UNIT TWO: Overview of the 4 fields Archaeology

Unit 2: Overview: Week 4

This section covers a more detailed description of each of the 4 fields: Biological/Physical Anthropology, Archaeology, Linguistics, Cultural Anthropology:

Sources include:

Schoenberg, Arnie. Introduction to Physical Anthropology, 2/10/17
http://www.oercommons.org/courses/introduction-to-physical-anthropology/view

Evans, Tracy Cultural Anthropology Lumen Publishing: 2017. (Candela Open Courses)
https://courses.candelalearning.com/anthropologyx15x1/part/unit-9/

Outline:

2.2 Archeological Anthropology

Explore the "Society for American Archaeology"
Read section "What is Archaeology"
Look at FAQs

2.2a methods
Read and follow links : Source Society for American Archaeology: Archaeology for Educators: "Methods of Gathering Data"

Methods for Gathering Data

Historical Research Techniques (Archival Research, Oral History)
In the Field (Tools of the Trade, How do we find sites?, Surface Surveys, Shovel Test Pits, Geophysical Surveys, Evaluating Site Significance).
Data Recovery (Research Design, Gridding the Site, Excavating a Unit, Stratigraphy)
*In the Lab (*How Old is it? Analyzing Artifacts, Analyzing Features).
Resources (Historical Research Techniques, In the Field, Data Recovery, How old is it?, Analyzing Artifacts, Analyzing Features)

2.2b Example of a fieldsite
Explore and interact Dr. Samuel V. Connell's fieldsite in Belize. Look at the student blogs about their field experiences.
Read Dr. Connell's online article about fieldschools.

2.2c Ethics -- NATIVE AMERICAN GRAVES PROTECTION AND REPATRIATION ACT

2.3Tools Continued –
Neo-lithic Revolution, Agricultural Revolution

2.1 Archeological Anthropology

EXPLORE AND INTERACT ON WEBSITE

Explore the "Society for American Archaeology" (SAA)

What is Archaeology?
https://www.saa.org/about-archaeology/what-is-archaeology

Having looked at the Society for American Archaeology site, what most surprised you about the field of archaeology?

2.2a methods

EXPLORE AND INTERACT ON WEBSITE

Society for American Archaeology: Archaeology for Educators: "Methods of Gathering Data"
https://www.saa.org/about-archaeology

METHODS OF GATHERING DATA:

Introduction

The methods used by archaeologists to gather data can be applied to any time period, including the very recent past. One archaeologist in the U.S. has become known for his study of the garbage discarded by the people of Tuscon, Arizona in the 1970s. This "garbology" project proved that even recent artifacts can reveal a lot about the people who used and discarded them.

Over the past 150 years archaeologists have developed many effective methods and techniques for studying the past. Archaeologists also rely upon methods from other fields such as history, botany, geology, and soil science.

In this section of Methods of Gathering Data you will learn how archaeologists gather and analyze information by utilizing historical research techniques, field methods for data recovery, and laboratory analyses.

Historical Research Techniques

Every archaeology project begins with a research design –a plan that describes why the archaeology is being done, what research questions it hopes to answer, and the methods and techniques that will be used to gather and analyze the artifacts and other archaeological materials. It will also outline where artifacts recovered from the project will be stored, and how the research will be reported and shared with the public.

Archival research

Archival research is often the first step in archaeology. This research uncovers the written records associated with the study area. If the area was inhabited during historical times (in the past several hundred years in North America) the archaeologist will look for primary historical documents associated with the study area. This archival research may take the archaeologist to public or university libraries, the local historical society or courthouse—or even into people's homes. Primary historical documents that archaeologists may consult before beginning their field research include: maps and/or photographs of the area, newspapers, land and tax records, and diaries and letters.

In addition to primary historical documents, archaeologists will look for site reports that have been prepared by other archaeologists who have studied this area. These reports will describe what was found in this area during any previous archaeological investigations and will help guide the new research. Documentation files for all of the recorded prehistoric and historic sites in each state are maintained in the State Historic Preservation Office, along with archaeological research reports pertaining to sites in the state.

Oral History

Oral history is another research method that archaeologists and historians may use to gather information. It includes any kind of information passed down by word of mouth, like stories you have been told about your family history, as well as traditions that your family observes. Archaeologists today collaborate with descendants of Native American peoples, and with African American communities who are only a few generations removed from the lives of their enslaved or free ancestors, to better understand the cultural traditions of their pasts. Archaeologists working on the 19th century Levi Jordan Plantation in Texas have interviewed descendants of both the plantation owners and the enslaved plantation workers as part of their research. These archaeologists hope to include the "voices' and perspectives of all of the past peoples who lived and worked on this plantation into their research. They have created the Levi Jordan web site to share this information with the public and to allow the public to communicate with the archaeologists.

At Castle Rock Pueblo in southwestern Colorado archaeologists have learned about the past culture of the Anasazi peoples through both the objects left behind, and the oral traditions of modern Puebloan people. Now get ready to take an electronic field trip back in time to Castle Rock Pueblo in AD 1200 and solve a mystery while you are there.

In the Field

While historians and archaeologists both use written documents to learn about the past, only archaeologists are trained to find and interpret archaeological sites. Here you will learn about some of the field methods archaeologists use to find sites and, when necessary, to excavate them.

Tools of the Trade

You may think of shovels when you think of digging, but the most important piece of equipment in the archaeologist's toolkit is actually the trowel. A trowel is used to carefully remove thin layers of soil from test units. Of course, many other tools are used by archaeologists in the field and lab to dig, sift, measure, and analyze artifacts. View some of Nicholas Toth discussion of tools and equipment that archaeologists use. (5 minutes) https://www.khanacademy.org/partner-content/big-history-project/early-humans/ways-of-knowing-early-humans/v/bhp-intro-archaeology

Some, like the *Scanning Electron Microscope* (SEM) are very specialized and high tech. Others, like tape measurers, toothbrushes, brooms and dustpans, are household objects. You can also view photographs of archaeologists using some of these tools on sites.

How Do You Find Sites?

Archaeologists use a number of different methods to find sites—and sometimes they are found just by accident. The prehistoric burials at Low Hauxley on the coast of England were discovered by an observant beach walker who noticed a stone box sticking out of a sand dune after a storm. A burial ground with remains of more than 400 17th and 18th century Africans was discovered during building construction in New York City. The African Burial Ground made a National Monument because of its importance and significance. Look at their website to learn more about the African burial in Manhattan: https://www.nps.gov/afbg/index.htm

An archaeological predictive model is a tool that indicates the probability that an archaeological site will occur in a certain area. It helps determine where you look for sites based on factors like distance from water, ground steepness, soil type, and other factors that influence where people settle or perform certain tasks. The methods used to find sites will depend upon the kind of research questions that the archaeologist is trying to answer. If highway or housing construction is planned, archaeologists may need to know of any archaeological sites on the property. First, they will check if any previous surveys have been done in the area and, if so, what was found. If no previous sites have been recorded, the archaeologist will conduct an archaeological survey to determine if the area contains any sites.

If sites are found, the archaeologist will want to know how many, their location, and how the sites relate to each other. Usually, to save time and money, only a sample of the area is tested.

