnings include Communication, Numeracy, Personal and Social Values and Skills and Independent Learning. These stratigraphic activities can be easily integrated within other subject areas such as mathematics, language arts and science.

The final activity in the archaeology section, "Site in a Bag," requires a teacher-directed, group problem-solving strategy (Wanuskewin Heritage Park 1992:30). The students bring a collection of objects from home which represent themselves and their lives. The students each receive a bag of artifacts to interpret. This activity requires analysis, inference making and drawing of conclusions based on the collection of artifacts. Discussions centre around the relationship between artifacts found in context, and the information that can be gained from this association. Common Essential Learnings include Communication, Creative and Critical Thinking and Personal and Social Values and Skills and Technological Literacy. Attitudinal concepts focus upon the value of protecting archaeological sites and leaving artifacts in situ to benefit future generations of archaeological investigators, and an enhanced appreciation of the inferential nature of

archaeological interpretations.

The general theme of these activities, from an archaeological perspective, is to inculcate a conservation ethic in students; an understanding of the importance of leaving archaeological sites untouched. The scientific nature of archaeology is also stressed to ensure that students understand that archaeology is not treasure hunting, but rather scientific investigation of the past.

An archaeology connection was also developed for the People and Plant and People and Animal themes. The information presented was designed to teach students about the ways archaeology is used to reconstruct past lifeways. For example, "archaeologists study plant remains to reconstruct past environments (palaeobotany) and past diets" (Wanuskewin Heritage Park 1992:42) and "archaeologists attempt to reconstruct past environments through faunal remains. They can determine many things about the people and the animals, and the relationship between the two" (Wanuskewin Heritage Park 1992:51).

Activities in the People and Animal theme deal with technology and its relationship to food procurement and culture change. The teacher information presents a time line for Southern Saskatchewan precontact cultures which illustrates changes in weapon and tool technology through time (e.g. projectile points, knives) and the introduction of pottery technology into the area. This section presents a holistic perspective of the interrelationship between climate, environment, resources and human technology. The interdisciplinary approach to learning assists students in acquiring an appreciation for the validity of different human lifestyles, the changes that take place through time in all cultures, and the technological expertise of peoples of the past. The

activity associated with the time line presents an opportunity for students to handle artifacts (casts of projectile points). Common Essential Learnings include Communication, Creative and Critical Thinking, Personal and Social Values and Skills, Independent Learning and Technological Literacy.

Although not directly related to the archaeology connection, the People and People theme begins with an examination of the lifestyle of First Nations peoples long ago, then moves to present-day reaffirmation of the vitality of First Nations peoples. The entire Wanuskewin Heritage Interpretive Centre is evidence of this vitality.

The culminating activity for the Wanuskewin edu-kit is writing a final report. The teachers can choose from several topics related to the three themes and/or archaeology at Wanuskewin Heritage Park. The report is patterned on the same format as archaeological site reports: hypothesis formation, description of activities, methodology, analysis and synthesis, interpretation and conclusions. This activity serves to link the stories of Wanuskewin with archaeology and, in turn, reinforces the processes employed by archaeologists in their investigation, interpretation and presentation of the past. The activity also synthesizes the students' learning, pulling together all the information the students have learned throughout the unit.

The Wanuskewin edu-kit is an excellent medium for introducing archaeological concepts, attitudes and methods to students. Although most teachers are not familiar with archaeology, the Wanuskewin edu-kit is extremely teacher-friendly. The teacher guide, with background information and detailed lesson plans complements the hands-on materials in the edu-kit. The background information has been carefully researched by teachers and subject specialists and evaluated and approved by superintendents of

education and the Wanuskewin Heritage Park elders. The lesson plans and edu-kit are based on the premise that hands-on or experiential activities will increase student enjoyment and interest in the subject and, therefore, increase the educational impact of the unit. The Common Essential Learnings and their focus upon inquiry, problem solving, skill development and holistic thinking were a major theme of this unit.

In conclusion, the First Nations peoples of the past are presented as successful, dynamic cultures who interacted and adapted to their environment. Students who complete this unit will have an expanded knowledge, appreciation and respect for the lifeways of First Nations cultures of the past and present. The role of archaeology in investigating and reconstructing past cultures is well represented in this edu-kit. Although the focus of this curriculum is social science (culture) students should also develop a thorough understanding (at a grade four level) of the scientific nature of archaeology, its relevance to investigations of the past, and the need for all people to protect archaeological sites.

5.5 Piloting the Wanuskewin Heritage Park Curriculum

After completion of the curriculum unit, five teachers were chosen to pilot the unit in their grade four social studies classes. The pilot teachers attended a workshop to introduce them to the curriculum, and to discuss expectations during the testing of the unit. Each of the themes in the edu-kit was outlined, and the archaeology connection was explained. The teachers appeared comfortable with the unit and enthusiastic about using the activities with their classes. The curriculum unit was piloted during three weeks of June, followed by a visit to Wanuskewin Heritage Park. Following their visit, four of the

teachers participated in a semi-structured interview.

5.5.1 Pilot Teacher Response

Although the curriculum writing team was composed of experienced teachers and their opinions about teacher needs are certainly valid, the opinions and perspectives of the teachers who piloted the Wanuskewin edu-kit are also very important. The pilot teachers were asked to express their thoughts about the basic ingredients of a teacher friendly curriculum. They were also asked to convey their thoughts regarding the educational value of archaeology in the Wanuskewin edu-kit.

The teachers were very positive about the archaeology components in the Wanuskewin edu-kit; they all planned to use the unit in the following year. One of the pilot teachers felt archaeology provides an excellent continuity between the past and the present. However, they all appeared to view archaeology as a "means to an end"; the most important element of the curriculum was the presentation of First Nations' culture. This perspective is closely linked to their reasons for visiting Wanuskewin Heritage Park. Three of the four pilot teachers stated the main reason they visited Wanuskewin Heritage Park was to introduce their students to First Nations' culture, although archaeology was also a strong drawing card. One teacher explained that her motive for the visit was to instil cultural pride in the First Nations' students in her class, and introduce other students to the beauty and depth of First Nations' culture.

The teachers felt the three-week curriculum was a sufficient length of time to spend on this topic. This time restriction seems to stem from two fundamental problems within school systems: teachers are extremely busy teaching mandated courses, and the

school curricula are so full that adding 'extra' subjects is difficult.

The teachers generally reiterated the curriculum writers' comments on the relevance of archaeology in education. Their comments were tempered by a rather cursory contact with archaeology, as compared to the extensive exposure experienced by the curriculum writers.

The pilot teachers had variable success with the archaeology activities, as can be expected in regular classrooms, with students of varying abilities and interests. However, since the curriculum and the activities are adaptable, the teachers modified the program to meet their students' needs. One teacher, in particular, felt the Wanuskewin edu-kit was a bit too detailed for her students (grade three-four), so she modified the activities and level of information to meet their needs.

A major goal of the edu-kit was to provide numerous hands-on activities for the students. The teachers identified the hands-on materials as one reason the students were so interested in the unit. The students particularly enjoyed the Saskatchewan technology time line which includes casts of projectile points and exercises in identifying the points. All the teachers reported the students were very interested and enthusiastic about archaeology. In fact, the archaeology sections appeared to be the highlight of the curriculum for many of the students.

The pilot teachers also recognized possibilities for integrating archaeology into other subject areas. They felt archaeology lends itself to all areas of the curriculum and can be integrated into many activities. These teachers incorporated some of the activities into other subjects, such as language arts (spelling archaeological terminology), mathematics (measuring and graphing), and drama (dramatization of "Maskwa and the

Bison Hunt"). They suggested most teachers use an interdisciplinary (multidisciplinary) approach. Therefore, any archaeology curriculum should be developed from this perspective. According to the teachers, the interdisciplinary nature of archaeology assisted the students in conceptualizing the study of the past. The teachers felt their students gained an awareness of how archaeological investigation fits into all the stories at Wanuskewin; for example, how archaeologists can learn about past environments using plant remains.

Although the teachers appeared very interested in archaeology, they also appeared to be somewhat hesitant to commit more of their time to archaeology or the Wanuskewin edu-kit, especially to attend inservices or workshops. One of the pilot teachers stated that teachers spend so much of their time at inservices now, they are very appreciative of a curriculum that is complete or "self-sufficient." The teachers emphatically stated that curricula must include the necessary background information, resources and materials to enable teachers to use the curriculum 'as is.' They felt that teachers who are especially interested in archaeology would probably appreciate an inservice to provide additional information. Since archaeology is so new to the school curricula, the teachers felt they would need a resource person to contact for further information. In-school visits by an archaeological resource person were identified as more valuable than separate inservices.

A formal archaeology curriculum is one way of introducing archaeology to the public, in this case students. The pilot teachers were asked to identify additional archaeology opportunities they would like to see developed for their students. All four teachers suggested tours of archaeology sites, opportunities to view and examine artifacts,

and volunteering to dig at sites as excellent ways to introduce students to archaeology. Three of the four pilot teachers also identified presentations by professional archaeologists and volunteering at an archaeology laboratory as opportunities to learn about archaeology. Two teachers suggested tours of archaeological sites should be related to presenting the culture of the groups who lived at the site. The need to fully prepare students before they become involved in any of the activities was also stressed.

To summarize, all the pilot teachers felt including archaeology in the curriculum was a good idea. However, it was very apparent that these teachers search for materials that offer more than one educational experience; archaeology was viewed as a means to teach about the past lifeways of First Nations peoples and to increase the students' interest in studies of the past. In addition to the interest-value of archaeology, the visual and tactile elements of the hands-on activities were a highlight of the edu-kit. From the response it appears teachers are enthusiastic about including archaeology in their teaching.

Although two of the teachers recognized the integrative nature of archaeology, the multidisciplinary usefulness of archaeology should be further stressed by educational archaeologists. In addition, the pilot teachers' level of understanding about the goals and usefulness of archaeology in curricula was not the same as the understanding displayed by the curriculum writers. This discrepancy is entirely understandable since the curriculum writers were involved in the developing process and had direct contact with an archaeologist for more than a year. This problem indicates the need for workshops, classes and other forms of inservice to familiarize teachers with the nature of archaeology and its educational merits.

5.5.2 Observations of Classes at Wanuskewin

Three of the grade four pilot classes were observed during their visit to Wanuskewin Heritage Park. The responses and interests of the groups indicated the specific areas of the unit that were emphasized during the pilot project. Group one appeared to have spent considerable time on the stone tool technology activities. Many of the students responded well to the atlatl demonstration; they identified the atlatl as a hunting tool from activities in the edu-kit. However, the importance of conserving archaeological sites was obviously not stressed since it was necessary to constantly remind the students not to pick up rocks and bones they discovered along the trails. These students particularly enjoyed the Main Theatre which has hands-on activities.

Some of the students in Groups two and three were First Nations students. These groups appeared to have a deeper knowledge of First Nations' cultures and made many interesting and informed comments as we walked along the trails. The on-site weapons activity was an excellent culminating activity to reinforce the information they learned in class about stone tools and hunting technology. Both groups responded well to the archaeology sites on the trails. They discussed these sites in relation to the information they learned through the curriculum. They asked intelligent, informed questions and appeared well prepared. Group two also displayed high levels of interest and understanding of archaeological concepts and terminology. For example, they recognized and discussed the bison jump in the Main Theatre and the Newo Asiniak bison jump on the trails. Groups two and three were very environmentally conscious out on the trails; they did not pick up any objects and stayed on the trails at all times. These two groups also displayed a keen interest in archaeology as a discipline. They were curious about

what archaeologists do, where they work, and if school children might have a chance to work on an excavation in the future. Group two toured Wanuskewin Heritage Park alongside another group which was not a part of the pilot program. As could be expected, there was a marked difference between the two groups' knowledge of First Nations culture and archaeology.

This culminating visit to Wanuskewin Heritage Park, following the three-week curriculum unit, was an excellent educational experience. The students had some background knowledge about First Nations' culture and archaeological sites which added to their enjoyment and understanding of the exhibits and sites at Wanuskewin Heritage Park. All three groups included many students who were very interested in archaeology and the archaeological sites. After participating in simulated activities at school, these students were able to observe real archaeological sites, an active archaeological laboratory and the material culture of First Nations peoples.

5.5.3 Student Responses

The teachers also administered a short questionnaire to the 69 students involved in piloting the unit. The questionnaire focused on the students' perceptions of archaeology and its appeal to them. The quality of answers varied greatly, and certain questions on some of the questionnaires were virtually indecipherable and therefore unusable.

The majority of students appeared to enjoy the archaeology segment of the unit; all but one of the respondents stated they enjoyed learning about archaeology. Sixty-two of the students (62/69) also felt all students should have the opportunity to learn about

archaeology in school. The 'no' responses seemed to suggest some concerns about archaeology taking over and becoming the only subject they learned in school. Several students found the curriculum too hard and/or boring, suggesting that school is not the place to learn about archaeology. The 'yes' answers overwhelmingly emphasized how much fun, and how interesting it was to learn about archaeology. They also felt it was important to learn about the past, especially about First Nations peoples who have lived in the Saskatoon area. Some students suggested that being introduced to archaeology in school may encourage students to become archaeologists when they are adults. Several students thought their own interpretations of the past may assist archaeologists in their interpretations. Only one student missed the point and thought that we should learn about archaeology "so that we can find things."

The students were asked what they think archaeology teaches people. The responses varied, but most students (50/69) understood that archaeology is a scientific tool for learning about "life in the past," in particular, First Nations' cultural past. Seven of the students focused upon artifacts, such as bison bones, and six students identified archaeological methods and techniques. Six students' responses were indecipherable.

The students also discussed the most important message they learned about archaeology. Many of the students focused upon archaeological methodology (23/69) and the artifacts that archaeologists find (14/69). Twenty-three of the students reiterated that archaeology teaches us about the people who lived in the past. Five students emphasized the importance of archaeological excavations. Unfortunately, only two students identified conserving and protecting cultural heritage sites as important. Interestingly, two students felt they learned how much archaeologists still have to learn. Two of the responses were

indecipherable.

When asked to identify which part of archaeology they found most interesting, some of the students confused the archaeology activities in the classroom with the archaeology out at Wanuskewin Heritage Park. The students seemed to prefer actual sites such as the bison jump (11/69); they also liked the stratigraphic profile (8/69) they viewed at the archaeological site. Perhaps this is partly due to having completed several activities dealing with stratigraphy in the classroom. One class did not have the opportunity to see the dig which affects the findings of this question. Some of the students (15/69) focused upon the classroom activities (e.g. puzzles, bone excavation pit, projectile points and the story, "Maskwa and the Bison Hunt") in the edu-kit as their favourite part of the archaeology section, while 22/69 students chose excavation techniques. Other responses included dating techniques (1/69), learning about the past (3/69), and two students chose "everything." Seven responses were indecipherable.

To gauge the level of exposure to archaeology before this curriculum project, the students were asked if they had ever visited an archaeology site. The vast majority of the students (63/69) had never had any contact with archaeology or archaeological sites. Although these students are very young, the data does show the lack of opportunity or incentive to visit archaeology sites. Six students stated they had previously been to an archaeology site at Drumheller (which is really palaeontology, not archaeology).

The students were very positive towards opportunities to become involved in other archaeology activities (61/69). The students were asked to check as many of the suggested activities as they wished. The majority of the students wanted the opportunity to volunteer at an excavation (42/69) or in a laboratory setting (35/69). Only eighteen of

the students chose touring other archaeological sites, while (21/69) of the students wanted to talk to a real archaeologist. Fifty-nine of the students appeared eager to have their families learn about archaeology which further substantiates the impression that these students found archaeology interesting and worthwhile.

Responses to this questionnaire indicate a positive regard for archaeology. The students found the curriculum to be interesting and they enjoyed their visit to Wanuskewin Heritage Park. The students appeared to place equal emphasis on archaeological methods, finding artifacts and the importance of learning about past cultures. Due to the age of these students it is difficult to expect any well developed conceptualization of archaeology's value to society as a whole. However, by introducing archaeology as a partner in telling the story of First Nations peoples, archaeology became relevant to the students and should assist in developing their future attitudes towards archaeological conservation.

5.6 Public Perception of Archaeology

Archaeology's lack of visibility in education can be traced to an overall problem within the general public. Very few people have the opportunity to visit sites and observe archaeologists at work. Although this study focuses upon the roles of archaeology in education, the general public exerts a strong influence on the development of educational programs. Therefore, the public's perception of, and interest in, archaeology must be taken into consideration. During a three-day period in June of 1991, 149 visitors to Fort Battleford National Park public archaeology program were queried about their attitudes toward archaeology.

Of the 149 respondents, 105 had never visited an archaeological site. However, virtually all the respondents indicated they would like further opportunities to observe archaeologists at work. All of the respondents felt archaeology is a worthwhile experience, and the majority (140/149) of the people felt archaeology should be included in school curricula. This high percentage of positive responses indicates the general public views archaeology as a relevant educational experience, both for themselves and their children.

