ARCHAEOLOGY

Archaeology

- Understanding the human past through the physical manifestation of human activity
- Studies:
    - Material culture
    - Ancient ways of life
    - Cultural change
    - Cultural diversity in the past

CRM

- Cultural resources management
- Archaeology as a profession, rather than for research

Long term perspectives

- Learning about the past so as not to repeat it

Social Justice

- Archaeology provides a less biased version of the past
    - People use biased versions to justify current inequality
- History is written by the victors
    - Archaeology can tell the stories of marginalized groups
- Gaining information about the slave experience
    - African cultural traditions

Ethical issues

- Access to human remains and sacred objects in colonial contexts
- Scientific importance vs. cultural importance
- Looting and the antiquities trade
- Heritage tourism and conservation
    - Lascaux
    - They made a faux one because people would wear away the cave paintings with their moisture and humidity that caused mold
- Destruction of antiquities during military conflict or by political regimes

Major events on the human journey

- Origins of art
    - Upper paleolithic
    - Art for arts sake

- Origins of agriculture
    - Domestication of plants and animals
        - Symbiotic relationship
    - Developed because of:
        - Population pressure
        - Environmental change
        - Social concentration
    - Positive outcomes
        - Larger labour force
        - Increased social complexity
    - Negative outcomes
        - Reduced diversity of resources
        - Larger populations can sustain infectious diseases
        - Environmental degradation
- Origins of civilization
    - Cities
        - The settlement of people into cities
    - Civilization
        - The linkage of cities in a hierarchy to form states
    - Made possible by the development of agriculture
    - Permanent settlements
    - Development of social inequity

Importance of context

- What can things tell us about people
    - Safety pin - style or function?
- Looting and illegal selling of artifacts takes away their context from an archaeological/interpretive perspective

Artifacts

- Portable objects made, modified, or used by people

Ecofacts

- Non-artifactual environmental remains related to human activity
    - I.e. animal remains, bones, and seeds
- Environmental reconstruction
    - Pollen analysis
        - Tracks change in relative abundance of species
            - Types of trees and their abundance can tell the climate

        - Indicator species
            - Small, less mobile species called microfauna are sensitive indicators
                - Rarely eaten
                - More likely to have arrived on site due to natural processes rather than human transport
                - Therefore they reflect the local environment
                    - I.e. land snails are only found in areas with high levels of calcium carbonate in the soil
                - Certain animals thrive in certain environments
- Reconstructing social organization
    - People of different status had differential access to food resources
    - Different kinds of animal remains found in respective areas show their eating habits

Features

- Non-portable artifacts
    - I.e. ditch, pathway, rings at stonehenge

Sites and cultural landscapes

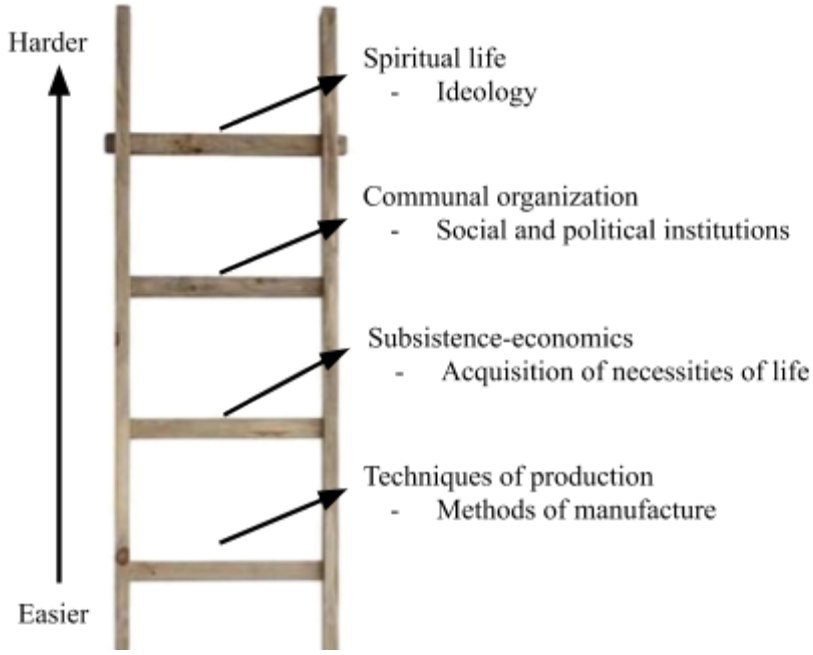
- Site
    - Any location in which physical evidence of human activity exists
- Cultural landscape
    - Illustrative of the evolution of human society and settlement over time, under the influence of the physical constraints or opportunities provided by the natural environment