Surface Surveys

A *surface survey* is a systematic examination of the land. A team of archaeologists will walk in straight lines back and forth across the study area looking for evidence of past human activity, including stone walls or foundations; artifacts made of stone, ceramics, or metal; color changes in the soil that may indicate features such as hearths, middens (garbage pits), or storage pits They will use a compass and long tape measure to make sure they walk in a straight line and will record the exact location of all evidence they find. Artifacts are collected and put in bags with a label of their exact location. Features, which cannot be removed, are photographed and drawn. This technique is useful in plowed fields.

Shovel Test Pits

Shovel test pits (or "STP's") are a series of shallow pits dug in an area that archaeologists believe to be a potential site, revealing artifacts or features. Usually test pits are done where the ground has not been farmed or plowed and it contains a lot of surface vegetation. The soil may be screened (sifted) to recover small artifacts and often profiles (pictures) of the test pits are drawn to record what the soil looks like in each unit.

Geophysical Surveys

There are a number of non-invasive techniques archaeologists can use to find sites without having to dig. Examples of geophysical surveys that do not involve disturbing the soil include are magnetometry, resistivity and ground penetrating radar (GPR): http://www.archaeologyexpert.co.uk/groundpenetratingradarinarchaeology.html

Evaluating Site Significance

After conducting a survey an archaeologist will have enough information to determine if any significant archaeological resources are located in the study area. If no sites are found, or if the sites are not determined to be "significant" as defined by the law in the National Historic Preservation Act then construction may proceed. The archaeologist will write and file a site report in the State Historic Preservation Office, which describes their research. If significant sites were found, an excavation may be planned. In the next section we will discuss how important data is recovered from archaeological sites through excavation.

Data Recovery

Believe it or not archaeologists do not often excavate (dig) entire sites. Archaeology is a destructive science—meaning that once a site is excavated it is gone forever. The artifacts and information gathered remain, but the site itself can never be recreated. Excavating sites is also costly and time consuming. Once the dig is done, archaeologists have a professional responsibility to analyze all of the artifacts and information obtained, to report on their research in scholarly journals and to the public, and to curate the collections. For all of these reasons, archaeologists generally excavate sites only when they are threatened by

destruction from construction or development or when they may reveal important information about past cultures. And they usually excavate only a small portion of any site. Although archaeologists work on all kinds of sites and in all parts of the world, the same basic process is followed everywhere when an excavation is planned.

Research Design

Before an excavation begins, archaeologists write a research design. This outlines "who, what, where, when, how, and why " the fieldwork is being carried out. This important document is reviewed before archaeologists are granted permission to excavate a site. In the U.S. this plan must be reviewed by the *State Historic Preservation Office* (SHPO) where the work will be carried out. If an American archaeologist wants to work in a foreign country, permission must be granted by the appropriate agency in that government. Tribal (Indian) lands in the U.S. have their own review processes and some tribes have their own archaeology programs that control access to sites on tribal lands. Once a research design is approved and permits area granted, a team is put together and the necessary tools and materials are gathered.

Gridding the Site

Once a site has been excavated, it is gone forever. Because of this, archaeologists must record exactly where all of the artifacts and features on a site are located. Before any soil or artifacts are removed from a site, a site grid is created. A datum point, or fixed reference point from which all measurements are taken, is established and a rectangular grid is superimposed over the whole site. Each square in the grid is precisely measured and assigned a number. These squares are often referred to as units. This system allows the archaeologist to create a precise map of the site and to record the exact location of all the features and artifacts on the site.

Excavating a Unit

Archaeologists use a statistical sampling method to select which squares or units they will excavate. To begin they will collect surface artifacts, then remove any ground cover using a shovel and trowel. All soil removed from a unit is screened (sifted) to recover small artifacts and ecofacts whose exact location, both horizontally and vertically, is recorded. Artifacts from each unit are stored in plastic bags that are labeled with the site and excavation unit numbers and level. The unit may be dug in arbitrary levels (such as every 10 cm) or by following the natural stratigraphy (layers) of the unit. These short videos show how to prepare a test unit for excavation.
https://www.youtube.com/watch?v=7m9wq_mtY4Q

https://www.youtube.com/watch?v=k_Itaza4lUA

Phil Harding--of the popular British archaeology series "The Time Team"-- demonstrates the proper way to use a trowel to remove soil from a unit.
https://www.youtube.com/watch?v=0bmr6wqdO4s

Stratigraphy

Over time both natural processes like the decay of organic matter, and cultural (caused by humans) processes, create soil layers. In cross section these soil layers resemble a layer cake, with the oldest layers on the bottom and the most recent layers on the top. This is called the Law of Superposition and is one of the most important principles in archaeology. Stratigraphy is the study of geological or soil layers that is used to determine the relative age of each layer. There are many factors that can disturb the stratigraphy on a site and make it hard to determine the relative ages of the layers. Stratigraphy is one clue used by archaeologists to determine the relative age of an artifact or site. In the next section we will look at other ways of determining how old something is. Short 1:42 video
https://www.youtube.com/watch?v=iUQ4C5bfBVE

In the Lab

Archaeologists spend much more of their time in the laboratory analyzing artifacts and data than they do in the field. In this section, you will learn how archaeologists analyze artifacts, features, and other information recovered in the field to help answer their research questions. During the investigative process, they also seek to learn when site was occupied, the purpose of the objects recovered, what the people ate, the kinds of structures they lived and worked in, with whom they traded, and much more. They may also look at how the site they are analyzing relates to other sites that are nearby or quite distant. The analysis will depend upon what research question the archaeologist began the project with.

"How old is it?"

There are a variety of techniques that can be used to find out how old an artifact or an archaeological site is. Stratigraphy can determine the relative age of soil layers and artifacts and can help us understand the order in which events occurred. However, if an artifact of known age such as a coin with a mint date is found in a soil layer it can tell us when something occurred. Tree-ring dating, or dendrochronology is one of the oldest dating methods used by archaeologists. It is based on the principle that trees produce growth rings each year and the size of the rings will vary depending upon rainfall received each year. Archaeologists have built up long sequences of rings from tree trunks that extend back centuries. In the American Southwest tree ring dating goes back to 59 BC. *Radiocarbon (C14)* dating is the most widely used method to date objects made of organic matter. *Potassium-argon dating* can be used to date extremely old – up to 100,000 years old. *Obsidian hydration dating* is used on artifacts made from volcanic glass. This is just a sample of the many physical and chemical dating methods that archaeologists have used to date archaeological sites.

Analyzing Artifacts

Artifacts are important sources of information for archaeologists. Artifacts can tell us about the diet, tools, weapons, dress, and living structures of people who made and used them.

Recovered artifacts are washed, sorted and catalogued, and stored after they are brought back from the field. Archaeologists analyze individual artifacts but also may sort them into groups to see patterns. For example, they might weigh all of the oyster shells together or count all of the nails and consider them as one unit. Where artifacts are found on the site provides a clue to the kinds of activities that occurred such as stone tool or weapon production or food preparation. The type of material the artifact is made of is another important piece of information that can inform whether the materials were obtained locally or by trading with another group. Artifacts provide a window into the lives of peoples who lived before.

