1.) DATE: 04/09/2012  
2.) COMMUNITY COLLEGE: Maricopa Co. Comm. College District  

3.) COURSE PROPOSED: Prefix: ASB  Number: 230  Title: Principles of Archaeology  Credits: 3  
   CROSS LISTED WITH: Prefix:  Number: ; Prefix:  Number: ; Prefix:  Number: ; Prefix:  Number: ;  

4.) COMMUNITY COLLEGE INITIATOR: Dean Wheeler  PHONE: 623-845-3903  
   FAX: 623-845-3024  

ELIGIBILITY: Courses must have a current Course Equivalency Guide (CEG) evaluation. Courses evaluated as NT (non-transferable are not eligible for the General Studies Program.  

MANDATORY REVIEW:  
☒ The above specified course is undergoing Mandatory Review for the following Core or Awareness Area (only one area is permitted; if a course meets more than one Core or Awareness Area, please submit a separate Mandatory Review Cover Form for each Area).  

POLICY: The General Studies Council (GSC-T) Policies and Procedures requires the review of previously approved community college courses every five years, to verify that they continue to meet the requirements of Core or Awareness Areas already assigned to these courses. This review is also necessary as the General Studies program evolves.  

AREA(S) PROPOSED COURSE WILL SERVE: A course may be proposed for more than one core or awareness area. Although a course may satisfy a core area requirement and an awareness area requirement concurrently, a course may not be used to satisfy requirements in two core or awareness areas simultaneously, even if approved for those areas. With departmental consent, an approved General Studies course may be counted toward both the General Studies requirements and the major program of study.  

5.) PLEASE SELECT EITHER A CORE AREA OR AN AWARENESS AREA:  
   Core Areas: Social and Behavioral Sciences (SB)  Awareness Areas: Select awareness area...  

6.) On a separate sheet, please provide a description of how the course meets the specific criteria in the area for which the course is being proposed.  

7.) DOCUMENTATION REQUIRED  
☒ Course Description  
☒ Course Syllabus  
☒ Criteria Checklist for the area  
☒ Table of Contents from the textbook required and/or list or required readings/books  
☒ Description of how course meets criteria as stated in item 6.  

8.) THIS COURSE CURRENTLY TRANSFERS TO ASU AS:  
☒ DECASBprefix  
☐ Elective  

Current General Studies designation(s): SB  

Effective date: 2012 Spring  Course Equivalency Guide  

Is this a multi-section course?  ☒ yes  ☐ no  

Is it governed by a common syllabus?  ☒ yes  ☐ no  

District-wide course competencies/outline  

Chair/Director: SHEREEN LERNER  Ricker  

Chair/Director Signature: Emailed approval to J.  

AGSC Action:  Date action taken:  
☐ Approved  ☐ Disapproved  

Effective Date:
**ASU–[SB] CRITERIA**

A SOCIAL AND BEHAVIORAL SCIENCE [SB] course should meet all of the following criteria. If not, a rationale for exclusion should be provided.

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>Identify Documentation Submitted</th>
</tr>
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<tbody>
<tr>
<td>![checkbox]</td>
<td>![checkbox]</td>
<td>Course Competencies, Course Outline, Syllabus, Course Synopsis &amp; Assignments, Textbook TOC (see table below for details)</td>
</tr>
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</table>

1. Course is designed to advance basic understanding and knowledge about human interaction.

| ![checkbox] | ![checkbox] |

2. Course content emphasizes the study of social behavior such as that found in:

- ANTHROPOLOGY
- ECONOMICS
- CULTURAL GEOGRAPHY
- HISTORY

| ![checkbox] | ![checkbox] | Anthropology |

3. Course emphasizes:
   a. the distinct knowledge base of the social and behavioral sciences (e.g., sociological anthropological).
   **OR**
   b. the distinct methods of inquiry of the social and behavioral sciences (e.g., ethnography, historical analysis).

| ![checkbox] | ![checkbox] |

4. Course illustrates use of social and behavioral science perspectives and data.

| ![checkbox] | ![checkbox] |

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**THE FOLLOWING TYPES OF COURSES ARE EXCLUDED FROM THE [SB] AREA EVEN THOUGH THEY MIGHT GIVE SOME CONSIDERATION TO SOCIAL AND BEHAVIORAL SCIENCE CONCERNS:**

- Courses with primarily fine arts, humanities, literary, or philosophical content.
- Courses with primarily natural or physical science content.
- Courses with predominantly applied orientation for professional skills or training purposes.
- Courses emphasizing primarily oral, quantitative, or written skills.
<table>
<thead>
<tr>
<th>Course Prefix</th>
<th>Number</th>
<th>Title</th>
<th>Designation</th>
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<tbody>
<tr>
<td>ASB</td>
<td>230</td>
<td>Principles of Archaeology</td>
<td>SB</td>
</tr>
</tbody>
</table>

Explain in detail which student activities correspond to the specific designation criteria. Please use the following organizer to explain how the criteria are being met.

<table>
<thead>
<tr>
<th>Criteria (from checksheet)</th>
<th>How course meets spirit (contextualize specific examples in next column)</th>
<th>Please provide detailed evidence of how course meets criteria (i.e., where in syllabus)</th>
</tr>
</thead>
</table>
| 1. Course is designed to advance basic understanding and knowledge about human interaction | Emphasis is placed on adopting a global perspective; on taking a holistic and cross-cultural approach to examining world prehistory. Trade is examined to illustrate how the exchange of material goods and information has been a fundamental component of human interaction for a long time. Human interaction within communities and among kin groups is also examined. | **Course Competencies:**
1. Define the nature of archaeology as a social science.
2. List and describe the major events in the history of archaeology.
3. Contrast the different approaches to the study of archaeology.
4. Describe the purpose and process of archaeological research and data acquisition.
5. Describe methods used to date archaeological finds.
6. Identify and analyze the ways archaeologists reconstruct human behavior.
7. Explain the relevancy of archaeology in today's society.

**Course Outline** (please see subtopics under each major heading):
I. Archaeology as a Social Science
II. Origins of Archaeology
III. Approaches to the Study of Archaeology
IV. The Nature of Archaeological Data
V. Archaeological Research
VI. Archaeological Survey and Excavation
VII. Archaeological Age Determination
VIII. Reconstruction of Past Human Behavior
IX. Archaeology in Today's Society |
2. Course content emphasizes the study of social behavior such as that found in: Anthropology

Anthropology is, in the simplest sense, the study of humankind in all times and places. It is one of the foundational disciplines of the social and behavioral sciences. The field of archaeology uses methods that are fundamental to the discipline of anthropology.

Course Competencies:
1. Define the nature of archaeology as a social science.
2. List and describe the major events in the history of archaeology.
3. Contrast the different approaches to the study of archaeology.
4. Identify and analyze the ways archaeologists reconstruct human behavior.

Course Outline (please see subtopics under each major heading):
I. Archaeology as a Social Science
II. Origins of Archaeology
III. Approaches to the Study of
### Course Competencies:

4. Describe the purpose and process of archaeological research and data acquisition.
5. Describe methods used to date archaeological finds.
6. Identify and analyze the ways archaeologists reconstruct human behavior.

### Course Outline (please see subtopics under each major heading):

IV. The Nature of Archaeological Data
V. Archaeological Research
VI. Archaeological Survey and Excavation
VII. Archaeological Age

Archaeology
VIII. Reconstruction of Past Human Behavior

**Syllabus:**
Sections II, III, IV, X, XI

**Course Synopsis & Assignments:**
The Nature of Archaeology (pp. 1-7)
Interpreting the Past: Culture History and Mechanisms of Culture; Cultural Process; Major Developments in World Prehistory (pp. 18-22)

**Textbook:**
Chapter 1 Introducing Archaeology and Prehistory
Chapter 3 Acquiring the Record
Chapter 4 How Did People Live?
Chapter 5 Individuals and Interactions
Chapter 7 Explaining the Past
Chapter 10 The Great Diaspora
Chapter 11 The Earliest Farmers
Chapter 12 The First Civilizations
Chapter 13 Early Asian Civilizations
Chapter 14 Maize, Pueblos, and Mound Builders
Chapter 15 Mesoamerican Civilizations
Chapter 16 Andean Civilizations

3.b. Course emphasizes the distinct methods of inquiry of the social and behavioral sciences

The primary goal is to learn about past human lifeways, which includes aspects of social behavior. Considerable emphasis is placed on the nature of archaeological inquiry and field methods, particularly the way archaeologists move from recovering the material remains of the past, to reconstructing what life was like for the people who left them behind.
| Information Knowledge and behavioral science perspectives gleaned from archaeological studies can be applied to contemporary societies. Emphasis is placed on how challenges faced by those who came before us, in some fundamental respects, are not all that different from challenges faced by humans today, be they cultural or environmental. |

| 4. Course illustrates use of social science approaches to study of past and present human behavior. Emphasis is placed on understanding of human behavior in the context of the social and environmental setting. The focus is on the development of analytical skills and the ability to apply these skills to real-world problems. |

| Course Content: |

| Chapter 1: The Prehistory of the Past |
| Chapter 2: The Present Group |
| Chapter 3: How Did People Live? |
| Chapter 4: The Archaeological Record |
| Chapter 5: Explaining the Past |

| Course Materials: |

| Textbook (please see subtopics in each chapter): |
| Sample Exercises: |

Several examples of activities are used in the course that are designed to teach students about the methods and inquiry used in archaeology.
<table>
<thead>
<tr>
<th>Human Behavior IX. Archaeology in Today's Society</th>
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</thead>
<tbody>
<tr>
<td>Syllabus: Sections I, II, III, IV, IX, X, XI</td>
</tr>
</tbody>
</table>

**Course Synopsis & Assignments:**
- The Nature of Archaeology (pp. 1-7)
- The Battle of Maiden Castle (pp. 15-18)
- Interpreting the Past: Culture History and Mechanisms of Culture; Cultural Process; Major Developments in World Prehistory (pp. 18-22)
- Martin's Hundred, Virginia (pp. 30-40)

**Textbook:**
All chapters illustrate the use of SB Science perspectives and data.
Official Course Description: MCCCCD Approval: 6-27-1995

ASB230 1995 Fall - 9999

Principles of Archaeology
Introduction to archaeological methods and theory.
Prerequisites: None.

Course Attribute(s):
General Education Designation: Social and Behavioral Sciences - [SB]

Go to Competencies   Go to Outline

MCCCCD Official Course Competencies:

ASB230 1995 Fall - Principles of Archaeology
9999

1. Define the nature of archaeology as a social science. (I)
2. List and describe the major events in the history of archaeology. (II)
3. Contrast the different approaches to the study of archaeology. (III)
4. Describe the purpose and process of archaeological research and data acquisition. (IV, V, VI)
5. Describe methods used to date archaeological finds. (VII)
6. Identify and analyze the ways archaeologists reconstruct human behavior. (VIII)
7. Explain the relevancy of archaeology in today's society. (IX)

Go to Description   Go to top of Competencies

MCCCCD Official Course Outline:

ASB230 1995 Fall - Principles of Archaeology
9999

I. Archaeology as a Social Science
   A. Archaeology and the scientific method
   B. Archaeology and history
   C. Archaeology and anthropology

II. Origins of Archaeology
   A. Collectors and antiquarians
   B. Transition to modern archaeology

III. Approaches to the Study of Archaeology
   A. Culture history
   B. Cultural process
   C. Postprocessual archaeology

IV. The Nature of Archaeological Data
   A. Artifacts and features
   B. Archaeological
   C. Context
   D. Data acquisition
E. Data analysis

V. Archaeological Research
   A. The scope of research
   B. Research designs
   C. Ethnographic analogy
   D. Case study in research design

VI. Archaeological Survey and Excavation
   A. Methods for sampling
   B. Reconnaissance and surface survey
   C. Excavation

VII. Archaeological Age Determination
   A. Relative dating
   B. Chronometric dating

VIII. Reconstruction of Past Human Behavior
   A. Technology
   B. Environment
   C. Subsistence
   D. Exchange
   E. Settlement patterns
   F. Population
   G. Ideology and symbols

IX. Archaeology in Today's Society
   A. Cultural resources and cultural resource management
   B. Contract archaeology
   C. Preservation of the archaeological record
   D. Working with native peoples
SYLLABUS

ASB 230
Principles of Archaeology

Course Description

This class is an introduction to archaeological methods and theory. It defines the nature of archaeology as a social science including major events in the history of archaeology and the different approaches to the study of archaeology. In this class we will learn about the purpose and process of archaeological research and data acquisition and the methods used to date archaeological finds. We will identify and analyze the ways archaeologists reconstruct human behavior and explain the social relevance of archaeology to today’s world. We will cover certain key principles in gaining a better understanding of archaeology. These principles include:

*Stewardship*: Archaeological resources are nonrenewable and finite; issues related to conservation, information retrieval, cultural resource management, and vandalism will be discussed.

*Diverse interests*: Diverse groups such as descendant communities, state, local and federal agencies and others compete for and have vested interests in archaeological sites. Archaeologists, therefore, share their knowledge with many diverse audiences and engage these audiences in defining the meaning and direction of their projects.

*Social Relevance*: We will highlight ways in which we can use the past to help us think productively about the present and the future.

*Professional Ethics and Values*: We will discuss how archaeologists conduct themselves in relation to the resources, their data, their colleagues, and the public and why ethics and values are a critical part of the archaeological profession.

*Communication*: You will be asked to prepare written reports, participate in class discussions, and use the computer for a variety of activities and assignments. An archaeologist must be able to make a clear and convincing argument in public as well as professional contexts based on the analysis and interpretation of relevant information.

*Basic Archaeological Skills*: Through class activities you will be introduced to basic archaeological skills such as map making and reading, interpretation of data, and classification of materials.

*Real World Problem Solving*: Through class activities and assignments and outside opportunities, we will connect what we learn in the classroom to the real world.

*Course purpose*: The purpose of this course is to introduce the student to archaeological methods and theory.
Course description: This class is an introduction to archaeological methods and theory. It defines the nature of archaeology as a social science including major events in the history of archaeology and the different approaches to the study of archaeology. In this class we will learn about the purpose and process of archaeological research and data acquisition and the methods used to date archaeological finds. We will identify and analyze the ways archaeologists reconstruct human behavior and explain the social relevance of archaeology to today's world. We will cover certain key principles in gaining a better understanding of archaeology (see above). Examples of archaeological work are drawn from a variety of sources from all over the world.

Course objectives: By the end of the course, students should be able to:

1. Define the nature of archaeology as a social science Document and describe evidence of occupation in the Americas
2. Describe the major events in the history of archaeology
3. Contrast different approaches to the study of archaeology
4. Describe the purpose and process of archaeological research and data acquisition
5. Describe the methods used to date archaeological finds
6. Identify and analyze the ways archaeologists reconstruct human behavior
7. Define the relevancy of archaeology in today's society

Text: Ancient Lives by Brian Fagan
This text discusses archaeological ethics, stewardship, and conservation of the past. Also provides alternative perspectives on the past and important issues for Native Americans and other indigenous peoples.

Course Synopsis & Assignments
The dates for tests, activities, and assignments will be given in class.

COURSE SCHEDULE

Section I. Introduction to Course

B. Introduce professor
C. Course format
   1. Introduce MCC anthropology web area and others:
      http://www.mc.maricopa.edu/dept/d10/asp/
   2. Lectures, videos, slides, small group and class discussion
   3. Class activities
   4. Evaluations: reflections, class activities, current events, extra credit opportunities (see attached for assignments)
   5. Readings and web-based resources
D. Questions about the course?
Section II. Archaeology and Anthropology

A. Define anthropology (study of humankind; understand social and cultural behavior)
B. Describe each of four sub-fields (biological, cultural, linguistics, archaeology). Provide examples of how each is applied in real world.
C. Define culture; have students assist in definition, providing examples
D. Archaeology as social science: Science is concerned with gaining knowledge about the natural world by observation. Archaeology deals with past events that no longer can be directly observed, although the evidence left behind can be studied to reconstruct what took place. Examples.
E. Scientific method: self-correcting set of procedures for gaining and testing our knowledge of the observable world. Examples.
F. Difference between history and archaeology: example (Civil War).
H. Diverse interests: diversity of archaeologists: prehistoric, classical, historical, underwater; academia, cultural resource management, government; descendant communities, the public, agencies, communities, private property owners, etc.
I. Why is archaeology important? Reconstruct and explain cultures and lifeways of ancient societies; understand human diversity; look at mysteries of the past; "archaeology provides a constant reminder of our common and recent, biological and cultural heritage, in a world where racism is commonplace." (Fagan, page 21).
J. Video
K. Read Fagan, Chapters 1.
L. Activity: Define the four subfields (branches) of anthropology. In what way are the linked together to form the discipline of anthropology? Define and discuss three key elements of culture and how each helps us better understand human behavior.

Section III. Approaches to the study of archaeology

A. Historical perspectives
B. Goals of archaeology
C. Process of archaeological research: ethical responsibilities
D. Read Fagan, Chapter 2

Section IV. The archaeological record

A. Culture, cultural systems, cultural process
B. Context
C. Time and Space
D. Preservation conditions
E. Read Fagan, Chapter 3

Section V. Archaeological research

A. Archaeological data
B. Research design
C. Archaeological research projects
D. Read Fagan, Chapter 3

Section VI. Archaeological survey and excavation

A. Field survey
B. Remote sensing
C. Site survey
D. Testing
E. Excavation
F. Data processing
G. Read Fagan, Chapter 4

Section VII. Classification of artifacts

A. Read Fagan, Chapter 5

Section VIII. Archaeological age determination

A. Relative chronology
B. Absolute dating
C. Read Fagan, Chapters 6-8

Section IX. Analyzing the past

A. Artifacts
B. Ecofacts
C. Features
D. Read Fagan, Chapters 9-12

Section X. Reconstruction of past human behavior

A. Subsistence
B. Settlement and landscape
C. Trade and exchange
D. Technology
E. Spatial order and behavior
F. Belief systems
G. Social stratification
H. Interpretation
I. Read Fagan Chapters 13-16

**Section XI.** Archaeology in today's world

A. Looting and antiquities collection
B. Destruction in the name of progress
C. Cultural resource management
D. Working with Descendant Communities
E. The responsibility of archaeology/archaeologists
F. Read Fagan, Chapter 17
INTRODUCTION TO ARCHAEOLOGY

Archaeology is about material culture - the things that people use to adapt to the world around them. Archaeology is about anthropology - the study of humankind. Archaeology is more than "things" in a museum or "things" that are necessarily old. These "things" are part of people's material culture and they can tell us how people used them and in what context these and other parts of the material culture played in their lives. Archaeologists ponder the things left behind by peoples who lived and died throughout almost two million years of human existence. These material remains are called artifacts and features. It is artifacts and features that help archaeologists reconstruct the hows and whys of people's lives. This course is a journey into how archaeologists, and more generally, anthropologists, pursue the study of humankind.