The public also had the opportunity to indicate which educational opportunities appeared most relevant to them (see Table 5.1). The most popular activities included tours of archaeological sites for students and the general public and viewing artifacts. Evening lectures and media reports were chosen by more than half of the respondents. Active participation in a laboratory or excavation setting met with a positive response as well. These responses indicate two major points: the public wants to be involved in archaeology and the opportunities available to the public should be varied. Most people who wanted to work on an excavation preferred a fairly short time (1 day - 1 week). This response is indicative of a public that is curious and interested in archaeology. The lower response rate for laboratory analysis may indicate a lack of understanding concerning the tasks associated with laboratory analysis.

The general comments from the public appear to indicate an overall perception that studying the past is important; archaeology is one method for making 'history come alive.' Many of the respondents appeared fascinated by the artifacts being uncovered, and the knowledge about the past that can be gleaned from archaeology. They also indicated that archaeologists should promote archaeology to the public and set up opportunities for

students and the general public to become involved in archaeology.

Table 5.1 Additional Archaeological Activities Identified by the General Public

Activity	No. of Responses
tours for school children	126
tours for general public	133
evening lectures	79
opportunity to view artifacts	136
media coverage	76
volunteer at excavation	94
volunteer at laboratory	69

5.7 Discussion

The Wanuskewin edu-kit is a curriculum unit designed to present cultural and historical information about the First Nations peoples of Saskatchewan. The uniqueness of the unit stems from the inclusion of archaeology. Archaeology is viewed as a means for investigating the past and is used as one vehicle for presenting cultural and historical information.

The relevance of this approach has been examined in the literature and within the Wanuskewin curriculum. Most educational archaeology programs focus upon

archaeological methods and techniques to enhance students' learning skills, and this curriculum unit is certainly no exception. However, the Wanuskewin edu-kit goes beyond mere mechanical replication of archaeological research and into the realm of divergent thinking. Within this curriculum, students question the place of material culture and learn to see archaeology as the tool for bringing out this information. This new perception helps students develop a sense of the past; students are encouraged to view the past as a reality, with real people who lived real lives.

The holistic nature of cultural investigations and the interdependence of cultural systems is a central theme in the Wanuskewin curriculum unit. Students are encouraged, through the cultural and archaeological evidence, to conceptualize First Nations culture as a system of integrated wholes. Archaeology's connection to the study and reconstruction of these systems of culture is an integral part of the curriculum.

The motives of modern archaeology for producing educational archaeology programs centre on developing a conservation ethic in the public and presenting an accurate picture of archaeology. There is a pressing need to inculcate a sense of stewardship in students so that the future protection of archaeological sites is more certain. As the students worked with the archaeological activities and materials in the Wanuskewin edu-kit, they developed a respect for the scientific methodology employed in archaeology. However, even more importantly, they also developed a respect for the precontact peoples of Saskatchewan. The impact of this outlook is likely to be very positive for protection and conservation of archaeological resources.

A major theme throughout this study has been the educational value of archaeology. Saskatchewan's educational goals focus upon development of skills for

lifelong learning. The Wanuskewin lesson plans were designed to emphasize the Common Essential Learnings identified by Saskatchewan Education (1988) as the foundations of learning. Archaeological investigation leads to scientific inquiry and use of scientific processes to assist in cultural interpretation. Virtually all of the activities in the curriculum met these goals by employing a hands-on or experiential approach.

The Wanuskewin edu-kit was developed through a collaborative approach, bringing First Nations teachers and an archaeologist to work alongside non-aboriginal teachers. This group set out to develop a culturally, archaeologically and educationally relevant unit which would serve the needs of First Nations peoples, archaeologists and especially teachers and students. From all reports, the writing committee was successful in this endeavour.

The public's positive response to the archaeological project at Fort Battleford indicates a general support for increased archaeological activities for students. However, before the public will become vocal advocates for archaeology in the schools, archaeologists need to become more organized in their efforts to further educate parents, teachers, etc. about the relevance of archaeology in education.

In conclusion, the roles of archaeology in this curriculum were threefold. First, archaeology was used as a vehicle for strengthening learning skills such as critical and creative thinking. Secondly, archaeological evidence was used to present cultural and historical information about First Nations peoples' past. Third, because of its inherent mystery and student fascination, archaeology was used as a launching pad for the entire curriculum unit. For these reasons, and due to the obvious success of the Wanuskewin edu-kit, it is concluded that archaeology is educationally relevant as a social science.

CHAPTER SIX

EDUCATIONAL RELEVANCE OF ARCHAEOLOGY AS A SCIENCE: "ARCHAEOLOGY IN THE SCHOOLS"

6.1 Introduction

Archaeology is usually associated with the social sciences and history. However, archaeological investigation also employs scientific methods and techniques. This study examines the educational relevance of archaeology as a science in the project "Archaeology in the Schools" (Fedorak and Lodoen 1993). The purpose of this project was to introduce students to scientific inquiry using archaeology as the instructional tool and "to increase students' awareness and involvement in the natural sciences" (Fedorak and Lodoen 1993:iii) through experiential archaeological activities. The strength of archaeology as a vehicle for introducing scientific process is examined.

Eight sequential modules that simulate an archaeological research project were developed by myself and a fellow graduate student from the Department of Anthropology and Archaeology, University of Saskatchewan. The modules were designed to introduce students to scientific processes such as "observation, hypothesis formulation and testing (identification, classification and typology, comparative, qualitative and quantitative analysis) and interpretation of data" (Fedorak and Lodoen 1993:iii) (see Table 6.1).

The modules were designed to demonstrate the integrative, multidisciplinary nature

of archaeology by incorporating cognate disciplines into the activities (see Table 6.2). In addition, social and developmental skills, including the Common Essential Learnings (see Table 6.3) were emphasized. Each module was developed around archaeological concepts or topics (see Table 6.4). These modules were grouped into two major themes: an excavation unit and a stratified site. Sixteen grade seven and eight students participated in the initial testing of the modules. None of these students had ever been involved with archaeology before this project. Student interest in, and responsiveness to the modules was also examined.

The following section will briefly describe and evaluate the modules. This discussion will focus on the educational and archaeological value of each module. Some of this discussion has been previously presented in "Archaeology in the Schools" (Fedorak and Lodoen 1993). In addition, these modular activities have recently been expanded to ten modules.

Table 6.1. Scientific Processes Used in Modules

Modules	Scientific Processes
Create-a-Site	Observation, measurement, inference, prediction, data recording, hypothesis formulation
Stratified Site	Observation, experimentation, interpretation of data
Artifact Classification	Observation, identification, classification, inference, prediction, recording of data, hypothesis formulation, experimentation, interpretation of data
Excavation	Observation, measurement, prediction, identification, collection and recording of data, classification, hypothesis formulation, interpretation of data
Mapping profile and floorplan	Observation, measurement, collection and recording of data, classification, interpretation of data
Laboratory analysis	Observation, identification, classification, prediction, recording data, hypothesis formulation, interpretation of data, generalization

Table 6.1. cont...

Site interpretation	Observation, inference, prediction, classification, recording data, hypothesis formulation, interpretation of data, drawing conclusions, generalization
Site Report	Observation, inferences prediction, recording data Interpretation and synthesis of data
Excavating a real site	Observation, measurement, inference, prediction, collection and recording of data, classification, hypothesis formulation, interpretation of data, generalization

Table 6.2. Multidisciplinary Nature of Modules

Modules	Cognate Disciplines
Create-a-site	Chemistry, Behaviourial Sciences Environmental Studies, Geography, Palynology, Soil Sciences
Stratified Site	Botany, Environmental Sciences, Geography, Geology, Mineralogy, Sedimentology, Soil Sciences
Artifact Classification	Mathematics, Mineralogy
Excavation	Biology, Botany, Chemistry, Behaviourial Sciences, Ecology, Environmental Studies, Geography, Palynology, Soil Sciences,
Mapping profile and floorplan	Chemistry, Fine Arts, Geology, Geography, Mathematics, Sedimentology
Laboratory analysis	Behaviourial Sciences, Biology Botany, Chemistry, Ecology, Environmental Studies, Geology, Mathematics, Mineralogy, Palynology
Site interpretation	Behaviourial Sciences, Biology, Botany, Chemistry, Environmental Studies, Geology, Soil Sciences
Site Report	Behaviourial Sciences, Biology, Botany, Chemistry, Environmental Studies, Geology, Sedimentology, Soil Sciences
Excavating a real site	Biology, Botany, Chemistry, Behaviourial Sciences, Ecology, Environmental Studies, Geology, Sedimentology, Soil Sciences

Table 6.3. Common Essential Learnings in Modules

Modules	Common Essential Learnings
Create-a-Site	Communication, Numeracy, Critical and Creative Thinking, Independent Learning
Stratified Site	Communication, Critical and Creative Thinking, Independent Learning
Artifact Classification	Communication, Numeracy, Critical and Creative Thinking, Technological Literacy, Independent Learning
Excavation	Communication, Numeracy, Critical and Creative Thinking, Technological Literacy, Independent Learning
Mapping profile and floorplan	Communication, Numeracy, Critical and Creative Thinking, Technological Literacy, Independent Learning
Laboratory Analysis	Communication, Numeracy, Critical and Creative Thinking, Technological Literacy, Independent Learning
Site Interpretation	Communication, Numeracy, Critical and Creative Thinking, Technological Literacy, Independent Learning
Site Report	Communication, Critical and Creative Thinking, Independent Learning
Excavating a real site	Communication, Numeracy, Critical and Creative Thinking, Technological Literacy, Independent Learning

Table 6.4. Archaeological Concepts And Topics Used in Modules

Modules	Concepts
Create-a-site	site formation processes material culture decay and decomposition archaeological terminology bioturbation natural erosional forces
Stratified Site	soil formation processes sediment deposition stratification, Law of Superposition site disturbances relative and absolute dating bioturbation natural erosional processes site formation processes
Artifact Classification	comparative analysis (attributes, function) lithics technology human behaviourial patterns archaeological interpretation
Excavation	archaeological methods and techniques provenience, context and association field recording techniques environmental evidence site disturbance behaviourial patterns

Table 6.4 cont...

Mapping profile and floorplan	archaeological methodology stratigraphy provenience, context geological processes site formation processes
Laboratory analysis	analysis and hypothesis testing (description, identification, classification)
Site Interpretation	site formation processes archaeological interpretation behaviour patterns environmental determinants site disturbances holistic nature of archaeology multi/interdisciplinary nature of archaeology
Site Report	synthesis of archaeological data holistic nature of archaeology multi/interdisciplinary nature of archaeology human behaviour patterns
Excavating a real site	archaeological methods and techniques site formation processes site disturbances settlement patterns human behaviour patterns archaeological conservation

6.2 Description and Evaluation of the Modules

Module One: The Archaeology Site, includes two preparatory activities; an introduction to archaeological concepts, and planning and constructing an archaeological site. Through audio and visual media, the students were introduced to archaeological concepts (e.g. decay), and terminology (e.g. artifact, ecofact, feature) commonly used in archaeology. The students were also familiarized with the various cognate disciplines used in archaeological research. The second activity involves creating a simulated archaeological site composed of four units. This activity is designed to assist students in conceptualizing the site formation processes, in effect as a 'living site' changes into an 'archaeological site'. The students were divided into two groups of eight students; each group created a storyline to describe a contemporary site (e.g. backyard, campground), drew a floor plan of the site and discussed the artifacts that may be found at their site after a period of abandonment. Using one meter square 'unit boxes', the students built these sites using contemporary artifacts (e.g. plastic cutlery), soils, gravels, ash, rocks, etc. to represent features, and various seeds as ecofacts. Disturbances that can affect the state of a site (e.g. erosional forces, bioturbations) were simulated and causal relationships were discussed. The students were required to work cooperatively in small and large groups and display sound creative and organizational skills.

After initial hesitation, the students appeared to understand the archaeological concepts presented in the activities; the constructed sites displayed well thought out plans, creativity and imagination. The learning environment during activity two was informal; students freely interacted with each other and the archaeologists. Individual groups initiated discussions regarding the archaeological concepts presented earlier and

brainstormed about the type of site they were going to create.

This module presents a fair amount of conceptual information in a relatively short period of time. Suggestions for modification of this module include separating the module into two, and providing visual aids by demonstrating the creation of a simulated site.

Module Two: Stratified Soil Formation, is a teacher-directed, hands-on activity which involves creating soil and depositional layers or strata in an aquarium. The main objective of this module was to present geological and archaeological concepts through participatory activities. The activity began with an explanation of glacial deposition and the stages of soil formation. As each stage was described, the students built the layer using materials supplied for the activity. After completing the soil formation exercise, sediment deposition was simulated by creating several layers, including: a sand layer from a flood, an ash layer from prolonged volcanic action, erosional soil layers (e.g. wind blown topsoil), and several black soil occupation layers. The students also created erosional disturbances and bioturbations. At the conclusion of the activity the aquariums exhibited physical evidence of basic geological concepts such as the Law of Superposition, stratigraphy, and the relevance of these concepts to archaeological research (e.g. relative dating).

This module familiarized the students with several archaeologically relevant concepts, in a visually effective manner. Consequently, the students were able to quickly grasp these concepts. Several students commented that they had never really understood soil formation processes from reading information in a textbook. Cause and effect was readily apparent as the building of the stratified site proceeded. Environmental issues

were incorporated into the discussions; students related this information to soil erosion problems in Saskatchewan. Several groups integrated the site formation processes discussed in module one into this activity; they created precontact hearths in one of the occupation layers.

The success of this module was due to several factors: 1) the relaxed pace; the instructor presented relevant, interesting information (e.g. history of glaciers in Saskatchewan); instructions for building the strata were given and the students then built the layer - the process was then repeated; 2) the activity was hands-on, set in a cooperative learning atmosphere; the students worked together to build each layer and create the disturbances; 3) the finished product was impressive and visually pleasing; and, 4) the students were aware they were learning fairly difficult concepts from several disciplines, but they were also having fun.

Module Three: Classification, introduced the students to description and classification, through several hands-on activities. The initial activity involved describing contemporary objects according to various physical characteristics. The second, more complex activity, involved the analysis and classification of artifacts. These activities required the students to use analytical skills, while describing, identifying and classifying the objects. In the first part of the activity the students practised on contemporary objects. Discussions centred on the ways archaeologists categorize artifacts according to attributes (e.g. shape, size, material) and determine possible functions based on these attributes. In the second part of the activity the students worked with real artifacts (e.g. projectile points and tools such as scrapers).

This module prepared the students for a later module when they were responsible

for classifying the artifacts they excavated from the simulated sites. The students found the initial parts of the activity rather trying; they became more interested when they began classifying real artifacts. They particulary enjoyed discussing the relationship between archaeological evidence of technology and interpreting patterns of human behaviour. They critically examined this approach to investigation of the past. The students' response is indicative of the need to be relevant. The earlier classification exercises did not appear relevant to the students, they were more like typical school work. However, when they began working with real archaeological evidence and discussing laboratory analysis and classification's relationship to interpretation of the past, the activity became relevant. This relatively straightforward activity should be tagged to the classification tasks the students will begin in module six.

Module Four: Excavation Methods and Techniques was the focal point of the unit excavation theme. The purpose of this activity is to introduce students to archaeological field methods and to encourage the students to use their interpretational skills as they work. The two groups of eight students switched sites and began excavating the units using recognized archaeological methods and techniques. These methods included: 1) record keeping: taking depth below surface (DBS) measurements and completing identification cards for the artifact bags; 2) removal of the soil using archaeological tools (trowels, dustpans and buckets), screening the soil for small artifacts and ecofacts (e.g. seeds); 3) material retrieval: placing screened fragments in properly identified fragment bags and leaving all major artifacts and features in situ. This activity required the students to work together in small groups (two people per unit box). The complexity and number of tasks required the students to practice strong organizational skills.

While performing the archaeological tasks the students were exposed to a number of cognate disciplines associated with archaeological research. In particular, the students gained an understanding of chemical, biological and behavioural influences on a site. They also investigated environmental evidence (the seeds planted in the site four weeks prior had all sprouted and caused some disturbance).

Most of the students considered this module the highlight of the simulated activities. They demonstrated their understanding of the scientific nature of archaeology through conscientious excavation and enthusiastic interpretation of the units. The students worked together in a cohesive group, sharing tasks, assisting in even the most menial aspects of the work, and demonstrated an amusing but understandable proprietary attitude towards the materials found in "their" unit.

Although this excavation was simulated, the students took the activity seriously. They concentrated on the scientific processes involved in systematically excavating the unit and the analysis that would be required in future modules. The importance of archaeological concepts such as provenience (location of an artifact, ecofact or feature in relation to other artifacts, ecofacts and features) were demonstrated in this activity. Finding artifacts was never an important element of the exercise (although if the artifacts had been of precontact origin the students may have focused on the 'finds' rather than the process). From all indications, and as will be seen later, this simulated exercise was a valuable educational exercise and a valuable training ground for working on a real archaeological site.

The purpose of Module Five: Drafting Techniques is to introduce students to drafting and graphic recording techniques used in archaeological research through hands-

on exercises. The first activity involved plotting the profile of the stratified site they had created in module two. The students worked together in their original small groups to interpret and plot the strata of the stratified site. This activity required the students to take vertical and horizontal measurements of the layers, plot them on the profile form and develop a detailed key to identify the layers. In activity two the students horizontally measured and mapped all in situ artifacts and features on the floor plan and 'bagged' the artifacts with completed identification cards. Throughout the activity previously introduced archaeological concepts such as stratigraphy and context were reinforced.