Analyzing Features

A feature shows human activity but unlike most artifacts it cannot be removed from the archaeological site. A feature might be a stain in the soil that is evidence of a former fence post. Photographs, drawings, and soil samples of the fence post collected by the archaeologist are part of the scientific record of that feature and are just as important as the nails and other artifacts that might be found nearby. Features like soil stains can reveal the outlines of prehistoric or historic structures such as houses and barns, or longhouses and earthen lodges. Other types of features include hearths (fire pits), storage pits, and middens –what archaeologists call garbage dumps. Privies (outhouses) are important features in historical archaeology sites because people used to dump their garbage as well as broken pottery and other housewares into them.

Additional Resources

WATCH -- Experimental Archaeology:

The Science of History: Experimental Archaeology & Stoneboiling (3:43)

https://www.youtube.com/watch?v=vAWMmiPF1T4

WATCH -- In the Field

Doing an Archeological Field Survey (2:06)

https://www.youtube.com/watch?v=8rFIu-0NnGE

WATCH --Data Recovery

Archaeological Methods: Set up a 1m grid square (5:36)

https://www.youtube.com/watch?v=xNdFDzQzqPk

Inside the Archaeology Lab: Cataloging the Artifacts (3:46)

https://www.youtube.com/watch?v=6ev6oRmPm-E

How Old Is It?

WATCH A-Z of Archaeology: 'C - Carbon Dating' (5:11)
https://www.youtube.com/watch?v=SasTxhAtgOo

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Analyzing Artifacts

Archaeological Analysis:

- https://greekarchaeology.osu.edu/arch-edu/analysis
-

WATCH Analyzing the Past - Chemistry, Archaeology, and Art: Ruth Ann Armitage at TEDxEMU (12:07)

- https://www.youtube.com/watch?v=oB3IsM_cG1Q

2.2b Example of a fieldsite

EXPLORE AND INTERACT ON WEBSITE

Explore Dr. Samuel V. Connell's fieldsite in Belize:
https://sites.google.com/site/umapinbelize/Home

What did students have to say about their experiences working on this fieldsite (the blog)?
https://umap2010.wordpress.com/

READ THE FOLLOWING:

Read Sam Connell's online article:
Connell, Samuel V. "Broadening the Scope of Archaeological Field Schools" The SAA Archaeological Record, January 2012, pp 25-28.
http://onlinedigeditions.com/publication/?i=97816

You should be able to explain:

What is a field school?

What type of experiences did students have?
What were some of the research findings?

4/3/15 Museum in Peru, Archaeological Artifacts
Photo by Lisa Pope Fischer

2.2c Ethics - Native American Graves Protection and Repatriation Act

Susquehannock artifacts on display at the State Museum of Pennsylvania, 2007

The Native American Graves Protection and Repatriation Act (NAGPRA), Pub. L. 101-601, 25 U.S.C. 3001 et seq., 104 Stat. 3048, is a United States federal law enacted on 16 November 1990.

The Act requires federal agencies and institutions that receive federal funding[1] to return Native American "cultural items" to lineal descendants and culturally affiliated Indian tribes and Native Hawaiian organizations. Cultural items include human remains, funerary objects, sacred objects, and objects of cultural patrimony. A program of federal grants assists in the repatriation process and the Secretary of the Interior may assess civil penalties on museums that fail to comply.

NAGPRA also establishes procedures for the inadvertent discovery or planned excavation of Native American cultural items on federal or tribal lands. While these provisions do not apply to discoveries or excavations on private or state lands, the collection provisions of the Act may apply to Native American cultural items if they come under the control of an institution that receives federal funding.

Lastly, NAGPRA makes it a criminal offense to traffic in Native American human remains without right of possession or in Native American cultural items obtained in violation of the Act. Penalties for a first offense may reach 12 months imprisonment and a $100,000 fine.

The intent of the NAGPRA legislation is to address long-standing claims by federally recognized tribes for the return of human remains and cultural objects unlawfully obtained from prehistoric, historic, former, and current Native American homelands. Interpretation of human and indigenous rights, prehistoric presence, cultural affiliation with antiquities, and the return of remains and objects can be controversial and contested. It includes provisions that delineate the legal processes by which museums and federal agencies are required to return certain Native American cultural items—human remains, gravesite materials, and other objects of cultural patrimony—to proven lineal descendants, culturally related Native American tribes, and Native Hawaiian groups. Specifically, these types of items which are found and scientifically dated to a time prior to 1492 C.E. are to be turned over to Native American tribes. This would include any future discovery of Viking burials, such as those from Leif Ericson's lost colony (which is thought to be similar to L'Anse aux Meadows).

Outcomes of NAGPRA repatriation efforts are slow and cumbersome, leading many tribes to spend considerable effort documenting their requests; collections' holders are obliged to inform and engage with tribes whose materials they may possess. NAGPRA was enacted primarily at the insistence and by the direction of members of Native American nations.[2]

Tribal concerns

Tribes had many reasons based in law that made legislation concerning tribal grave protection and repatriation necessary.

- State Statutory Law: Historically, states only regulated and protected marked graves. Native American graves were often unmarked and did not receive the protection provided by these statutes.
- Common Law: The colonizing population formed much of the legal system that developed over the course of settling the United States. This law did not often take into account the unique Native American practices concerning graves and other burial practices. It did not account for government actions against Native Americans, such as removal, the relationship that Native Americans as different peoples maintain with their dead, and sacred ideas and myths related to the possession of graves.
- Equal Protection: Native Americans, as well as others, often found that the remains of Native American graves were treated differently from the dead of other races.
- First Amendment: As in most racial and social groups, Native American burial practices relate strongly to their religious beliefs and practices. They held that when tribal dead were desecrated, disturbed, or withheld from burial, their religious beliefs and practices are being infringed upon. Religious beliefs and practices are protected by the first amendment.
- Sovereignty Rights: Native Americans hold unique rights as sovereign bodies, leading to their relations to be controlled by their own laws and customs. The relationship between the people and their dead is an internal relationship, to be understood as under the sovereign jurisdiction of the tribe.
- Treaty: From the beginning of the U.S. government and tribe relations, the tribe maintained rights unless specifically divested to the U.S. government in a treaty. The U.S. government does not have the right to disturb Native American graves or their dead, because it has not been granted by any treaty.

Description

The *Native American Graves Protection and Repatriation Act* is a law that establishes the ownership of cultural items excavated or discovered on federal or tribal land after November 16, 1990. The act also applies to land transferred by the federal government to the states under the Water Resources Department Act.[3] However, the provisions of the legislation do not apply to private lands. The Act states that Native American remains and associated funerary objects belong to lineal descendants. If lineal descendants cannot be identified, then those remains and objects, along with associated funerary and sacred objects, and objects of cultural patrimony belong to the tribe on whose lands the remains were found or the tribe having the closest known relationship to them.[3] Tribes find the burden of proof is on them, if it becomes necessary to demonstrate a cultural relationship that may not be well-documented or understood. Nowhere has this issue been more pronounced than in California, where many small bands were extinguished before they could be recognized, and only a handful, even today, have obtained federal recognition as Native Americans and descendants of Native American bands.