1. Archaeology

Archaeology Introduced (Computer module; Assignment One - What is Archaeology? Your definition and selection of 10 critical terms.)
Antiquarians - a legacy and the excitement of the find
Who Built Stonehenge (Video) - a lesson in archaeology
Ancient Lives - Chapter 1, Introduction Archaeology and Prehistory

First Unit Terminology Examination

THE NATURE OF ARCHAEOLOGY

"We can look to the past to see the future. The hallmark focus of this generation is a redefining of archaeology from a rather abstract pursuit to one that has direct impact on day-to-day concerns" (Chuck Redman, Arizona State University.) "Archaeology is more than just an indulgence of a rich society. We really do have something to say to future generations" (Don Rice, Southern Illinois University.) "We should not repeat the mistakes they made. Grazing and overcutting have made the Middle East bleak and unproductive while Europe, profoundly altered by human activity, is not longer in a natural state" (Jeff Dean, University of Arizona.) There is an upside to the story archaeologists tell however. Many societies have a record of success for hundreds, even thousands of
years. People such as the Lacandon Maya or the Hopi leave us lessons that we need to learn because they are marked by success rather than failure. Ask yourself "what does history repeat itself?" as you learn about what archaeology is and what archaeologists have learned.

Reflect on the following prepared by Brian Fagan for his Anthro 3 course at the University of California, Santa Barbara (UCSB); it fits well with the direction we will take in ASB230:

**Space-Context**

Space in Archaeology is not the limitless frontiers of the heavens, but a precisely defined location for every find made during an archaeological survey or excavation. Archaeological objects of any type have an exact find spot, a context in the three ordinary dimensions of space to produce the latitude, longitude, and depth measurements that define a point uniquely. This spatial component of context is just as important as the precise date of an artifact.

Space is important to archaeologists because it enables them to determine the distances between different objects or features, or between entire settlements, or settlements and key vegetation zones and landmarks. Important distances can be a few inches of level ground between a dagger and the skeleton of its dead owner, or a mile separating two seasonal camps, or a complicated series of interrelated distance measurements separating dozens of villages that are part of an elaborate trading system carrying luxury goods like sea shells through several geographic regions hundreds of miles apart.

Space studies in archaeology depend on another fundamental law: The Law of Association. Simply stated is Association in archaeology is the horizontal relationship between artifacts and other archaeological finds or results of human activity. Finds are said to be associated with one another, or with occupation layers in a site when they are deemed to be contemporary with one another. This is directly tied to the concept of Context. It is through the recording of association that archaeologists place things in context so that one can infer behavioral references. Think of an artifact that is found all by itself without anything around it. How much could be inferred about its context to any behavior. Context in space is closely tied to cultural behavior, and is best illustrated by the grave setting in the Introduction to Archaeology computer module.

**A hierarchy of Archaeological Entities**

Space and Time; two critical elements in studying the human past, are the foundation of a whole hierarchy of important archaeological entities—units and concepts used by archaeologists to subdivide, classify, and interpret the past.

By the phrase "Hierarchy of Archaeological Entities" we mean: A hierarchy of theoretical terms devised by archaeologists that enable them to classify the archaeological record into ordered levels. These levels start at the lowest level with individual artifact attributes, and at their highest subsume the human world system.

In other words, the Hierarchy is a set of entirely arbitrary labels used by archaeologists to classify and manipulate their data in the field and laboratory. When studying the Hierarchy, an understanding of which is essential for a journey through human prehistory, you should always remember that terms like "attribute," "artifact," and so on are theoretical constructs designed to assist
research. They do not necessarily coincide with the original peoples' view of their own artifacts, houses, and so on.

**World Prehistory and World Systems**

World Prehistory, the subject matter of much of this course, is the study of human prehistory from a global perspective. It behooves us, therefore, to approach the subject from a global perspective. The way we do this is through the notion of a World System.

The highest level in our hierarchy of archaeological entities is that of the World System, which is a reflection of the perspective of human prehistory that emerges from this course. We must now look at this idea more closely, and define what we mean, in general terms, by "World system."

Since World War II, archaeology has become increasingly specialized and more and more hi-tech, to the point that relatively few archaeologists know much about the prehistory of any area other than their local region and research locale. This means that general theories of prehistory are few and far between. In this course, we take you on a journey through human prehistory on a global basis, and do so within a broad, overall theoretical framework that applies as much to the earliest humans as it does to the very twilight of prehistory in recent centuries. This framework is based on a general notion of a "World System."

Today, we live in a world of numerous nations and cultures that are linked together by global ties at every level and of every type imaginable. Some ties are economic—trade in gold, grain, and other commodities, to say nothing of automobiles and luxury goods. Others are spiritual—the philosophical ties of Christianity, Islam, and other world religions. Many are political, links forged by common allegiances to political canons, or by formal treaty. All these networks encompass vast distances and hundreds of diverse societies, even before we contemplate the subtle and not-too-subtle environmental links that join all of humankind with imperishable and fragile chains.

Anthropologist Eric Wolf has argued persuasively that all human societies have been linked together in many subtle ways ever since Europeans embarked on their voyages of discovery to Africa, Asia, the Americas, and the Pacific in the fifteenth century AD. These societies have influenced each other in all manner of obvious and not-so-obvious ways—to make the notion of "pristine" societies, uninfluenced by others, an untenable one.

Wolf is at least partially, if not wholly, right in his assumption—as far as the past five or six centuries of prehistory are concerned. The Mediterranean civilizations—Rome, Greece, Alexander the Great, the Persians, the Assyrians and Babylonians, to say nothing of the Chinese, created widespread "world systems" that impacted many other societies, but not, of course, on the scale of recent centuries. But what about earlier prehistory?

It is our belief that human societies have formed part of a world system since the earliest times—but the character of this world system has changed radically through the millennia. We live today in a world system generated, nurtured, and constantly changed by human actors. Our remote predecessors lived in a world system shaped not by humanity but by global forces of climatic and environmental change—by the constant climatic changes of the Ice Age, which began over 2.5 million years ago.

We can divide our notion of a world system into four stages, themselves grouped into humanly-created and natural systems:

**Humanly-Created Systems**
1. Modern World System (AD 1400 to modern times). This system, created by the European Age of Discovery and its consequences, spans the last five centuries of prehistory.

2. Nascent World System (c.1500 BC to AD 1400). Far-flung, but still regional, systems created by early imperial civilizations, and their successors—Medieval France, the Italian nation-states, and so on.

**Natural Systems**

3. Holocene World System (c. 12,000 BC to modern times). Post Glacial, or Holocene, times saw the retreat of Ice Age glaciers from northern latitudes, world sea levels rise from about 300 feet below modern levels, and major, and constantly fluctuating climate change on a local and global scale. These changes saw a rapid warming-up after the end of the Ice Age, with the warmest temperatures in about 4,000 BC.

   The Holocene saw major changes in human society, the emergence of food production and village life, also the development of the first state-organized societies. Note that this System continues right into modern times, for humanly-created world systems only begin to assume dominance in human affairs after about AD 1400.

4. Ice Age (Pleistocene) World System (2.5 million years to 12,000 BC). The Pleistocene, the so-called Great Ice Age, is the last geological epoch. It began about 2.5 million years ago and ended with the retreat of northern ice sheets after 12,000 BC. In fact, we are in the midst of a warm cycle of the Ice Age today, but geologists and archaeologists separate the Holocene from the Pleistocene for convenience.

   The ever-changing cycles of Ice Age climate were the backdrop, the global ecological system that affected the early evolution and spread of humankind. Conceptually, we study world prehistory against this changing backdrop, for global environmental fluctuations affected all of humankind, even groups separated by thousands of miles and living in quite different environments.

   As we shall see, local changes were as important as global ones in triggering developments in human biological and cultural evolution that had ultimately momentous effects on the future course of human prehistory.

   From the very earliest times, humans have been an integral part not only of their own local ecosystems, but of the global ecosystem as well. This was, and still is, the world system that governs, and still governs, the biological, and increasingly the cultural, evolution of humankind. World prehistory, the subject matter of the last seven assignments of this course, is the study of the relationship between evolving and spreading humanity and this ever-changing world system. It is also the study of the diverse ways in which humans have achieved increasing control over the global ecosystem, creating the artificial world system along the way.

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3. **Historical Science**

   Cannibalism in the Southwest (Video) - a study of how to.
   Hypothesis Building - Looking for Problem Orientations
   Out of the Past (Video) - Introduction to Ancient Prehistory
   Introduction of an Archaeologist (Assignment Two: Identify an Archaeologist: Prepare a class presentation)
Explore the Anasazi computer module available through the Information Commons. This is a good way to explore a variety of terms associated with archaeology. Especially relate the terms cultural area and culture history.

4. An Example of asking Questions

Pueblo Grande Revisited

Assignment Three: perform a research study and identify 5 new archaeological terms used in the context of the study.

Ancient Lives - Chapter 2, The Record of the Past; Chapter 3, Acquiring the Record
Fourth Unit Terminology Examination

The City of Phoenix has granted you money to excavate a portion of Pueblo Grande in Phoenix, Arizona. This special honor places you among a select few who have had an opportunity to study this important Hohokam site. Excavation at Pueblo Grande started over 100 years ago and more information is learned each time someone is given the opportunity to archaeological study Pueblo Grande.

There are some simple rules to follow as you begin your project. Carefully read through the introductory screens. These provide you with valuable information you will need to know as your conduct your research. The final screens include directions on the excavation and guide you as you consider important research questions for a study of the site. When you have completed these screens, click on the button that initiates the excavation.

The first screen you will see after you click this screen has two parts. The upper part are special tools you can use to look at different windows. You will note that one of these will be darker than the others. This means that the "site map" is open. As you click on these tool buttons, a window will open and the button will change color. By clicking on the button again, the window will hide and the button will return to its original color. You might want to open the "field guide" by clicking on the appropriate button. The Field Guide will open. Click on the tool button again to close the Field Guide. Now click on the "help" button to open the special Help window. This help window explains a few of the special aspects of the program that you will have to know to excavate effectively. Click the "help" button again to close the Help window before beginning your exploration of the site.

The Site Map shows you where the "unknown area" is located. This is the portion of the site you will excavate within and do your research. Before clicking in this area, click on some of the parts of the part to see what is known. Some parts of the site are described in the Field Guide while other information may appear in a small window. You will need to click the "OK" button in these windows before you can go on with your exploration. When you are ready to begin your excavation, click in the shaded "unknown area".
A note will appear immediate after you click this area. This note will indicate you need to select a method to select the areas you will excavate. Because the City of Phoenix can provide you with limited funds to conduct your research, you will be able to "sample" the area and not excavate all of it. This will actually preserve a portion of the area for future archaeological investigation so it has its benefits. You can either select to have a random sample drawn by the computer or you can manually select the areas you want to work it. If you click the "manual" button, you need to click in 5 grid cells to indicate the areas you want to work within. If you click the "random" button, the computer will select 5 cells. The computer will tell you when you have completed the selection process. If you want to know about sampling or random sampling, click on the buttons and information from your Field Guide will help you.

Once you have completed the selection process, you need to click the mouse in one of the selected grid units. This will open a new window below. You need to follow the following rules as you excavate within the grid unit you have selected:
1. Excavate beginning with the top level (Level One).
2. Excavate from the top down.
3. Excavate all features you unearth in each level before excavating a new level.
4. There will be three types of features to excavate. By clicking on them you excavate them.
5. After you excavate a house, you need to obtain radiocarbon or pollen reports for the house by clicking on the appropriate button. It does not matter which button you select first. The computer will remind you after the first three houses you excavate. If you forget to get these report immediate after excavating the house, you will not be able to go back to get this information.
6. You will note that an inventory of different kinds of artifacts will appear after you excavate a house or oven. You can find out what each artifact type is by clicking on the icons. Information is possessed in the Field Guide to help you.
7. An inventory is compiled by the computer for information about each house. This is not true for ovens or canals. You will need to record information about these two types of features as you excavate them.
8. Your crew excavates a 5 meter long segment of each canal. The computer will indicate the width and depth of each canal segment that is excavated.

When you have worked through each level in the grid unit and completed your excavations here, you need to return to the earlier window and select another unit to excavate. You need to click in the window and then click a second time in another of the grid units you selected earlier. This will open up new levels in the bottom screen for you to continue your excavations. (Again, you will have to click in the lower window and then click on the first level to see what you unearthed.)

Continue this process until you have completed all your 5 of your grid units. When you have finished, it is time to perform your research. This is done by clicking on the "research" button at the top of screen. This will open up a new window that will guide you through your research. The research has been structured to step you into different research topics. By clicking on each of the topics, new windows will be opened. You can print these windows as you close them. You can sort data by clicking on the appropriate buttons.
As you print the first window, select the format for the print to print the page sideways (the right-hand image for page format). After you do this, all windows will be printed in this manner.

When you have completed your research, click on the final button to get a summary of your excavation and a record of the fieldwork costs. Print this page as you close the window. After you have done this, you can either quit the program or click the "research" tool button to close the Research window. You may wish to gather more information from the Field Guide before you quit.

Your second assignment is to identify five research problems and address them. You can use any of the problems posed within the context of the program or any others that you personally defin

5. Attributes, Types, and Interpretations (Assignment Four)
(As part of the assignment, identify 5 new terms that you used in the context of the assignment.)
Out of the Past - Chapter 6; Human Habitats

In order to help you understand what attributes are and how they work to build types, you will be asked to work through a three stage project.

The work involves first evaluating some artifacts for purposes of planning. A randomly selected 1% sample of a collection of worked ceramics (sherds) will be made available to you. Your task will be to define a strategy for full analysis of this collection by identifying six or more attributes (characteristics) that would be the foundation of the full analysis. The second task involves a separate collection. You will examine 17 projectile points from a collection of artifacts donated to Mesa Community College by Mr. and Mrs. Frank and Lillie Efland of Moline, Illinois. In this case, your task will be to define groups (types) based on what you see. Finally, you will evaluate the temporal context of a prehistoric site found in northeastern Arizona. A sample collection of diagnostic ceramics was made and you will use this to help tentatively date the site. Anthropologists at Mesa Community College are planning to sponsor excavations at the site if the temporal context places the site in the range of A.D. 700 to A.D. 900. If they date to a broader time range or to any other time period, the College does not wish to consider it for future use by their Archaeological Exploration class. You will make a recommendation whether the site should be excavated or not.

(1) The Worked sherds will be available in the Social/Cultural Office.

(2) Projectile points have been digitized and will be available for viewing and classification in the Information Commons.

(3) The diagnostic ceramics have been digitized and will be available for viewing and analysis in the Information Commons. The Ceramic Specialist for Mesa Community College has previously identified critical attributes for the temporal context identification.
6. Archaeological Survey (Assignments Five and Six): as part of this assignment, again identify 5 new terms you utilized in the context of this assignment. This assignment has two parts: a written report and a 5 minute presentation.

Ancient Lives - Chapter 2, The Record of the Past; Chapter 4, How Did People Live?
Out of the Past (Video) - Reconstructing Households
Out of the Past (Video) - Reconstructing Economies

SURVEY, EXCAVATION AND ANALYSIS OF THE PAST

This assignment is the last devoted to the method and theory of archaeology. We discuss ways in which archaeologists find archaeological sites and basic survey techniques, then take you on a group survey in the Valley of Mexico to find sites in the field. Next we examine the basic principles of archaeological excavation, of uncovering and recording archaeological data in the ground. Back in the laboratory, we learn how to analyze artifacts, then discuss some of the fundamental theories of world prehistory. By the end of this week, we are confident that you will have sufficient archaeological grounding to embark on a journey through the intricacies of world prehistory.

FINDING ARCHAEOLOGICAL SITES

Of all archaeological research procedures, none seems more mysterious than the archaeologist's uncanny ability to find artifacts, to locate archaeological sites without, apparently, anything to work with. How does this "magic" work? What methods do archaeologists use to discover the past?

A great deal of archaeological survey is common sense, simply walking the countryside and looking for tell-tale signs of artifacts and other features. An ability to assess landscape, and a well-developed sense of observation, are important qualities for any archaeologist.

Any discussion of archaeological survey - the process of finding archaeological sites - begins with preservation conditions. These vary dramatically from one area to the next, depending on local soil and environmental conditions - to say nothing of humanity generated circumstances like deep digging for modern building foundations in the heart of ancient cities. Such digging can disturb priceless layers of ancient occupation on a large scale.

Clearly, it is impossible for archaeologists to survey every square foot of a research area - it would cost much too much to do this. The solution is to use random sampling techniques, techniques we will employ in a simple way when we go into the Valley of Mexico.

Few archaeologists have written general descriptions of sampling in archaeological survey, so George Michaels of the University of California, Santa Barbara, has written one specially for you, a description which follows, and which you should read carefully. The essay covers basic terminology used in our site survey.

How do archaeologists go about finding archaeological sites, and why is it important? Answering those two questions are the goals of this discussion. Although most of this discussion speaks of sampling as it relates to regional survey for site location, it is equally applicable to sampling as applied to individual sites for both surface survey and excavation, as well as to the problem of sampling things like collections of artifacts. As in all sciences, researchers in archaeology rarely have the time, budget, or resources to collect all of the data relating to a particular problem, phenomenon, region, or site. As a result, in one way or another, all archaeologists end up working with samples of the population that they are interested in studying. Sampling design is that branch of methodology
that helps archaeologists collect samples that have a knowable level of reliability in regard to representing the population in which they are interested.

**HOW DO ARCHAEOLOGISTS FIND SITES?**

The ways in which archaeologists go about finding sites are almost as varied as the number of archaeologists. Very often finding sites is a matter of happenstance. It is not uncommon, for example, for farmers, contractors, landowners to accidentally discover sites on their property or job site and then bring those sites to the attention of archaeologists out of curiosity or legal necessity. Much of archaeological history is marked by this kind of fortuitous circumstance. Sometimes archaeologists, armed with some theory about the location of sites within a region, will actually conduct a formal survey of the region in an effort to find sites. These surveys can vary in formality from the classic "windshield survey" of Mesoamerican, Southwestern, and African archaeology to highly formalized walking surveys guided by probabilistic sampling theory, accurate maps, aerial photographs and even satellite imagery. Most surveys fall somewhere in between these two extremes and often combine elements of a number of different techniques.

Prior to the mid 1960's, most survey conducted by archaeologists consisted of one of three types. Theses were 1) total surveys - that is surveys where 100% of the region of interest was covered in an effort to collect site information; 2) systematic surveys - these are surveys where some systematic method for covering a proportion of the region of interest is employed in an effort to obtain a reasonable representation of the number and types of sites located in the region; 3) expedient surveys - these are surveys where expedient means were employed to find as many sites as possible in the time available.