This complex series of activities required the students to work together, showing commitment and patience during the exacting tasks. The students found these activities quite difficult but exhibited a considerable amount of forbearance and patience. Even when serious mistakes were made, they erased their work and began again.

One of the problems with this module was the amount of work required in two and a half hours; the module should have been divided into two modules to ease the time pressures and the complexity of the work. Although most of the students would not describe this activity as "fun", the finished products (floorplan and profile plan) were visually impressive which gave the students a sense of pride and accomplishment.

Module Six: Identification and Cataloguing, introduces laboratory analysis (observation, description, identification and classification of data) to the students. The excavated materials from module four were cleaned, organized, and classified according to the classification skills they learned in module three. Inventory sheets and catalog cards were also completed. The students completed this activity with ease; the materials were analyzed and all forms were accurately completed. They worked together in small

groups, in a relaxed atmosphere. They discussed their analysis of the materials, and readily sought clarification of process or interpretation. The importance of archaeological analysis in scientific archaeological research was reinforced, and the cognate sciences employed during this analysis (e.g. mineralogy, lithic technology, behaviourial patterns) were discussed on an informal basis. Although this work became tedious for some students, they all recognized the importance of laboratory analysis in archaeological research. This activity is easily modified by reducing the number of artifacts in module four, and expanded by increasing qualitative and quantitative analysis of the material evidence.

In Module Seven: Interpreting Data, the students worked as a site group, compiling all the information and materials accumulated by each of the four unit groups. As a cohesive group, they attempted to interpret the data and, through inference, the activities carried on at the site. Discussions included how artifacts present clues to the activities carried out at the site, identification of the site (e.g. campground) and based on the ecofacts, the type of environment likely associated with this site. The students also discussed site formation processes which may have altered the evidence at the site and how archaeologists account for disturbances when interpreting a site. This activity stressed the holistic, interdisciplinary nature of archaeology, enabling the students to synthesize and integrate the accumulated information. The students responded to this activity with less than their usual enthusiasm. This response is understandable considering the lack of active participatory exercises and the large amount of paperwork associated with this module. The students also appeared to be somewhat confused about the process involved in this activity. Interpretation of the data should be combined with

the site report module as they are both sequential steps in the synthesis process.

As part of module seven, the students were also required to prepare a public display of the modules for visiting dignitaries. The students organized the stratified sites and documentation, and took turns explaining the scientific processes, and archaeological and geological concepts associated with the modules. Several students built new excavation units for the display. The creative ideas exhibited in the new simulated sites and the quality of explanations served to demonstrate the degree of understanding the students gained from the project. The students clearly and concisely explained the modular activities, the disciplines employed by archaeologists to carry out archaeological research, and the archaeological significance of the activity. Several students took the opportunity to 'plug' the educational relevance of archaeology in teaching science.

Module Eight: Documenting the Research, was the final activity in the sequence of simulated modules. The site report consisted of an eight page booklet which the students filled out. The purpose of this activity is to allow the students to bring together all the data they had gathered and the archaeological knowledge they have accumulated over the length of the project. The students synthesized the information, and working in cooperative groups, wrote a site report for their respective sites. Communication skills were consistently emphasized in this activity (as in all the activities). In the second part of the module, the students reported their conclusions through oral presentations. A few of the students did not like this activity because of all the writing. However, most of the students saw the relevance of bringing closure to the archaeological project. The continuous re-evaluation of archaeological interpretation was also discussed during this module.

These modules are educationally relevant for a number of reasons. As indicated in Table 6.1, the students were involved in scientific inquiry through predominantly hands-on activities. In addition, the students were continually involved in several learning skills, in particular, oral and written communication and critical and creative thinking. Throughout the sessions the students integrated cognate disciplines into their work, in particular, discussions of human behaviour, environmental indicators, geological formations, and chemical reactions on organic and inorganic materials.

The students were also provided with the unique opportunity of applying their new skills and knowledge while working on a real archaeological site. The university field school, excavating at Wanuskewin Heritage Park, invited the students to work with them for a day. Each excavation unit had two or three students working with an experienced university archaeology student. This ratio appeared to guarantee more than adequate supervision.

The students were very careful excavators, employing the excavation techniques they learned in the simulated activities; they fully understood their responsibilities and were meticulous in performing their duties. The students worked at an acceptable pace, in fact, more work was completed that day than usual. The initial nervousness exhibited by the attending archaeologist soon disappeared; he was pleasantly surprised at the quality and quantity of work produced by the students.

As the students worked they asked questions, and even interviewed the archaeologists who were working with them. They also freely and enthusiastically offered interpretations of the artifacts they recovered, proposed possible activities associated with the units they were working in, and attempted to identify the overall functions of the site.

By the end of the day the students were tired, pleased with their accomplishments and very appreciative of archaeological research methodology. Overall, the students found the experience fulfilling and very interesting.

This culminating activity provided an unique educational experience for the students; they were able to take the skills they had learned in simulation and apply them to an actual research situation. The educational, cultural, archaeological and social value of this experience cannot be over-emphasized. The importance of concepts such as provenience and context took on new meaning, as did the importance of leaving archaeological sites intact unless there is a scientific or mitigating reason to excavate. These students were working in real history, recovering artifacts used by real people in another time. The social value of working as a member of a research team, alongside real archaeologists, is beyond measure.

The Common Essential Learnings advocated by Saskatchewan Education (1988) were very evident in these activities. The students used their observational and communication skills while interacting with each other and the university archaeologists and through keeping detailed records. Numeracy skills were employed while measuring and recording soil strata and provenience of artifacts. Critical and Creative Thinking Skills were used as they analyzed and interpreted the data they were uncovering. Technological Literacy was evident in their examination of projectile points and tools and through discussions of the relationship between technology and human behaviour. Personal and Social Values and Skills showed up in respect for the people who lived and worked at the site, and for the archaeologists who investigate the past. Independent Learning was evident as the students worked as carefully as they were able, while eagerly

absorbing information about this archaeological site.

This discussion has concentrated on an evaluation of the modules from my perspective as an educational archaeologist. The following section will focus on the students' perceptions of the educational and archaeological value of the modular activities.

6.3 Evaluations and Observations by Students

The modules were designed to stimulate students' interest in scientific discovery. Allen (1991) states that a multifaceted activity-oriented science curriculum will capture the interest of students and, therefore, is relevant to education. The students were asked to identify all the modular activities they found interesting (see Table 6.5); checking as many activities as they wished. The profile and floor plan mapping activities were separated in the questionnaire, given their complexity and association with the two separate archaeological themes.

In this project, all the students found the archaeology activities very interesting. The most popular activities were creating and excavating the site. Excavating the units was chosen by all of the students, while eight out of the ten students identified creating the site as most interesting. These choices are not surprising since excavation is most readily identified with archaeology. These activities are also participation-intensive. Seven of the students also identified mapping the profile as very interesting. This response is somewhat surprising considering many of the students experienced difficulty with this activity and did not appear to particularly enjoy the activity although they were proud of completing the difficult tasks. Creating the stratified site and interpreting the unit site were chosen as favourites by half the students. The low rating on creating the

stratified sites is very surprising given the fact that all of the students seemed to enjoy the activity very much and were thrilled with the finished product. The least popular activities were the site report, cataloguing the artifacts and mapping the floor plan - these activities required a lot of paperwork. Classification was also rated low as a favourite activity; this response reflects the attitudes exhibited during the activity. The fact that some of the questionnaire responses do not correlate with the responses of the students during the activities may be due to confusion in the wording of the question; asking the students to identify the activities they found most interesting. Some of the students marked all the activities, others only chose one or two activities. There may also have been some confusion about the activity associated with the stratified site.

Although some of the students only chose a few activities as most interesting, it was obvious they enjoyed all the activities. When asked to identify activities they found least interesting, only two students identified any of the modules. One student least enjoyed the site report because of the writing required, and the other student disliked the measuring and classification activities because they "were boring." When asked why the students found the activities interesting, five of the students stated the activities were "fun." The students also responded that they could get their hands dirty and actually work as an archaeologist. Two of the students liked the activities because they were creative and challenging. These responses validate a major premise concerning archaeology; educational archaeologists have repeatedly found that students enjoy participating in hands-on archaeological activities which reflect actual research procedures. The majority of the students did not find any of the activities too difficult to complete. Measuring and mapping the stratified site was identified as too difficult by two students.

Table 6.5 Most Favoured Archaeological Activities

Activities	Favourite Choices
create a site	80%
create a stratified site	50%
profile mapping	70%
unit excavation	100%
mapping floor plan	40%
classification	40%
cataloguing	40%
interpretation of site	50%
site report	40%

This activity was the most complex exercise in the sequence of modules and should be modified for younger students.

The multidisciplinary nature of archaeology was stressed throughout the project. All students agreed that archaeology is a good method for learning about other sciences. One student summed up the general feelings of the students by stating, "It's more fun to be doing things like playing with dirt, than to be taking notes that you'll never remember anyways." Eight of the students felt that it was easier and more interesting to learn about other sciences using archaeological activities.

A major emphasis in these modules is skill development. The students utilized many skills while participating in the module activities. Skills suggested in the questionnaire were presented in a very simplified context that could be easily identified by the students. All the students agreed that creative thinking, organization and cooperation were used in the activities. Nine of the students also identified mathematics, art and writing in the activities. One student added analyzing and assimilation of factual data.

Table 6.6. Additional Archaeological Activities

Activity	Students' Choice
dig a real site	90%
school yard dig	50%
laboratory analysis	60%
classroom archaeology	50%
another project like this one	30%
other	0%

Archaeology curriculum is a first step in getting students involved in further archaeology projects. These students were asked to identify additional activities in which they would like to participate (see Table 6.6). The most favoured archaeology activity was volunteering at a real archaeological dig. Comments throughout the project indicated

the students felt qualified to work as volunteer archaeologists. They also appeared quite interested in working in an archaeological laboratory. Archaeological projects offered at their school, either a school yard dig, or classroom activities, were also positively received. Three of the students indicated they would like to become involved in a project similar to this one.

In the concluding comments of the questionnaire, some of the students reiterated their desire to work on a real dig. These comments are an indication of the level of interest the students experienced throughout the project. The students enjoyed the project and felt it was a worthwhile educational opportunity. The final consensus from the students was, "science is fun and interesting if it is integrated into archaeology."

Educational archaeologists suggest that students enjoy hands-on activities and, therefore, absorb educational concepts more readily. These modules certainly support this premise. The students appeared to consistently enjoy the activities and were able to integrate the scientific concepts and skills into a finished product. Overall evaluation of these modules in a contrived situation suggests they are an extremely efficient, valuable educational program. The following section will provide further evaluation of the modules in a regular classroom situation.

6.4 Evaluation of Modules in a Regular Classroom

Although the modules were tested by student volunteers in Wanuskewin Heritage Park's laboratory, this was a very artificial or contrived situation. These students volunteered to participate in the project; they were very eager, well behaved students, class size was limited, and the facilities were designed for this type of project. These

modules were further evaluated in a regular classroom in order to develop a more realistic assessment of their applicability in a classroom situation. The class included 13 grade seven students and 20 grade eight students.

Investigations in the classroom focused upon the practicality of integrating these materials into a classroom setting, and the adaptability of the modules to a range of student abilities and interests. Therefore, the following discussion will not include detailed descriptive analysis of the modules, as in section 6.3. Rather, observations and insights into the practical aspects of these modules will be discussed, beginning with an informal presentation of the procedures and circumstances surrounding the project's implementation in a regular classroom, and concluding with some insights and recommendations for the future.

Module One: The Archaeology Site actually involved two major sections, spread over two sessions. The first day involved preparation and organization. The activities were outlined to the students after which they were introduced to the discipline of archaeology. The students appeared very interested in archaeology, and in particular, the exotic places where archaeologists work and the artifacts found in these countries. Heritage protection laws, both in Saskatchewan and in other countries were discussed. However, the students did not seem to grasp the importance of protecting artifacts rather than collecting them. They also tended to associate archaeology with digging for dinosaur bones and Indiana Jones exploits. Some of the students appeared disappointed or even annoyed when their misconceptions were pointed out.

In the second part of the session the students built ten one meter square unit boxes and three screening boxes under the direction of the principal of the school. Having the

principal involved in the project gave the students and the principal a rare opportunity to work together. The students participated enthusiastically; all the hammering, gluing and noise was great fun. Involving the students in the organization and preparation of the project provided a sense of continuity for the rest of the activities.

After the unit boxes were completed, the students were divided into two groups of sixteen and seventeen students. The groups met in the classroom and the art/science room to plan the sites. Unlike the original module, these students chose their own sites. They chose to build a backyard of an abandoned farmhouse and the concession area at the Exhibition Grounds. They were instructed to keep the identity of their site a secret from the other group. The students then had to decide, as a group, what cultural evidence would likely be found at their particular site and assign responsibilities for finding and bringing these materials to school. Two recorders were chosen in each group to draw up the site plan and list the required materials. Most of the students made excellent suggestions for ecofacts (e.g. sunflower seeds, pistachio nuts, and chicken bones at the exhibition; garden seeds, grass and wheat at the farmyard) and artifacts (e.g. gum wrappers and bottle caps at the exhibition; legos and nails at the farmyard) that may be found at the sites. Although their suggestions for features were reasonable, some were difficult to adequately duplicate (e.g. paved street at the exhibition; barn at the farmyard).

As with the volunteer students at Wanuskewin Heritage Park, the students were somewhat hesitant about the project in the beginning but quickly became involved as they began to understand the nature of the activity. The major problems with this activity (and all ensueing modules) was the lack of time and space, and the large number of students in each group. The students needed more time to prepare their site plans through critical

and creative group discussions. Individual attention and discussion, which was prevalent with the volunteer students, was difficult due to the large number of students. Obviously, this activity required several assistants (e.g. parents) to work with the groups and encourage the quieter students to participate.

The students were responsible for gathering required materials. In addition, I collected a variety of possible artifacts and the majority of soils and sands. The sites were created outdoors in order to provide adequate space, avoid disturbing other classes and minimize clean-up. Several problems became evident at once. Properly supervising 33 students spread over a distance is impossible for three people. In addition, the teacher and parent assistant were unsure of some aspects of the activity. Therefore, I assumed most of the responsibility for conducting the activity. However, both sites were successfully created, the students were proud of their accomplishments and looked forward to excavating the sites.

At this point we realized our mistake in creating the sites outdoors - the school doors were too narrow to allow us to take the unit boxes into the school. Some of the boxes were placed in a storage shed; however, they were tilted as they went through the doorway, which disturbed the soil matrix. This accident led to a discussion on the difficulties with interpretation of disturbed sites. Due to this experience, we came to the conclusion that the unit boxes need not be one meter square, half this size would be more than adequate.

The sequence of the modules was changed in order to finish excavations before inclement weather moved into the area. Module Four: Excavation Methods and Techniques required a great deal of preparation. The students were responsible for

collecting all the necessary equipment (pails, trowels/soup spoons, dust pans, measuring tapes, etc.). I also brought a great deal of equipment. Since we could not leave partially excavated sites out in the open for another week, the students were under a great deal of pressure to finish the excavation and move on to Module Five: Drafting Techniques. Because of the time pressures and lack of adequate preparation, some of the students were not careful in their excavation and, in particular, record keeping. With 33 students it was difficult for all of them to even see the demonstrations, and again time constraints which precluded individual explanations. The students grasped the concept of excavating quadrants, however, they had difficulty understanding the measurement techniques (e.g. depth below surface (DBS)), and some difficulty recognizing soil changes. Despite these problems, the students were able to complete the tasks satisfactorily. These two modules should definitely be carried out on separate days with several well prepared assistants to reinforce initial explanations and assist in difficult tasks such as measuring and mapping the floorplan. The students were very enthusiastic about the excavation process, and less enthusiastic about measuring, mapping and collecting the materials. The groups that adhered to their individual work assignments performed the most efficiently.

The students completed Module Three: Classification and Module Six: Identification and Cataloguing for their fourth session. Contemporary kitchen utensils were used for the initial explanation and demonstration; the students grasped the idea that classification revolves around a set of characteristics or attributes such as size, shape, material, and colour in order to determine possible function. The students created an inventory list and catalogued their materials. The number of artifacts and ecofacts varied in each unit box. Therefore, some groups finished quickly while other groups needed

assistance near the end of the session. Several groups were actively interpreting their units as they worked. These activities require a great deal of paperwork and should be broken into short class periods over several days to ease the monotony.

Module Seven: Interpreting Data and Module Eight: Site Report were combined. The site report booklet was modified for these students and focused on inference-making and interpretational questions rather than straight description. The students remained in their unit groups but also interacted as a site group. There were several highly motivated and organized students in each group who directed the exercise and essentially synthesized the data. The students did not hesitate to approach me for clarification of some point. The activity was fairly successful and the site reports were of good quality.