Congress attempted to "strike a balance between the interest in scientific examination of skeletal remains and the recognition that Native Americans, like people from every culture around the world, have a religious and spiritual reverence for the remains of their ancestors."[4]

The act also requires each federal agency, museum, or institution that receives federal funds to prepare an inventory of remains and funerary objects and a summary of sacred objects, cultural patrimony objects, and unassociated funerary objects. The act provides for repatriation of these items when requested by the appropriate descendant of the tribe. This applies to remains or objects discovered at any time, even before November 16, 1990.[5]

Since the legislation passed, the human remains of approximately 32,000 individuals have been returned to their respective tribes. Nearly 670,000 funerary objects, 120,000 unassociated funerary objects, and 3,500 sacred objects have been returned.[5] NAGPRA serves as a limitation, sometimes restricting excavation of American Indian remains and cultural objects, thereby potentially limiting the possible study of these objects.[6]

Map of Native American reservations

The statute attempts to mediate a significant tension that exists between the tribes' communal interests in the respectful treatment of their deceased ancestors and related cultural items and the scientists' individual interests in the study of those same human remains and items. The act divides the treatment of American Indian human remains, funerary objects, sacred objects, and objects of cultural patrimony into two basic categories. Under the inadvertent discovery and planned excavation component of the act and regulations, if federal officials anticipate that activities on federal and tribal lands after November 16, 1990 might have an effect on American Indian burials—or if burials are discovered during such activities—they must consult with potential lineal descendants or American Indian tribal officials as part of their compliance responsibilities. For planned excavations, consultation must occur during the planning phase of the project. For inadvertent discoveries, the regulations delineate a set of short deadlines for initiating and completing consultation. The repatriation provision, unlike the ownership

provision, applies to remains or objects discovered at any time, even before the effective date of the act, whether or not discovered on tribal or federal land. The act allows archaeological teams a short time for analysis before the remains must be returned. Once it is determined that human remains are American Indian, analysis can occur only through documented consultation (on federal lands) or consent (on tribal lands).

A criminal provision of the Act prohibits trafficking in Native American human remains, or in Native American "cultural items." Under the inventory and notification provision of the act, federal agencies and institutions that receive federal funds are required to summarize their collections that may contain items subject to NAGPRA. Additionally, federal agencies and institutions must prepare inventories of human remains and funerary objects. Under the act, funerary objects are considered "associated" if they were buried as part of a burial ceremony with a set of human remains still in possession of the federal agency or other institution. "Unassociated" funerary objects are artifacts where human remains were not initially collected by—or were subsequently destroyed, lost, or no longer in possession of—the agency or institution. Consequently, this legislation also applies to many Native American artifacts, especially burial items and religious artifacts. It has necessitated massive cataloguing of the Native American collections in order to identify the living heirs, culturally affiliated Indian tribes, and Native Hawaiian organizations of remains and artifacts. NAGPRA has had a dramatic effect on the day-to-day practice of archaeology and physical anthropology in the United States. In many cases, NAGPRA helped stimulate interactions of archaeologists and museum professionals with Native Americans that were felt to be constructive by all parties.

Slack Farm and Dickson Mounds

The 1987 looting of a 500-year-old burial mound at the Slack Farm in Kentucky, in which human remains were tossed to the side while relics were stolen, made national news and helped to galvanize popular support for protection of Native American graves.[11][12]Likewise, several protests at the Dickson Mounds site in Illinois, where numerous Indian skeletons were exposed on display, also increased national awareness of the issue.[13]

Return to the Earth project

Return to the Earth is an inter-religious project whose goal is to inter unidentified remains in regional burial sites.[14] Over 110,000 remains that cannot be associated with a particular tribe are held in institutions across the United States, as of 2006.[15] The project seeks to enable a process of reconciliation between Native and non-Native peoples, construct cedar burial boxes, produce burial cloths and fund the repatriation of remains. The first of the burial sites is near the Cheyenne Cultural Center in Clinton, Oklahoma.[15][16]

Controversial issues

Archaeologists are concerned that they are being prevented from studying ancient remains which cannot be traced to any historic tribe. Many of the tribes migrated to their territories at

the time of European encounter within 100–500 years from other locations, so their ancestors were not located in the historic territories.[17] Such controversies have repeatedly stalled archaeological investigations, such as in the case of the Spirit Cave mummy; fears have been voiced that an anti-scientific sentiment could well have permeated politics to an extent that scientists might find their work to be continuously barred by Native Americans rights activists.[18]

Kennewick Man

Compliance with the legislation can be complicated. One example of controversy is that of Kennewick Man, a skeleton found on July 28, 1996 near Kennewick, Washington. The federally recognized Umatilla, Colville, Yakima, and Nez Perce tribes had each claimed Kennewick Man as their ancestor, and sought permission to rebury him. Kennewick, Washington is classified as part of the ancestral land of the Umatilla.

Archaeologists said that because of Kennewick Man's great age, there was insufficient evidence to connect him to modern tribes. The great age of the remains makes this discovery scientifically valuable.[19] As archaeologists, forensic specialists, and linguists differed about whether the adult male was of indigenous origin, the standing law, if conclusively found by a preponderance of evidence to be Native American, would give the tribe of the geographic area where he was found a claim to the remains.[20] New evidence could still emerge in defense of tribal claims to ancestry, but emergent evidence may require more sophisticated and precise methods of determining genetic descent, given that there was no cultural evidence accompanying the remains.

One tribe claiming ancestry to Kennewick Man offered up a DNA test, and in 2015 it was found that the Kennewick man is "more closely related to modern Native Americans than any other living population." However, the remains still have not been released.[21]

International policies

Distinctive Marking of Cultural Property, Hague Convention

The issues of such resources are being addressed by international groups dealing with indigenous rights. For example, in 1995 the United States signed an agreement with El Salvador in order to protect all pre-Columbian artifacts from leaving the region. Soon after, it signed similar agreements with Canada, Peru, Guatemala, and Mali and demonstrated leadership in implementing the 1970 UNESCO Convention. The UNESCO convention had membership increase to 86 countries by 1997, and 193 by 2007. UNESCO appears to be reducing the illicit antiquities trade. It is not an easy business to track, but the scholar Phyllis Messenger notes that some antiquities traders have written articles denouncing the agreements, which suggests that it is reducing items sold to them.[22]

An international predecessor of the UNESCO Convention and NAGPRA is the 1954 Hague Convention for the Protection of Cultural Property in the Event of Armed Conflict.[23] The Hague Convention was the first international convention to focus on preserving cultural heritage from the devastation of war. Looting and destruction of other civilizations have been characteristics of war recorded from the first accounts of all cultures.

Minik Wallace (Kalaallit) in New York, 1897

On September 30, 1897, Lieutenant Robert Peary brought six Inuit people from Greenland to the American Museum of Natural History in New York, at the request of the anthropologist Franz Boas, in order to "obtain leisurely certain information which will be of the greatest scientific importance" regarding Inuit culture.[24] About two weeks after arrival at the museum, all six of the Inuit people became sick with colds and fever. They began to perform their tribal healing process and were mocked for their bizarre behavior. These people became a form of

entertainment for the Americans. By November 1, 1897, they were admitted to the Bellevue Hospital Center with tuberculosis, which they likely had contracted before their trip. In February, the first Inuit died and shortly after that two more followed. By the time the sickness had run its course, two men survived. Minik was adopted by a superintendent of the museum, while Uissakassak returned to his homeland in Greenland. Later, after being lied to and being told that his father Qisuk had received a proper Inuit burial, Minik was shocked to find his father's skeleton on display in the museum.