The classic windshield survey is a good example of an expedient survey. In this type of survey, the archaeologist piles into his/her pickup truck and takes advantage of whatever road network exists in a region to explore the area looking for evidence of sites such as standing ruins or mounds. Using this technique, in the right terrain, a large number of sites can be located over a large area fairly quickly. The technique suffers from a bias in that sites that aren't located close to roads, or that do not have readily identifiable surface manifestations are often overlooked or missed entirely.

Systematic surveys can also suffer from a similar type of bias in the results they return. If there is some periodicity in the distribution pattern of sites that does not coincide with the system of survey coverage, then whole sets or classes of sites can be missed. Although this kind of error is less likely with systematic as opposed to expedient survey, it is still a possibility. The only way that an archaeologist can be absolutely certain of finding all of the kinds and ages of sites within a region is to do a total survey. Unfortunately, few of us have the time or resources available to engage in a total survey.

Archaeologists grappled with these problems, and they were recognized as problems, as best they could until the introduction of probabilistic sampling techniques in the 1960's. What distinguishes probabilistic sampling from other kinds of systematic and unsystematic sampling? At the root of the distinction is the way in which the sample is selected and what can be inferred from the sample after it has been collected.

Probabilistic sampling is based on probability theory. At its core probability theory stipulates that collecting a random sample from a population will result in a more representative sample of the population than any systematic or unsystematic sampling technique by avoiding collection bias that may result in sample bias. The larger the sample, the greater the probability that the sample will reflect the full range of variability in the population of interest. There is, of course, always the chance that some potentially important, but low probability, variability will be missed by random sampling.
techniques. On the whole, however, probabilistic sampling is better at characterizing most of the variation in a population than non-probabilistic sampling.

Another advantage of probabilistic sampling is that not only are the results probably more reliable, but the degree of reliability can be specified depending on the size of the population, and the size of the sample. Thus while an archaeologist who has conducted a systematic survey of a region can say that in the area covered there were 100 large sites and 50 small sites, she cannot reasonably extend those numbers to the rest of the region of interest. If the same archaeologist had conducted a 20% random sample of the region of interest, and found 100 large sites and 50 small sites, she could reasonably state that there are probably 500 large sites and 250 small sites in the region as a whole, and that the proportion of large sites to small sites in the entire region is about 2/3 to 1/3.

Thus the real advantages of probabilistic sampling are that it results in more representative data, specifiable levels of reliability, and involves a smaller commitment of time, money and other resources to collect the data than total survey.

**TYPES OF SAMPLING IN ARCHAEOLOGY**

This section discusses the differences in various types of sampling employed in archaeology, and explores how these various techniques can be used. Central to the discussion is an understanding of two basic terms. The population or universe consists of the whole collection of things that one is interested in studying. Thus the population could consist of all archaeological sites existing in the universe of the Basin of Mexico, or all side notched projectile points found in the American Southwest, or all college students within the United States. A sample is a subset of the population, ideally collected from throughout the appropriate universe. So, for example, a sample of the sites from the Basin of Mexico could consist of all sites found in 20% of the surface area of the Basin, or a sample of the side notched projectile points from the American Southwest could consist of 10% of the points collected from each site where they were found, or all of the students at MCC would constitute a sample of all American college students.

As mentioned above, some samples are better than other samples depending on the problem the data are expected to address. For example, if we wanted to examine the drinking habits of American college students, which of the following would be a better sample:

1) 10% of the student body of MCC

2) 10% random sample of the student body of Wellesley College

3) 1% random sample of the student bodies of all state universities with enrollments of over 20,000 students.

If you answered with number 3 you were right. The student body of MCC, while being a sound systematic sample, is probably not representative of the socio-economic or ethnic composition of college students nationally. Furthermore, by restricting the sample to 10% of the MCC population, we may not sample the entire range of socio-economic or ethnic groups that are represented at UCSB. The sample from Wellsley would be even more biased because it has smaller enrollments than MCC, and hence has less chance of being representative. In addition, Wellesley is an all female college, so the drinking habits of Wellesley students would not reflect the drinking habits of all American college students!

The last sample would probably accurately reflect the information for which we are looking. First by being a random sample of all students within the sampling universe, there probably would
not be any bias introduced by the collection method. Second, the size of the sample would be such that any bias could probably be discounted (well over 100,000 responses as opposed to 1600 for number 1 and about 500 for number 2). Finally, by collecting only from state sponsored schools, we would be much more likely to be collecting data from a population that includes all socio-economic and ethnic backgrounds reflected in the total population of all American college students.

The kinds of obvious and not-so-obvious biases that could have clouded our survey of American college students can also cloud archaeological samples of sites, features, artifacts, etc. The purpose of sampling design is to try to control against sample bias in order to ensure that the data collected will help answer the research problem being posed, and to develop a plan that fits within the financial and time constraints that always exist while still producing a useful body of data.

**Judgmental Sampling**

As the name implies, judgmental sampling relies on the archaeologist making a judgment about where the data collection should occur. Generally these judgments are based on previous experience in the region, some knowledge of the association of topography and the location of sites, and other experiential factors. In short, it is sampling based on looking where you know you have a pretty good chance of finding what you are looking for. There are good reasons and bad reasons for employing this kind of strategy, and whether or not a reason is good or bad depends largely on the kind of research problem that the archaeologist is trying to address. Thus, if the archaeologist is trying to characterize the settlement pattern of an entire region, but only looks in locations where he knows there are probably sites, ignoring other areas, then his characterization will probably not be very accurate.

**Systematic Sampling**

Systematic sampling relies on imposing a regular system of collection units on the region being studied. Thus something as simple as superimposing a grid on the region and then examining every 5th grid unit is an example of systematic sampling. The idea behind systematic sampling is that the entire area is covered in some systematic way in an effort to improve the representativeness of the sample as compared to the population. The problem with systematic sampling is that there is no good method for extending the results of the survey to those areas that were not sampled. The system in effect can potentially induce its own bias in the collection of data. On the one hand this is desirable, because it ensures that intuitively non-obvious locations are examined as well as obvious ones. The problem with interpretation is that there is no logical justification for why those units that were not surveyed should be excluded, when they had no chance of inclusion from the outset.

**Simple Random Sampling**

Simple random sampling relies on using tables of random numbers or computer operated random number generators to determine which members of a population will be included in a sample. A random sample simply means that every member of the population has an equal chance of being chosen for any given sample. It is the equality of probabilities of being included in a sample that makes the simple random sample and its cousins such powerful analytical tools.

There are two types of simple random samples, samples with replacement and samples without replacement. A sample with replacement simply means that each member of the population selected for the sample is returned to the pool of possible sample members after having been chosen. Thus in a random sample with replacement there is a chance that some members of the population might be selected more than once. In a random sample without replacement, after a member has been chosen for sampling, it is removed from consideration. Thus, in a random sample without
replacement, no member of the population can be selected more than once. A random sample without replacement is the most common type of simple random sample, but is not a pure random sample in the theoretical sense.

Simple random sampling can be employed in a number of ways, depending on the unit of analysis. A common unit of analysis in field biology, botany, and geography is the point. Generally a point is a small area defined by an X and Y coordinate on a grid superimposed on the region being studied. Sample units are chosen by drawing a random number for the X coordinate and a random number for the Y coordinate. Point sampling is not generally used in archaeological survey, but is often used in collecting surface samples from sites. Regional archaeological analysis generally employs quadrats. Quadrats are square units that can be of any size from 0.5 m to 1.0 km generally. A region will have a grid of quadrat units superimposed on it. Then a certain percentage of the total area will be selected as the target area to survey. Finally, units are assigned sequential numbers from 1 to n. A table of random numbers or a random number generator are then used to pick a sample of quadrats based on the quadrat numbers. Standard surveys vary depending on the size of the quadrats and the total size of the region of study. Standard sample sizes generally range from 5 to 20 percent of total surface area.

Stratified Random Sampling

There are times when it makes sense to break a region up into subregions for analysis. A common problem in many areas is that within the study region there may be dramatic topographic or vegetation differences that may have affected human occupation of the region. In those cases it makes sense to break the larger region into subregions on the basis of topography, vegetation zones, or rainfall. Breaking the region up into separate zones is called stratifying the sample. In a stratified random sample, a certain percentage of the surface area of each stratum is selected for analysis, and within each stratum the units selected for analysis are picked at random, i.e. each unit within each stratum has an equal chance of being selected for analysis. Thus in a mountainous area, for example, you may have a region of interest covering 100 km². You may have reason to believe that topography may have played an important role in determining human settlement patterns in the area prehistorically. Rather than doing a 10% simple random sample of the area, which might neglect some of the elevation zones, you choose to do a 10% stratified random sample based on elevation. This strategy will ensure that each topographic zone is equally represented in the final sample. You would then superimpose a grid over the area, let's say 1 km² units, giving you 100 units total. Then you would divide the area into three zones of elevation (low, medium, and high). For this example let us say that your zones have 33 units in the low area, 34 units in the medium area and 33 units in the high area. You then need to select the units in each area that will be surveyed. If you want a 10% random sample, you would use a table of random numbers or a computer random number generator to pick 3 units from the low and high areas and 4 units from the medium area. This gives you a 10% random sample of each area and a 10% stratified random sample from the entire study area (3 + 3 + 4 = 10 = 10% of 100).

SAMPLING UNITS IN ARCHAEOLOGY

Two types of sampling units were discussed above, points and quadrats. There are other types of sampling units that are employed in archaeology. As mentioned above, point sampling is often used in making surface collections from individual sites. In these cases points might be defined as a circle with a 1 meter radius about a specific point, or they might be defined as very small quadrats, e.g. 0.5 meters square. The second type of unit mentioned above was the quadrat or square sampling unit. Quadrats are often used for regional survey, and because archaeologists excavate square holes,
they are generally used for sampling a site by excavation. A quadrat can be any size, but in general, for regional survey quadrats are usually not larger than 1 km², and may be as small as 0.25 km². For excavation samples quadrats are generally 1 m², but may be as small as 0.5 m² or as large as 5 m² depending on the size and type of site, and the research questions being asked. A third common type of sampling unit is the transect. A transect is a linear sampling unit of a specific length and width. Thus, transects used for surface collecting individual sites could be 100 m long and 2 m wide. The person doing the survey would walk a straight line along a predefined path and collect or note all artifacts spotted within 1 meter either side of the center line of the transect. The same principal applies to transects used for regional survey. In the case of regional survey transects the lengths of the transect are often measured in kilometers, and the width measured in tens of meters. The survey path would be walked by a team of people equally spaced to visually observe all surface features in front of and between team members. The sampling strategies discussed above can be applied equally to point, quadrat or transect sampling units. In the case of transect units, the transects may be judgmentally located so as to intersect the maximum number of vegetation zones that the archaeologist knows will yield sites. The transects could also be spaced uniformly over a region in a systematic survey. Transects can also be used in simple or stratified random sampling strategies. In the case of simple random sampling, the transects could either be chosen as random latitudes or longitudes crossing the region of interest, or a random starting and ending point might be chosen, and then the surveyors have to walk between the two points - regardless of what's in the way!

**SUMMARY**

The purpose of sampling design is to try to control against sample bias in order to ensure that the data you collect will help you answer the research problem you are posing, and to develop a plan that fits within your financial and time constraints while still producing a useful body of data. This simple statement, paraphrased from Lewis Binford's landmark 1964 American Antiquity article, revolutionized American archaeology, although slowly. One of the reasons for the relatively slow adoption of explicit research designs and the use of probabilistic sampling strategies, is that they seemed to run counter to the intuitive techniques employed in archaeology since its beginnings. One constantly heard argument from the early history of probabilistic sampling in archaeology was that random sampling techniques could, theoretically, miss sites as big as Teotihuacan in the Basin of Mexico, or sites whose locations could accurately be predicted on the basis of years of experience in a particular area. The argument is absolutely correct. Why then spend the time on fancy variations on probabilistic sampling?

The answer is three fold. First, if the goal of research is to cost effectively collect a truly representative sample of sites in a region, or areas of a site, etc. while controlling for possible sampling bias, then only probabilistic sampling can fill this bill. Second, sites or features that are unusually large, unique, or predictable probably won't be missed by the people on the ground actually doing the survey, regardless what the sampling strategy is. Archaeologists in the field are constantly bombarded with new and changing information about their study area, from local landowners, casual observations by crew members, etc. Large, unique, or important sites will not go unnoticed if the archaeologist in the field has his or her wits about them! The advantage to probabilistic sampling is that small, unpredictable sites or features will also be found if they exist. Finally, there is no proscription against using any combination of sampling techniques in any given study or study area. In this regard, commonsense and good scientific judgment should rule over pure technique or traditionalistic sentiment.
ARCHAEOLOGICAL SURVEY IN THE FIELD: THE VALLEY OF MEXICO

It is time to put some of the principles you have learned so far into practice, so we are going to take you into the field in Mexico. We are not doing this physically, of course, but via our old friend the Macintosh.

You will be divided into small collaborative groups. Each group is a research team, and you have to go into the field with each other. This is because no major archaeological survey project is ever undertaken by a single individual. Each team of 2-3 people will conduct their survey, compile the results, and appropriate tables and graphs. You will then prepare a five-minute oral presentation of your method, results, and interpretations for the rest of your section. This section will be similar to the professional seminars where archaeologists present their recent work to their peers for comment and evaluation.

Be warned that you will need some time to complete this, so don't try and squeeze it in between other appointments or classes.

The Valley of Mexico was vitally important in later prehistoric times, for it was the center of several famous Mexican civilizations, among them that centered on Teotihuacan, and the Toltec and Aztec civilizations overthrown by Hernan Cortes and his Spanish conquistadors in 1521. An Aztec Indian of the sixteenth century would not recognize the Valley today, for it is buried under the urban sprawl of Mexico City and intensive agriculture, ranching, and drainage operations have transformed the landscape. But it remains an area where archaeological sites are remarkably abundant, and was the subject of a long-term archaeological survey by William Sanders and teams from Pennsylvania State University in the late 1960s and 1970s. Sanders and his research teams compiled a vast body of site data—not only locations but dimensions, artifact contents, and so on. We draw on the data which they published for this assignment.

Full instructions are contained on the early cards of the exercise, but basically what we do is award you a (hypothetical) grant to carry out archaeological survey in the Valley. This provides you with resources and people, and you have to design your research project and analyze the results, just like a real archaeologist does.

Please do not be intimidated by this prospect, for the unfolding exercise is easy to follow, and the decisions you have to make are all based on either knowledge you have acquired, data given to you, or good old fashioned common sense.

We stress that this exercise requires a collective response, not an individual one. It is up to you to iron out disagreements within the group before presenting the material in section!

This is a challenging exercise, so enjoy...

ARCHAEOLOGICAL EXCAVATION
Excavation—the very word conjures up images of pith-helmeted professors excavating in the shadow of mighty pyramids. In fact, archaeological excavation is a highly precise science, one that involves detailed recording not only of finds, but of the context in time and space which they are discovered. It has been said that a successful excavation should be so much a complete record that the excavator can reconstruct the site down to the inch using the excavation notebooks. Of course this is an exaggeration, but archaeologists never forget that every time they are digging a site, they are destroying the finite records of the past. In short, excavation is destruction.

This is obvious if you think about it, for every time archaeologists probe an archaeological site, they destroy occupation layers and other features that record the context of its contents. And, as we have learned, context is critically important in archaeology. Fundamentally, excavation is a complex process of research design, recording, and interpretation that is based on the fundamental principles of time and space which we talked about in earlier assignments.

* Now read the essay by the great British archaeologist Sir Mortimer Wheeler, who excavated an Iron Age hill fort at Maiden Castle in southern England before World War II. He excavated the entrance of the fort and discovered the remains of a fierce battle and hastily buried war casualties. This classic essay on a Roman attack in AD 43 shows how archaeological evidence can be used to reconstruct the past.

Read this for enjoyment, but always be thinking about how the archaeological evidence was used to build up the portrait of the battle that follows:

**The Battle of Maiden Castle**

The Early Roman Period (c. A.D. 43-70)

And so we reach the Roman invasion of A. D. 43. That part of the army of conquest wherewith we are concerned in Dorset had as its nucleus the Second Augustan Legion, whose commander, at any rate in the earlier campaigns, was the future Emperor Vespasian. Precisely how soon the invaders reached Maiden Castle can only be guessed, but by A. D. 47 the Roman arms had reached the Severn, and Dorset must already have been overrun. Suetonius affirms that Vespasian reduced "two very formidable tribes and over twenty towns (oppida), together with the Isle of Wight," and it cannot be doubted that, whether or no the Durotriges (as is likely enough) were one of the tribes in question, the conquest of the Wessex hill-fort system is implied in the general statement. Nor is it improbable that, with the hints provided by the mention of the Isle of Wight and by the archaeological evidence for the subsequent presence of the Second Legion near Seaton in eastern Devon, a main line of advance lay through Dorset roughly along the route subsequently followed by the Roman road to Exeter. From that road today the traveller regards the terraced ramparts of the western entrance of Maiden Castle; and it requires no great effort of the imagination to conjure up the ghost of Vespasian himself, here confronted with the greatest of his "twenty towns." Indeed, something less than imagination is now required to reconstruct the main sequence of events at the storming of Maiden Castle, for the excavation of the eastern entrance has yielded tangible evidence of it. With only a little amplification it may be reconstructed as follows.

Approaching from the direction of the Isle of Wight, Vespasian's legion may be supposed to have crossed the River Frome at the only easy crossing hercabcouts—where Roman and modern Dorchester were subsequently to come into being. Before the advancing troops, some 2 miles away, the sevenfold ramparts of the western gates of Dunium towered above the cornfields which probably swept, like their modern successors, up to the fringe of the defenses. Whether any sort of assault was attempted upon these gates we do not at present know; their excessive strength makes it more likely
that, leaving a guard upon them, Vespasian moved his main attack to the somewhat less formidable eastern end. What happened there is plain to read. First, the regiment of artillery, which normally accompanied a legion on campaign, was ordered into action, and put down a barrage of iron-shod ballista-arrows over the eastern part of the site. Following this barrage, the infantry advanced up the slope, cutting its way from rampart to rampart, tower to tower. In the innermost bay of the entrance, close outside the actual gates, a number of huts had recently been built; these were now set alight, and under the rising clouds of smoke the gates were stormed and the position carried. But resistance had been obstinate and the fury of the attackers was roused. For a space, confusion and massacre dominated the scene. Men and women, young and old, were savagely cut down, before the legionaries were called to heel and the work of systematic destruction began. That work included the uprooting of some at least of the timbers which revetted the fighting-platform on the summit of the main rampart; but above all it consisted of the demolition of the gates and the overthrow of the high stone walls which flanked the two portals. The walls were now reduced to the lowly and ruinous state in which they were discovered by the excavator nearly nineteen centuries later.