Module Two: Stratified Soil Formations proved to be the most difficult module to organize with a large class and small facilities and lack of equipment. Locating enough aquariums for the entire class also proved difficult; eventually we gathered two large and three small aquariums. All the aggregates were donated by a local quarry. The grade seven and eight students completed the module on separate days. As with the volunteer students, this was a teacher-led activity; the students were required to take 'jot' notes on the information presented, listen carefully to the instructions, then build the strata. The students appeared very impressed as the layers of soil and sediments were created, and enthusiastically participated in creating bioturbations and experimenting with erosional forces (hair dryer for wind storm and squirt bottles for stream action).

The classroom teacher felt this activity made quite an impression on the students. For example, one student missed the first day of the activity; the other students insisted she wait to participate with the grade seven students to avoid missing the relevance of the

whole activity.

Mapping the Profile, Module Five: Drafting Techniques, was completed the following week. Before we began the activity, I recapped the previous session, reiterating the geological, archaeological, environmental and soil formation concepts we had discussed. A brief question and answer session indicated the students had retained much of the information from the previous week. Again, time restraints interfered with these discussions. Most of the students were very conscientious about completing the tasks and worked industriously on this activity. They coloured each strata as they plotted it; the completed form, with several different coloured strata and a detailed key, was visually pleasing and gave the students a sense of satisfaction. After completion of the project, the grade eight students had to empty their aquariums for the grade seven students. This was unfortunate since one of the intrinsic values of this activity is the sense of accomplishment and the visual impressiveness of the finished product. The entire activity was repeated with the grade seven students.

Assessing the practicality of using this project in a classroom presents a quandary. On the one hand, the logistical problems are almost insurmountable. However, the activities were generally a success and definitely educationally worthwhile. The major problems included large class size, inadequate facilities, time restraints, lack of assistance (volunteer parents), and my own inexperience in dealing with students who are not always eager to learn or behave appropriately. However, the students obviously enjoyed the activities. Given the relatively short attention span of younger students and the problems we experienced with running out of time during the scheduled half day sessions, these activities should be divided into class periods, spread over several days. In addition, no

more than 12 to 15 students should participate in these activities at any given time. This recommendation presents serious logistical problems in today's typically over-crowded classes. Again, to successfully facilitate these activities dedicated volunteer assistance is required.

The classroom teacher, although familiar with archaeology from several university courses, felt she could not manage these activities without the assistance of an educational archaeologist. This presents a major problem since archaeologists are seldom available to spend the required amount of time, nor are funds usually available to pay for their assistance. One possible remedy for this problem could be inservices and workshops where the teachers actually participate in the activities themselves. Parent information nights and/or brief training sessions before they assist the classroom teacher would also be advisable. In addition, these problems may be mitigated if educators and archaeologists collaborate to develop an educationally and archaeological valid curriculum unit which takes into consideration the practical aspects of teaching in regular classrooms.

Besides the obvious lack of teacher participation in developing these modules, professional teachers were not involved in the initial testing of the modules at Wanuskewin Heritage Park. Therefore, receiving some feedback from the classroom teacher was perceived as very important. Following the completion of the modular activities, the teacher was asked to express her opinions regarding the modules and archaeology's place in education.

6.5 Teacher Evaluations and Comments

This semi-structured interview revolved around four main topics: 1) integration of archaeological activities into mainstream subject areas; 2) the "Archaeology in the Schools" modules' educational value; 3) student responses to the project; and, 4) curriculum needs of teachers.

Archaeology's integrative and multidisciplinary nature was recognized and appreciated by the teacher. She felt archaeology cannot be separated into distinct categories (e.g. only a cultural or scientific emphasis), especially since educational trends are moving towards an integrative approach, where it is possible to move from subject to subject within the same theme. However, the teacher also felt it is important to clearly present a foundation or knowledge base; defining archaeology, identifying the strategies or methods archaeologists use and why this work is important. Once the underlying strategies and knowledge base are established, archaeology can be placed in many subject areas and used to teach many different skills and processes.

The "Archaeology in the Schools" project was treated as an isolated unit during testing in the classroom. The next step, according to the teacher, is to integrate archaeology into other subject areas throughout the year, in order to connect archaeology to the larger corpus of knowledge presented to students in a school year (e.g. compare the scientific methods used by archaeologists and biologists; integrate archaeological stories into their literature unit on mysteries; use archaeological measurement techniques in mathematics, etc.).

Following this project, the teacher suggested she would incorporate additional archaeological information and strategies into the lessons and tie archaeology into a

cultural context. In particular, developing technological literacy from a cultural perspective was identified as very important. For example, examining technological changes from precontact times to present day. Visual aids such as a collection of precontact tools and weapons (casts) weres also identified as important. In essence, the teacher felt archaeology is an excellent candidate for an integrated approach to teaching.

In the classroom setting, the type of students and their intellectual abilities and behaviour varied widely. Expecting these students to respond in the same manner as the hand-picked volunteer students at Wanuskewin is unrealistic. The teacher felt all the students were initially very interested in archaeology because of its exotic flavour. As the project progressed two or three students began to become less enthusiastic, particularly about the amount of work required of them. On the other hand, two or three students also became even more enthusiastic about the project. The teacher felt this was a typical reaction from a regular classroom, for any project. Most of the students fell in the middle, going along with the project, gaining some additional knowledge and experience. It appeared the more unusual the activity, the more the students enjoyed the work. For example, they were very proud of the stratified profile because of all the different layers and disturbances. The students took a great deal of pleasure in colouring the strata on their profile form - again an indication of the importance of impressive finished products. The least favourite part of the project was the measuring of artifacts before removing them from the excavation unit. Their dislike of this exercise probably stems from difficulties in understanding the process. The site report was also somewhat overwhelming because of the length (six pages).

Generally speaking, most of the students were surprised at the amount of work and

degree of difficulty associated with archaeological research. The teacher felt the project forced the students to go beyond the typical question and answer textbook methods, to a level where they had to take the materials, analyze them and come to some conclusions by using their critical and creative thinking skills. This approach is what made the project appear so difficult and, and in turn, so educationally valuable. The teacher felt the activities in this project covered the Common Essential Learnings very well; she felt this is a strong point in favour of including archaeological programs in school. The emphasis on scientific process was also identified as important; going from knowledge to comprehension to evaluation. Most of the students appeared to grasp the concepts presented in the activities. Employing a cooperative learning strategy helped all the students feel good about the tasks they performed. For example, when mapping the stratified profile or classifying and cataloguing the artifacts, each student had a task to complete. They were held responsible for their work, which reinforced independent learning skills. The teacher felt our whole approach to the project was a wonderful learning experience for the students. In particular, the students were involved in setting up the program from the beginning, and they were responsible for collecting all the necessary supplies and equipment. Communication skills were constantly enhanced; they discussed the tasks they were performing in a group situation, completed several worksheets and wrote a final site report. Many of the activities required mathematical exercises which strengthen students' numerical skills.

The students displayed a high degree of enthusiasm for the project; students are always enthusiastic about hands-on activities, especially when rocks and dirt and water bottles are part of the equipment. Further indications of their enthusiasm for the project

included a willingness to work outside in the rain, stay after school to complete activities, and participate in setting up before the activities and cleaning up after the activities.

Unlike the teachers in the Wanuskewin social studies unit, this classroom teacher does have previous academic and field school experience with archaeology. However, she has never included archaeology in her teaching because of the planning and preparation that would be involved in researching and creating teaching materials. As earlier stated by the curriculum writers and pilot teachers, this classroom teacher also felt she needed someone else (an archaeologist) to develop the materials and to ensure the information was complete and accurate. In fact, she suggested that many teachers would use well prepared, self-sufficient teaching packages if inservice was also available. The key factor is teacher comfort level - the curriculum unit must be set up to meet the needs of the teachers or they will not use the unit.

The teacher identified several needs of teachers which must be considered when developing archaeology curricula. The curriculum must be complete, with all the components the teacher will use in teaching the unit. These components include basic background information (at-a-glance sheets); activities designed for a specific, identified age range; lesson plans with lists of all materials and the time required to perform the activities; and, copies of all necessary forms and worksheets. In addition, teachers need activities which accommodate many different learning styles (e.g. hands-on activities as compared to workbook sheets and manuals).

The teacher also identified several prerequisites to successfully carrying out a project such as "Archaeology in the Schools." An adequate facility must be available and the materials and equipment must be easily obtainable and inexpensive. Parental

assistance is also vital, especially to maintain control. Including parents in the project is also an excellent public relations strategy - the parents also become aware of archaeology's relevance in education.

After taking part in this project, the classroom teacher plans to use the activities in the future. Her plans include spending a summer getting together the materials and developing an integrated approach, so that the activities become a part of the social studies, science, language arts and fine art subject areas. She identified the stratified soil activity as her first choice since the students particularly enjoyed this activity.

In conclusion, the teacher felt archaeology is a "perfect" subject to use in elementary schools. Archaeological activities integrate all of the Common Essential Learnings and emphasize use of skill application, synthesis, analysis and evaluation of information. The teacher felt her students now look at archaeology from a different perspective; they have a much better understanding of archaeology as a scientific discipline.

6.6 Discussion

This study has examined archaeology's educational relevance as a teaching vehicle for the natural sciences, through a sequence of modules. Unlike the Wanuskewin edu-kit, this project is not a developed curriculum unit; the modules were created by two archaeologists to examine the efficacy of using archaeological activities to introduce students to scientific inquiry. The development of these modules is viewed as an initial step in creating archaeological curricula emphasizing the scientific, integrative and multidisciplinary nature of archaeology.

A unique feature of this project is the total involvement of the students in hands-on activities which simulate archaeological research and emphasize visual and tactile experiences. The activities were completed by the students and the finished products were visually impressive. This focus served to instill a sense of accomplishment in the students. In addition, archaeological concepts such as context and provenience were reiterated through practical application during the activities. Applying concrete examples of abstract scientific concepts assisted the students in understanding the information presented.

Educational archaeologists have advocated taking advantage of archaeology's multidisciplinary nature to introduce cognate disciplines and their concepts. Each of these modules employs the knowledge and resources from several other disciplines in an attempt to present a holistic perspective of archaeological investigation.

A major focus of all the modules is strengthening of life-long learning skills as outlined in the CELs (Sask. Ed. 1988). These activities encouraged the students to question scientific acquisition and interpretation of data, and, in effect, served to stimulate the students' creative and critical thinking skills. Virtually all of the Common Essential Learnings, including numeracy, communication, independent learning and technological literacy are an integral part of the modules.

The students who participated in this project, both at Wanuskewin Heritage Park and in the classroom, were very interested in archaeology as a discipline and were eager to participate in archaeological research. The activities introduced the students to the technical and scientific side of archaeology. Most students were surprised at the exactness of archaeological research and the difficulties associated with interpretation of

data. In this way, the students developed an increased respect for archaeology as a science rather than as a 'treasure hunting adventure.'

For the Wanuskewin student volunteers, the overall success of the modules and their educational validity was embodied in the final activity. These students worked side-by side with real archaeologists on a real archaeological site at Wanuskewin Heritage Park. Most of these student are likely to never forget the experience. This experience proved a major premise of educational archaeology; working in a simulated site does not induce an 'artifact mentality', and young students can work productively and carefully on a supervised archaeological project.

Although the modular activities were a resounding success in the Wanuskewin laboratory, the realities of a classroom situation call their viability into question. For most teachers the prospect of preparing and carrying out these activities would be overwhelming. Therefore, teacher-friendly, integrative curriculum materials must be developed to encourage teachers to attempt this project. In addition, most teachers would find these modules, with their emphasis on the technical, scientific aspects of archaeology (in other words, 'doing archaeology'), too limiting. Rather, any curriculum developed with these modules must also integrate the cultural side of archaeology into the program, as in the Wanuskewin edu-kit.

An important element missing in this process was collaboration between teachers and archaeologists to ensure the modules are educationally valid. From all reports the archaeologists were successful in this endeavour, however, it is strongly recommended that any additional development of this project include collaboration with experienced educators, particularly science and social studies teachers.

These modules successfully accomplished the stated goal of introducing students to scientific inquiry using archaeology as the teaching vehicle. However, due to the narrow focus, several major goals of educational archaeology are missing in this project. In particular, a major goal of educational archaeology is to develop a 'conservation ethic' in students. Unless special emphasis is placed on this topic, the modular activities are unlikely to instill this concept in the students. In addition, it is not in the mandate of this project to present cultural information or assist in development of a 'sense of the past.' Rather, the methods employed in archaeological investigation are emphasized. These problems were solved during the initial project by having the students work at a real site where they were exposed to cultural evidence and gained an insight into the value of archaeological sites and investigation of the past.

In conclusion, the roles of archaeology in this project were to: 1) introduce cognate disciplines and the multidisciplinary nature of archaeology; 2) introduce students to science process; and, 3) integrate life-long learning skills into the activities. In effect, the project exemplifies archaeology's efficacy as a teaching vehicle in science. Therefore, although this project does not reach its full potential, archaeology is certainly educationally relevant as a science.

CHAPTER SEVEN

DISCUSSION AND RECOMMENDATIONS

This study has examined the relevance of educational archaeology programs from a theoretical and practical perspective. The following discussion will synthesize the interdependence and interconnectedness of the various components in educational archaeology programs. In addition, recommendations for future development of educational archaeology programs are suggested.

7.1 Educational Archaeology: A Model of Interdependence and Interconnectedness

Archaeologists who advocate development of educational archaeology programs cite the unique benefits of cohesive, integrated programs. An idealized conceptualization of educational archaeology programs and the interrelated components of these programs is elaborated in this section. A schematic diagram of the interconnected parts of educational archaeology programs is presented in figure 7.1 as a visual aid to the following discussion.

The majority of educational archaeology programs have been developed by educators who are interested in archaeology as a teaching vehicle. Archaeologists have also been involved in developing educational archaeology materials. Almost exclusively, the perspectives of North American aboriginal peoples have been ignored. A review of

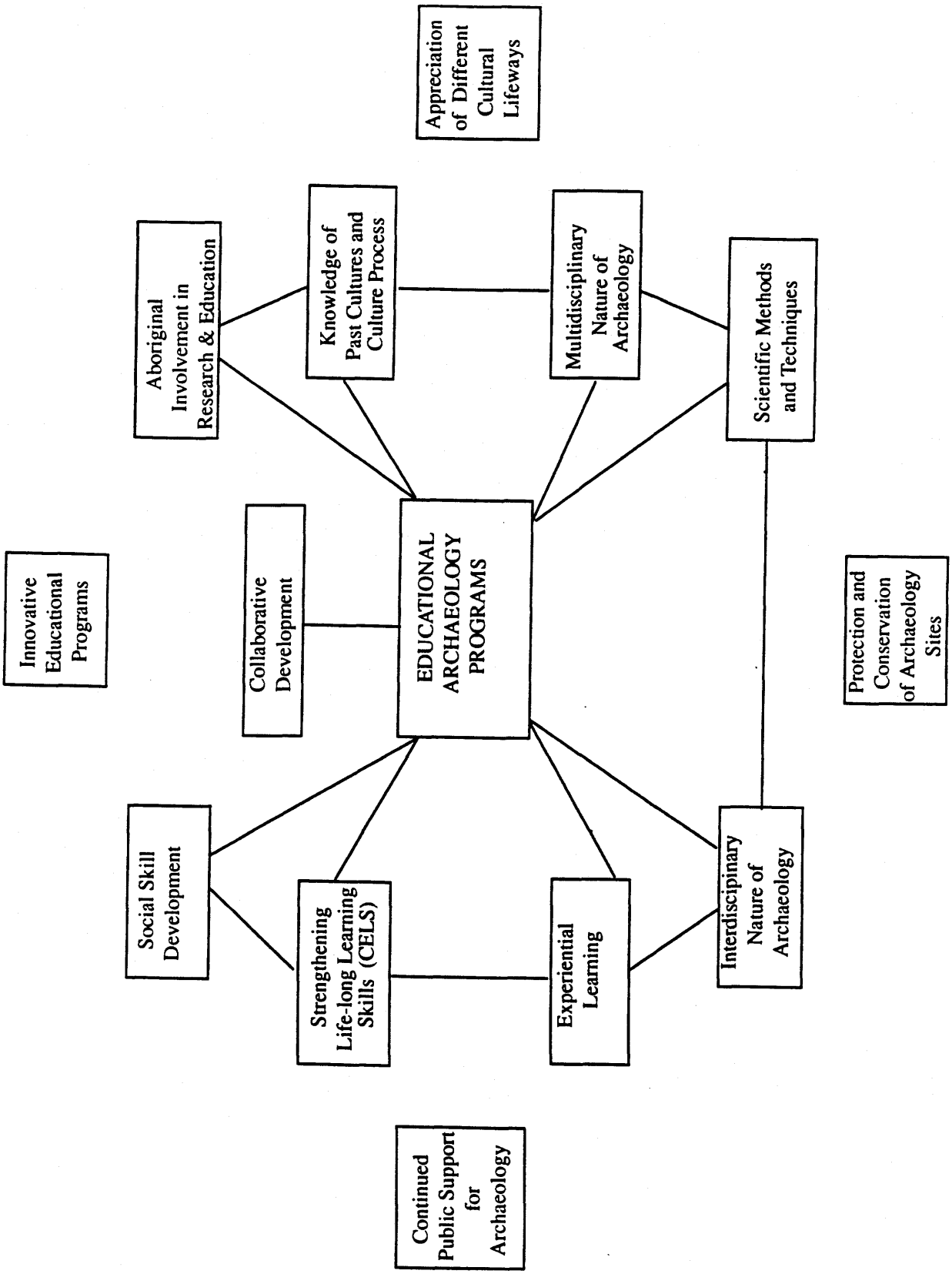


Figure 7.1. Educational Archaeology: A Model of Interdependence and Interconnectedness

the literature indicates these uncoordinated efforts have, in some cases, resulted in serious problems with the archaeological, educational and cultural validity of the programs. These problems indicate a need for a **collaborative** approach to curriculum development. A collaborative approach brings representatives from the archaeological, educational and North American aboriginal communities into the writing process. These people work together to develop educationally and archaeologically valid materials which present accurate, culturally sensitive information about peoples of the past. Indeed, it is strongly suggested that without a collaborative approach, development of archaeological curricula that meet the needs of all these groups is unlikely.