Excavation

- Recording
    - Record 3D provenience using a datum and a grid
- Stratigraphy
    - The layers of soil and other material that comprise an archaeological site
        - Natural and cultural strata
- Law of superposition
    - Where one stratum overlies another, the lower one was deposited first
    - Bottom up chronologically
    - Can be modified by human activity

Hawkes ladder of inference

- Some kinds of behaviour are easier to reconstruct based on the material record



Relative dating

- Place objects in chronological order

Absolute dating

- Provide chronological age of an object
    - Ex. radiocarbon dating, tree ring dating

Seriation

- Artifacts from numerous sites in the same culture are placed in chronological order

Radiocarbon dating

- Measures the decay of the radioactive form of carbon

Middle range theory

- Things that we can observe today that organize the material record can be used to help explain how the material record was produced in the past
- Ethnographic analogy

    - Similarities between living groups and patterns observed in the archaeological record
    - E.g. Native American groups use localized pottery styles, women were responsible for ceramic production, matriarchal society. An archaeological group has the same pattern, we use the Native American analogy to assume they also had a matriarchal structure
    - How they did things relates so social organization
- Ethnoarchaeology
    - Study the use of material culture in living cultures
- Experimental archaeology
    - Attempting to recreate something using the same techniques available at the time to understand how they made it

Subsistence categories

- Foraging hunter-gatherers
    - Food comprised of wild plants and animals that they collect themselves
    - Mobile, small communities
- Pastoralism
    - Subsistence based on the herding of animals such as cattle, sheep, goats, and pig
    - Rely on secondary products
        - Don't kill the animal often
        - Milk, wool, hides, etc.
- Horticulture
    - Subsistence based on plant cultivation with hand tools only
    - Growing crops, domestication
    - Still some hunting and gathering
    - Higher food yields
- Agriculture
    - Intensive plant cultivation, often with the use of animals to assist in the preparation of fields
    - Raised field agriculture
    - Surplus food production

Wild vs domesticated

- Humans control the breeding of plants and animals for selected traits
- Plants
    - Increased seed size
    - More seeds
- Animals

    - Smaller body size
    - Fewer adult males

Survey

- Aims
    - Locating sites
    - Investigating sites without large scale excavation
- Degrees of information
    - Limited
    - How many sites, how big are they, what's the general layout
- Recording/maps
    - Topographic maps
    - GPS
    - Google earth

Targeted vs. random sampling

- Targeted
    - Uses prior knowledge of landscape to guide where to survey/excavate
    - Look in areas where experience suggests you're likely to find sites
    - Advantages
        - Increased chances of finding sites
        - Can avoid difficult or inaccessible terrain
    - Disadvantages
        - Unlikely to find anything that doesn't meet your targeted criteria
        - Can't generalize about the rest of the landscape
- Random
    - Divides survey area into equally sized units, then randomly selects units to survey
    - Advantages
        - Results can be extrapolated to a whole study area
        - More likely to locate a variety of sites
    - Disadvantages
        - More time-consuming and expensive

Non-invasive survey techniques

- Local knowledge
- Fieldwalking
- Aerial photography/satellite imaging
- Geophysical surveying (underground)

Invasive survey techniques

- Coring
- Test pitting
- Wholesale excavation

Research questions at different spatial scales of analysis

- Region
- Site
- Dwelling

GIS

- Geographic information system
- Computerized system for bringing together info (satellite photos, aerial photos, topographic maps, etc.)

Socio-political organization

- Band
    - Mobile, egalitarian, flexible leadership
    - No differentiation in status
    - Temporary shelters
- Tribe
    - United group of independent communities
    - Informal leadership
    - Indications of social differentiation
- Chiefdom
    - Local group(s) under the control of a chief
    - Hierarchical
    - Permanent houses
    - Domesticated diet sources
- State
    - Like a chiefdom
    - Has a formal government
    - Systems of writing
    - Cities
    - Elaborate social stratification
    - Military specialists
- Empire
    - One state exercises control over other groups within a broad territory
    - Expansion through military power