That night, when the fires of the legion shone out (we may imagine) in orderly lines across the valley, the survivors crept forth from their broken stronghold and, in the darkness, buried their dead as nearly as might be outside their tumbled gates, in that place where the ashes of their burned huts lay warm and thick upon the ground. The task was carried out anxiously and hastily and without order, but, even so, from few graves were omitted those tributes of food and drink which were the proper and traditional perquisites of the dead. At daylight on the morrow, the legion moved westward to fresh conquest, doubtless taking with it the usual levy of hostages from the vanquished.

Thereafter, salving what they could of their crops and herds, the disarmed townfolk made shift to put their house in order. Forbidden to refortify their gates, they built new roadways across the sprawling ruins, between gateless ramparts that were already fast assuming the blunted profiles that are theirs today. And so, for some two decades, a demilitarized Maiden Castle retained its inhabitants, or at least a nucleus of them. Just so long did it take the Roman authorities to adjust the old order to the new, to prepare new towns for old. And then finally, on some day towards the close of the sixties of the century, the town was ceremonially abandoned, its remaining walls were formally "sighted," and Maiden Castle lapsed into the landscape among the farm-lands of Roman Dorchester.

So much for the story; now for its basis. First, scattered over the eastern end of Maiden Castle, mostly in and about the eastern entrance and always at the same Romano-Belgic level, were found upwards of a dozen iron arrowheads of two types: a type with a pyramidal point, and the simple flat-bladed type with turn-over socket. Arrowheads occurred at no other Iron Age level, but both types are common on Roman military sites where ballistae but not hand-bows are to be inferred. There, then, in the relatively small area uncovered, are the vestiges of the bombardment.

Secondly, the half-moon bay which represents the Iron Age B adaptation of the Iron Age A barbican, close outside the portals of the eastern entrance, was covered with a thick layer of ash associated with the postholes of three or more circular or roundish huts. In and immediately below this ash were quantities of late Belgic or "Belgicizing" pottery. In the surface of the ash was similar pottery with scraps of pre-Flavian Samian. There are the burned Belgic huts, covered by the trodden vestiges of the continued post-conquest occupation for which more tangible evidence will be offered shortly.

Thirdly, into this ash a series of graves had been roughly cut, with no regularity either of outline or of orientation, and into them had been thrown, in all manner of attitudes—crouched, extended, on the back, on the side, on the face, even sitting up—thirty-eight skeletons of men and women, young and old; sometimes two persons were huddled together in the same grave. In ten cases extensive cuts were present on the skull, some on the top, some on the front, some on the back. In
another case, one of the arrowheads already described was found actually embedded in the vertebra, having entered the body from the front below the heart. The victim had been finished off with a cut on the head. Yet another skull had been pierced by an implement of square section, probably a ballista bolt. The last two and some of the sword-cuts were doubtless battlewounds; but one skull, which had received no less than nine savage cuts, suggests the fury of massacre rather than the tumult of battle—a man does not stay to kill his enemy eight or nine times in the melee; and the neck of another skeleton had been dislocated, probably by hanging. Nevertheless, the dead had been buried by their friends, for most of them were accompanied by bowls or, in one case, a mug for the traditional food and drink. More notable, in two cases the dead held joints of lamb in their hands—joints chosen carefully as young and succulent. Many of the dead still wore their gear: armlets of iron or shale, an iron finger-ring, and in three cases bronze toe-rings, representing a custom not previously, it seems, observed in prehistoric Britain but reminiscent of the Moslem habit of wearing toe-rings as ornaments or as preventives or cures of disease. One man lay in a double grave with an iron battle-axe, a knife and, strangely, a bronze ear-pick across his chest. The whole war cemetery as it lay exposed before us was eloquent of mingled pity and distraction; of weariness, of dread, of darkness, but yet not of complete forgetfulness. Surely no poor relic in the soil of Britain was ever more eloquent of high tragedy, more worthy of brooding comment from the presiding Spirits of Hardy's own Dynasts.

The date of the cemetery was indicated by a variety of evidence. Most obvious is the Roman arrowhead embedded in the vertebra, but other associated relics point to the same conclusion. The seventeen pots put into the graves at the time of burial are all of that Wessex "Romano-Belgic overlap" class which has long been recognized at Jordan Hill, Weymouth, and elsewhere. The gear with one of the skeletons included, as has been remarked above, a Roman "ear-scoop," the use of which may or may not have been understood more clearly by its Belgic possessor than by the modern antiquary; at least it implies Roman contacts which, in Wessex, appear not long to have anticipated the Roman Conquest. One grave, moreover, contained a late British coin, and though it was impossible to say safely whether the coin was inserted at the interment or was incorporated in the loose ash into which the grave was cut, at least it was dropped within a very short time of the event. And finally, the materials included in the strata which "bracket" the cemetery are themselves, as noted above, sufficient to indicate a date at the end of the pre-Conquest period.

There, then, is the climax of the more human side of the story of conquest. But on the structural side the evidence for that event and for its sequel is no less vivid. On the topmost Belgic road-metal, in both portals of the eastern entrance but particularly in the southern, excavation revealed the tumbled stones from the massive walls that had formerly flanked the entrances. Here and there the fallen stones lay overlapping, like a collapsed pack of cards, in the sequence in which they had formerly stood as a vertical wall. With them was no cascade of rampart-earth such as might have implied a fall through subsidence, even could one presuppose the coincidence of the simultaneous fall of every part of the structure; the walls had been deliberately pulled down and no attempt had been made to replace them. But that was not all. Over the debris in each portal a new road had been built, metalled like the Belgic roads now buried beneath them. The new roads partially covered the surviving bases of the flanking walls, showing that the condition of these toady is identical with their condition at the time of the road-building and confirming the permanence of the structural ruin. No provision of any kind was made in the new scheme for a gate; not a single post-hole was associated with the new road, and indeed the mutilated rampart-ends would have provided a poor setting for a fixed barrier. The implications of all this are evident. The entrance had been systematically "slighted" and its military value reduced permanently to a minimum; but traffic through it did not cease, no interval occurred in the continuity of the occupation.
The picture is now complete in outline. Disarmed at the Roman Conquest, Maiden Castle remained in use for about a quarter of a century after the invasion, a pre-Roman city still in all essentials, partaking only a little of the cultural equipment of its conquerors. The picture is a reasonable and convincing one. The first generation of Roman rule was preoccupied with the subjugation of the difficult hill-countries of the north and west, with the development of mining areas, the planning of arterial roads, the founding or development of those few towns which had an immediate military or commercial function. Dorset offered, it is true, iron ore on a modest scale; but between Sussex and the Mendips there was little mineral wealth to attract the Roman prospector in the first flush of conquest. Wessex could wait. There was no urgent need to upset the traditional economic basis of the urbanized peasantry which crowded the downlands. To do so would have been to court added political difficulties at a time when difficulties were already manifold. It was better that, under surveillance, the Wessex farmers should for a time (and doubtless in return for the periodical payment of just or unjust dues) be allowed to maintain themselves in the fashion which they knew. The removal or, alternatively, the ennoblement of their rulers would rob them of independent leadership. A few police-patrols would do the rest.


7. **Reconstructing the Past (Assignment Seven)**

The Conjunctive Approach

Easter Island Archaeology (Video) - an example of "over-kill"

or good investigation?

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**INTERPRETING THE PAST:**

**CULTURE HISTORY AND MECHANISMS OF CULTURE CHANGE**

Culture History, or, rather, the Culture-Historical Method, is based on two fundamental principles. These are:

- Inductive research methods, the development of generalizations about a research problem that are based on numerous specific observations, and

- A Normative View of Culture, the notion that abstract rules govern what a culture considers normal behavior. This normative view is a descriptive approach to culture, which can be used to describe culture during one time period or throughout time. Archaeologists base it on the assumption that surviving artifacts, such as potsherds, display stylistic and other changes that represent the changing norms of human behavior through time.

All culture-history research is based on inductive methods, which acquire specific data from one or many archaeological sites that are not only accumulated but also subjected to a gradual synthesis. This leads to generalizations based on the data.

The sequence of research begins with identifying a research area with reconnaissance and site survey. These surveys yield sites and surface collections of artifacts, which enable the researcher to develop at least a provisional relative chronology for the area. The research continues with carefully
selected excavations designed to test the validity of the sequence and to refine and expand it. The
data base from the excavation consists of artifacts and structures, and of food remains and other
information. Artifacts and structures are the primary concern of culture historians, for they provide a
sensitive barometer for studying technological and cultural change throughout time and space.
Archaeologists have developed the Hierarchy of Archaeological Entities, already described, to aid
them in classifying artifacts and other data.

The Mechanisms of Culture Change developed by culture historical archaeologists are used to
account for sudden changes in the archaeological record. Culture change is not necessarily smooth
and orderly. A brand new technology can suddenly appear in a site occupied over many centuries.
People may turn rapidly from fishing to agriculture. How did these changes come about? Culture
historians use four cultural models to characterize culture change—involuntary variation, invention,
diffusion, and migration.

Invention, diffusion, and migration are far too general cultural mechanisms to explain the
ever-changing relationships between human cultures and their environments. The identification of
these mechanisms is largely a descriptive activity, based on artifacts and other material remains.

The explanation of culture change requires more sophisticated research models, based on the
notion that human cultural systems are made up not only of many complex, interacting variables—
religious beliefs, technology, subsistence, and so on—but that these cultural systems also interact with
the natural environment and other complex systems.

Both of these topics are important, and you should take notes, then write one-sentence
definitions in the spaces provided below. Don't just copy things from the readings. Make sure you
truly understand what you are writing down—you may be asked a question about a concept in
section, and we expect you to know it.

This is rather dull stuff, but it's important that you understand these basics before embarking
on world prehistory.

CULTURAL PROCESS

There is a vast difference between merely describing things, and trying to explain why they are the
way they are. Of nothing is this truer than the prehistoric past. A lot of people still associate
archaeology with mere collecting and description, when, in fact, the major thrust of much recent
fieldwork has been toward explaining why humans evolved, the processes by which people began
agriculture and domesticated animals, the reasons for the emergence of urban civilizations. It is these
reasons which are, perhaps, the most fascinating thing of all about archaeology. This is the study of
cultural process, a body of ever-changing theory that challenges archaeologists to recover ever more
fine-grained and detailed information from the field.

MAJOR DEVELOPMENTS IN WORLD PREHISTORY

We have now finished with the basic methods and principles of archaeological research, the
foundation for our study of world prehistory. The remainder of this assignment takes a brief look at
some of the theoretical arguments that lie behind world prehistory.

World prehistory differs from local archaeology in its broad coverage, its concern with major
developments in the prehistory of humankind. These are the developments we cover in the next six
assignments. The final assignment summarizes, pulls everything together for you.

The Origins of Humankind (before 2.5 million to 1.6 million years ago).
The origins of humanity in tropical Africa, and the behavioral and cultural changes associated with this development.

The Origins of Human Diversity (1.6 million to 50,000 years ago).

The emergence of Homo erectus and modern humans (Homo sapiens sapiens), and the peopling of tropical and temperate latitudes of the Old World by human beings.

Homo sapiens and the Peopling of the World (50,000 to 12,000 years ago).

The prehistory of the late Ice Age, and the settling of arctic latitudes, also the first settlement of the Americas and Australia.

The First Farmers (12,000 to 8,000 years ago).

The origins of agriculture and animal domestication, and the beginnings of village life, in Old World and New.

The Origins of States (5,000 years ago to recent times).

The beginnings of literate civilization in the Near East and elsewhere in the Mediterranean Basin, and Asia, and later in the New World.

The important thing about world prehistory is that it examines major developments in human biological and cultural evolution from a global perspective, assessing major trends and broad cultural changes. These include such phenomena as the first settlement of arctic latitudes by Stone Age hunter-gatherers, the emergence of cultural complexity in human societies, and the reasons why food production became a valid subsistence strategy in so many parts of the world.

Two broad approaches characterize the study of world prehistory and both are in widespread use:

**Culture History Approach**

The culture history approach has as its primary goal the development of regional sequences of prehistoric cultures, sequences based on stratigraphic and chronological observations at many sites. This approach uses patterns of similarities and dissimilarities in artifacts and assemblages to identify prehistoric cultures. It have been successful in doing so, especially with very early human cultures like, say, the Acheulian hand-axe tradition of 300,000 years ago.

This approach tends to be descriptive rather than theoretically based, is based on a normative view of culture, which enables one to explain why cultures are similar or different. Unfortunately, this approach tends to ignore much valuable information on prehistoric technology, subsistence, and settlement patterns, with the result that much of the complexity and variability of the archaeological record for world prehistory is ignored.

**Culture as Adaptation Approach**

This approach is based on a definition of human culture as humanity's non biological means of adaptation, and is the result of humans' unique ability to use symbolic models. Through this ability, events and objects are created and infused with meaning that can be appreciated, decoded, and
understood. The Culture as Adaptation approach is concerned not with discovery, description, and classification, but with the explanation of change and variation in the past, by examining the behavioral content of the same archaeological record as that used by culture historians.

The approach uses a multidimensional model to identify the significance of the patterning of, and variation in, date recovered from archaeological sites. This model assumes that the archaeological record varies as a result of ancient human behavior. This, in turn, is related to the many and diverse ways that human societies chose to adapt to their environments.

In other words, these two approaches can be summarized as follows:

- Culture History is concerned with discovery, description, and classification.

- Culture as Adaptation approaches examine the behavioral context of the same archaeological data. They seek to explain cultural change and cultural variation in the past, not merely to describe it.

Your next assignment is designed to explore a significant aspect of ancient human behavior. Again we will take you to the Valley of Mexico, but this time to research the origins of agriculture. You will analyze the floral, faunal, and archaeological remains from a cave in central Mexico called El Riego Cave. Your assignment is to report on the findings. You will look for macrobotanical remains for those plants identified below. The following questions should guide your research:

**Question 1.** Describe the way of life of the earliest occupants of the El Riego Cave. These are the people whose activities resulted in the deposition of Stratum 6.
   A. During what chronological phase did this occupation take place and what are the dates of the beginning and end of this phase?
   B. What activities were carried out in the cave at this time?
   C. Do the archaeological remains suggest that the cave was occupied all year round or for a shorter time, perhaps seasonally. If the occupation was seasonal, which season or seasons are represented. What is the evidence for your interpretation?
   D. Describe the human-plant interaction. Are there signs of human interference with the genetic makeup of plants? Are there signs of plant processing in this stratum?

**Question 2.** Compare the activities of the earliest people who used the El Riego Cave (represented by Stratum 6) with those who came next (Stratum 5).
   A. How much time elapsed, if any, between the two occupations?
   B. Were both groups of people using the cave at the same time of year? Please explain the basis for your interpretation.
   C. What were the El Riego people doing that was new compared with the activities of the Ajureado people? Please develop your answer fully by explaining the evidence and the implications of your interpretation.

**Question 3.** Describe the overall transition from dependency upon wild to domesticated plants as documented in the El Riego Cave deposits presented here. You will need to identify the stratum,
phase name and the dates of the earliest appearance of plants that are definitely altered compared to their wild progenitors. 

A. Discuss which plants are involved and the evidence that you use to support your interpretation.

**Question 4.** Trace the evolutionary history of Zea mays as documented in the archaeological deposits of El Riego Cave. In order to answer the question fully, you must consider when maize first appears in the archaeological deposits and the earliest time when it can be determined that domestication of this plant was taking place. Also discuss the varieties of corn that were ultimately developed and the farming methods that were used through time.

**Question 5.** What wild plants continued to be used throughout the sequence of El Riego cave? Discuss whether or not you think that these plants have been changed by their long association with humans.

Again, it will be required that you identify and define new terminology that you learned as a result of this assignment. Include this in conjunction with your report.

**MACROFLORAL IDENTIFICATION LISTING**

**Squash Seeds**
Several kinds of squash are found in the cave deposits such as those of El Riego. Cucurbita pepo remains are the most numerous species of cucurbit (i.e., squash, pumpkin and gourd) found in these deposits. This could mean that the cave was occupied during the season when the fruits are most abundant (summer) but C. pepo fruits are easily stored and today are available year round in the valley. These particular seeds are one of two variants found. This variant can be distinguished by its slender seed which is identical to the seeds from squash found in the Tehuacan Valley today.

Cucurbita pepo L. includes a wide variety of cucurbits such as the pumpkin, acorn squash, zucchini and crookneck squash. The fruits, seeds and flowers are edible. Remains of this species are the most numerous cucurbits (i.e., squash, pumpkin and gourd) found in deposits. This could mean that the cave was occupied during the season (summer) when the fruit was most abundant. However, C. pepo fruits are easily stored and today are available year-round in the valley. The seeds shown here are one of two variants found in the archaeological record. This variant can be distinguished by its broad seeds which are identical to seeds from modern domesticated squash collected from northern Mexico.

Cucurbita mixta remains are the most abundant species of cucurbits found in the excavations in the Tehuacan Valley. Its seed can be recognized by its relatively long and narrow form and its slightly enlarged margins. Archaeological specimens of Cucurbita mixta appear in the Tehuacan Valley deposits at least by 5000 years B.C. These early seeds are interpreted as being from a domesticated plant.

**Avacado Seeds**
These avocado seeds (or pits) were found in the earliest deposits of similar caves dating to the Ajuereado Phase. Their small size (see photograph) is similar to that of present day native wild avocado, which is found in tropical evergreen forests. Therefore, these seeds must come from a wild plant. Such forests are found in barrancas above the Tehuacan Valley floor and were probably a part of the El Riego Oasis at the time of the Ajuereado occupation.
Maize Root and Stalk
Maize basal stalk with roots found in the Palo Blanco Phase deposits have stalk diameters of approximately 15 mm. This dimension is significantly smaller than those of modern maize grown under normal agricultural conditions but much greater than in reconstructed wild maize. The mesocotyls on these basal-stalk fragments are relatively short. This suggests that the maize seed germinated on the surface of the soil because the mesocotyl elongates during germination until the seedling reaches ground surface. In addition, the upper regions of the permanent roots have no secondary root scars. This also indicates that the base of the maize stalk was not covered with soil. The practice of hilling (i.e., pulling soil around the base of the maize stalk) which is common in Mexico today, apparently was not in use when this plant was sown.