The interdependence of a collaborative approach and the **involvement of First Nations peoples in archaeological research and education** is significant. Precontact peoples are the predominant focus of archaeological investigation in Canada. Therefore, it is reasonable to expect and, indeed, to demand First Nations peoples actively participate in archaeological research, interpreting the archaeological record, and educating non-aboriginal people about the diversity and richness of their cultural past. Educational archaeology programs also have a great deal to offer First Nations students as a link between their ancestors' past and contemporary First Nations society. The importance of archaeology as a medium for presenting **knowledge of past cultures and cultural changes** that have taken place over time cannot be over-emphasized. For example, by studying ancient cultures students can come to understand the interconnectedness and interdependence of the environment, culture and technology. Wanuskewin Heritage Park and the "People in Their World" edu-kit are excellent examples of a collaborative approach to archaeological research and presentation of First Nations cultural education.

In addition to archaeology's efficacy as a social science, archaeology is also scientific and **multidisciplinary in nature.** Educational archaeology programs, such as the "Archaeology in the Schools" project attempt to integrate cognate disciplines into archaeological activities. These multidisciplinary activities provide students with an opportunity to become familiar with other disciplines and their relevance to archaeology. **Scientific methods and techniques** employed by archaeologists can be integrated into educational archaeology programs to familiarize students with science process. Archaeology's scientific, multidisciplinary nature, and its mandate to reconstruct past lifeways, provide students with an **interdisciplinary** or holistic conceptualization of the interrelated parts of a cultural system and the connection between archaeological research and interpretation of the past.

Thus far, the interconnectedness and interdependence of archaeology as a social and natural science, and its relevance as a vehicle for transferring this information to students has been discussed. However, archaeology is also relevant as a vehicle for meeting the goals of education. The nature of archaeological investigation lends itself to **experiential** or participatory learning experiences. Archaeological activities are hands-on and require application of many skills which in turn strengthen **life-long learning skills,** identified by Saskatchewan Education (1988) as the Common Essential Learnings. In addition, students who are involved in hands-on archaeological activities, simulated or real, work as a cooperative team, enhancing **social skill development.**

Archaeologists have a vested interest in the development of exemplary educational archaeology programs. Educational archaeologists believe that as the public (in this case students, teachers and parents) is introduced to archaeological information about past

cultures, their **appreciation for the vitality of different cultural lifeways** will increase. In turn, this awareness can accentuate the importance of **protecting and conserving our archaeological resources.** And, finally, greater appreciation for archaeology, both as a means of investigating the past, and as a vehicle for educating young people, should increase **public funding and support** for future archaeological research.

7.2 Recommendations for Future Development of Educational Archaeology Programs

The previous discussion attempts to briefly conceptualize the interdependence and interconnectedness of the various components of educational archaeology programs. Obviously, there are many interrelated issues to be considered when developing educational materials that are educationally, archaeologically and culturally relevant. The complexity of creating valid programs is further demonstrated by the need to consider the realities of classrooms, with a wide range of student and teacher needs. Educational archaeologists have to understand the needs of this audience in order to determine the direction of the program and the messages to be presented. The following discussion will offer some general recommendations for development of educational archaeology curricula which meet the needs of teachers and students, and which can provide educationally, archaeologically and culturally relevant programs.

Educational archaeologists realize it is highly unlikely there will ever be elementary school courses devoted entirely to archaeology. However, small curriculum units which integrate with other subject areas are a viable alternative. There are many benefits to such a format, for both teachers and students. An integrated approach

provides flexibility; classroom teachers can use as many or as few of the archaeological activities as they wish. This approach also enables teachers to use archaeology as a vehicle for skill enhancement and strengthening of the Common Essential Learnings throughout all subjects areas. Employing an integrated approach avoids the appearance of an 'archaeology theme' or 'doing archaeology'. Rather, students will be introduced to a holistic conceptualization of archaeological research. In addition, students will become familiar with archaeology's multidisciplinary nature as teachers integrate information and concepts from cognate disciplines into the archaeological activities. With an integrated approach, the teacher can emphasize especially interesting or relevant areas of the curriculum and offer optional, more complex activities to students who appear particularly interested in archaeology.

Therefore, an integrated approach is strongly recommended for the initial direction of archaeological curriculum development. This type of approach is well suited to educational archaeology. In fact, as suggested throughout the study, the activities associated with archaeological research naturally integrate with other subject areas. This integrative approach fulfils educational archaeology's mandate to encourage teaching with archaeology rather than only about archaeology.

The initial grade level recommended for such a program is grade seven; this recommendation is based on several factors. Teachers are usually searching for projects which will interest students at this age. These students are able to understand most abstract concepts and are old enough to carry out archaeological activities. Setting up more advanced learning experiences, such as working at a real archaeological dig or creating a simulated dig in the school yard are also possible at this grade level. The

grade seven science and social studies curricula are particularly relevant to scientific, multidisciplinary archaeological research. For example, soil formation processes and geological concepts are stressed in this grade. Grade seven social studies curricula emphasize Canada and its people, which includes the study of First Nations peoples.

The grade four "People in their World" social studies unit, although not in regular use at this time, focuses upon First Nations culture, and the grade nine social studies curriculum (as it stands now) includes a short section on ancient civilizations, with a brief introduction to Saskatchewan archaeology. Therefore, a grade seven unit emphasizing the scientific and multidisciplinary nature of archaeology is recommended to complement the existing archaeology units.

Although this archaeology unit would emphasize the scientific nature of archaeology, the social science aspects of archaeology must also be recognized. As indicated in the study, teachers view archaeology as a means to an end - to present archaeological reconstruction of past cultures and, in particular, First Nations culture. Therefore, this archaeology unit should integrate archaeological research and analysis techniques with the study of First Nations history. In addition, to meet the overall objective of educational archaeology, heritage protection should also be emphasized in this unit.

In effect, this unit should provide a merging of the cultural and scientific facets of archaeology, patterned after the "People in Their World" curriculum unit and activities similar to some of the modules in the "Archaeology in the School" project. The dual themes (science and culture) of this unit do not preclude a cohesive curriculum. As Smith (1991a:80) succinctly states, "there must be a balance between explaining the value and

workings of archaeology, revealing the mysteries of past and present cultures, teaching life skills, and promoting respect for archaeological sites." In other words, this curriculum should emphasize teaching **with** archaeology and **about** culture.

The components of this proposed archaeology unit should emphasize a 'teacher-friendly' approach. Archaeology is an unfamiliar discipline for most teachers, therefore, the educational archaeology unit must be "complete." This unit should include an extensive teacher guide, with background information integrating precontact history with archaeological investigation techniques. Teachers also need detailed lesson plans and "how to" instructions which outline required materials; diagrams of equipment such as unit boxes, and/or practical alternatives such as cardboard boxes; and, objectives of the lessons. All work sheets and forms required for the activities need to be provided, with copyright permission. In addition, this unit should include a bibliography listing resources for the teachers: human resources, such as Department of Anthropology and Archaeology, University of Saskatchewan educational personnel; archaeological books written in lay person's language; additional sources for archaeological activities and lessons, such as educational archaeology magazines and teacher newsletters; sources for hands-on materials such as local archaeological societies that create casts of projectile points; and, recommended out-of-school excursions to visit archaeological sites, museums, etc. Although an edu-kit, such as the one created for the grade four Wanuskewin curriculum unit, would be ideal, financial constraints are a reality. Therefore, the curriculum package must be self-sufficient even without an accompanying edu-kit.

The activities developed for this unit should reflect the various needs of teachers and students, and incorporate a variety of teaching strategies. In particular, a large part

of the activities should encompass hands-on experiences which conform well to archaeological research techniques and the nature of material culture. These activities should also be adaptable so that teachers can modify the activities for some students and expand the project for other students.

A recurring theme throughout this research has been the need to make teachers aware of the usefulness of archaeology as a teaching vehicle. Therefore, it is recommended that a promotional or informational campaign be initiated to advise educators of archaeology's relevance as a teaching vehicle. This 'campaign' should include hands-on workshops and inservices designed to familiarize teachers with the possibilities for using archaeology in the classroom.

A collaborative approach is strongly recommended for development of the archaeology unit. For this particular unit representatives from education, including social studies and science teachers, some of which are First Nations teachers, and an educational archaeologist should make up the writing team. In addition, resource people such as consultants from the school boards and elders from the First Nations community should be on hand to lend support and direction.

In conclusion, this discussion has offered some general guidelines or recommendations for development of an educationally, culturally and archaeologically relevant curriculum unit for grade seven students. A detailed description of the activities, resources and informational focus of this unit is not within the mandate of this study. However, development of this type of curriculum will hopefully be attempted in the future.

CHAPTER EIGHT

CONCLUSION

Educational archaeology is a new subdiscipline of public archaeology which emphasizes development of educational programs in schools. Educational archaeologists strongly believe that "the dual goals of archaeological research and public education can be successfully combined in a balanced program and that each goal can in fact contribute to the success of the other" (Phagan and Pilles 1988:15). The primary purpose of educational archaeology is to immerse students in the process and content of archaeological research through educational activities and projects. A major premise of this study is that students who are involved in educational archaeology programs will develop an increased appreciation for the importance of archaeological research and conservation of archaeological resources.

The roles of archaeology in education have been examined in this study in order to determine archaeology's relevance as an educational vehicle. These roles have been separated into development of attitudinal concepts and advancement of educational skills. Attitudinal concepts focus on presenting a more realistic account of the discipline's research goals, the subjective nature of archaeological interpretation, and the development of a conservation ethic in young people. Archaeologists perceive this conservation ethic to be an extremely important goal of educational archaeology.

An important role of educational archaeology is to present archaeological interpretations of past cultures to students in a manner which emphasizes the vitality of people who lived in the past. Educational archaeologists and educators believe that expanding students' horizons and assisting them in developing a sense of the past is an important social role of archaeology.

Educational archaeologists' roles in education focus upon developing materials that reflect educational trends and demonstrate archaeology's usefulness as a teaching vehicle. In particular, educational archaeologists develop hands-on materials and activities that integrate a myriad of learning skills and strategies into the program. Archaeology's scientific, multidisciplinary nature is especially valid in meeting education's goals. Educational archaeological activities simulate archaeological research methods and enable teachers to integrate information from cognate disciplines into archaeological lessons. These educational activities and programs reflect a major premise of this study: archaeology is more relevant if school programs are developed which emphasize teaching with archaeology rather than only about archaeology.

The educational materials produced during this study take two different approaches to meet educational, archaeological and cultural objectives. The Wanuskewin edu-kit, "People in Their World" uses archaeology as a vehicle for presenting a holistic view of precontact First Nations' culture. In addition, this unit provides integrative, hands-on activities designed for young students, which replicate archaeological research methods and interpretational strategies. This unit endeavoured to instil a sense of the past and a sound conservation ethic in young students. The unit was developed through a collaborative effort, involving educators, First Nations' educators and an archaeologist on

the team. A third major premise of this study is the value of using a collaborative approach to develop accurate, culturally sensitive, educationally valid materials.

The second educational archaeology project, "Archaeology in the Schools" emphasizes the multidisciplinary, scientific nature of archaeology through modules which simulate archaeological research. This project demonstrated the efficacy of archaeology in teaching science process, and as an educational vehicle for introducing cognate disciplines.

Although the two projects are quite different, they are not mutually exclusive. In fact, a major recommendation of this study is to combine the best aspects of both these projects into an archaeological curriculum which explicitly meets the goals of archaeologists and educators, and meets the educational needs of students. Combining archaeological resources which present reconstructions of the past, with participatory activities which simulate archaeological investigation meets archaeological, cultural and educational goals. In essence, utilizing educational archaeology programs as an instructional vehicle is an extremely viable application of archaeology.

In conclusion, archaeology is a relevant educational vehicle, presenting information about past cultures, in an interesting, effective manner. Archaeological methods and techniques lend themselves to meeting educational goals and strengthening life-long learning skills. Society as a whole benefits from students gaining an increased respect for the validity of past cultural lifeways and an understanding of the need to protect our archaeological record for future generations.

REFERENCES

Adams, B.C.
1986 Museums and education - the past in action. In Archaeological 'Objectivity' in Interpretation 3:1-7. World Archaeology Congress. Allen and Unwin, Southampton and London.

Alderton, D. and M. Manning
1977 Industrial archaeology for middle schools. In Industrial Archaeology 14(2):291-303.

Allen, Dorothea
1991 Hands-On Science. 112 Easy to Use, High-Interest Activities for Grades 4-8. The Centre for Applied Research in Education. West Nyack, New York.

Allen, Rodney F. and R.G. Felton
1980 What in the world? Artifact analysis in social education. In Georgia Social Science Journal 11(1):1-3, 16.

Anawak, Jack
1989 Inuit perceptions of the past. In Who Needs the Past? Indigenous Values and Archaeology, edited by R. Layton, pp. 45-50. Allen and Unwin, London.

Andel, Marie A.
1990 Digging for the secrets of time: Artifacts, old foundations, and more... . In Social Studies and the Young Learner 3(1):9-11.

Anslinger, C. Michael and Daniel P. Thiel
1984 Archaeology for the science teacher: Interdisciplinary applications. In The Hoosier Science Teacher 10(1):14-19.

Bailey, Wilfrid C. and Francis J. Clune, Jr.
1968 Preparation of elementary school units on the concept of culture. In Human Organization 27(1):6-9.

Barden, Elmo B.
1984 Digging. In Curriculum Review 24(2):5-6.

Barnett, Don C.
1989 Teaching Social Studies. Bocam Publishing, Saskatoon.

Benge, Donna and Jeanne Miller
1988 Archaeology in the classroom. In Fighting Indiana Jones in Arizona, edited by A.E. Rogge and John Montgomery, pp. 79-82. 1988 Proceedings. American Society for Conservation Archaeology, Phoenix, Arizona.

Bense, Judith A.
1991 The Pensacola model of public archeology. In Archeology and Education: The Classroom and Beyond, edited by KC Smith and Francis P. McManamon, pp. 9-12. Archeological Assistance Study No. 2. Washington, D.C.

Bewley, R.
1983 Archaeology and the public: Foreword. In Archaeological Review From Cambridge 2(1):3-4.

Beyer, Barry K.
1968 Using inquiry for the social studies guidelines for teaching. A Monograph of the Cooperative Center for Social Science Education. Ohio University, Athens, Ohio.

Bielawski, Ellen
1986 Dual perceptions of the past: Archaeology and Inuit culture. In Archaeological 'Objectivity' in Interpretation 3:1-11. World Archaeology Congress. Allen and Unwin, Southampton and London.

Blanchard, Charles E.
1991 Education and/or entertainment. Archaeology and prehistory in the public schools. In Archaeology and Public Education 2(1):1-3.

Blancke, Shirley and Cjigkitoonuppa John Peters Slow Turtle
1990 The teaching of the past of the Native peoples of North America in U.S. schools. In The Excluded Past, edited by Peter Stone and Robert MacKenzie, pp. 109-133. Unwin Hyman, London.

Brilliant, Judith Feinberg
1991 Critical thinking. In Archaeology 44(3):40.

Brooks, Robert L.
1991 Diaries in the Dirt. In Archaeology and Public Education 1(4):8-9.

Brown III, Marley R.
1991 Introductory remarks. In Archeology and Education: The Classroom and Beyond, edited by KC Smith and Francis P. McManamon, pp. 1-2. Archeological Assistance Study No. 2. Washington, DC.

Burtt, Fiona
1987 "Man the Hunter": Bias in children's archaeology books. In Archaeological Review from Cambridge Review from Cambridge 6(2):157-176.

Carlson, R.L.
1979 Archaeology: Public and academic. In Social Sciences and Public Policy in Canada, edited by A.W. Rasporich, pp. 143-148. Faculty of Social Science. Inaugural Symposium Paper, Toronto.

Carroll, Ives Fowlkes
1987 Schoolyard archaeology. In The Social Studies 78(2):69-75.