In 1993 the museum finally agreed to return the four Inuit skeletons to Greenland for proper burial. Representatives of the Museum went to Greenland that year to participate. In contrast to peoples in other areas, some local Inuit thought that the burial was more desired by the Christian representatives of the museum, and that the remains could have just as appropriately been kept in New York.[25] David Hurst Thomas' study of the case shows the complexity of reburial and repatriation cases, and the need for individual approaches to each case by all affected parties.[25]

Protecting cultural property

In the United States, the Archaeological Resources Protection Act (ARPA) protects archaeological sites on federally owned lands. Privately owned sites are controlled by the owners. In some areas, archaeological foundations or similar organizations buy archaeological sites to conserve associated the cultural property.

Other countries may use three basic types of laws to protect cultural remains:

- Selective export control laws control the trade of the most important artifacts while still allowing some free trade. Countries that use these laws include Canada, Japan, and the United Kingdom.
- Total export restriction laws are used by some countries to enact an embargo and completely shut off export of cultural property. Many Latin American and Mediterranean countries use these laws.
- Other countries, such as Mexico, use national ownership laws to declare national ownership for all cultural artifacts. These laws cover control of artifacts that have not been discovered, to try to prevent looting of potential sites before exploration.

2.3 Neolithic Revolution – Agricultural Revolution

A Sumerian harvester's sickle dated to 3,000 BC

The **Neolithic Revolution** or **Neolithic Demographic Transition**, sometimes called the **Agricultural Revolution**, was the wide-scale transition of many human cultures from a lifestyle of hunting and gathering to one of agriculture and settlement, allowing the ability to support an increasingly large population.[1] These settled communities permitted humans to observe and experiment with plants to learn how they grow and develop.[2] This new knowledge and ways led to the domestication of plants.[2]

Archaeological data indicates that the domestication of various types of plants and animals evolved in separate locations worldwide, starting in the geological epoch of the Holocene[3] around 12,500 years ago.[4] It was the world's first historically verifiable revolution in agriculture. The Neolithic Revolution greatly narrowed the diversity of foods available, with a switch to agriculture which led to a downturn in human nutrition.[5]

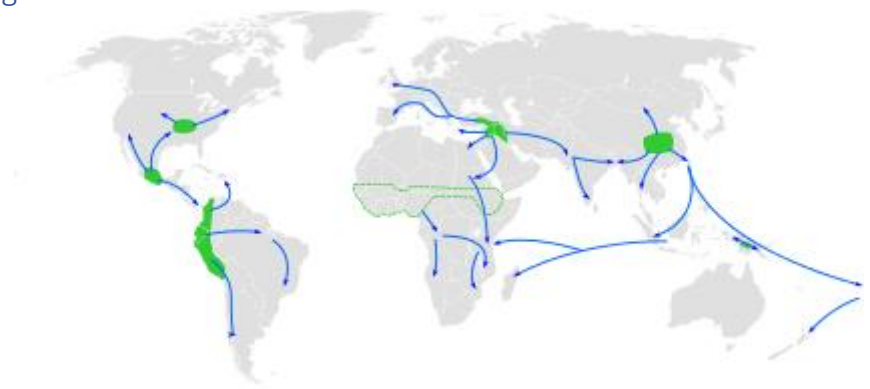
The Neolithic Revolution involved far more than the adoption of a limited set of food-producing techniques. During the next millennia it would transform the small and mobile groups of hunter-gatherers that had hitherto dominated human pre-history into sedentary (non-nomadic) societies based in built-up villages and towns. These societies radically modified their natural environment by means of specialized food-crop cultivation (e.g.,irrigation and deforestation) which allowed extensive surplus food production.

These developments provided the basis for densely populated settlements, specialization and division of labour, trading economies, the development of non-portable art and architecture, centralized administrations and political structures, hierarchical ideologies, depersonalized systems of knowledge (e.g., writing), and property ownership. Personal land and private property ownership led to hierarchical society, class struggle and armies. The first fully developed

manifestation of the entire Neolithic complex is seen in the Middle Eastern Sumerian cities (c. 5,500 BP), whose emergence also heralded the beginning of the Bronze Age.

The relationship of the above-mentioned Neolithic characteristics to the onset of agriculture, their sequence of emergence, and empirical relation to each other at various Neolithic sites remains the subject of academic debate, and varies from place to place, rather than being the outcome of universal laws of social evolution.[6][7] The Levant followed by Mesopotamia are the sites of the earliest developments of the Neolithic Revolution from around 10,000 BC. It has been identified as having "inspired some of the most important developments in human history including the invention of the wheel, the planting of the first cereal crops and the development of cursive script, mathematics, astronomy and agriculture."[8][9]

Agricultural transition



Map of the world showing approximate centers of origin of agriculture and its spread in prehistory: the Fertile Crescent (11,000 BP), the Yangtze and Yellow River basins (9,000 BP) and the New Guinea Highlands (9,000–6,000 BP), Central Mexico (5,000–4,000 BP), Northern South America (5,000–4,000 BP), sub-Saharan Africa (5,000–4,000 BP, exact location unknown), eastern North America (4,000–3,000 BP).[10]

Knap of Howar farmstead on a site occupied from 3,700 BC to 2,800 BC

The term Neolithic Revolution was coined in 1923 by V. Gordon Childe to describe the first in a series of agricultural revolutions in Middle Eastern history. The period is described as a

"revolution" to denote its importance, and the great significance and degree of change affecting the communities in which new agricultural practices were gradually adopted and refined.

The beginning of this process in different regions has been dated from 10,000 to 8,000 BC in the Fertile Crescent[4][11] and perhaps 8000 BC in the Kuk Early Agricultural Site of Melanesia[12][13] to 2500 BC in Sub-Saharan Africa, with some considering the developments of 9000–7000 BC in the Fertile Crescent to be the most important. This transition everywhere seems associated with a change from a largely nomadic hunter-gatherer way of life to a more settled, agrarian-based one, with the inception of the domestication of various plant and animal species—depending on the species locally available, and probably also influenced by local culture. Recent archaeological research suggests that in some regions such as the Southeast Asian peninsula, the transition from hunter-gatherer to agriculturalist was not linear, but region-specific.[14]

There are several competing (but not mutually exclusive) theories as to the factors that drove populations to take up agriculture. The most prominent of these are:

- The **Oasis Theory,** originally proposed by Raphael Pumpelly in 1908, popularized by V. Gordon Childe in 1928 and summarised in Childe's book Man Makes Himself.[15] This theory maintains that as the climate got drier due to the Atlantic depressions shifting northward, communities contracted to oases where they were forced into close association with animals, which were then domesticated together with planting of seeds. However, today this theory has little support amongst archaeologists because subsequent climate data suggests that the region was getting wetter rather than drier.[16]
- The **Hilly Flanks** hypothesis, proposed by Robert Braidwood in 1948, suggests that agriculture began in the hilly flanks of the Taurus and Zagros mountains, where the climate was not drier as Childe had believed, and fertile land supported a variety of plants and animals amenable to domestication.[17]
- The **Feasting** model by Brian Hayden[18] suggests that agriculture was driven by ostentatious displays of power, such as giving feasts, to exert dominance. This required assembling large quantities of food, which drove agricultural technology.
- The **Demographic theories** proposed by Carl Sauer[19] and adapted by Lewis Binford[20] and Kent Flannery posit an increasingly sedentary population that expanded up to the carrying capacity of the local environment and required more food than could be gathered. Various social and economic factors helped drive the need for food.
- The **evolutionary/intentionality theory**, developed by David Rindos[21] and others, views agriculture as an evolutionary adaptation of plants and humans. Starting with domestication by protection of wild plants, it led to specialization of location and then full-fledged domestication.
- Peter Richerson, Robert Boyd, and Robert Bettinger[22] make a case for the development of agriculture coinciding with an increasingly stable climate at the beginning of the Holocene. Ronald Wright's book and Massey Lecture Series A Short History of Progress[23] popularized this hypothesis.
- The postulated Younger Dryas impact event, claimed to be in part responsible for megafauna extinction and ending the last glacial period, could have provided

circumstances that required the evolution of agricultural societies for humanity to survive.[24] The agrarian revolution itself is a reflection of typical overpopulation by certain species following initial events during extinction eras; this overpopulation itself ultimately propagates the extinction event.