Corn Cobs
Chapalote maize is a form of domesticated corn that first appeared in the Tehuacan Valley during the Palo Blanco Phase. Its appearance is due to the introduction of triploid maize into the valley and its subsequent hybridization with "wild" and early cultivated maize. This distinct strain of maize has brown kernels, cobs that are about 10 cm long, slender rachis, and indurate glumes. It is still grown today in northwestern Mexico.

Corn Cobs
"Slender pop" maize appears during the Palo Blanco Phase, but has been discovered at other cave sites in the valley as early as the Santa Maria Phase (800-150 B.C.). The cobs are more slender and cylindrical in shape than those of Chapalote maize, also found in the Palo Blanco deposits. Cob length is approximately 7 cm. It is possible that many ears were produced on a single plant making it a highly productive corn variety. This strain of maize may be the prototype of Mexican popcorn, a food beloved by American film audiences.

Common Bean
The common bean is a polymorphic (i.e., many forms) plant species that includes hundreds of cultivated varieties (e.g., navy, red kidney and pinto beans). It is the most widely grown of all the beans discovered in the Tehuacan Valley. Common beans are generally grown in neutral or slightly alkaline soils, from sea level to above 2000 m in elevation. Although they appear in the Tehuacan Valley as early as the Coxcacan Phase (4300–4000 B.C.), they do not become abundant until the Palo Blanco Phase (ca. A.D. 300).

Runner Bean
This strongly vining species of bean can be identified by its purple or variegated purple seed. These seeds are generally larger than those of common and sieva bean. The earliest runner beans discovered archaeologically in the Tehuacan Valley date to the Santa Maria Phase (900-200 B.C.). The appearance of this variety of bean in the Palo Blanco and Venta Salada deposits is consistent with other occurrences in the valley. MacNeish suggests that this species of bean was not grown in the immediate vicinity of El Riego Cave because it would not have thrived in the hot and arid conditions of the area. It is possible that the beans were grown in the cool, pine and oak forested uplands above El Riego Cave.

Sieva Bean
The sieva bean is the Mesoamerican version of the Peruvian lima bean. In fact these two bean types are independent domesticates derived from the same geographically separated subspecies. The curved pod and smaller seed distinguishes the lima from the sieva bean. The appearance of the sieva bean in the Tehuacan Valley during the Venta Salada Phase is thought to parallel the growing importance of the common bean.

**Tepary Bean**

The seeds of this species of bean (Tepary) are smaller than those of other cultivated American beans. Although this bean is not cultivated on a commercial scale, collections made a few decades ago by the Museum of Anthropology, UCB indicate that the tepary bean was common along the Pacific coast of northern Mexico. This is interpreted as a relic of the more extensive prehistoric distribution. The tepary bean first appears in the Tehuacan Valley during the Abejas Phase (5000 years BP), but does not appear in large quantities until the Palo Blanco Phase (ca. A.D. 300).

**Maguey Spine**

Various species of wild Agave (commonly known as maguey or century plant) produce food and raw material that have been important to household economies in Mesoamerica. These species are difficult to distinguish on the basis of archaeological remains. Today agaves grow on hill slopes of the Tehuacan Valley and are found near El Riego Cave. The archaeological presence of leaf tip spines suggest that fibers had been extracted from the leaves. The spines may have been removed initially, or used as needles to work the fibers and removed when stitching was complete. Agave leaves may be harvested for fiber at any time of the year.

**Pochote Pod**

Ceibas produce kapok, a fine fiber similar to that of cotton, that was used in ancient and even modern times, until the development of synthetic fibers. The small, C. parvifolia is widespread in the Tehuacan Valley. It is much smaller than the giant ceibas of the lowland tropical forests. Seeds, produced in the late dry season, may be eaten raw. The floss, which is attached to the seeds, may be spun into a yarn. In one instance a ball of floss was found protecting a mass of seed paste.

**Mesquite Seeds**

Many kinds of wild acacia are found today in the Tehuacan Valley and some are in the vicinity of the El Riego Cave. They all produce seed bearing pods that may be eaten whole when they are immature. When this is done, the fibrous material is spit out. Also the immature seeds may be stored for later use but they must be processed. These pods are produced in the early rainy season. The mesquite’s (Prosopis juliflora) pods and seeds are particularly abundant in the archaeological remains of the Tehuacan Valley.

**Mesquite Quids**

Many kinds of wild acacia are found today in the Tehuacan Valley and some are in the vicinity of the El Riego Cave. They all produce seed bearing pods that may be eaten whole when they are immature. When this is done, the fibrous material is spit out. Also the immature seeds may be stored for later use but they must be processed. These pods are produced in the early rainy season. The mesquite’s (Prosopis juliflora) pods and seeds are particularly abundant in the archaeological remains of the Tehuacan Valley.

**Prickly Pear Cactus**
Fruits (tunas) and the flat stems (nopales) of the prickly pear cactus are traditional foods of the Mesoamerican diet. Both may be eaten raw with no preparation. Paleobotanists find it impossible to distinguish the wild from cultivated forms with only archaeological fragments of the stems and fruits. The fruits appear in the dry season and the young pads — the most desirable for food — are produced in the early spring.

8. Archaeology in Today's Society

World Prehistory Book
Ancient Lives – Chapter 17, So You Want to Become an Archaeologist
Out of the Past (Video) - Collapse

RELEVANCE
The question of questions remains—what use is archaeology, why is it important in the modern world? This question used to be subsumed under the hoary old topic of "relevance," but that is far too simplistic a way of looking at a complex subject. Archaeology has many applications, many uses in the late twentieth century world. We can only look at some of them. In the final analysis, we can break the question down into two parts:

• What does archaeology mean to me, as an individual?

• What does it mean to society as a whole, and why should we take it seriously?

Read the following description of how archaeologists have rediscovered ancient agricultural methods in Bolivia and reintroduced them to the local farming economy. This is a superb example of how archaeologists can solve economic problems in the twentieth century world. You will see a video in class that tells this story visually.

TIWANAKU - A LESSON LEARNED AND APPLIED
(by Brian Fagan)
In the closing centuries of the first millennium AD, the farmers of Tiwanaku in northern Bolivia supported thousands of non-food producers by intensive cultivation of local swamps. When the city was abandoned, the farmers dispersed and their innovative swamp agriculture was forgotten. Today, the local Aymara Indians eke out a living from arid hillsides, where irregular rainfall and winter frosts regularly decimate the meager potato crops from the thin soil. Many of them own lands on the Pampa Koani, the lake floodplain, where bogy conditions and severe frosts alternately rot and freeze growing tubers. 1000 years ago, the landscape was very different, for the floodplain was
covered with rows of lush raised gardens intersected with canals. The fields literally burst with a bounty of potatoes, more than enough to feed 50,000 people, many of them non-farmers. Bolivian archaeologist Oswaldo Rivera and his University of Chicago colleague Alan Kolata teamed up some years ago to investigate the thousands of ridges and depressions that covered the plain around Tiwanaku. They soon discovered that they were looking at a vast, abandoned agricultural system and persuaded a local farmer to allow them to dig out the silted canals on his land, to recreate the ancient raised fields. Despite vigorous opposition from his fellow villagers, the farmer agreed, with dramatic results. The potato plants grew higher than he had ever seen. When a severe frost descended on the Altiplano, the villagers watched over their fields all night. The crops in the hillside were ruined, but the potatoes on the raised field below were barely damaged. At dawn, a thin, white mist covered the plot, protecting the precious crop, a fog blanket caused by the heat retained by the surrounding canals. The mist soon burnt off in the warm sun, but returned every night the temperature went below zero. Therein lay Tiwanaku's hydrological genius, for her farmers devised a simple, highly effective way of protecting their crops, while planting them in exceptionally productive, well watered and easily fertilized soil.

Rivera and Kolata found that Tiwanaku's rulers invested vast resources in reclaiming flat altiplano land, especially during and after the great drought of the 6th century AD. By creatingridged fields and carefully conserving the soil, the overseers of huge field systems based on state-founded settlements were able to obtain high crop yields from hitherto unproductive land. Their agricultural systems were part of an extensive network of terraced, stone-walled houses and courtyards, many containing burials. The canals were sophisticated constructions, with a base of cobblestone topped with gravel and impermeable clay, which kept salt from the lake's brackish waters from seeping into the overlying topsoil. These large field systems supported a population of 40,000 to 120,000 people in the 32 square mile Tiwanaku valley alone. Their productivity may have been as high as 400% more than current yields.

The rediscovery of these ancient farming techniques is paying off handsomely among the Aymara. About 1,200 farmers have now redeveloped raised fields and at least another 50 villages want training in prehistoric agriculture. The local diet is improving dramatically, for fish and ducks in the canals provide added nutrition in a country where over half the children suffer from malnutrition.

COLLAPSE - ISSUES TO PONDER

There are many college courses entitled the Rise and Fall of Civilizations. It is easy to see that ancient civilizations have collapsed. Archaeological studies show they have collapsed for a variety of reasons. Collapse is, in fact, a complex issue. It is interesting to note that the story of civilization involves a rise and then a fall. It bears on the point that complex societies are difficult to hold together. There appear to be different reasons why this is the case. Let us walk through several case studies of collapse to see what might be at the root. In a video you will see in class, Jeff Dean will discuss the implications of population growth, decreasing soil fertility or productivity, and climatic change as the primary reasons for collapse. Look at these cases in this light:

Early Mesopotamia

Charles Redman of Arizona State University provides us with a scenario in early Mesopotamia. By about 2300 B.C., the Ur empire attempted to maximize production. This involved increasing the amount of water used to irrigate fields. This expansion increased the risk for salinization. This also involved an scalar increase in the level of effective management. Extending farming into marginal lands used not only increased the amount of water used for irrigation but also
decreased the amount of herding land available. Herding had traditionally been an important strategy that was used to buffer against failures in irrigation farming. Political stability and economic growth were achieved by increased centralization of political control at the same time that agricultural productivity was increased. This tended to weaken the ability of the system to react to agricultural problems. Redman believes that state ideologies assumed that everyone's interest converged in the objectives of the central authority. He posits that not everyone may have taken this assumption to heart. This could lead to less central power just at the point when it was needed.

There was a real move toward a large urban population. Fortified sites such as Uruk suggest that inter-city warfare may have been a continual problem. There was a growing military power base in the rise of cities in early Mesopotamia. The cities continued to grow not only in terms of size but also in numbers. It is likely that politically powerful city expanded outward to influence towns and hamlets around it. Ultimately, however, this city would have found itself bounded by other powerful cities. This is circumscription. Early city kings identified themselves as kings and warlords. Some of these warlords write about their ability to conquer several other city-states. While this ultimately laid the foundations for later nation-states (larger, more centralized and structured political entities), the success of city-states depended upon both growth and defense.

The interplay between the increasing productivity and competition would have stressed the political power. It was not until a military ruler names Sargon of Agade formed a more power nation-state entity around 2350 B.C. that a new order was established in Mesopotamia. It is significant to note that recent research in the area suggests that there was a massive impact resulting for salination - salt build up in the soil and a massive climatic deterioration that may have lasted for nearly 300 years. In an already marginal area in terms of climate, such a massive change could have caught over-extended city-states in a no-win situation.

**China**

By about 1500 B.C., the late Neolithic population in China had grown to a substantial level. It is at this time that the Shang dynasty was founded. The capital of the Shang was Anyang. It was the rich floodplain that enabled Chinese population to flourish. It was at this time that writing in China emerged. Records, called oracle-bone inscriptions, consisted of predictions about future events recorded on turtle shells or animal bones. The basic units of this writing systems were formed by ideograms (pictures that depict objects or concepts).

The Shang ruling house was surnamed Zi and was formed through familiar and ancestry lines. The ruling class apparently regarded themselves as members of a hierarchically arranged kinship network that was ranked. The Shang retained their supremacy only by periodic shows of force. As the Shang increased their territory, the royal authority appears to have evolved gradually towards a strong monarchy. By about 1200 B.C., the last king of the Shang had even proclaimed himself to be the human counterpart of a supreme god. The kings now had a government consisting of departments with separate functions. Rule also was structured divided into a series of provinces.

The Shang appeared to possess a sizable army of archer-warriors who road in horse drawn chariots. These elite warriors were accompanied by thousands of foot soldiers who were the drafted into military service when required. Normally, these soldiers were the farming population that was at the core of Shang society. A lowest level of slaves provided labor. Slaves were acquired as a result of war with neighboring tribes.

Ideology is an important means by which to legitimize ruling authority. During the Shang period, shamanism was supreme. Shamans were able to mediate between the real and supernatural worlds. They also served as scribes and clerks, ceremonial dancers, and even high ranking
governmental officials. One could consider these shamans as proto-intellectuals who controlled knowledge as well as religion.

Shang influence eroded as a new group from the Zhou region spread eastward. The Zhou managed to create an alliance with lesser states and eventually surrounded the Shang central province. The last kings of the Shang had exhausted resources by engaging in costly wars. Morale was low and they were defeated by the Zhou army. A weak linkage between the provinces was the ultimate collapse point for the Shang.

The Zhou organized a new interstate order. It was largely a feudal system based on a royal house and their close allies. They then formed garrisons in different provinces creating at the same time a network of matrimonial ties between feudal lords in the different provinces. It was this bonding that formed a gigantic lineage system around the Zhou rulers. The Zhou king was a supreme patriarch of the kinship network and lord of the feudal pyramid at the same time. The Zhou also created a state religion based on the worship of ancestors and natural forces or spirits. The Zhou believed that they had received the "mandate from heaven" to rule because they were worthy and legitimate founders of the familial order.

The Zhou were ultimately weakened by defeat in military campaigns against northern barbarian tribes. It was a heavy burden to maintain the large defensive force necessary to hold off these tribes and at the same time not deplete resources. There was a further problem for the Zhou that stemmed from the increasing size of the royal family. As the royal family grew, this meant that land was parcelled out to create new vassal states. This led to internal fragmentation and control over agricultural productivity.

The next phase of Chinese history is on the Spring and Autumn period and the Warring States period. Vassal states quarrelled among themselves for over 500 years following the collapse of the Zhou dynasty. These periods were marked by constant warfare. The Zhou feudal system was ultimately destroyed. It was the Qin state that finally formed a unified force and again consolidated power under a central, large state. This time, the Chinese state was based on a monarchy with strong military control and an extensive bureaucracy. Bureaucrats were recruited from among intellectuals who had been educated by members of the former elite. Out of this move came people such as Confucius who taught humanism. It is at this time that Taoism also emerged.

The Qin unification ushered in a long line of imperial dynasties. This was a single state government with strong centralized control. The bureaucracy was built at the central state level and within each of the provinces. There were strong lines of control between the provinces ruled by governors and the central state ruled by the imperial king. Law was standardized and a strong authoritarian rule was imposed. Practical matters were focuses of the state. These included defense, agricultural productivity and health. Education was oriented toward civil service and no more. It was at this time that the Great Wall of China was built and guarded by 500,000 soldiers. It is said that 700,000 laborers were put to work on the burial mound of the first emperor of the Qin dynasty (see story above.)

Around 200 A.D., the Han dynasty reshaped the Chinese system by focusing on recruitment of intellectual bureaucrats at the local level. Confucianism was made the state religion. This ideology nicely fit with the reshaped government base. It emphasized the individual's social responsibility and collective security provided by participation as a whole. It created the stabilizing balance between the absolute monarchy and the rest of society. It also provided a check against improper power usage by the monarch and the ruling nobles.

As we end this brief overview of Chinese dynastic rule, it is important to remember that as with the Shang and Zhou, the Han dynasty or empire collapsed. Foreign wars and power struggles and internal rebellions continued to take a toll on Chinese dynasties. It was a consolidated state
system, however, that the Han had evolved from earlier efforts that remained basically in place. It was a change in the "mandate from heaven" that tended to change after the Han.

**Egypt**

Much of the emerging picture of daily life in ancient Egypt is one or arduous and repetitive toil. While there may have been a strong belief in the common goal, life was hard for those who supported the Old Kingdom. While irrigation supported a vast agricultural system, all of it was done by hand. Farmers filled two heavy jars from the canals and then carried them on their shoulders to the fields. Oxen dragging simple wooden plows tilled the fertile soil followed by men sowing grains of emmer wheat. Villages were crowded and probably dirty. Huts were made of thatch and mud brick.

What tied the kingdom together was an interplay of belief and the Nile itself. Hand dug canals and the annual flooding of the Nile provided for the extensive empire. The population of the Old Kingdom was probably between 1,000,000 and 1,500,000 people. Less than 1% was literate. Egyptians believed that writing had been invented by the god Thoth and words were spoken and written with magical power. Scribes, therefore, played an important role in ancient Egyptian society as they did elsewhere (refer to the Maya for another example of the importance of scribes.) It is now becoming clearer that the elite of the Old Kingdom were devoted to excessive self-indulgence. Murals depict royal banquets, where guests sat on beautifully woven mats and servants attended. Great amounts of food and drink were consumed.

It is possible to construct a picture of life where Egyptians were pre-occupied with the pharaohs' immortality. It was a belief that through the king there was an expression of the divine nature of society itself. People really believed in building pyramids as a matter of faith. The pyramid itself was an enormous machine that helped the king go through the wall of the dead, achieve resurrection, and live forever in the world of the gods. It made his transfer into a god complete and legitimized his successor as the son of a god.

While this helped unify the Old Kingdom, it had a potential downside. Around 2465 B.C., pyramids suddenly became less important. It was at this point, nearly in the middle of the Old Kingdom, that people grew weary with each Pharaoh's effort to outdo his predecessor. In addition, several Pharaohs died before their pyramids were finished causing embarrassment and shaking the faith of the masses. After this point, no Pharaoh ever again build a colossal mortuary pyramid. Yet, the funerary culture grew more complex and sophisticated, even as the Pharaoh's omnipotence waned.

Toward the end of the Old Kingdom, rulers became more aggressive sending out armies to conquer the desert nomads to the east and south. By 2200 B.C., the Old Kingdom was in real trouble. Its last ruler, Pepi II, gained the throne as a boy and ruled the Nile for 90 years as the state collapsed around him. A climatic shift may have tipped Egyptian life from hard to worse. The life-giving flood of the Nile grew undependable and droughts made crop yields drop. Local authorities found they could make decisions without the instruction of the Pharaoh as government collapsed. Under weak rule, the royal coffers of Pepi II dwindled and wealth emerged at lower levels of governing authority. Famines and chaos disrupted trade routes, especially to the north. Eventually, the god's blessing of the Pharaoh was revoked. By 2150 B.C., the Old Kingdom ended with a complete collapse. All the pyramids were looted, not secretly by by organized bands in broad daylight. Temples were burned and these was widespread violence and even evidence of cannibalism.