Chilcott, John N.
1977 Curriculum models for teaching anthropology. In Anthropology and Education Quarterly 3:14-18.

Christensen, Bonnie L.
1993 ERS programs benefit Upper Midwest educators. In Archaeology and Public Education 3(3):5, 8.

Clarke, Peter
1986 What does archaeology have to offer? In Presenting Archaeology to Young People, edited by Stephen Cracknell and Mike Corbishley, pp. 9-12. Research Report No. 64. Council for British Archeology.

Cleere, Henry
1989 Introduction: The rationale of archaeological heritage management. In Archaeological Heritage Management in the Modern World, edited by H. Cleere, pp. 1-19. Unwin Hyman, London.

Conaty, Gerald T.
1989 Canada's First Nations and museums: A Saskatchewan experience. In International Journal of Museum Management and Curatorship 8(4):407-413.

Cook, Thomas G.
1985 Using students in research: The Lagoon Site. In Archeology and Education: A Successful Combination for Precollegiate Students, edited by Karen Ann Holm and Patricia J. Higgins, pp. 23-29. Anthropology Curriculum Project, University of Georgia, Athens, Georgia.

Corbin, Dena
1985 Introduction to archeology: A unit for middle schools. In Archeology and Education: A Successful Combination for Precollegiate Students, edited by Karen Ann Holm and Patricia J. Higgins, pp. 37-42. Anthropology Curriculum Project, University of Georgia, Athens, Georgia.

Corbishley, Mike
1986a Archaeology for pre-university students: Curricula and extra-curricula approaches and influences. In Archaeological 'Objectivity' in Interpretation 3:1-11. World Archaeology Congress. Allen and Unwin, Southampton and London.

1986b Archaeology, monuments, and education. In Presenting Archaeology to Young People, edited by Stephen Cracknell and Mike Corbishley, pp. 3-8. Research Report No. 64. Council for British Archaeology.

Cotter, John L.
1979 Archaeologists of the future: High schools discover archaeology. In Archaeology 32(1):29-35.

Council for British Archaeology (CBA)
1989 Archaeology for ages 5 to 16. Proposals from the Council for British Archaeology.

Cracknell, Stephen
1986 Introduction. In Presenting Archaeology to Young People, edited by Stephen Cracknell and Mike Corbishley, pp. 1-2. Research Report No. 64. Council for British Archeology.

Craeger, Joan G. and Darrell L. Murray
1971 The advantages and applications of modules. In The Use of Modules in College Biology Courses, edited by Joan G. Craeger and Darrell L. Murray, pp. 9-13. Commission of Undergraduate Education in the Biological Sciences, Washington, D.C.

Dale, F.
1986 Past present or past absent? In Archaeological 'Objectivity' in Interpretation 3:4-7. World Archaeological Congress. Allen and Unwin, Southampton and London.

Danes, Lois M.J.
1989 The development of cognitive skills through archaeology. In Social Studies Journal 18:43-45.

Delaney, Al, Jr.
1977 Teaching anthropology as science at the junior high school level. In Anthropology and Education Quarterly 8(1):19-22.

Devine, Heather
1985 Curriculum Development in Archaeology and Prehistory. A Needs Assessment in Social Studies Education. Revised Sept. 1985.

1989 Archaeology in social studies: An integrated approach. In History and Social Science Teacher 24(3):140-147.

1991 The role of archaeology in teaching the native past: Ideology or pedagogy? In Canadian Journal of Native Education 18(1):11-22.

1992 Archaeology, prehistory and the native learning resources project. A paper for the Second World Congress, Barquisimeto, Venezuela.

Dick, Robert G. and C.I. Woburn
1984 The garbage box: An exercise in archaeology. In History and Social Science Teacher 20(1):44-47.

Diers, Russell and James LoGiudice
1982 Archaeology: A means of challenging the gifted student. In G/C/T 22:2-7.

Doi, Gary K.
1975 Let's have some archaeology in elementary science! In The Science Teacher 42(5):39.

Donahue, Jack and James M. Adovasio
1985 Teaching geoarchaeology. In Anthropology and Education Quarterly 16(4):306-310.

Dunnell, Robert C.
1984 Hope for an endangered science. In Archaeology Jan-Feb:87-90.

Dyche, Barbara
1985 Why archeology when your curriculum is thinking skills? Developing a sequential archeology curriculum for grades 6 through 12. In Archeology and Education: A Successful Combination for Precollegiate Students, edited by Karen Ann Holm and Patricia J. Higgins, pp. 31-36. University of Georgia, Anthropology Curriculum Project, Athens, Georgia.

Ellick, Carol
1990 Archaeology for the classroom. In Archaeology and Public Education 1(2):10-11.

1991a Archeology is more than a dig: Educating children about the past saves sites for the future. In Archeology and Education: The Classroom and Beyond, edited by KC Smith and Francis P. McManamon, pp. 27-31. Archeological Assistance Study No. 2. Washington, D.C.

1991b More than a dig. In Archaeology 44(3):42-43.

Enloe, Walter
1991 Explorers and investigators of the commonplace: Children as human scientists. In Archaeology and Public Education 1(4):1-3.

Erickson, Paul
1985 Precollege anthropology in Nova Scotia: Promotions by Saint Mary's University. Archeology and Education: A Successful Combination for Precollegiate Students, edited by Karen A. Holm and Patricia J. Higgins, pp. 67-75. University of Georgia, Anthropology Curriculum Project, Athens, Georgia.

Erickson, Paul and Patricia C. Rice
1990 Introduction: Themes for the 1990's. In Anthropology & Education Quarterly 21(2):101-105.

Farbregd, Oddmann
1988 Archaeology in school: The Norwegian pilot project. In A Future For Our Past 3(1):1-2.

Faught, Michael and Gittings, James S.
1991 Project origins: Archeology for people with handicaps. In Archeology and Education: The Classroom and Beyond, edited by KC Smith and Francis P. McManamon, pp. 19-26. Archeological Assistance Study No. 2. Washington, D.C.

Fedorak, Shirley and Phyllis Lodoen
1993 "Archaeology in the Schools" Final report. University of Saskatchewan, Saskatoon, Sask.

Fox, W.A.
1986 Archaeology and native studies in Ontario. In Archaeology Notes 86(1):7-13.

Frink, Douglas and Richard Allen
1993 History in our backyard: Hands-on experience with archaeology. In Archaeology and Public Education 3(3):6, 8.

Gettings, Duane
1970 Unearthing an Indian culture: A total involvement program. In The Science Teacher 37(8):59-61.

Gibbons, Guy
1984 Anthropological Archaeology. Columbia University Press, New York.

Gilbert, Steven
1984 Model labs: An active approach to science process learning. In Curriculum Review Nov/Dec: 75-77.

Gronemann, Barbara
1988 Free-lancing archaeology. In Fighting Indiana Jones in Arizona, edited by A.E. Rogge and John Montgomery, pp. 87-91. 1988 Proceedings. American Society for Conservation Archaeology, Phoenix, Arizona.

1992 A response to Blanchard. In Archaeology and Public Education 3(2):9-10.

Haas, Blakely
1978 Man and his culture. In G/C/T 1(1):155-163.

Hanks, Christopher C. and David L. Pokotylo
1988 The MacKenzie Basin: An alternative approach to Dene and Metis archaeology. In Arctic 42(2):139-147.

Hartman, David W.
1985 Understanding science through anthropological inquiry: Two cases. In Archeology and Education: A Successful Combination for Precollegiate Students, edited by Karen Ann Holm and Patricia J. Higgins, pp. 51-66. University of Georgia, Anthropology Curriculum Project, Athens, Georgia.

Havilland, William A.
1993 Cultural Anthropology, 7th edition. Harcourt Brace Jovanovich College Publishers, Toronto.

Hayden, Michael, William P. Delainey, David L. Farmer and Maureen L. Johns
1992 Roots of Society. Prentice-Hall Canada, Inc., Scarborough, Ontario.

Head, Lara E.
1993 Learning in Lubbock. In Archaeology and Public Education 4(2):5.

Henkoff, Ronald
1978 Learning by digging: The Kampsville credo. Report on Teaching No. 5. In Change 10(1):12-15.

Higgins, Patricia J.
1981 Limits to change: Getting anthropology into secondary social studies classrooms. In Teaching Anthropology to Students and Teachers. Reaching a Wider Audience, edited by Patricia J. Higgins and Ruth O. Selig, pp. 27-41. University of Georgia, Anthropology Curriculum Project, Athens Georgia.

Higgins, Patricia J. and Holm, Karen Ann
1985 Introduction. In Archeology and Education: A Successful Combination for Precollegiate Students, edited by Karen Ann Holm and Patricia J. Higgins, pp. 1-8. University of Georgia, Anthropology Curriculum Project, Athens, Georgia.

Hill, J.D.
1987 Confessions of an archaeologist who dug in school: Or, is archaeology in school a good or desirable thing? In Archaeological Review From Cambridge 6(2):143-155.

Holm, Karen A.
1984 Can you dig it? In The Science Teacher 51(4): 48-49.
1985 Preparing teachers to introduce archeology into the curriculum. In Archeology and Education: A Successful Combination for Precollegiate Students, edited by Karen Ann Holm and Patricia J. Higgins, pp. 9-15. University of Georgia, Anthropology Curriculum Project, Athens, Georgia.

Holman, Nigel and Fiona Burtt
1987 Archaeology as education. In Archaeological Review From Cambridge 6(2):110-114.

Howard, Michael C. and Janet Dunaif-Hattis
1992 Anthropology. Understanding Human Adaptation. Harper Collins Publishers.

Jaus, H.T.
1975 Digging science. In Science and Children 13(1): 30-31.

Johnson, M.H. and N.A.C. Holman
1986 Interpretation and criticism: A justification for archaeology. In Archaeological Review From Cambridge 5(1):106-109.

Johnson, Mike
1991 The language of oysters: Science and archaeology. In Archaeology and Public Education 1(4):6-7.

Joyce, Bruce and Marsha Weil
1986 Models of Teaching, 3rd ed. Prentice-Hall, Inc., Englewood Cliffs, New Jersey.

Kissock, Jonathan
1987 Archaeology and its place in the primary school curriculum. In Archaeological Review From Cambridge 6(2):119-127.

Kling, Robert W.
1984 The Center for American Archaeology: A pioneer in the "New Archaeology." In Nature Study 38(1):5-6.

Kolb, David A. and Linda H. Lewis
1986 Facilitating experiential learning: Observations and reflections. In Experiential and Simulation Techniques for Teaching Adults, edited by Linda A. Lewis, pp. 99-108. Jossez-Bass, Inc., San Francisco.

Layton, Robert
1989 Introduction: Who needs the past? In Who Needs the Past? Indigenous Values and Archaeology, edited by R. Layton, pp. 1-20. Allen and Unwin, London.

Leone, Mark P.
1981 Archaeology's relationship to the present and the past. Modern Material Culture. The Archaeology of Us, edited by Richard H. Gould and Michael B. Schiffer, pp. 5-13. Academic Press, New York.

1983a The role of archaeology in verifying American identity. In Archaeological Review From Cambridge 2:44-50.

Lowenthal, D.
1981 Introduction. In Our Past Before Us. Why Do We Save It?, edited by David Lowenthal and Marcus Benney, pp. 10-15. Temple Smith Ltd., London.

MacDonald, Cathy
1993 Approaches to the past. In Archaeology and Public Education 3(3):7.

Mandell, Alan and Barbara S. Allison
1984 Digging into earth science. In The Science Teacher 43(5):47.

Mathis, Mark A.
1986 Mysteries and relics of the past intrigue kids. In PTA Today 11(6):11-12.

Mayer-Oakes, William J.
1989 Science, service and stewardship - a basis for the ideal archaeology of the future. In Archaeological Heritage Management in the Modern World, edited by H. Cleere, pp. 52-57. Unwin Hyman, London.

McManamon, Francis P.
1991 The many publics for archaeology. In American Antiquity 56(1):121-130.

McNutt, Nan
1990 A plan for the future. In Archaeology and Public Education 1(2):14-15.

1991a Saving tradition. In Archaeology 44(1):42.

1991b An SAA teacher workshop - not just for teachers. In Archaeology and Public Education 1(3):3.

Messenger, Phyllis

1990 Public education and archaeology - a philosophical look at taking action. In Archaeology and Public Education 1(2):1-2.

1993 A plan for the future. In Archaeology and Public Education 4(1):1,4,9.

Munro, Patricia S.

1980 Revitalizing an archaeological past: A museum program for children. In Curator 23(3):175-181.

Onderdonk, Richard

1986 Piaget and archaeology. In Archaeology 38: 80.

Passe, Jeff and Mundy Passe

1985 Archeology: A unit to promote thinking skills. In The Social Studies 76(6):238-239.

Peoples, James and Garrick Bailey

1994 Humanity. An Introduction to Cultural Anthropology, 3rd edition. West Publishing Co., Minneapolis/St. Paul, Minn.

Phagan, Carl J. and Peter J. Pilles, Jr.

1988 Public participation archaeology at Eldon Pueblo. In Fighting Indiana Jones in Arizona, edited by A.E. Rogge and John Montgomery, pp 13-16. 1988 Proceedings. American Society for Conservation Archaeology, Phoenix, Arizona.

Plants, Robert W.

1984 Projectile point classification. In Science and Children 21(5):6-9.

Potter, P.B., Jr.

1990a Historic preservation goals for archaeological education in New Hampshire. In Teaching Anthropology Newsletter 17:3-5.

1990b The "What" and "Why" of public relations for archaeology: A postscript to DeCicco's public relations primer. In American Antiquity 55(3): 608-613.

Pretty, Kate

1987 Archaeological education for everybody. In Archaeological Review From Cambridge 6(2):115-118.

Price, T. Douglas and Gary M. Feinman
1993 Images of the Past. Mayfield Publishing Company, Mountain View, California.

Reece, Richard
1987 Teaching archaeology as perpetual revolution. In Archaeological Review From Cambridge 6(2): 175-180.

Reed-Sanders, Delores and Sylvia H. Flores
1983 The multicultural project: Methods for incorporating anthropology into pre-college classroom activities. In Anthropology and Multicultural Education: Classroom Applications, edited by Yolanda T. Moses and Patricia J. Higgins, pp. 142-175. University of Georgia, Anthropology Curriculum Project, Athens, Georgia.

Reid, Connie and Rebecca Timmons
1994 Montana's Heritage: Bringing Archaeology into the Classroom. Kootenai National Forest.

Renfrew, Colin
1984 What's new in archaeology? Reprinted from the UNESCO COURIER, July. Archaeology Jan/Feb: 83-86.

Rice, M.J.
1985a Foreword. In Archeology and Education: A Successful Combination For Precollegiate Students, edited by Karen A. Holm & Patricia J. Higgins, pp. i. University of Georgia, Anthropology Curriculum Project, Athens, Georgia.

Rice, Patricia C.
1985b Using a simulated site to teach data analysis in archaeology. In Anthropology Education Quarterly 16(4):301-305.

1990 Introductory archaeology: The inexpensive laboratory. In Anthropology and Education Quarterly 21(2):167-172.

Riley, Thomas J.
1992 The roots of Illinois. A teacher institute. In Archaeology and Public Education 3(2):6.

Rogers, Jerry L.
1988 Managing our nation's archeological resources for future generations. In CRM Bulletin 11: Special Issue.

Rogge, A.E. and Patti Bell
1988 Teaching teachers to teach with archaeology. In Fighting Indiana Jones in Arizona, edited by A.E. Rogge and John Montgomery, pp. 69-74. 1988 Proceedings. American Society for Conservation Archaeology, Phoenix, Arizona.

1989 Archaeology in the Classroom: A Case Study from Arizona. Archaeological Assistance Program Technical Brief No. 4. National Park Service, Washington, D.C.

Rutherford, Douglas
1992/93 Shooting ourselves in the foot: An ethical consideration for precollegiate archaeologists. In Teaching Anthropology Newsletter 21-22:2-3.

Samford, Patricia
1992 Public archaeology at Colonial Williamsburg. In Archaeology and Education 2(2):7-9.

Sanders, K.
1990 Archaeology is more than a dig. In Archaeology and Education 1(2):15.

Saskatchewan Education
1988 Understanding the Common Essential Learnings. A Handbook for Teachers.

Schermer, Shirley J.
1992 Discovering Archaeology. An Activity Guide for Educators. Special Publication. Office of the State Archaeologist. University of Iowa, Iowa City.

Selig, Ruth O.
1991 Teacher training programs in anthropology: The multiplier effect in the classroom. In Archeology and Education: The Classroom and Beyond, edited by KC Smith and Francis P. McManamon, pp. 3-6. Archeological Assistance Study No. 2. Washington, D.C.

Sentelle, Sam P.
1986 Digging to learn: Teaching science, history and social studies through archaeology. In Educational Leadership 44(2):10-12.

Sharer, Robert J. and Wendy Ashmore
1987 Archaeology: Discovering Our Past. Mayfield Publishing Co., Mountain View, California.

Shaw, Terry J.
1983 The effect of a process-oriented science curriculum upon problem-solving ability. In Science Education 67(5):615-623.

