



INTRODUCTION TO ANTHROPOLOGY

ANTH 101
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Archaeology



1. The **scientific method**: **theories** (or *best-known realities*) support specific **hypotheses** (or *educated guesses*), for which the scientist must then seek **evidence** (or *intended proof*).

In anthropology there are specific

- **a) types of evidence**, and particular ways of
- **b) finding evidence**,
- **c) analyzing the evidence**, and
- **d) dating the evidence** that can tell us more about human beings of the past and present.

Methods have developed to help achieve all of these tasks...



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2. Archaeological Methods a. Types of Archaeological Evidence

i. Artifacts = human creations

Examples:

- ~ **Lithics (stone tools)**; only type of artifact available for 99% of human history!
- ~ **Ceramics** (technology developed roughly 10,000 years ago)
- ~ **Wood and Bone** (not durable like lithics)
- ~ **Metal and Glass** (primarily contemporary artifacts)



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a. Types of Archaeological Evidence



ii. Ecofacts = natural objects affected by humans

Examples:

- ~ **Bones** of animals people have eaten (teeth marks may be evidence – “scarring”)
- ~ **Pollen** from plants retrieved from the environment for human use ([Archaeo-palynology](#));
- ~ **Remains of insect and animal pests** (cockroaches and mice, e.g.)

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a. Types of Archaeological Evidence



iii. Fossils = impression or hardened remains of mineral deposits from animals or plants

Once in a great while, conditions are favorable for preservation. Useful sites include those covered by:

- **Volcanic ash**
- **Limestone**
- **Highly mineralized groundwater** (calcium deposits, particularly)

Since these sites are relatively rare, we don't have a complete fossil record.

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a. Types of Archaeological Evidence



iv. Features = an artifact not easily removable from a site.

Examples include:

- ~ **Hearths** - fire leaves charcoal and altered soil structure;
- ~ **Living floors** – soil compaction occurs from constant trampling;
- ~ **Buildings** – clearly not removable, but provide a lot of information

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b. Finding the Evidence

i. **Archaeological Sites:** known or suspected locations of human activity in the past

ii. Methods of discovery

- **Pedestrian Survey:** simply walking the site
- **Remote Sensing:** geomagnetics, ground penetrating radar

iii. **Site Disturbance:** sites can be used by humans more than once; how can we tell what's what?

Taphonomy: the study of the processes of site disturbance



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c. Analyzing the Evidence: Protect or Dig?

i. **Conservation** – preserving a site/artifact

Restoration – historical archaeology (eg. Yaxuna)

ii. **Excavation:** tedious, time-consuming and careful process; may disturb or destroy site.

Measurement of the size and weight of artifacts, written descriptions, photography, sketches and CAD record the site with great accuracy.



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iv. Types of Analysis:

1. Formal Analysis (Comparison)

(examines the *form* of an artifact/fossil and compares to a *typology*.)

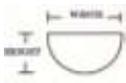
Ex: comparative bead identification
See p30 text for illustration.



2. Metric Analysis (Measurement)

Involves an exacting process of size, weight and other physical features.

See p31 text for illustration.



Formal Analysis **Metric Analysis**

Figure 2-1 (p. 30)
A Projectile Point Chronology from the Icehouse Bottom Site in Tennessee

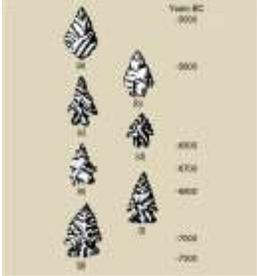
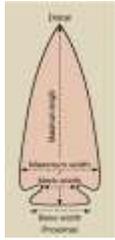


Figure 2-2 (p. 31)
Standard Metrical Measurements of Chipped Stone Tools



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d. Dating the evidence: accuracy is gained by cross-checking using *many* methods of dating



i. Relative methods: contextual
Geologic Stratigraphy and **indicator artifacts**
F-U-N trio - bones & teeth exposed to water:
Flourine⁺, Uranium⁺, Nitrogen⁻ = older

ii. Absolute (chronometric) methods
Chronometric (literally "measuring time") methods can give the researcher specific information regarding age of an artifact or fossil.

1. **Epigraphic Dating** (writing)
Historical documents can determine exact date information.
2. **Dendrochronology** (tree rings)
Can reveal climatic changes in relatively recent historical periods.

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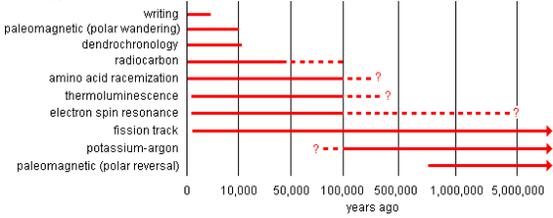
3. Paleomagnetism: measures changes in earth's magnetic field;
- **polar wandering** - 10,000 mya;
- **polar reversal** - 5 to 55 mya.

4. Thermoluminescence and Electron Spin
- **Thermo.:** good for objects heated in the past (hearths, meteorites, eg) ~100kya+
- **E. Spin:** good for delicate objects (wood, bone, eg) ~100kya+

5. Amino Acid Racemization
- There are basically two forms of amino acids: L and D. Living things only use the L-form. However, as soon as the creature dies, the *L-amino acids convert to the D-form* through a process called "**racemization**". Racemization rates are a sort of "clock" to determine the time of death. Good for ~ 100kya

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Date Ranges of Various Chronometric Methods



Archaeology VIDEO



Time Team America

Range Creek, Utah

Located in the remote Book Cliffs region of eastern Utah, Range Creek is the kind of site archaeologists dream about. The sage-covered meadows and rocky cliffs are scattered with the remnants of an ancient people: pit houses half-buried in the sand, mysterious petroglyphs scratched into the rock walls and bits of pottery and stone tools lying where they were dropped over a thousand years ago. Best of all, most of the hundreds of archaeological sites remain virtually untouched, providing a rare opportunity to find out what may have happened to the Fremont people who once flourished here. Time Team probes the ground, scales the cliffs and learns what life was like in these canyons a thousand years ago.