Egypt was to rise twice again. It never again held the same basis of social order and at times was controlled in a manner we might recognize as a police state. The Old Kingdom would be glorified as the "Golden Age."
The first emperor of China (the Qin Emperor)

This is the story of the death of the First Emperor of China, Ch'in Shih-huang-ti. Three attempted assassinations undoubtedly made the Emperor nervous about dying. The concentration of wealth and prestige about a single man gave rise to expectations that his death should show symbolism of immortality. The First Emperor's capital, palace and tomb were as lavishly planned as the Great Wall of China. His absolute power was immense. No fewer than 300 astrologers watched the skies for the Emperor. Yet, these men feared for their lives and merely flattered the Emperor with positive signs. The discovery of a meteorite in 211 B.C.left the Emperor enormously worried. This clearly had impacts on those around him who only wished to please the Emperor.

The First Emperor died in 210 B.C. while on a tour of the eastern provinces of China. Having progressed down the Yang-tze river and along the coast of the Yellow Sea, he had a dream one night about a context with a sea-god that had human form. He was advised to hunt a monstrous fish with a crossbow in order to remove the evil spirit that was keeping him from making contact with the immortals. After killing what was probably a whale, the Emperor became sick and died within a month. Because they feared for their lives, his two principle advisors suppressed the news, forged an edict ordering both the heir apparent and a chief general to commit suicide, and then forged a will granting the Emperor's second son the title of Second Sovereign Emperor.

As if this story seems strange, the events surrounding the burial of the First Emperor may be the oddest of all. As if the First Emperor was still alive, the imperial party traveled back to the capital. The coffin was carried in a litter escorted by the Emperor's favorite eunuchs, who presented food and official reports as usual and issued imperial commands from the covered litter. It was summer and the litter began to smell. To disguise the stench, the escort was told to load a cart of salted fish. Thus, the would-be-immortal ruler returned to his palace followed by a cart of smelly fish. The great terra cotta army and Mount Li were prepared and the First Emperor of China was buried nine months latter.

MARTIN'S HUNDRED, VIRGINIA (Assignment Eight)

Archaeology is concerned with the material remains of the past, with human behavior revealed through artifacts, structures, food residues, and so on. As such, it offers a dispassionate window into the past, one that looks at minute details of daily life, at people regardless of rank and status in life. It comes into its own with Historical Archaeology, where historical documents provide a wealth of information about peoples' lives. But there are limitations. We know much of the doings of the George Washington's of this world, but precious little about the common person, the humble farmer or artisan working in field or cottage. There is some information about them, especially in later times. Someone recorded their birth, marriage, and death, the taxes they paid, the inventory of their estate at death. But we know precious little of their day-to-day lives, of their houses, diets, and artifacts. It never occurred to anyone to set these down at the time.

The first English colonists to settle in North America were mainly humble farmers and yeomen, people of rural backgrounds who possessed a low-tech agriculture culture that was little changed from the Middle Ages. Hardly surprisingly, their society was based on their rural roots back in the Old World. It was only a half a century or more later that colonial culture became more
elaborate, as more immigrants arrived, and later generations adapted more closely to American conditions, in isolation from their original homeland.

Most colonists lived in tiny hamlets, inconspicuous settlements of just a few houses, a place of worship, some common structures, and perhaps a palisaded fort. Most of them have vanished without trace, or lie under the foundations of modern cities. This is why the colonial village at Martin's Hundred, Virginia, is so important, for it lay close to the surface in unencumbered land.

Martin's Hundred came to light in 1976, when historical archaeologist Ivor Noël Hume was looking for theouthouses of an eighteenth-century plantation. Instead, he stumbled across postholes and structures of an early seventeenth-century hamlet named Wolstenholme Towne, built by settlers who opened the Martin's Hundred tract along the nearby St. James River in 1519. Martin's Hundred was a tiny village of a few thatched houses, overlooked by a strong, palisaded fort with a watch tower, designed to protect the inhabitants against Indians and Spanish ships. In the event it was useless, for Indian raiders overran the hamlet in 1521, killing most of the inhabitants and burning Wolstenholme to the ground. Only a few survivors remained, and they soon abandoned the village, which was forgotten for more than four centuries.

Ivor Noël Hume's excavations were a remarkable achievement, not only in terms of clean, meticulous excavation, but of archaeological detective work as well.

We start our exploration of Martin's Hundred with four readings, which follow. They give you useful insights into Noël Hume's approach to this complex site. They are carefully selected to give you not so much an impression of the settlement, but to show you some of the processes involved in reconstructing it. In short, they give you insights into Noël Hume's archaeological and historical detective work, into his thinking about the site.

Please settle down for a period of undisturbed, intensive reading of the four passages that follow:

- A general description of the fort and how it was reconstructed from postholes and other archaeological features,

- The story of William Harwood and his house, a superb piece of archaeological detective work,

- The archaeology of the massacre,

- Finally, a description of how art can give insights into Colonial life.

**The Fort**

The fort's greatest width and length measured 93 by 130 feet, and the clearly defined watchtower we had found at the southeast corner was duplicated at no other. We had known since the autumn of 1977 that no bastion projected from the northeast corner, but for several weeks I remained convinced that another had stood at the northwest. Eventually, however, I was wooed to Eric Klingelhofer's argument that the very irregular and shallow holes at that corner were really no more than the ghosts of fortuitously located roots. I have never been happy about my capitulation, for the "roots" created a projecting box measuring 7 feet, 6 inches square—more or less what was needed to protect the fort's vulnerable north wall (see Plan Map). Being closest to the nearest tree-flanked ravine, this was the direction from which any Indian attack was likely to come. Furthermore, although we were finding traces of slots parallel to the four interior sides of the palisades of the fort, and were reading them as evidence of a parapet step or platform on which musketeers could stand to fire over the walls, muskets (as previously noted) could not be fired at an angle below the horizontal.
without the ball rolling out. Thus an area extending at least 20 feet from the palisades was safe from musketry unless, at a minimum of two corners—of which the northwest corner could have been one—there were projecting flankers enabling enfilade fire to rake the walls from the outside.

A flanker or bastion at the southwest corner of the fort was undisputed. The holes there were clearly left by posts and not by roots, but unlike the big watchtower at the southeast corner (or my imagined flanker at the northwest), this one tapered from an interior width of 7 feet, 6 inches to an exterior dimension 2 feet narrower. Much of the inside was occupied by a shallow, loam-filled trough nesting in the subsoil, which we believed to be the remains of a large piece of wood 4 feet, 4 inches long, 1 foot, 6 inches wide, and of unknown thickness. We interpreted it as a block to support and carry the downward thrust of a large post reinforcing the floor of the flanker. If this interpretation was correct, it could have had but one purpose—to help support the weight of a cannon.

Standing on a pair of tall steps and sighting along the lines suggested by the tapering structure, I could see that the gun must have been mounted to fire downriver, narrowly missing the corner of the Company Compound storehouse. To reach any effective distance out into the river, the cannon had to be large, and we had a single clue that in Martin's Hundred there had been such a weapon. The cannon ball found on Site A, which we had associated with Governor Harwood and his "Piece of Ordnance," now assumed new importance. The ball, as previously noted, weighed 6 3/4 lbs., and had a diameter of 3 3/4 inches. Standard wisdom has it that shot 3 1/2 to 4 inches in diameter were fired from two types of cannon, sakers and demi-culverins. They were heavy guns, ranging in weight from 1,500 to 3,000 pounds, and at a 10-degree elevation a saker had a useful range of 2,170 yards and a demi-culverin of up to 2,400 yards, an ample distance to hit shipping in a river whose channel sweeps relatively close to shore as it passes Carter's Grove. Clearly, the gun platform was not built to defend against the Indians but against England's long-time bogeyman, the Spaniard.

The big gun interpretation had its problems. Unless the platform extended inside the fort in some manner not revealed by the archaeological evidence, it had a floor length of only 6 feet, 6 inches; yet a saker (the smaller of the two guns) had an average barrel length of 8 feet and required a run-back or recoil distance of about half its barrel length. Mounted on a four-wheeled naval carriage, and with its muzzle presumably projecting out from the flanker as far as the front wheels would allow, the gun's crew barely had room to draw it back far enough for loading. On the other hand, if the gun was of a size to fit comfortably on the platform, its ball size and range would have been insufficient to keep enemy ships at bay. We were left to draw what comfort we could from the Tower of London's ordnance expert, Howard Blackmore, who admitted that the documents hint at greater variations in barrel lengths to bore measurements than surviving seventeenth-century guns suggest. Thus, we cannot discount the argument that guns of saker bore and shorter length were made, but have not survived.

As noted earlier, we had fewer problems with the evidence provided by our fort's palisade post-holes than we did with its cannon; they equated well with Strachey's description of Jamestown's "Planckes and strong Posts," and with Ralph Hamor's portrayal of Henrico, the new town further up the James River, as being defended by a palisade of "pales posts and railes." The character of the pales was revealed in a 1613 intelligence report smuggled out of Virginia in a shoe, and sent to the Spanish ambassador in London. The British defenses were described as being "of boards and so weak that a kick would break them down." Although the pales may have rotted and been parting company from their rails, it is hard to believe that the supporting posts were ready to fall. Strachey had told us that those at Jamestown were set 4 feet into the ground. Our fort's post-holes were nowhere near as deep, and even allowing for loss of depth through subsequent erosion and land use, the evidence clearly pointed to a lighter and therefore less tall defense-work. But how much lighter, and to what degree less tall?
The Jamestown palisades were said to be 14 feet high, but there was no mention of any platform inside for musketeers to fire over the top. Protection must have been provided by enfilade fire from the large bastions at each of the three corners. I felt certain that we should be thinking of palings only tall enough to prevent an enemy from scaling them and to provide chest-high protection for defenders standing on our parapet step. We knew that instructions issued in London to the settlers of Berkeley Plantation (another, Martin's Hundred-like venture further upriver) called on them to build a palisade 7 feet, 6 inches high around their 400 acres. No mention was made of whether this wall was to give protection from an enemy or was merely a deterrent to wild animals; but from much further away, at Ferryland on the Newfoundland coast, came more specific information. There, that colony's governor, Captain Edward Wynne, wrote to his employer Sir George Calvert in July 1622, reporting that:

We got home as much or as many trees as served us to palizado into the Plantation about foure Acres of ground, for the keeping off of both man & beast, with post and rayle seven foot high, sharpened in the toppe, the trees being pitched upright and fastened with spikes and nayles. At Ferryland, therefore, the pales were 7 feet high, and pointed. Taken at face value, Captain Wynne's description suggests that his pales were made from tree trunks fastened to the rails; but that is difficult to do if the trees have not first been split to provide one flat face. Even then the "spikes and nayles" needed to secure half a tree to a rail would have to be long enough to pass through both and still project far enough to be clenched—very large nails. So far, we had found relatively few of any size along our palisade lines.

Remembering that John Smith's list of equipment needed by an emigrant family included "2 frowes to cleave pale," I concluded that even the Ferryland "trees" would have been split, and that the Virginia evidence was sufficient to justify interpreting our pales as flat surfaced. We had no justification, however, for our parapet step, though logic dictated that if the pales were tall enough to keep attackers out, defenders would have to stand on something to see and shoot over the top. I estimated the height of my step as being close to 3 feet. Taking an average male height from the skeletons on Site A as being about 5 feet, 6 inches, I asked artist Pat Kidd to be a musketeer and stand with a matchlock musket in the firing position. Measuring down from the underside of the gun to her feet gave us an estimated distance from the top of a 7-foot, 6-inch pale ("sharpened in the toppe" a distance of 6 inches) to the top of the parapet step. I deduced that the back of the step was supported by vertical timbers and that it had been filled with dirt. The only problem was that when standing to fire, Pat needed a width of 2 feet, 5 inches, and the platform would have given a maximum of 2 feet, 9 inches—no room for stepping back to reload. That flaw in my interpretation bothered me for several years, just as did the lack of depth to the gun platform. A published report of a surviving parapet platform in a ruined village fort in Northern Ireland led us to Dungiven in County Londonderry, but when we got there the platform had been torn down to enlarge a parking lot. Eventually the evidence I was seeking came to light closer to home, on Southampton Island at Bermuda. Protecting one side of the entrance to the harbor stands a small stone fort reputedly built in 1620 by Governor Nathaniel Butler (the man whose uncharitable report hastened the demise of the Virginia Company), and having a parapet step edged with stone and filled behind with rubble. Tidewater Virginia has no natural stone, while Bermuda has virtually nothing else. I had little doubt therefore that the Southampton Fort construction (though probably an eighteenth-century addition) was the stone-built version of our wood-supported step. It was only 2 feet wide.

The Story of William Harwood

Those in New Netherland and in New England who have no means to build farm-houses at first according to their wishes, dig a square pit in the ground, cellar fashion, six or seven feet deep, as
long and as broad as they think proper, case the earth inside all around the wall with timber, which they line with the bark of trees or something else to prevent the caving in of the earth, floor this cellar with plank and wainscott it overhead for a ceiling, raise a roof of spars clear up and cover the spars with bark or green sods, so that they can live dry and warm in these houses with their entire families for two, three, and four years...

Here was a thoroughly reasonable answer. With the eaves of the roof extending far beyond the walls and resting on the ground, any water approaching the building would thus be channeled around it before it could reach the hole in which the subterranean home was seated. That we failed to find any trace of such channeling is readily explained: All evidence of it had long since been eradicated by plowing. Recalling Dutch colonial secretary Van Tienhoven's statement that these cavernous structures were occupied until such times as the farmers could afford something better, we deduced that ours, too, marked the first phase in the evolution of Site A. Remembering, too, the woodworking tools found on the floor, we conjectured that it may have been the temporary home of carpenters sent to construct other, more conventional buildings. But sent by whom and for whom?

Back we came to the fundamental questions upon whose correct answers all our archaeological interpretations depended: Who owned this property; what did he do there, and for how long? Was he perhaps the sixty-year-old occupant of the isolated coffin, or the much younger man who lay beside an older woman closer to the house? I doubted whether we could ever be sure, but we had been left a few tantalizing hints, some almost microscopically small but one as large and as solid as a cannonball—all pointing to an unmarried man, one who managed to survive longer than virtually all his contemporaries who knew him as the "Governor" of Martin's Hundred.

From the upper filling of the cellar hole had come two short strands of silver wire and another of gold, each about as thick as sewing thread, the kind of wire used in the early seventeenth century to decorate better-quality clothing. More revealing was the discovery of a short length of woven gold twisted and glued into a point, a sartorial embellishment which was called just that—a point. They hung from the ends of shoulder laces and in rows dangling from men's garters. Here, therefore, were the remains of once elegant clothing such as the Dutch artist Thomas de Keyser depicted in his famous 1627 portrait of the diplomat and poet Constantijn Huygens. He is shown seated with gold woven in patterns through his coat and breeches, and with gold points hanging from his garters. Beside Huygens stands his clerk, his clothes bordered with silver—gold for the master and silver for the clerk.

Englishmen, too, dressed according to the dictates of fashion and wealth. Thus, in 1621, several military captains leaving for service in Europe had themselves immortalized by the celebrated court painter Daniel Mytens, each verbally ablaze with gold threads and dangling points. We are safe in assuming that plantation "governors" and military lieutenants heading for America would have appeared similarly resplendent as they boarded their ships at Deptford or Portsmouth. How they looked when they disembarked after weeks of insanitary confinement aboard small and uncomfortable ships may have been somewhat different. It is clear, nonetheless, that clothing continued to define social stratification just as it had done through the Middle Ages. Although in England the last of the medieval sumptuary laws was repealed by order of James I, in Virginia, in July 1621, the governor and his council had passed a resolution to "Suppress drunkenness gaming and excess in cloaths [and] not to permit any but ye Council & heads of hundreds to wear gold in their cloaths." One of the council members endorsing the resolution was the head of Martin's Hundred, and therefore the only man there legally permitted to wear gold in his clothes. His name was William Harwood.
We know that William Harwood was living in the Hundred between 1623 and 1625, a fact of no little importance to us, since his name was absent from the Virginia Company records in 1622, when the plantation faced its greatest challenge.

Linking Harwood to our Site A by means of a few gold and silver threads was tenuous at best. One garter does not a governor make. Indeed, we could (and did argue that because Virginia's legislative council found it necessary to enact its own sumptuary law, people other than councillors and heads of hundreds were wearing gold in their clothing. Then, too, with most clothes being imported, and their owners dying with alarming rapidity, hand-me-downs must have been commonplace. An old pair of breeches with gold threads at the thigh and a hole at the seat was still an old pair of breeches, and no archaeologist studying a few threads can be sure whether he is looking at the remains of rags or riches. Fortunately, William Harwood's immortality does not hang solely by a thread. We found another, more substantial link in the form of an iron cannonball, 3 3/4 inches in diameter and weighing 6 3/4 pounds—a relatively big ball, for a large gun. In the 1625 census, Harwood was the only person in Martin's Hundred listed as possessing a "piece of Ordnance, I whth all things thereto belonging", and nothing belonged more than a cannonball. On the other hand, does one ball make a cannon? Who can say that someone did not borrow the ball from Harwood's magazine and use it to grind wheat into flour?

In archaeology so much is built on foundations of conjecture that invariably there are alternative scenarios for just about everything. The best we can do is to attack them all and endorse only those that most stoutly withstand the buffeting of cynical colleagues. William Harwood is one such survivor. For about nine years he was the dominant figure in Martin's Hundred, although we have no evidence that he was ever given the official title of "Governor" by the London based society.

The Massacre and Archaeology

Beyond the little house (which we named the Domestic Unit) were fourteen more graves, arranged in two rows, as though the occupants had been decanted from a cart standing on a roadway and buried in holes dug on either side of it. The bones proved to be in dreadful condition, several skeletons barely more than brown stains in the ground. In some cases only the enamel of the teeth survived, and in others there was nothing at all. One of the latter group offered us something else instead: the ghost image of a horizontal timber, a foam-filled slot sunk into the grave floor, running the full length of it and in section measuring 6 inches by 6 inches. Although no wood fibers survived in the slot, nails driven into the original timber from three sides remained in position, indicating that the wood had been used for some other purpose before being laid on the bottom of the grave and subsequently pushed down into the wet clay by overlying ground pressure. But why had it been put there?

Audrey suggested that the grave was waterlogged before the corpse arrived for burial, and that some considerate soul thought it would be respectful to lay a timber on the floor to keep the body out of the wet. I found that hard to swallow for all sorts of reasons, not the least of them the fact that the timber was too narrow for the corpse to have been balanced on top of it. Besides, the early Virginia colonists not only took death in their stride, those doing the sexton's work would have known that once they began shoveling dirt into the hole they would displace the water and the loved one would get wet anyway. My explanation was more dramatic. Audrey called it melodramatic and would have none of it.