Smardz, Karolyn
1989a Educational Archaeology: Toronto students dig into their past. In History and Social Science Teacher 24(3):148-155.

1990 Archaeology in the Toronto school system: The Archaeological Resource Centre. In The Excluded Past, edited by Peter Stone & Robert MacKenzie, pp. 293-307. Unwin Hyman, London.

Smith, KC
1991a At last, a meeting of minds. In Archaeology 44(1):35-39. Archeological Institute of America, New York.

1991b By Land or by sea: Archeology programs for youths at the Museum of Florida History. In Archeology and Education: The Classroom and Beyond, edited by KC Smith and Francis P. McManamon, pp. 13-17. Archeological Assistance Study No. 2. Washington, D.C.

1994 Girl scouts discover archaeology on land and under water. In Archaeology and Public Education 4(3):6-7.

Smith, KC and McManamon, Francis P.
1991 Foreword. In Archeology and Education: The Classroom and Beyond, edited by KC Smith and Francis P. McManamon, pp. vii-ix. Archaeological Assistance Study No. 2. Washington, D.C.

Smith, KC and Piateck, Bruce John
1993 New discoveries in the oldest city. In Archaeology and Public Education 4(2):7, 8.

Smith, Murray
1980 Archaeology as an aid in cross-cultural science education. In Journal of American Indian Education 3:1-7.

Smith, Shelley
1990 "Intrigue of the past: Investigating archaeology." In Archaeology and Public Education 1(2):4-5.

Sobol, Ken and Julie M. Sobol
1993 Digging in. Students get a chance to be archaeologists for a day. In Canadian Geographic, Mar/April:47-51.

Stimmell, Carole
1991 Report from the Canadian Archaeology Association Education Committee. In Archaeology and Education 2(1):4-5.

Stone, John R.
1978 Archaeology: Resources for the classroom. In History and the Social Science Teacher 14(1): 15-20.

Stone, Peter G.
1987 Approaches to the past: Why, and how, do we teach about the past? In P.A.C.T. News 18. Papers presented to the 'The First Meeting on Making Children Aware of the Existence, Study and Conservation of the Archaeological Cultural Heritage'.

1989 Interpretations and use of the past in modern Britain and Europe. Why are people interested in the past? Do experts know or care? A plea for further study. Who Needs the Past: Indigenous Values and Archaeology, edited by R. Layton, pp. 195-206. Unwin Hyman, London.

Stone, Peter and Robert MacKenzie
1989 Is there an 'excluded past' in education? In Heritage Interpretation, edited by David L. Uzzell, pp. 113-120. Belhaven Press, London.

Struever, Stuart
1975 The Koster Expedition and the New Archaeology. In The Science Teacher 42:26-32.

Stuart, Lise
1993 Eldon Pueblo public programs emphasize cultural awareness. In Archaeology and Public Education 4(1):7.

Tirrell, Peter B.
1983 Archaeology for elementary and secondary students. In Anthropology and Multicultural Education: Classroom Applications, edited by Yolanda T. Moses and Patricia J. Higgins, pp. 44-73. University of Georgia, Anthropology Curriculum Project, Athens, Georgia.

Trigger, B.
1980 Archaeology and the image of the American Indian. In American Antiquity 45(4):662-72.

Ucko, Peter
1986 Political uses of archaeology. In Archaeology, Politics and the Public, edited by Colin Dobinson and R. Gilchrist, pp. 45-50. Occasional Papers No. 5. University of York, York, England.

Urban, S.
1988 Archaeology is more than a dig. In Fighting Indiana Jones in Arizona, edited by A.E. Rogge and John Montgomery, pp. 25-78. 1988 Proceedings. American Society for Conservation Archaeology, Phoenix, Arizona.

Vantilburg, Joanne
1981 Creating your own archaeological dig. In The Social Studies 72:261-264.

Walker, Ernest G.
1987 Indian involvement in heritage resource development: A Saskatchewan example. In Native Studies Review 3(2):123-131.

Wanuskewin Heritage Park
1992 "People in Their World - A Study of the First Nations People on the Plains."

Watts, Lou Ellen
1985 They dig archaeology. In Science and Children 23:5-9.

Webber, Kikanga Nuri and Fiske, Shirley J.
1983 Teaching multicultural concepts through experiential methods. In Anthropology and Multicultural Education: Classroom Applications, edited by Yolanda T. Moses and Patricia J. Higgins, pp. 126-141. University of Georgia, Anthropology Curriculum Project, Athens, Georgia.

Williamson, David
1991 A simulated archaeological dig for high school. In Teaching Anthropology Newsletter 18:8-9.

Young, Peter
1991 A valuable ethic for kids. In Archaeology 44(1):2.

APPENDICES

APPENDIX A

GLOSSARY

absolute dating - assigning actual dates to archaeological data

archaeological record - physical evidence of human activity through time

artifacts - objects made or modified by humans (e.g. stone tools)

assemblage - a set of artifacts found within an occupation level at an archaeological site (Price and Feinman 1993)

attribute - distinguishing characteristics of artifacts

bioturbations - disturbances in strata due to animal action (e.g. gopher burrowing), and plant action (eg. tree roots).

collaborative approach - individuals from various fields or areas of expertise working together in a cooperative atmosphere to develop educational materials that meet the educational objectives of associated groups

conservation - the recognition that archaeological materials are non-renewable resources, in need of protection from destruction and decay (Fedorak and Lodoen 1993)

context - the way in which cultural material found at an archaeological site is related and how this material relates to the broader pattern of culture history (Reid and Timmons 1994).

cultural relativism - the view that all cultures are unique and valid in their own right

Cultural Resource Management - conservation and selective investigation of cultural remains; development of ways and means, including legislation, to safeguard the past (Sharer and Ashmore 1987)

ecofacts - organic and inorganic materials associated with human activity but not altered by humans (e.g. seeds)

educational archaeology - subdiscipline of public archaeology which focuses upon development of archaeological materials and programs, usually for elementary and secondary educational purposes.

features - cultural remains which are not removable from an archaeological site (eg. fire hearth)

flintknapper - a producer of stone tools

in situ - the original position of an object

Law of Superposition: the principal that objects or material buried or deposited earliest will be found in the deepest strata and those buried latest will be found in the top strata (Schermer 1992)

lithics - stone artifacts, including weapons (e.g. projectile points) and tools (e.g. knives)

material culture - artifacts, ecofacts and features associated with human activity

modules - independent sets of activities which include clearly defined objectives and which can stand alone or fit into a larger sequence of activities.

provenience - location of archaeological material in a unit, using horizontal and vertical measurements

public archaeology - field of archaeology specializing in conservation and educational services

relative dating - arranging archaeological data in chronological sequence (e.g. young to older)

teaching vehicle - instructional instrument that makes conveying or communicating knowledge easier (The World Book Dictionary 1968).

unit - an excavation area, usually one meter square (Fedorak and Lodoen 1993)

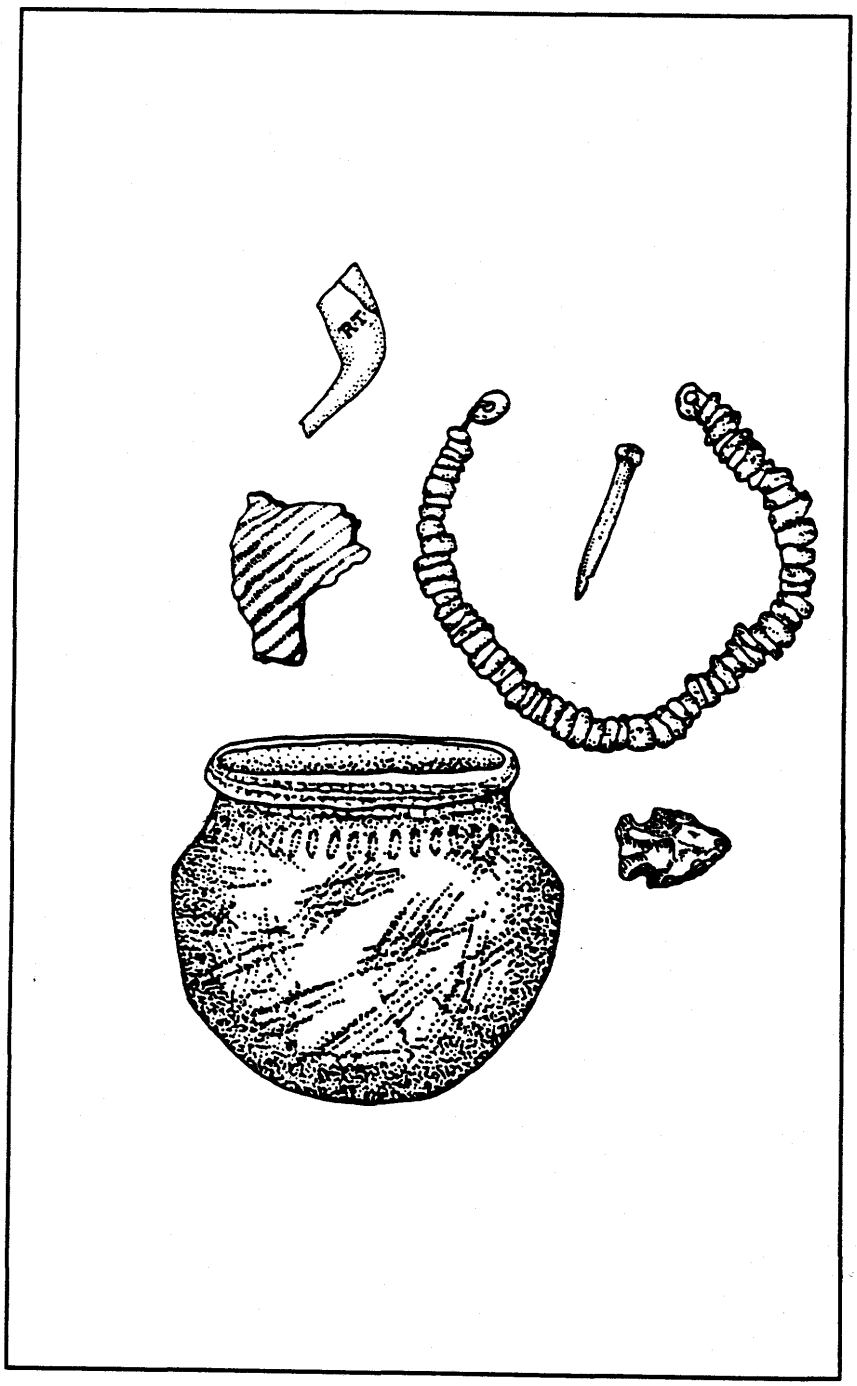
APPENDIX B

"PEOPLE IN THEIR WORLD" TEACHER INFORMATION

ARCHAEOLOGY

TEACHER INFORMATION

"It's not what you find, it's what you find out."
David Hurst Thomas 1989



WHAT IS ARCHAEOLOGY?

The word "archaeology" conjures up romantic images of exciting adventures in exotic places, and it certainly is true that archaeology has been carried out all over the world. But right here in our own backyard we have many mysteries to solve and puzzle pieces to fit together about the people who have lived in Saskatchewan for thousands of years. This is the true excitement of archaeology - discovering the way people lived in the past. Archaeology has often been called the "window on a hidden past."

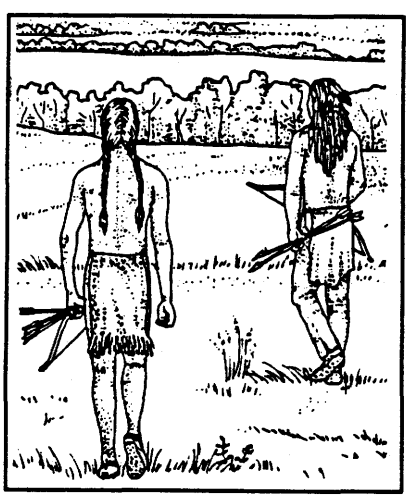
Archaeology is the scientific study of material remains from past cultures, and is an important part of the study of human kind, both past and present, which is called anthropology. People who study and practise archaeology are called "archaeologists".

There are many different kinds of archaeologists. Some archaeologists are interested in ancient cultures

that existed before written records were kept. In Saskatchewan, archaeological resources tell the story of First Nations Peoples before contact with Europeans. The cultural remains span from about 12,000 B.P. ("before present", which in archaeological terms is 1950).

Other archaeologists are interested in more recent cultures. They study cultures that have writing systems and have left written records. These archaeologists may be studying cultural remains only a few decades or centuries old (i.e. fur trade posts).

Some specialized kinds of archaeologists include marine archaeologists, classical archaeologists, experimental archaeologists and public archaeologists.



WHY STUDY ARCHAEOLOGY?

Archaeologists seek to describe and explain past human existence or how people used to live. Thus, archaeologists are attempting to reconstruct past lifeways. This information will enable archaeologists to understand how people have interacted with their environment in order to survive.

Archaeologists also study cultural change. This means they try to understand how cultures have changed over time.

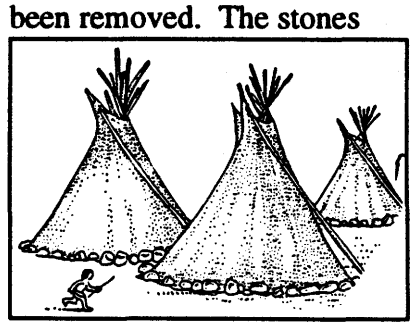
Archaeologists ask questions like:

- when did people live here?
- who were they?
- how long did they live at this site?
- what was the climate like?
- why did they choose this site (specialness of this site)?
- what did they eat? (human subsistence - how people get their groceries).
- in what activities did they participate? e.g. hunting.
- in what kinds of homes did they live?

MATERIAL CULTURE

Archaeologists are searching for materials remains of past cultures that will provide clues to how they lived. There are several major types of material remains that assist archaeologists in this task. The largest and perhaps most important type of archaeological remain is the site.

A "site" is a place where evidence of past human activity is found. There are many different kinds of sites. At Wanuskewin Heritage Park there are "habitation sites" (places where people camped and lived); "kill sites" (where animals were killed for food); and "processing sites" (where animals were cut up - butchered). Habitation sites have areas where shelters or dwellings are situated; as well as certain activity areas. A tipi ring is good evidence of a habitation site. A tipi ring is a circle of stones left after the tent has been removed. The stones



were used to hold down the edges of the hide tent. Sometimes there was a small hearth of stones in the centre of the tipi. Activity areas at a site may include processing areas, where butchered animals were prepared/ preserved; hideworking areas; tool making areas, etc.

A kill site is an area where animals were killed in some way. The Newo Asiniak bison jump at Wanuskewin is an example of a bison kill site. Other types of kill sites are pounds, traps and surrounds. Archaeologists can often tell a kill site by the bone bed. Bone beds are thick layers of bones which may also include some broken projectile points, and other tools. If the jump was used many times over the years there would be many layers of bones built up. Sometimes bison jumps had rows of stone cairns for drive lanes at the top of the ravine.

Other types of sites include stone quarries (sources of stone for making tools), burials, rock paintings, and boulder monuments (alignments).

Archaeologists often find many material remains at a site. One major type of remain is a "feature". Features are the result of human activity but they cannot be removed from the soil. Features include hearths, pits, workshop areas, and middens (garbage dumps). Features are important to archaeologists because they tell us about the function of the site and activities that took place at the site.

One of the most common material remains found at a site is "artifacts". Artifacts are objects that have been created or modified by humans. Artifacts can be picked up and moved from the site. Some examples of artifacts include projectile points for hunting, knives and scrapers for butchering and processing of animal remains and pottery sherds from vessels. All these artifacts show evidence of human activity.

"Ecofacts" are materials remains that have not been altered by humans but are associated with human activity. Some ecofacts are plant and animal remains. For example, a bison bone bed may represent the remains of human food procurement strategies. Ecofacts are most commonly used to reconstruct the environment and the resources that were exploited by past cultures.

ARCHAEOLOGICAL METHODOLOGY

How do archaeologists collect information about past peoples?

Since archaeologists are scientists, they must be very careful when gathering the data they need to reconstruct a culture's past. Unlike other scientists, archaeologists usually dig into the ground to find the evidence they need.

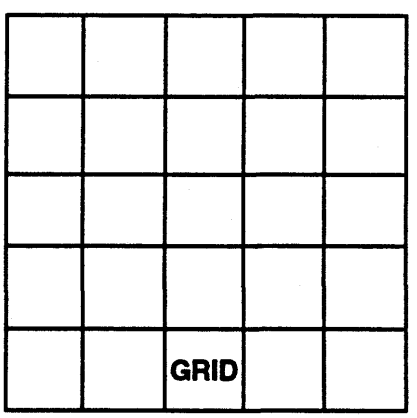
Often archaeologists will do surveys of an area to determine if there are any archaeological sites. Test pits are dug to see if there are any archaeological remains below the surface. If it is found that a site does indeed exist and there is some scientific reason to gather the information,then archaeologists will excavate the site. Often an excavation will take place because this area is going to be disturbed, for example, a road is going to be built.