- Leonid Grinin argues that whatever plants were cultivated, the independent invention of agriculture always took place in special natural environments (e.g., South-East Asia). It is supposed that the cultivation of cereals started somewhere in the Near East: in the hills of Palestine or Egypt. So Grinin dates the beginning of the agricultural revolution within the interval 12,000 to 9,000 BP, though in some cases the first cultivated plants or domesticated animals' bones are even of a more ancient age of 14–15 thousand years ago.[25]
- Andrew Moore suggested that the Neolithic Revolution originated over long periods of development in the Levant, possibly beginning during the Epipaleolithic. In "A Reassessment of the Neolithic Revolution", Frank Hole further expanded the relationship between plant and animal domestication. He suggested the events could have occurred independently over different periods of time, in as yet unexplored locations. He noted that no transition site had been found documenting the shift from what he termed immediate and delayed return social systems. He noted that the full range of domesticated animals (goats, sheep, cattle and pigs) were not found until the sixth millennium at Tell Ramad. Hole concluded that "close attention should be paid in future investigations to the western margins of the Euphrates basin, perhaps as far south as the Arabian Peninsula, especially where wadis carrying Pleistocene rainfall runoff flowed."[26]

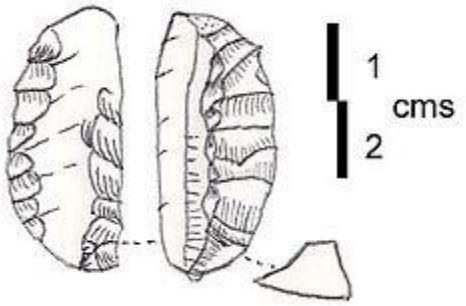
Domestication of plants

Neolithic grindstone for processing grain

Once agriculture started gaining momentum, human activity resulted in the selective breeding of cereal grasses (beginning with emmer, einkorn and barley), and not simply of those that would favour greater caloric returns through larger seeds. Plants that possessed traits such as small seeds or bitter taste would have been seen as undesirable. Plants that rapidly shed their seeds on maturity tended not to be gathered at harvest, therefore not stored and not seeded the following season; years of harvesting selected for strains that retained their edible seeds longer.

Several plant species, the "pioneer crops" or Neolithic founder crops were named by Daniel Zohary, who highlighted importance of the three cereals, and suggesting domestication of flax, pea, chickpea, bitter vetch and lentil came a little later. Based on analysis of the genes of

domesticated plants, he preferred theories of a single, or at most a very small number of domestication events for each taxa that spread in an arc from the Levantine corridor around the fertile crescent and later into Europe.[27][28] Gordon Hillman and Stuart Davies carried out experiments with wild wheat varieties to show that the process of domestication would have happened over a relatively short period of between twenty and two hundred years.[29] Some of these pioneering attempts failed at first and crops were abandoned, sometimes to be taken up again and successfully domesticated thousands of years later: rye, tried and abandoned in Neolithic Anatolia, made its way to Europe as weed seeds and was successfully domesticated in Europe, thousands of years after the earliest agriculture.[30] Wild lentils present a different challenge that needed to be overcome: most of the wild seeds do not germinate in the first year; the first evidence of lentil domestication, breaking dormancy in their first year, was found in the early Neolithic at Jerf el Ahmar (in modern Syria), and quickly spread south to the Netiv HaGdud site in the Jordan Valley.[30] This process of domestication allowed the founder crops to adapt and eventually become larger, more easily harvested, more dependable in storage and more useful to the human population



An “Orange slice” sickle blade element with inverse, discontinuous retouch on each side, not denticulated. Found in large quantities at Qaraoun II and often with Heavy Neolithic tools in the flint workshops of the Beqaa Valley in Lebanon. Suggested by James Mellaart to be older than the Pottery Neolithic of Byblos (around 8,400 cal. BP).

Selectively propagated figs, wild barley and wild oats were cultivated at the early Neolithic site of Gilgal I, where in 2006[31] archaeologists found caches of seeds of each in quantities too large to be accounted for even by intensive gathering, at strata datable c. 11,000 years ago. Some of the plants tried and then abandoned during the Neolithic period in the Ancient Near East, at sites like Gilgal, were later successfully domesticated in other parts of the world.

Once early farmers perfected their agricultural techniques like irrigation, their crops would yield surpluses that needed storage. Most hunter gatherers could not easily store food for long due to their migratory lifestyle, whereas those with a sedentary dwelling could store their surplus grain. Eventually granaries were developed that allowed villages to store their seeds longer. So with more food, the population expanded and communities developed specialized workers and more advanced tools.

The process was not as linear as was once thought, but a more complicated effort, which was undertaken by different human populations in different regions in many different ways.

Agriculture in the Fertile Crescent

Early agriculture is believed to have originated and become widespread in Southwest Asia around 10,000–9,000 BP, though earlier individual sites have been identified. The Fertile Crescent region of Southwest Asia is the centre of domestication for three cereals (einkorn wheat, emmer wheat and barley) four legumes (lentil, pea, bitter vetch and chickpea) and flax.[32] The Mediterranean climate consists of a long dry season with a short period of rain, which may have favored small plants with large seeds, like wheat and barley. The Fertile Crescent also had a large area of varied geographical settings and altitudes and this variety may have made agriculture more profitable for former hunter-gatherers in this region in comparison with other areas with a similar climate .

Finds of large quantities of seeds and a grinding stone at the paleolithic site of Ohalo II in the vicinity of the Sea of Galilee, dated to around 19,400 BP has shown some of the earliest evidence for advanced planning of plant food consumption and suggests that humans at Ohalo II processed the grain before consumption.[33][34] Tell Aswad is oldest site of agriculture with domesticated emmer wheat dated by Willem van Zeist and his assistant Johanna Bakker-Heeres to 8800 BC.[35][36] Soon after came hulled, two-row barley found domesticated earliest at Jericho in the Jordan valley and Iraq ed-Dubb in Jordan.[37] Other sites in the Levantine corridor that show the first evidence of agriculture include Wadi Faynan 16 and Netiv Hagdud.[4] Jacques Cauvin noted that the settlers of Aswad did not domesticate on site, but "arrived, perhaps from the neighbouring Anti-Lebanon, already equipped with the seed for planting".[38] The Heavy Neolithic Qaraoun culture has been identified at around fifty sites in Lebanon around the source springs of the River Jordan, however the dating of the culture has never been reliably determined.[39][40]

Agriculture in China

Northern China appears to have been the domestication center for foxtail millet (Setaria italica) and broomcorn millet (Panicum miliaceum) with evidence of domestication of these species approximately 8,000 years ago.[41] These species were subsequently widely cultivated in the Yellow River basin (7,500 years ago).[41] Rice was domesticated in southern China later on.[41] Soybean was domesticated in northern China 4500 years ago.[42] Orange and peach also originated in China. They were cultivated around 2500 BC.[43][44]

Agriculture in Europe

Szentgyörgyvölgy cow – 4500 BC

Tilling with Hungarian Grey cattles

The fertile Carpathian Basin was the place where Europeans survived the Ice Age. The territory between the Danube and the Tisza rivers was the powerhouse of the agricultural knowledge.