We knew from the report of the massacre published in London in 1622 that survivors charged the Indians with the most heinous atrocities. The more I thought about it, the more reasonable I thought it that our buried timber had been a product of the massacre's aftermath. The grave lay only 2 feet from the southwest corner of the Domestic Unit—much too close, if the house was inhabited. I
argued that it was not, and that ashes in some of the post-holes pointed to its having burned in the Indian attack. Afterwards, according to the official account, they "fell again upon the dead, making as well as they could, a fresh murder, defacing, dragging, and mangling the dead carkasses into many pieces, and carrying some parts away in derision, with base and brutish triumph."

Suppose, I argued, that the main posts of the little house still stood when the Indians returned to finish their work. The body of a colonist found nearby was scalped, dismembered, and then tied to one of the posts and left there to be found by returning survivors. Rather than trying to untie the rotting cadaver, the survivors cut down the post and buried them as one. We kept quiet about these new graves and my grim interpretation of them even though the supporting evidence did exist. It told a tale infinitely more gruesome than anything I had imagined. Describing Chief Powhatan's own treatment of prisoners, John Smith wrote this:

He caused certaine malefactors to be bound hand and foot, then having of many fires gathered great store of burning coales, they rake these coales round in the form of a cock-pit, and in the midst they cast the offenders to broil to death. Sometimes he causeth the heads of them that offend him, to be laid upon the altar or sacrificing stone, and one with clubbes beates out their brains. When he would punish any notorious enemy or malefactor, he causeth him to be tyed to a tree, and with Mussell shells or reeds, the executioner cutteth off his i[[]]oynts one after another, ever casting what they cut off[[]] into the fire; then doth he proceed with shells and reeds to case the skynne from his head and face; then doe they rip his belly and so burne him with the tree and all. Thus themselves reported they executed George Cassen.

Cassen had been one of twelve laborers who arrived in Virginia with the first settlers, and had made the mistake of going off on his own in defiance of Smith's orders. While I had been away in Ireland, conservator Gary McQuillen continued the slow and difficult job of reassembling our supposed massacre victim's skull. Soon after he began, it became clear that we had been wrong in concluding that the man had been killed by a blow to the side of the head. The skull had suffered another even more massive blow to the back which had driven fragments of its occipital bone forward almost into the eye sockets. There also was a short, sharp, and wide fracture just above the right eye beside the nose. I had seen this while the skull lay in the ground and had supposed that it was another of the many breaks caused by the blow to the right side of the head. I was wrong.

Virginia's chief medical examiner, Dr. David K. Wiecking, and his deputy, Dr. Marcella F. Fierro, joined Larry Angel in a collective examination and interpretation of what we had found. All three felt certain that the first blow had been a hard slicing one to the forehead, and that the other, crushing blow or blows followed after the victim had fallen to the ground. Only with blows struck in that order could the natural pressure within have been released to allow the cranial fragments to be driven inside the skull. That explanation posed a question for which no one had a truly convincing answer. Since virtually all the skull fragments survived, we wondered how so monstrously damaged a head could have remained together while the man was being moved from the murder scene to the grave. We had two suggestions: Either the broken head had dried and congealed before the burial party moved the corpse, or the man was wearing a stocking type Monmouth cap that held his skull together.

Countering the latter argument was the evidence of a narrow scratch in the bone, running from a point close to the left ear and extending up across the brow on a line 1 3/4 inches above the left eye as far as the nose. Larry Angel agreed that this might have been caused by a right-handed assailant beginning the scalping process from behind, and added that the scar was consistent with later scalping evidence from Georgia. But our man could hardly have been scalped while wearing a hat; furthermore, it would almost certainly have been done before the skull was battered to pieces.
We were left with other loose ends, not the least of them being the type of weapon used to strike the first blow. The cut was too short for an iron ax (unless the attacker badly misjudged his range), and too sharp to have been caused by an Indian's stone or wooden tomahawk. Remembering that according to survivors' testimony, the Indians "in some places, sate downe at Breakfast with our people at their tables, whom immediately with their owne tooles and weapons, cyther laid downe, or standing in their houses, they basely and barbarously murthered," I deduced that the weapon was indeed a European's tool—specifically, a garden spade.

Most seventeenth-century spades were of wood shod at the blade edge with a sandwiching strip of tempered iron. We had found such a spade shoe in the nearby potter's pond, and its corner neatly fitted the gash in the skull. Once again the gap between conjecture and proof seemed impossible to bridge. Drs. Angel, Wiecking, and Fierro all agreed that the damage might have been caused by such a weapon; but although they had examined scores of homicide victims, none had been killed with a garden spade. Thus I was left with that always unsatisfactory Scottish verdict of "not proven."

**Art and Archaeology**

The only way to determine which artists are working from memory and which from life is to study their pictures in such detail that you get to know their work by the back of a chair, the placement of a candlestick, or the color of a cap. Sometimes they bluntly gave away the tricks of their trade. When other inspiration failed, they painted themselves in their studios. A landscape painter is revealed briskly at work on a country scene with nothing more inspiring in front of him than a blank studio wall. Immediately he is struck from our list of dictators of barns and fences, for even if he is masterful in his rendering of them, we can never be sure that this barn went with that fence, or that a window really would have been in precisely the relationship to that artist's door. Relying less on memory, but no less suspect, are Maes-style artists like Joos van Craesbeeck, who showed himself in his studio painting as rigid a group of models in the role of revelers as you can expect to find in a department store window. Common to this picture and to several others by better-known artists is a flagon set in the foreground, beside a seated toper, but with its handle pointing away from him and in the direction of the artist, who put it there after his models had taken their positions.

I began the archaeological anatomizing of paintings early in the 1960s, when I found myself questioning the often heard claim that England's superb genre painter, William Hogarth, was a reliable source for virtually every aspect of English life in the second quarter of the eighteenth century. The more I studied his pictures (and the engravings copied from them), the most distrustful I became. The bonding of his brick walls was often architecturally incorrect; a table knife looked more like a miniature scimitar (his eighteenth-century biographer and pictorial analyst, John Ireland, took it for a razor), and wine bottles Hogarth put on his tables in the 1750s were the same as he had drawn decades earlier. Clearly, in later life, Hogarth was drawing from memory, ignoring the fact that objects he had learned to paint in the 1720s had changed their shapes during the ensuing years.

Having learned to treat Hogarth's visual statements with caution, I came to the Netherlandish artists more wanting than willing to believe them, and as it turned out, with good reason. Perhaps most prolific of the Flemings was David Teniers the Younger (1610—1690), who began painting in his twenties and lived to be eighty. Specializing in scenes set in taverns, military guardrooms, and apothecaries' and alchemists' shops, he preserved for us an endless array of scruffy people in less than elegant surroundings. In many of these pictures we find a shelf anchored to a back wall, and on it a pot closely resembling one found at our Site A, and considered by us to be a chamber pot. Teniers's version, however, invariably has what may be either a spoon or a pestle protruding from it—raising
fair questions about the validity of our chamberpot interpretation. At the same time, we have good reason to doubt whether Teniers's pot ever stood on that shelf. Not only does it turn up in several pictures, it is usually accompanied by a glass flask having a twist of paper stuffed in its mouth. Peering about in these same paintings we find other similarities: a split wooden block used as a seat or footstool, a split-ended bench (often with a broom leaning against it), a colander-shaped, earthenware dish being used as a brazier from which to light a pipe or warm an old man's hands. Then there are Teniers's people: a man with his back to us whose posture leaves no doubt about what he is doing (sometimes into a tub or simply against a wall), a red-capped fellow in a window or peering out of a crowd, and someone entering or leaving a room, a stock trick to create a sense of movement and to suggest that more is going on just beyond the frame.

In the foreground of one of his tavern scenes, this Flemish Hogarth shows a blue and gray stoneware bottle decorated on its sides with three medallions. This is no fictional pot; on the contrary, it is of a distinctive type whose medallion fragments have been unearthed at Jamestown, on another Virginia site in northern Tidewater, on a fort site in the Virgin Islands, and from a dirt pile flanking a roadside utility trench in Frankfurt, Germany. In each case the medallion bore the date 1632 or 1622. Recalling, therefore, that Teniers's earliest paintings date from around 1622, we had grounds to argue that this was one of them. The date was important to us, because on a bench to the left of the picture stands a delicate drinking glass whose stem elements resembled some very small fragments we had found on Site A. Taking the picture at its face value, our critics might argue that the artist was showing us that we were wrong in concluding that the presence of delicate drinking glasses pointed to an affluent household (as the previously quoted comment by David DeVries, about being received by the Governor with a Venice glass of sack, seemed to suggest), for in Teniers's painting the glass is precariously perched on a bench in the tuckiest of taverns.

I concluded that Teniers had drawn the glass from his stock of real or imaginary props, and had put it on his bench without giving any thought to its cultural implications 350 years later. A glass was synonymous with drinking, and it made a pleasant change from painting earthen beer-pots and stoneware bottles. Nevertheless, David Teniers's picture did have something to tell us; it said that this type of glass was in use as late as the 1630s, otherwise he would not have learned to paint it with such fidelity. Furthermore, even if the picture had been painted several years later than the dates suggested by the stoneware bottle, its evidence still fitted well alongside our persisting sense that Site A was occupied in the 1630s and 1640s, thus placing most of its life in the post-Harwood period.

The fragility of glass was such in the seventeenth century that although it was not costly to make, and when broken had no value at all, it may well have had a far higher value in Virginia than it would where the factories producing drinking glasses were within easy reach. Goblets of silver or silver-gilt had greater intrinsic worth, and while it is quite likely that Harwood and his successors owned such things, their value as bullion made sure that they were not left behind to fall into the hands of archaeologists. We must therefore seek evidence of status, if not in the glass, in the top-of-the-line imported ceramics. Immediately, however, we find ourselves in danger of confusing the desirability and price of today's antiques with their original worth. That problem was brought home to me after we found fragments of a large, brown stoneware Bellarmine bottle in the rubbish-filled cellar. Decorated with three medallions and of pleasing shape, it would, intact, have been a highly desirable antique. Later I learned just how desirable; in London's Chelsea Antiques Fair I found a very close parallel for our three-medallion bottle, the first of its kind I had seen in thirty years of collecting German stonewares. It cost us more than $1,200, and today the price would be higher still. With that in mind, it was easy to see our sherds as evidence of wealth. I was able to put this discovery in a more sober perspective when, in the Brussels Royal Museum of Fine Arts, I found a small panel painting by the Dutch genre painter Adriaen van Ostade (he was
born in the same year as David Teniers, lived almost as long, and painted as much), and in it an even closer parallel for our bottle than I had bought at the Chelsea fair. Van Ostade's setting for the bottle was not the home of men with golden garters, but a beat-up table outside a rural tavern, where two rustic musicians were playing while a third sang, the bottle aspiring only to keep him in voice. Like wine bottles today, the Rhenish stoneware bottles of the sixteenth and seventeenth centuries were valued for their contents, not for themselves.


**MARTIN'S HUNDRED (Assignment Nine)**

We now come to the final exercise in the course, an exercise which brings together many of the methodological lessons learned here in a final synthesis. You are to study Martin's Hundred, an early Colonial hamlet in Virginia as an archaeologist would. This case study enables us to combine classic archaeological methods with data from historical records, and with acute observation, too. This example reminds us that archaeology is more that prehistory. Archaeological evidence sometimes tells us a different story than history or it can augment history. Archaeology is the study of humankind with a focus on the material remains that people leave. It is also a method for discovery. It is a way to unlock insights about life.

You now have a pretty good idea of the kind of evidence that is employed in the archaeological reconstruction of historical sites. In the Martin's Hundred exercise, we have compiled a wide variety of data on another of the Martin's Hundred locales excavated by Hume. You have access to artifact catalogs, historical documentation, plan maps, profiles, and descriptions of Colonial Period artifacts.

Finally, you should recognize that we live a world where the archaeology around us is disappearing. Development has taken a toll as has vandalism. The Federal government and the State of Arizona have taken steps to stop this destruction. This exercise is intended as a lesson on the "job" of archaeology in today's world. As part of your assignment, you must develop a reasonable plan for preserving the site while making it available for public viewing as a National Historic Monument. Your summary report to the National Park Service will include:

1. A brief description of the site,

2. A brief historical sketch placing the site in its historical context,

3. A short discussion of the data recovered at the site and your interpretation of the site's function and occupants, and finally

4. A succinct plan for the preservation and display of the site and its artifacts for the general public.

You will want to focus on the following questions as you work on your report:

Question 1. What is the geographic relationship of the site to other known sites of historical significance in the area, if there are any?
Question 2. What is the apparent function of the site (i.e. ceremonial, habitation, special purpose, fort, farmhouse, isolated dump, port, store, etc.)? If the function could not be ascertained, why not?

Question 3. Based on the artifactual evidence and other evidence, what was the apparent social status of the occupants of the site? If social status could not be ascertained, explain why.

Question 4. What is the age of the site? Include the earliest possible date of occupation, the latest possible date of occupation, and your estimate of the most likely date(s) of occupation. In your estimates, include supporting data for your estimates (i.e. type of artifacts, bracketing dates, etc.).

Question 5. On the basis of the preceding evidence, why should this site be considered for the National Register of Historic Places? If the site should not be considered, be very specific in explaining why it should not be considered.

Question 6. Based on the preceding evidence, what further work should be required to adequately preserve the historical importance of this site? (Further work may include - additional excavation, reconstruction, protection, or no further work). Please be specific in explaining why you feel this is the best course of action.

THE 106 PROCESS
You will find it helpful to read the next section before you complete this assignment. In archaeology, there is something known as "compliance". Federal and State of Arizona laws require consideration for cultural heritage. Archaeological sites are thought of as "nonrenewable resources" that can be destroyed by development of roads, freeways, canals, airports, etc. It is essential that projects are "in compliance". There is a process by which to ensure compliance. This is known as the "106 Process". Read the following section and you will learn more about this process.

Guide to the Section 106 Process

Introduction
The following guide provides an abbreviated view of the Section 106 review process established by the National Historic Preservation Act (NHPA) of 1966, as amended. In addition to Section 106, Section 110 of the NHPA, added in 1980, and Executive Order 11593, implemented in 1971, establish guidelines and responsibilities for Federal agencies. The information in this guide is a summary of material obtained from the Advisory Council on Historic Preservation. Section 106 review is the major Federal protective process for historic properties. It is administered by the Advisory Council on Historic Preservation, an independent Federal agency, under its regulations at 36 CFR Part 800.

The Law
The law was enacted because of public concern that so many of our nation's historic and prehistoric resources were not receiving adequate attention as the Government sponsored much needed public works. Congress recognized that legislation was needed to protect the many historic properties being harmed by Federal activities.
Section 106 of the National Historic Preservation Act requires that every Federal agency "take into account" how each of its undertakings could affect historic properties. A Federal undertaking includes the full range of Federal activities, such as construction, rehabilitation and repair projects, licenses, permits, loans, financial assistance, Federal property transfers, and many other types of Federal involvement. Whenever one of these activities has the potential to affect a historic or prehistoric property, the sponsoring agency is obligated to participate in the Section 106 process. The Federal agency involved in a proposed project or activity is responsible for initiating or completing the Section 106 process. Under certain circumstances, local governmental bodies may act as the responsible agency. The agency works with the State Historic Preservation Officer and the Advisory Council. Other possible participants in the Section 106 include local governments, representatives of Indian tribes, and applicants for Federal grants, licenses, or permits; others may join in the review process when it affects their interests or activities.

**Terminology**
In the discussion that follows, there are numerous terms which are applied specifically to Section 106 review. The terms most commonly used, and their definitions, are listed below. Reference to the appropriate section within 36 CFR Part 800 is also listed.

**State Historic Preservation Officer (SHPO)**
The official in each State or territory who (among other things) consults with the Federal agency during Section 106 review. The SHPO provides assistance regarding the presence and significance of historic or prehistoric properties in a project area, what efforts may be needed to find and evaluate them, whether the project will have a harmful effect on the cultural resources, and how to reduce or avoid that harm. The SHPO administers the National Register of Historic Places listing process at the State level. Each SHPO is appointed by the governor of the State. (800.2(n))

**National Register of Historic Places**
The nation's inventory of prehistoric and historic properties worthy of preservation and administered by the U.S. Department of the Interior. The list includes buildings, structures, sites, objects, and districts that possess architectural, engineering, archaeological, or cultural significance. Properties listed are not limited to those of "nationwide" significance; most are primarily significant at the State or local level. (800.2(k))

**National Register-Eligible Property**
A property that meets the criteria for inclusion in the National Register but has not yet gone through the formal nomination and listing process. For Section 106 purposes, an "eligible" property is treated as though it were already listed. (800.2(1))

**Advisory Council on Historic Preservation**
The Council is an independent Federal agency composed of nineteen members. They are charged with advising the President and the Congress on historic preservation matters. The Council reviews and comments on Federal and federally assisted and licensed projects which affect properties listed in or eligible for the National Register of Historic Places, consults with agencies on the formulation of procedures and programs pertaining to historic preservation, and works on establishing legislation. (800.2(d))
Criteria of Effect
The effect of a Federal action on a historic property is evaluated by determining whether the Federal action would cause any change (harmful or beneficial) in the characteristics that qualify the property for National Register listing. Such qualifying characteristics comprise a property's historical, architectural, archaeological, or cultural significance. (800.9(a))

Criteria of Adverse Effect
In order to decide whether its proposed activity would harm cultural resources, either directly or indirectly, a Federal agency needs to know the "criteria of adverse effect" to assess the impact of a project on cultural resources. (800.9(b)) The criteria include:

1. Destruction, damage, or alteration of all or part of a property.
2. Isolation from or alteration to the property's surrounding environment.
3. Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting.
4. Neglect of a property, resulting in its deterioration or destruction.
5. Transfer, lease, or sale of the property.

The Process
There are five steps in the Section 106 review process.

1. IDENTIFY AND EVALUATE HISTORIC PROPERTIES (800.4)
First, the agency reviews all of the available information that could help in determining whether there may be historic properties in the area of the proposed activity. Based on this review, the agency decides whether any additional survey work is needed to locate possible historic properties.

Next, the agency identifies all National Register-listed properties that might be affected by the proposed activity. The agency also identifies properties not actually listed in the Register, but which appear to meet eligibility criteria. Then the agency and the State Historic Preservation Officer (SHPO) together apply the National Register criteria to decide whether the properties are eligible for listing and thus subject to the Section 106 process.

11. ASSESS EFFECTS (800.5)
Once cultural resources have been identified and found to meet National Register criteria, the Federal agency determines whether its proposed activity will affect them in any way. Again, the agency works with the SHPO in making judgments based on criteria found in the Council's regulations. There are three possible findings:

1. "No Effect" - If there will be no effect of any kind on the cultural resources, the agency notifies the SHPO and interested parties of its determination of "no effect." If the SHPO does not object, the agency proceeds with the project.