An excavation or "dig" usually includes 1 m^2 units which are carefully dug downwards using shovels or trowels. All the soil that is scraped away is collected in buckets and carefully screened to find any small artifacts such as flakes that may have been missed by the archaeologist.

Units are excavated by levels, either arbitrarily (e.g. every 10 cm) or based on natural layers of soil or human activity (strata). Archaeologists then draw a "profile" of the unit wall which shows all the soil levels and human occupation levels which is called the "stratigraphy" of the site. Features such as hearths, and bone beds will also be evident in the profile.

Two important concepts of archaeology are provenience and context. "Provenience" is the location of the artifact. This means the archaeologist carefully measures and records where the artifact is located in the unit as well as how deep down the artifact is situated. "Context" is concerned with the location of the artifact in relation to other material remains in the unit.

Whenever an artifact or feature is found it is measured and mapped on a grid. A "grid" is comprised of perpendicular lines tied to a frame to make a large graph-like instrument. This grid is placed over the excavated unit in order to help determine the horizontal distribution or placement of artifacts and features in the unit. The archaeologist draws the artifacts and features onto grid paper to record their placement. The unit is usually photographed. Artifacts are then removed, bagged and sent to the laboratory for cleaning and cataloguing.



Archaeologists draw a site plan or map showing all the excavated units and major artifacts and features uncovered in these units.

It is obvious then that in situ (in original position) artifacts can tell archaeologists much about human activities associated with these artifacts. For example, animal bones close to a projectile point will tell the archaeologist that

people who used a certain projectile (ie. Oxbow) hunted this particular kind of animal at this time and place. This is why it is so important to carefully excavate a site rather than just randomly collect artifacts.

Archaeologists use other tools in their excavation work as well. If the artifact is very delicate or if the unit is very full of remains (ie. bison bone bed) then archaeologists may use grapefruit knives, and paint brushes to carefully remove all loose dirt. Sometimes the soil will be so wet (mud) that water screening is a faster method of screening. The wet soil is placed in a water screen to dissolve through the screen and leave any small artifacts. Archaeologists are also concerned with reconstructing the paleoenvironment of the site. They have devised methods such as flotation to collect pollen and seed samples.

Many of the tools used by archaeologists are common everyday household tools - buckets, shovels, trowels, dustpans, grapefruit knives, paint brushes, and measuring tapes. However, an archaeologist uses these tools in a very exacting, scientific manner in order to extract as much information as possible about the people who used to live at the site.

An excavation is considered complete if no further evidence of occupation can be found. All the material remains collected at the site are sent back to the laboratory for cleaning and cataloguing. Cataloguing means the artifacts are identified and assigned a catalogue number.

Although laboratory work may not seem as exciting as fieldwork, it is here that most of the important analyzing and interpretive work is accomplished. All of the notes, drawings, maps and photos are studied and compared to information gained from other excavations.

Archaeologists need to know how old the artifacts or features are, therefore, one very important component of lab work is dating. There are two major ways of dating artifacts: relative and absolute. "Relative dating" is comparing the artifacts to similar artifacts from other areas which have already been dated. Also, the deeper an artifact is situated, the older it is considered to be - this is known as the "law of superposition".

"Absolute dating" is more complex and must be done by chemical means. These methods (such as radiocarbon dating) assign an actual date or year to the artifact.

Lab work also includes conservation of the artifacts. Archaeologists not only clean the artifacts, but also work to prevent further decay and safely store them for future study.

A final stage of archaeological work is writing a site report which will include all the gathered data such as descriptions of artifacts, features, environment and history of the area; photos, drawings and maps, as well as a discussion of previous relevant research. Archaeologists attempt to pull all this information together to present a cogent reconstruction of the site and the people who occupied this site. The site report should read very much like a detective story!

CONSERVATION

A very important part of an archaeologist's duties is to teach people about the importance of conserving heritage (archaeological) sites. Many people are very fascinated by artifacts and want to collect these artifacts for themselves. But removing artifacts from an archaeological site also removes and destroys valuable evidence about who the people were and how they lived at this site. Therefore, archaeologists attempt to instill in the public a sense of pride in the past and an awareness that we must protect these sites.

Saskatchewan is a very fortunate province because we have The Saskatchewan Heritage Act (1980) which prohibits people from digging or collecting artifacts from an archaeological site unless they have a government permit. Only qualified archaeologists are issued permits. The Saskatchewan Heritage Act also ensures that all discoveries of archaeological sites are reported to the government. For example, if road construction uncovers an archaeological site, all work must cease until archaeologists have had time to investigate and recover all artifacts from the site.

Since a site is also destroyed when an archaeological excavation takes place, archaeologists do not randomly excavate sites just because they exist. Archaeologists only do excavations when there is a scientific need to gain some more information or if the site will be destroyed because of some human development, for example, a road. Archaeologists also attempt, when feasible, to leave part of a site unexcavated so that future archaeologists, with advanced scientific techniques and interpretation, may be able to return to the site for further research.

The primary goal of archaeology is to solve the mysteries of the past; the lifeways of the people and the way that these cultures have changed through time. To do this, archaeologists and other people must have a deep respect for these past peoples (cultures) and we must all work together to protect the only physical evidence we have - archaeological sites.

APPENDIX C

CURRICULUM WRITERS INTERVIEW SCHEDULE

General

1. How many years have you been teaching?

2. What grades and subjects have you taught?

3. Before this project, have you ever been involved in developing a curriculum project? Elaborate

4. Before this curriculum project have you ever been involved in any archaeology projects? Elaborate

5. Did you have any preconceived ideas about the discipline of archaeology?

6. In general, did you have any preconceived ideas about archaeology's educational value?

7. Before the project began, what was your attitude about including archaeology in this new curriculum? (Did you know we were going to include archaeology in the unit?)

Curriculum Writing Process

1. In your opinion, was the curriculum writing team a good representation of concerned parties?

   - teachers?

   - First Nations' teachers?

   - professionals (archaeologist)?

   - curriculum specialist?

2. Are there other groups that you think should have been represented on the team?

   If yes, who and why?

3. With regards to the writing process, I would like to find out if there was enough input from the different parties.

   - teachers?

   - First Nations' People?

   - archaeologists?

4. This collaborative process was supposed to better meet the needs of various groups with the finished product.
   (Lead in comment)

5. First of all, what are the needs of the following groups with regards to the finished curriculum:

   - the educators?

   - the First Nations' People?

   - the archaeologist?

   Were these needs met by the collaborative process?

   - educators?

   - First Nations' People?

- archaeologist?

If not, how could the process have been changed to meet their needs?

6. When writing curriculum, what were the responsibilities of each of these main groups?

   - the educator's?

   - the archaeologist's?

   - the First Nations Peoples'?

7. Do you feel this collaborative process could have been improved?

   ie. more brainstorming, cooperative writing, resource sharing, etc.

8. Did you encounter any problems when writing this curriculum?

9. Did you see other writers encounter any problems, or the group as a whole?

Educator Requirements

1. As a teacher, what components/ingredients of a curriculum are most useful to you?

   e.g. hands-on activities
   aids
   teacher guide
   other _____

2. What aspects of a curriculum make it 'teacher-friendly' to you?

3. Are you likely to include archaeology in your teaching? Why or why not?

4. Are there certain aspects of archaeology that appear particularly relevant to you?

   e.g. information about the past
   student interest
   methods employed by archaeologists
   (e.g. measuring, mapping)
   other _____

5. For what grades do you think archaeology is most relevant?

   List and justify.

Completion of Curriculum Project

1. Do you feel that the inclusion of archaeology in this curriculum was appropriate?

   Why or why not?

2. Is this a change in opinion from before the project began?

   If yes, why did you change your opinion?

   If no, why did you not change your opinion?

3. Do you think archaeology is a viable method of presenting the past?

4. Do you think educators such a yourself can present an accurate picture of the past using this curriculum?

Conclusions

1. After completion of the project were your opinions about the educational value of archaeology changed in any way?

2. Do you feel that educators, archaeologists and representatives of First Nations' Peoples can successfully collaborate to create worthwhile curricula?

3. I would like your opinions on what problems (practical, ethical and informational) you foresee in this type of collaborative endeavour?

   - ethical

   - practical

   - informational

Any additional comments?

APPENDIX D

PILOT TEACHERS INTERVIEW SCHEDULE

General

A. Experience/Contact With Archaeology

1. How much exposure have you had to archaeology before piloting this curriculum?

2. Have you ever visited an archaeological site before?

   Where? When?

   Worked as a volunteer?

B. Perceptions of Archaeology

1. Do you think archaeology is a worthwhile educational experience? Explain

2. Do you feel archaeological programs should be made more available to all people, or what specific groups should we focus upon?

   Are we doing a good enough job now, or should we be working at it more?

   What about the general public, ordinary people down the street? Are we reaching them?

3. What archaeological programs do you wish to see developed?

   1. for all people?

   e.g. ____ tours

   ____ presentations by archaeologists

   ____ opportunity to view artifacts found at sites

____ opportunity to volunteer at a dig

____ opportunity to work in a lab setting

4. Would you encourage or assist your students to become involved in any of these activities?

   Would you use them as part of your teaching strategy?

C. Education/Curriculum and Archaeology

1. What do you think of the inclusion of archaeology in the school curriculum?

   Do you think archaeology should be included in elementary and/or high school curricula?

2. If an optional, more in depth archaeological program was made available to you, would you use it in your classroom?

3. At what grade levels do you think archaeology should be introduced?

4. What can an archaeologists do to assist the teacher in presenting/teaching archaeology?

   e.g. information
   materials
   in-school visits by archaeologists
   teacher manuals?

   In particular, would archaeology workshops for teachers be beneficial?

5. Regarding the Wanuskewin archaeology curriculum was the information provided useful. Would you like more in-depth information, less, easier, etc.?

6. How did your students respond to the materials and activities? Discuss.

7. Will you continue using this Wanuskewin curriculum next year including the archaeology section?

8. Overall, were the students interested in archaeology? Did they have any preconceptions or was this subject new to them?

D. Wanuskewin

1. What did you think of the level of archaeology presented to the students at Wanuskewin Heritage Park?

   Was there enough emphasis, or too much?

   Did you work with them?

   What if you had not interacted with them?

   Do you think if there had been a staff member there it might have helped.

   Did you go out to the dig site?

2. Were there archaeological activities you hoped to see/do at Wanuskewin?

   Were you impressed with the archaeology or disappointed?

3. Did you visit Wanuskewin for the First Nations Peoples cultural components or the archaeology or both (what was the real drawing card for you, your students?)

4. Will you return with your class next year?

5. Any concerns, comments?

Personal Information (optional)

Male _____ Female _____

Age Range: 19-30 _____

31-45 _____

+45 _____

APPENDIX E

GRADE FOUR STUDENT QUESTIONNAIRE

Studying about archaeology is a new experience for most students. We would like to know what you think about the subject of archaeology. Please answer the following questions.

1. Did you enjoy learning about archaeology?

   ____ yes ____ no

2. Do you think all students should learn about archaeology at school?

   ____ yes ____ no

   Why or why not?

3. What do you think archaeology teaches us?

4. What is the most important thing you learned about archaeology?

5. When you were learning about archaeology, which part did you find most interesting?

6. Have you ever visited an archaeological site before?_____ If yes, where?

7. Would you like the opportunity to become involved in other archaeology activities?

   ____ yes ____ no

If yes, what would you like to do?

tour archaeological sites_____

work in an archaeological lab_____

talk to a real archaeologist ____

volunteer at an archaeological dig____

other _____

8. Would you like your parents, grandparents, brothers and sisters to have the opportunity to learn about archaeology?

____ yes ____ no

9. Personal information _____ male _____ female

age____

Name of School: _____

Thank you for participating in this study. The questions you have answered will help archaeologists design archaeology programs for many students.

APPENDIX F

PUBLIC QUESTIONNAIRE

The following questions are designed to assist in the study of archaeology programs for the public. Please fill in and return to an archaeologist at the site.

1. Is this your first visit to an archaeological site? ____ If not, what other sites have you visited?

2. Would you like the opportunity to visit more archaeological sites?

   ___ Yes ___ No

3. Do you feel archaeology is a worthwhile educational experience?

   ___ Yes ___ No

4. Would you like to see more archaeology included in school curricula?

   ___ Yes ___ No

5. If an archaeological dig was taking place in your local area, what educational features would you like to see? (can pick more than one)

   ____ tours for school children

   ____ tours for general public

   ____ evening lectures presented by archaeologists working on the project

   ____ opportunity to view artifacts found at the site

____ updates/reports in media

____ opportunity to be involved in cleaning and studying artifacts

____ other_____

6. Would you like the opportunity to participate on an archaeological dig?

___ Yes ___ No

If you could, how long would you like to work at a dig?

____ a day

____ a week

____ other_____

7. Any additional comments you may wish to make would be highly appreciated.

8. Personal Information

____ Male ____ Female

Age: 5 - 18 ____

19 - 30 ____

31 - 45 ____

+ 45 ____

Retired ____

Thank you for participating in this survey. The information you have provided will be invaluable for this study.

APPENDIX G

"ARCHAEOLOGY IN THE SCHOOLS"

VOLUNTEER STUDENT QUESTIONNAIRE

For the past eight weeks you have been participating in an archaeology pilot project sponsored by A-STEP. The purpose of this project is to develop classroom activities related to scientific methods and techniques used by archaeologists.

We would appreciate your comments about the project and the subject of archaeology. Please fill out the following questionnaire.

1. Did you find the archaeology activities you participated in interesting?

   _____ yes _____ no

2. Which activities did you find most interesting?

   creating a site ____

   creating a stratigraphic profile ____

   drawing the profile ____

   excavating the site ____

   drawing the floor plan of the site ____

   classification exercises ____

   cataloguing and identification of artifacts ____

   interpretation of site ____

   site report ____

other _____

Why did you find these activities the most interesting?

3. Were there activities you did not enjoy? (name them)

Why did you not enjoy these activities?

4. Were some of the ideas presented to you difficult to understand? _____

Which ideas were difficult to understand?

5. Do you think archaeology is a good way to learn about other sciences?

6. Do you think learning about other sciences was easier and more fun using archaeology activities?

7. What skills did you use in the program?

math ____

art ____

writing ____

creative thinking ___
(imagination)

organization ____

cooperation ____

other _____

8. Would you like to participate in more archaeology projects?

If yes, what other activities would you like to participate in?

_____ another project like this one

_____ archaeology digs at real sites

_____ school yard digs

_____ work in an archaeology lab as a volunteer

_____ archaeology courses in the classroom

_____ other _____

9. Do you think archaeology activities should be available to all students?

   Why or why not?

10. Have you ever been involved in an archaeology project before?

11. Personal information ____ male ____ female

    ____ age

12. Do you have any further comments you would like to make?

Thank you for participating in this study. The questions you have answered will help archaeologists design future archaeology programs for students.

APPENDIX H

CLASSROOM TEACHER INTERVIEW SCHEDULE

I. General

1. How long have your been a teacher?

2. What grades and/or subjects have you taught?

3. Have you had any previous experiences with, or exposure to archaeology?

   If yes, explain.

4. Have you ever taught archaeology in your classes?

   If no, why not?

   If yes, what was your focus?

5. If you used archaeology in teaching, would you emphasize social studies or science?

6. Would you teach with archaeology or about archaeology?
   Discuss.

7. Do you think more teachers would use archaeology in their teaching if curriculum packages were developed?

8. What are the ingredients needed in a curriculum to make it 'teacher-friendly'?

10. What specific ingredients do you look for in a curriculum?

II. Modules Testing

Student Interest

1. Did the students appear interested in archaeology?

2. Were they enthusiastic about the activities?
3. Do you feel they willingly participated in the activities?

4. Did they make any comments that led you to believe they liked/disliked the activities?

5. Did the students mention any activities they particularly liked/disliked?

Educational Value

1. Do you feel these activities exposed the students to scientific process?

   scientific methodology?

   other scientific disciplines?

2. Did the activities appear to stimulate the students' interest in science?

3. Did the students appear to grasp the concepts presented?

4. Did they have difficulty with any concepts?

5. Did the students appear to grasp the methods and techniques used in the activities?

6. Did they have any difficulties?

7. Were the modules organized at an appropriate level for a regular Grade 7-8 class?

8. Did the activities provide a variety of teaching/learning strategies?

   If yes, list as many different strategies as possible.

9. Did these activities provide the students with opportunities to strengthen CELs?

10. Which skills/CELs do you think were emphasized during these activities?

Problems\Modifications

1. What special problems do classroom teachers face when planning hands-on projects?

2. How can these problems be overcome?

3. Would you use these archaeological activities in your classroom again?

4. Under what circumstances?

5. Which activities would you use?

change?

discard?

Conclusions

1. Do you feel archaeology is a relevant subject to be taught in elementary schools?

   If no, why not?

   If yes, why?

2. What benefits do you see in using archaeology to teach?

   (In other words, is archaeology a worthwhile teaching vehicle?)

3. Do you think these activities increased the students knowledge of associated scientific disciplines (ie. soil sciences, geology)?

4. Do you feel that archaeology activities can be incorporated into other subjects (ie. mathematics, language arts)?

5. Do you think the students now understand what archaeologists do and the importance of archaeological research?