Agriculture in Africa

Nile River Valley, Egypt

On the African continent, three areas have been identified as independently developing agriculture: the Ethiopian highlands, the Sahel and West Africa.[45] By contrast, Agriculture in the Nile River Valley is thought to have developed from the original Neolithic Revolution in the Fertile Crescent. Many grinding stones are found with the early Egyptian Sebilian and Mechian cultures and evidence has been found of a neolithic

domesticated crop-based economy dating around 7,000 BP.[46][47] Unlike the Middle East, this evidence appears as a "false dawn" to agriculture, as the sites were later abandoned, and permanent farming then was delayed until 6,500 BP with the Tasian and Badarian cultures and the arrival of crops and animals from the Near East.

Bananas and plantains, which were first domesticated in Southeast Asia, most likely Papua New Guinea, were re-domesticated in Africa possibly as early as 5,000 years ago. Asian yams and taro were also cultivated in Africa.[45]

The most famous crop domesticated in the Ethiopian highlands is coffee. In addition, khat, ensete, noog, teff and finger millet were also domesticated in the Ethiopian highlands. Crops domesticated in the Sahel region includesorghum and pearl millet. The kola nut was first domesticated in West Africa. Other crops domesticated in West Africa include African rice, yams and the oil palm.[45]

Agriculture spread to Central and Southern Africa in the Bantu expansion during the 1st millennium BC to 1st millennium AD.

Agriculture in the Americas

Maize (corn), beans and squash were among the earliest crops domesticated in Mesoamerica, with maize beginning about 7500 BC, squash, as early as 8000 to 6000 BC and beans by no later than 4000 BC. Potatoes and manioc were domesticated in South America. In what is now the eastern United States, Native Americans domesticated sunflower, sumpweed and goosefoot around 2500 BC. At Guilá Naquitz cave in the Mexican highlands, fragments of maize pollen, bottle gourd and pepo squash were recovered and variously dated between 8000 and 7000 BC. In this area of the world people relied on hunting and gathering for several millennia to come. Sedentary village life based on farming did not develop until the second millennium BC, referred to as the formative period.[48]

Agriculture on New Guinea

Evidence of drainage ditches at Kuk Swamp on the borders of the Western and Southern Highlands of Papua New Guinea shows evidence of the cultivation of taro and a variety of other crops, dating back to 11,000 BP. Two potentially significant economic species, taro (Colocasia esculenta) and yam (Dioscorea sp.), have been identified dating at least to 10,200 calibrated years before present (cal BP). Further evidence of bananas and sugarcane dates to 6,950 to 6,440 BP. This was at the altitudinal limits of these crops, and it has been suggested that cultivation in more favourable ranges in the lowlands may have been even earlier. CSIRO has found evidence that taro was introduced into the Solomons for human use, from 28,000 years ago, making taro cultivation the earliest crop in the world.[49][50] It seems to have resulted in the spread of the Trans–New Guinea languages from New Guinea east into the Solomon Islands and west into Timor and adjacent areas of Indonesia. This seems to confirm the theories of Carl Sauer who, in

"Agricultural Origins and Dispersals", suggested as early as 1952 that this region was a centre of early agriculture.

Domestication of animals

When hunter-gathering began to be replaced by sedentary food production it became more profitable to keep animals close at hand. Therefore, it became necessary to bring animals permanently to their settlements, although in many cases there was a distinction between relatively sedentary farmers and nomadic herders. The animals' size, temperament, diet, mating patterns, and life span were factors in the desire and success in domesticating animals. Animals that provided milk, such as cows and goats, offered a source of protein that was renewable and therefore quite valuable. The animal's ability as a worker (for example ploughing or towing), as well as a food source, also had to be taken into account. Besides being a direct source of food, certain animals could provide leather, wool, hides, and fertilizer. Some of the earliest domesticated animals included dogs (East Asia, about 15,000 years ago),[51] sheep, goats, cows, and pigs.

Domestication of animals in the Middle East

Dromedary camel caravan in Algeria

The Middle East served as the source for many animals that could be domesticated, such as sheep, goats and pigs. This area was also the first region to domesticate the dromedary camel. Henri Fleisch discovered and termed the Shepherd Neolithic flint industry from the Bekaa Valley in Lebanon and suggested that it could have been used by the earliest nomadic shepherds. He dated this industry to the Epipaleolithic or Pre-Pottery Neolithic as it is evidently not Paleolithic, Mesolithic or even Pottery Neolithic.[40][52] The presence of these animals gave the region a large advantage in cultural and economic development. As the climate in the Middle East changed and became drier, many of the farmers were forced to leave, taking their domesticated animals with them. It was this massive emigration from the Middle East that would later help distribute these animals to the rest of Afroeurasia. This emigration was mainly on an east-west axis of similar climates, as crops usually have a narrow optimal climatic range outside of which they cannot grow for reasons of light or rain changes. For instance,

wheat does not normally grow in tropical climates, just like tropical crops such as bananas do not grow in colder climates. Some authors, like Jared Diamond, have postulated that this East-West axis is the main reason why plant and animal domestication spread so quickly from the Fertile Crescent to the rest of Eurasia and North Africa, while it did not reach through the North-South axis of Africa to reach the Mediterranean climates of South Africa, where temperate crops were successfully imported by ships in the last 500 years.[53] Similarly, the African Zebu of central Africa and the domesticated bovines of the fertile-crescent — separated by the dry Sahara desert — were not introduced into each other's region.

Consequence

Social change

It has long been taken for granted that the introduction of agriculture had been an unequivocal progress. This is now questioned in view of findings by archaeologists and paleopathologists showing that nutritional standards of Neolithic populations were generally inferior to that of hunter-gatherers, and that their life expectancy may well have been shorter too, in part due to diseases and harder work – hunter-gatherers must have covered their food needs with about 20 hours' work a week, while agriculture required much more and was at least as uncertain. The hunter-gatherers' diet was more varied and balanced than what agriculture later allowed. Average height went down from 5'10" (178 cm) for men and 5'6" (168 cm) for women to 5'5" (165 cm) and 5'1" (155 cm), respectively, and it took until the twentieth century for average human height to come back to the pre-Neolithic Revolution levels.[54] Agriculturalists had more anaemias and vitamin deficiencies, more spinal deformations and more dental pathologies.[55]

However, the decrease in individual nutrition was accompanied by an increase in population.