2. "No Adverse Effect" - If there could be an effect, but the effect would not be harmful to the cultural resource, the agency obtains SHPO concurrence and submits to the Advisory Council a determination of "no adverse effect." Unless the Council objects, the agency proceeds with its project or activity.
3. "Adverse Effect" - If there could be a harmful effect to cultural resources, the agency begins the consultation process.

111. CONSULTATION (800.5.6,8)
During this step, an effort is made to find acceptable ways to reduce the harm ("avoid or mitigate the adverse effect") to the cultural resource. The consulting parties are the SHPO and the agency; Advisory Council involvement is optional. Other interested parties, such as a local government, an Indian tribe, or a Federal applicant for a grant license or permit, may also be invited to participate in the consultation. A successful consultation resolves a conflict between the undertaking and preservation in a way that the consulting parties agree best serves the public interest.

The agency gathers needed documentation, informs the public that consultation is underway, and works with the consulting parties to find a solution. When the consulting parties have agreed on steps to avoid or reduce harm to historic properties, they sign a Memorandum of Agreement (MOA).

In a very few cases, the consulting parties cannot agree on a solution, in which case the consultation is terminated. The agency may then submit documentation to the Council and request the issuance of written Council comments.

IV. COUNCIL COMMENT (800.6)
Unless the Council has already signed the MOA (by virtue of being a consulting party), the agency submits the signed MOA to the Council for review. The Council can accept the MOA, request changes to it, or opt to issue written comments on the proposed activity.

If the consulting parties have terminated consultation, the Council issues written comments about the proposed agency action directly to the head of that agency.

V. PROCEED
If the Section 106 review process has resulted in a Council-accepted Memorandum of Agreement, the agency proceeds with its proposed activity according to the terms of that MOA. Absent an MOA, the agency must take into account the Council’s written comments, after which the agency makes the final decision about how (or whether) to proceed with its proposed activity. The agency notifies the Council of its decision.

Either outcome concludes the Section 106 review process and satisfies the agency’s statutory responsibilities under Section 106 of the National Historic Preservation Act of 1966, as amended.

Without further ado, please start work on the computer, which will guide you through the exercise.

FINALE
The question of questions remains-what use is archaeology, why is it important in the modern world? This question used to be subsumed under the hoary old topic of "relevance," but that is far too simplistic a way of looking at a complex subject. Archaeology has many applications, many uses in the late twentieth century world. We can only look at some of them. In the final analysis, we can break the question down into two parts:
• What does archaeology mean to me, as an individual?

• What does it mean to society as a whole, and why should we take it seriously?

We are going to rely on you to answer the first part of the question, for that is a matter of personal belief, emotional reaction, and experience. We can ponder the lessons that we have alluded to throughout this semester as a basis for pondering why archaeology may be important. But consider the following story. This is the tragic story of Slack Farm, Kentucky, an archaeological site devastated by illegal looting. This is a capsule statement on the ethics and crisis of archaeology, which Brian Fagan wrote for Archaeology Magazine. It summarizes the ethical dilemmas of archaeology in the context of one tragic case of destruction.

The Tragedy of Slack Farm by Brian Fagan

Like most archaeologists, I have, over the years, developed a numbness to the orgy of site destruction that surrounds us on every side. But a recent story about Slack Farm on the front page of The Los Angeles Times has opened old wounds afresh. "Plunder for Profit," "Looters Rob Old Graves and History" the headlines leaped out at me with sickening familiarity. But it was only when I read on that I began to realize the full horror of the events at Slack Farm.

The Slack Farm site lies near Uniontown, Kentucky, on land just opposite the confluence of the Ohio and Wabash rivers. The Slack family, which had for many years owned a house and farm at the site, had allowed no digging for artifacts, although on occasion people stole into the corn fields at night to dig illicitly.

Archaeologists had known about the site for years, knew that it was a large, relatively undisturbed Late Mississippian settlement. Judging from surface artifacts, the site dated to sometime between AD 1450 and 1650. The farm was of special importance, for it straddled the vital centuries of first European contact with the New World. Cheryl Ann Munson of Indiana University stresses the significance of the farm: she has studied every other large site of this period both up- and downstream. All the other sites have, Munson reports, long since been ravaged by pot hunters. Yet through last fall, Slack Farm had, remarkably, remained nearly intact, a unique archive of information about Late Mississippian lifeways.

But no more. With the death of Mrs. Slack the property changed hands. The tenant farmers on the site did make some attempt to keep people from looting the place. Last fall, however, ten pot hunters from Kentucky, Indiana and Illinois paid the new owner of the land $10,000 for the right to "excavate" the site. They rented a tractor and began bulldozing their way through the village midden to reach graves. They pushed heaps of bones aside, and dug through dwellings and the potsherds, hearths and stone tools associated with them. Along the way, they left detritus of their own-empty pop-top beer and soda cans—scattered on the ground alongside Late Mississippian pottery fragments. To day, Slack Farm looks like a battlefield—a morass of crude shovel holes and gaping trenches. Broken human bones litter the ground, and fractured artifacts crunch under foot.

Two months passed before local residents complained about the digging. Eventually the Kentucky State Police stepped in and arrested the diggers under a state law that prohibits desecrating a venerated object, such as a human grave. The looters pleaded not guilty to the charge—a misdemeanor—and now await trial. But whatever the court decides, the archaeological damage is done—and it is staggering.

No one knows how many graves were ravaged, what artifacts were removed, what fine pots or funerary ornaments vanished onto the greedy antiquities market. No signs of the dwellings, hearths
and other structures they disturbed remain. A team of archaeologists from the Kentucky Heritage Council, Indiana University and the University of Kentucky, aided by many volunteers, is now trying to assess the damage and record what is left of the site. They are cleaning up the pot hunters' holes, recording what intact features remain and collecting artifact samples to document and date the settlement more precisely.

The ravagers of Slack Farm had no interest in science or prehistory. They were hunting for artifacts for their personal collections and for money. There is a flourishing market in pipes, pendants, whole pots, and other Mississippian grave furnishings. Under these circumstances, pot hunting can be addictive.

Prehistoric artifact prices are staggering, and rising steeply as the illegal supply—especially from overseas—becomes scarcer. A stone axe can fetch as much as $1,000, a pipe up to $5,000. A looter who finds a rare type of Mississippian pottery bottle or an embossed copper plate can name his price, and expect to get it. The marketplace is so hungry for antiquities of every kind that a lively underground market in very high quality forgeries grows daily.

In some ways, one can hardly blame landowners for cashing in on the potential of such hidden treasures. They lease rights to companies to mine their land for coal. Why not lease rights to pot hunters to dig for artifacts? Both coal and artifacts can be regarded as wealth underfoot. But in the case of the prehistoric past the issues are much more complex.

This point was underlined for me when I showed the newspaper account of the Slack Farm tragedy to some friends at a coffee break. I was horrified by some of the reactions. "So what?" shrugged one coffee shop acquaintance. "It's a free country." He expressed what turned out to be a widely held view: it's up to landowners what they do with their property. In my numbness, I had forgotten that many people see nothing wrong with private landowners ravaging the past for profit as long as laws are not broken.

We have a strange relationship with the prehistoric past in this country. Most Americans, like my friends, have no direct cultural identification or emotional tie with North American prehistory, with Mesa Verde, Cahokia, or the many other brilliant achievements of the American Indian. As far as most people are concerned, history (and North American archaeology, for that matter) began with Leif Erikson, Christopher Columbus and the Pilgrim Fathers. Anything that predates European contact is considered somewhat irrelevant, and often ignored in school.

So most Americans of non-Indian descent tend to think of prehistoric Indian sites in impersonal, remote ways. Most would protest vigorously at the destruction of an important, privately owned, historic site from pioneer days, or shudder at the very thought of someone looting their neighbor's great-grandmother's grave. But a long-abandoned prehistoric Indian village and the graves of the people who once lived there are a different matter.

It would be naive to think that Slack Farm is an isolated incident. Looting and pot hunting have been endemic in the South east since the depression days of the 1930s, and were rife in the Southwest in the early years of this century. Reports from elsewhere in Kentucky, and from Illinois, Indiana and Ohio, testify to widespread vandalism directed against archaeological sites of every time period over the entire length of the Ohio Valley.

But there is far more to the Slack Farm tragedy than the material destruction of hundreds of prehistoric graves or of an entire archaeological site. For days after reading the news stories, I was haunted by the staggering scientific loss at Slack Farm.

To understand the dimensions of that loss one must realize that the Mississippian culture was a brilliant efflorescence of late prehistoric life in the Midwest and the South. Cahokia, Moundville and other great centers testify to that culture's extraordinary elaboration of public constructions and brilliant art traditions in ceramics, copper and shell. The first Mississippian communities appeared
after AD 750, at just about the time when maize farming took hold in eastern North America. Mississippian culture was past its apogee in many regions when Europeans first penetrated the Midwest in the seventeenth century.

Many questions about this ancient society remain unanswered. Most excavations have focused, fairly naturally, on a few town sites and their mounds and spectacular monuments. Very few villages or cemeteries have been investigated—especially with the full apparatus of modern, hi-tech archaeology. The well-preserved deposits at Slack Farm offered one of the few chances for such a painstaking investigation.

As in other Mississippian communities, the people who lived at Slack Farm probably enjoyed close and constant economic, political and social relationships with other villages and hamlets up and down the Ohio. But most of these sites also have been destroyed by looters. Until late last year, Slack Farm had been our best chance to study the dynamics of this Mississippian society.

Some of the fine Mississippian pots from Slack Farm so coveted by collectors are identical to vessels made in Arkansas, far from the Ohio valley. Some of the copper and marine shell ornaments prized by looters attest to even more distant trade for copper either with the Great Lakes area or the Appalachians, for marine shells with the Atlantic or Gulf coasts.

It may be news to looters, but the fragmentary bones they cast aside a real treasure trove of potential information on Mississippian diet and disease, of vital genetic data about the biological relationships between prehistoric Americans, of evidence on ancient warfare. We now have the scientific techniques to probe such questions. Unfortunately, most of the vital clues for doing so vanished when the site was destroyed.

Slack Farm straddles the vital centuries of European contact with American Indians. We know this because glass beads, brass tinklers and other European artifacts have come from the surface of the ravaged settlement. These finds testify to some form of indirect, or perhaps even direct, contact between the Slack Farm people and early European traders and explorers. Studying such imports requires a detailed knowledge of their precise archaeological context. The looted holes at Slack Farm remind us that we may never understand the true nature of these early contacts.

Christopher Columbus's quincentennial approaches fast, yet we still know little about the complex relationships between Europeans and Native Americans five centuries ago. What changes in culture resulted from European contact? Did exotic diseases decimate Midwestern populations? Were the Late Mississippian in the Ohio Valley the ancestors of one of the historic tribes of the Midwest and Southeast? What goods were traded between whites and Indians, and how did this new trade affect relationships between indigenous societies? The looted burials and village deposits at Slack Farm might have helped find some of the answers to these questions. They cannot help us now.

When historians look back at the history of archaeology in the late twentieth century, they will be struck by a tragic irony. The seventies and eighties were the decades when archaeologists finally developed the scientific technology to attack fundamental questions about the past. Yet the same scientists were powerless to stem the tidal wave of destruction that swept away the very data they could now study to its full potential.

The only bright side of the Slack Farm affair is the public outcry aroused locally by the looting. This protest led to new state legislation in Kentucky, which now makes it a felony to desecrate a human grave, regardless of the race or antiquity of the person buried. Yet, in Indiana similar legislative efforts failed. In surrounding states, no one is tackling the legal, ethical and archaeological problem of site vandalism.

It's not making front page headlines, but looting on the scale of Slack Farm is commonplace in nearly every state—from the Bering Strait to the U.S. Virgin Islands, especially on private lands. The fact is that we and our friends are not making enough noise about this insidious scandal society
tolerates in its midst. No one else is going to do it for us, so we had better raise our voices very loudly before it is too late.

Your LAST assignment (Assignment Ten) is to answer the questions posed regarding the importance of archaeology. It is important to redefine archaeology in terms of what you have learned from this course. Then, use things you have learned to support your response to the questions at hand.
SAMPLE EXERCISE 1


A grid system is a controlled layout of an area into arbitrary squares. One or two meter (m) squares are most frequently used. One purpose of the squares is to provide convenient sized excavation or collection units. At the same time, then corners of the squares provide reference points for the precise location of artifacts and features within the square. Typically we measure things from the southwest corner of a square.

Each square receives its designation from grid lines which cross at the southwest corner. Grid lines are not drawn on this site map; using the information provided along the boundary of the site you must create the grid. When locating a point, you write the north-south grid line name first (e.g., 720 North (N), 490 East (E)).

Within a given grid unit an artifact or feature can be located by triangulation. Triangulation consists of two horizontal measurements from the center of the item to be recorded to two corners of the grid. Through triangulation you hope to determine the precise location of an object.

Answer the following questions:

1. What feature number is located at 730 N, 478 E?

2. Draw four 2 x 2 meter units at

   740N, 482E

   722N, 484E

   728N, 472E

   746N, 476E

3. What feature numbers are located in each unit?

4. Give a precise location of each feature.

SAMPLE EXERCISE 2


An archaeological site is a "spatial concentration of material evidence of human activity" (Deetz 1967:11). It is not enough to know the location of a site on the ground. It must be
related spatially to other sites as well as to topographic and other environmental characteristics. The U.S. Geological Survey topographic map series is usually used for these purposes as are aerial photographs when they are available. Select a copy of a portion of a U.S.G.S. 7.5 minute map. Scale on the map is 1 inch=2000 ft. Place four sites on the map in varying topographic situations. Assume that all of these sites are habitation areas.

Answer the following questions:

1. What is the elevation of site #1?

2. What is the distance between Site #1 and Site #2? Site #1 and Site #3? Site #1 and Site #4?

3. What is the highest point within 3,000 ft of Site #3?

4. What is the lowest point within 3,000 ft of Site #3?

5. What is the nearest water source for these sites? Why may water be important to site location?

6. What is the general character of the topography around Site #1?

7. How would you characterize the pattern of site location for these four sites?

8. Where would you suspect other sites to be found in the region?

SAMPLE EXERCISE 3


Assume that an epidemic wipes out the U.S., killing everyone but conveniently leaving all buildings intact. Let’s say this happens two weeks from today. Your assignment is to look at the building you live in and determine what an archaeologist 2000 years from now would say about the date of the building. We’ll make several assumptions, the first of which is that our hypothetical archaeologist is hopelessly backward; she only knows the dating techniques we know today. A second assumption is that all paper will completely deteriorate but that all other material will preserve well. Among the questions you should answer are:

1. What will the archaeologist use to date the building?

2. When will she conclude the building was built?

3. When will she conclude the building was abandoned?
4. What are the sources of error in her conclusions?

The last question requires some elaboration. An archaeologist who taught this course several years ago had this to say about his house:

"The house in which I live has a toilet in the basement. All ceramic toilets that have tanks have the date of manufacture (month and year) stamped into the lid of the tank. (Look at yours if you think I am kidding). The date on the lid of my basement bowl is August, 1938. Does this date fix the date the house was constructed? In this case, no. It dates the toilet, or if the lid has been replaced, the replacement lid. The house was built in 1928. When originally constructed it had a coal-fired furnace in the basement. In 1933 this furnace was replaced by a gas-fired furnace. The old coal bin was turned into a shower stall and toilet. Therefore, the date in the toilet approximates the date of the first major renovations of the house. The materials from which the lid was made are the same as those of the toilet proper, so we can rule out the later replacement of the lid. The furnace conversion and the bathroom addition can be seen and traced through the stratifications of paint on the basement walls and modifications of the concrete floor. The toilet and its associated plumbing can be directly linked to these features. However, what if the toilet had been an heirloom, a measured possession that had been kept in its crate for many years as a cult object before its installation? In this case such a problem can be eliminated as all the fittings and drain pipes are of a pre-World War II vintage."

The moral of this story should be clear. When a date is derived from an object, the relationship between this date and the archaeological unit to which the date is attached must be established. The archaeological relationship, the context of the dated material and the remaining material and features, are all important.

Have some fun with this assignment. Points are awarded not only for the accuracy of the dates, but for the accuracy and elegance of your logic and for the variety of ways you come up with to establish your construction and abandonment dates.

Remember also that after an atomic blast, techniques such as radiocarbon dating will be of no use to you.

**FIELD PROJECT**

Archaeologists use artifacts discarded in a location to infer the activities that went on there. We'd like you to report on a simple experiment that relates activities with the artifacts that are left behind. Your write-up should be typed (with a hand-drawn map), should be no more than a single page in length and should do a reasonable job of completing all parts of the assignment. It is worth 10 points. We'll discuss the results in class.
1. Find a Location: Go to a public location, such as public park, a classroom, or an outside area on campus. Define a specific area of interest, no larger than about 25 feet by 25 feet (for example, 10 feet on either side of a picnic table, bench, newspaper stand, coffee bar, desk or whatever). The measurements don't have to be exact; you can pace it off or just estimate.

2. Location: In a sentence, identify the location (e.g., the picnic table in the Anthropology building courtyard).

3. Map. Draw a sketch map of your area. A sketch map can be in pencil and need not be drawn to scale or be of publishable quality, but it should be clear and should show the major features, such as tables, trash cans, planters, trees, grass, or sidewalk.

4. Artifact Inventory. Now look carefully all over the area you have laid out for discarded items on the ground or in formal disposal areas (like in a trash can). Your artifact inventory should consist of a list of artifact classes (5 or so classes should be sufficient; e.g. snack wrappers, soda cans, or newspapers) quantified in relative terms (e.g., rare, moderate, or common). This should be presented in a simple table such as the one that follows. (It isn't part of the assignment, but you might think about whether different classes of material are found in different parts of your area. Are soda cans more often found in trash cans and candy wrappers on the ground?)
   Soda cans rare
   Snack wrappers common
   Unidentified paper common

5. Inferred Behavior. Describe in a paragraph what the trash that you have recorded implies about the behavior that occurs in this area and why you draw those conclusions. Include some relative statements about frequency (e.g., common eating of candy). Don't describe what you've seen go on here, but what you infer based only on the trash.

6. Observed Behavior. Finally, spend 10 minutes observing the area you have selected and describe in a short paragraph the behaviors you observe and their relative frequency, recognizing that your 10 minutes may not be representative of all of the activities that take place in this location.

7. Contrast. Briefly discuss the relationship between your inferred and observed behaviors and how you would account for any differences. Again, a paragraph will suffice.
Ancient Lives: An Introduction to Archaeology and Prehistory, 4th Edition

By Brian Fagan

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