The traditional view is that agricultural food production supported a denser population, which in turn supported larger sedentary communities, the accumulation of goods and tools, and specialization in diverse forms of new labor. The development of larger societies led to the development of different means of decision making and to governmental organization. Food surpluses made possible the development of a social elite who were not otherwise engaged in agriculture, industry or commerce, but dominated their communities by other means and monopolized decision-making.[56] Jared Diamond (in The World Until Yesterday) identifies the availability of milk and/or cereal grains as permitting mothers to raise both an older (e.g. 3 or 4 year old) child and a younger child concurrently, whereas this was not possible previously. The result is that a population can significantly more-rapidly increase its size than would otherwise be the case, resources permitting.

Recent analyses point out that agriculture also brought about deep social divisions and in particular encouraged inequality between the sexes.[57]

Subsequent revolutions

Domesticated cow being milked in Ancient Egypt.

Andrew Sherratt has argued that following upon the Neolithic Revolution was a second phase of discovery that he refers to as the secondary products revolution. Animals, it appears, were first domesticated purely as a source of meat.[58] The Secondary Products Revolution occurred when it was recognised that animals also provided a number of other useful products. These included:

- hides and skins (from undomesticated animals)
- manure for soil conditioning (from all domesticated animals)
- wool (from sheep, llamas, alpacas, and Angora goats)
- milk (from goats, cattle, yaks, sheep, horses and camels)
- traction (from oxen, onagers, donkeys, horses, camels and dogs)
- guarding and herding assistance (dogs)

Sherratt argues that this phase in agricultural development enabled humans to make use of the energy possibilities of their animals in new ways, and permitted permanent intensive subsistence farming and crop production, and the opening up of heavier soils for farming. It also made possible nomadic pastoralism in semi arid areas, along the margins of deserts, and eventually led to the domestication of both the dromedary and Bactrian camel. Overgrazing of these areas, particularly by herds of goats, greatly extended the areal extent of deserts. Living in one spot would have more easily permitted the accrual of personal possessions and an attachment to certain areas of land. From such a position, it is argued, prehistoric people were able to stockpile food to survive lean times and trade unwanted surpluses with others. Once trade and a secure food supply were established, populations could grow, and society would have diversified into food producers and artisans, who could afford to develop their trade by virtue of the free time they enjoyed because of a surplus of food. The artisans, in turn, were able to develop technology such as metal weapons. Such relative complexity would have required some form of social organisation to work efficiently, so it is likely that populations that had such organisation, perhaps such as that provided by religion, were better prepared and more successful. In addition, the denser populations could form and support legions of professional soldiers. Also, during this time property ownership became increasingly important to all people. Ultimately, Childe argued that this growing social complexity, all rooted in the original decision to settle, led to a second Urban Revolution in which the first cities were built.

Disease

Llama overlooking the ruins of the Inca city of Machu Picchu.

Throughout the development of sedentary societies, disease spread more rapidly than it had during the time in which hunter-gatherer societies existed. Inadequate sanitary practices and the domestication of animals may explain the rise in deaths and sickness following the Neolithic Revolution, as diseases jumped from the animal to the human population. Some examples of diseases spread from animals to humans are influenza, smallpox, and measles.[59] In concordance with a process of natural selection, the humans who first domesticated the big mammals quickly built up immunities to the diseases as within each generation the individuals with better immunities had better chances of survival. In their approximately 10,000 years of shared proximity with animals, such as cows, Eurasians and Africans became more resistant to those diseases compared with the indigenous populations encountered outside Eurasiaand Africa.[60] For instance, the population of most Caribbean and several Pacific Islands have been completely wiped out by diseases. 90% or more of many populations of the Americas were wiped out by European and African diseases before recorded contact with European explorers or colonists. Some cultures like the Inca Empire did have a large domestic mammal, the llama, but llama milk was not drunk, nor did llamas live in a closed space with humans, so the risk of contagion was limited. According to bioarchaeological research, the effects of agriculture on physical and dental health in Southeast Asian rice farming societies from 4000 to 1500 B.P. was not detrimental to the same extent as in other world regions.[61]

Technology

During and after the Age of Discovery, European explorers, such as the Spanish conquistadors, encountered other groups of people who had never or only recently adopted agriculture.In his book Guns, Germs, and Steel, Jared Diamond argues that Europeans and East Asians benefited from an advantageous geographical location that afforded them a head start in the Neolithic Revolution. Both shared the temperate climate ideal for the first agricultural settings, both were near a number of easily

domesticable plant and animal species, and both were safer from attacks of other people than civilizations in the middle part of the Eurasian continent. Being among the first to adopt agriculture and sedentary lifestyles, and neighboring other early agricultural societies with whom they could compete and trade, both Europeans and East Asians were also among the first to benefit from technologies such as firearms and steel swords. In addition, they developed resistances to infectious disease, such as smallpox, due to their close relationship with domesticated animals. Groups of people who had not lived in proximity with other large mammals, such as the Australian Aborigines and American indigenous peoples, were more vulnerable to infection and largely wiped out by diseases.

In Summary

In this chapter you should learn what is *Archeological Anthropology* and the significance of their research methods including *finding a fieldsite, how they recover data, and how they date the data they find.* With all the fields of anthropology, ethics is an important aspect of research methodology. Especially for Archeologists, the repatriation of artifacts and human remains is a very important issue.

This chapter also briefly shows information from different cultural sites. As Archeologists are concerned with human artifacts, the remains of cultures, the Neolithic period marks an important turning point. Here we begin to see the effects of domestication of plants and animals.

•Archeological Anthropology

•Finding a fieldsite: (Surface Surveys, Shovel test pits, Geophysical Surveys)

•Data Recovery (Gridding, excavation, stratigraphy)

•Absolute Dating/ Dating Techniques (Radiocarbon (C14, Potassium-argon Obsidian hydration dating*)*

•Ethics (Repatriation)

•Neolithic

Summary Outline of this Chapter:

Outline:

2.2 Archeological Anthropology

Explore the "Society for American Archaeology"
Read section "What is Archaeology"
Look at FAQs

2.2a methods
Read and follow links : Source Society for American Archaeology: Archaeology for Educators: "Methods of Gathering Data"

Methods for Gathering Data

Historical Research Techniques (Archival Research, Oral History)
In the Field (Tools of the Trade, How do we find sites?, Surface Surveys, Shovel Test Pits, Geophysical Surveys, Evaluating Site Significance).
Data Recovery (Research Design, Gridding the Site, Excavating a Unit, Stratigraphy)
*In the Lab (*How Old is it? Analyzing Artifacts, Analyzing Features).
Resources (Historical Research Techniques, In the Field, Data Recovery, How old is it?, Analyzing Artifacts, Analyzing Features)

2.2b Example of a fieldsite
Explore and interact Dr. Samuel V. Connell's fieldsite in Belize. Look at the student blogs about their field experiences.
Read Dr. Connell's online article about fieldschools.

2.2c Ethics -- NATIVE AMERICAN GRAVES PROTECTION AND REPATRIATION ACT

2.3Tools Continued –
Neo-lithic Revolution, Agricultural Revolution

References by Section:

Methods -- reference

Society for American Archaeology
What is Archaeology? What do Archaeologists do?
https://www.saa.org/about-archaeology/what-is-archaeology

Ethics - Native American Graves Protection and Repatriation Act -- References

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