    - Widespread formal planned architecture

Social status

- Differential access to food
    - Higher social status = better or rarer food
- Dwelling size, structure, and organization
    - E.G. compounds for the elite, smaller town for lower classes
- Prestige goods
    - Rare, expensive, or imported

Feminism in anthropology

- Archaeologists were overlooking women's roles in the past
- Imposing present day gender inequalities
- How gender intersects with other social categories
- Critique of missing women
- "Finding women"
- Self-reflexivity
- Contribution of this new paradigm
    - Opened the door to study other overlooked groups
    - New narrative
    - Different way of presenting archaeological info
    - Reaches different audiences

Mortuary practices

- Gives sight into the organizational structure/complexity of a society
- As much about the living as the dead
- Can be an indicator of a deceased's status and roles in life
- Interment
    - The actual burial of an individual
    - Look for:
        - Number of individuals
        - Body position
        - Grave orientation
- Mummification
- Secondary burial
    - A body is reburied
    - Usually gathered and buried in collective graves
        - Emphasizes community identity
- Cremation

BIOLOGICAL ANTHROPOLOGY

Four fields of anthropology

- Paleopathology
    - The study of ancient diseases
- Primatology
    - The study of all non-human primates
- Human biology
    - Thinking about why humans differ
- Bioarchaeology
    - The study of human remains in archaeological contexts

Anthropological perspective

- Holistic
    - All aspects of human life interact in complex ways
- Comparative/qualitative
    - Similarities and differences among the widest range of societies to make conclusions about human nature, human society, and the human past
- Embraces cultural relativism
    - Non-judgemental approach to examining cultural beliefs and behaviours
    - Promoting the understanding of cultural practices

Long term perspective

- Human anatomy and adaptation
- Capacity for communication (language) and art
- Susceptibility to disease; disease patterns

Social justice

- There are no biologically distinct races
- Race is a cultural concept invented to separate and oppress
- Criminal investigations

Advocacy for non-human primates

- Environmental protection
- Galdikas, Goodall, Fossey

Linnaeus

- Created genus/species nomenclature
- Taxonomy

    - Classifying and naming things

Lyell

- Popularized uniformitarianism
    - Earth's surface has been and will be subject to slow, gradual change
    - Organisms also experience slow changes

Lamarck

- Law of use/disuse
    - If you use certain body parts or muscles, they build up
    - If you stop using them they will waste away
- Law of inherited acquired characteristics
    - The biological advantages that you develop will be passed on to your offspring
    - If you're ripped the baby is gonna be jacked
    - Untrue

Darwin

- Principles of variation
    - Members of a population are different from one another
        - No exact replicas
        - Variations are random
- Principle of heredity
    - Offspring inherit variations from their parents
- Principle of natural selection
    - Some variations are beneficial when the environment changes
    - Individuals possessing beneficial variations are more likely to survive and reproduce

Mendel

- Grew and studied pea plants
- Phenotype
    - Observable characteristics or traits
- Genotype
    - The genetic makeup of an organism
- Dominant and recessive genes
- Mendelian inheritance
    - For a given trait, an individual will get one "particle" from each parent
    - Particles/traits do not blend

    - Inheriting a particle for one trait does not determine which particle you will inherit from another trait
    - Particles are now called genes or alleles
        - A portion of DNA that codes for a particular trait

Evolution

- A change in the frequency of traits in a population over multiple generations

Importance of understanding human skeletal anatomy

- To make informed comparisons
    - Differences and similarities among humans and non-human primates
- To differentiate human remains from other skeletal material
- To read information about age, health, diet, roles in life, manner of death, etc.
    - What can we learn about that person's life, relationships, and community

Paleoanthropology

- The study of human evolution using the fossil record

Hominid

- All modern AND extinct GREAT apes. Gorillas, chimps, orangutans and humans, and their immediate ancestors. Not gibbons.

Hominin

- Any species of early humans that is more closely related to humans than chimpanzees, including modern humans themselves
    - Homo and australopithecus are the two most definite

Key skeletal features of bipedalism

- Habitually walking on two legs
- Legs angle inwards
- Spinal cord connects to the middle of the skull

Ardipithecus ramidus

- First evidence of bipedalism
- Grasping toe
- Transitional hominin between bipedal locomotion

Australopithecus afarensis

- Lucy

- No grasping toe
- Legs angles in for bipedal walking
- Still very ape-like, just bipedal
- Evidence of the commitment to walking bipedally

Neanderthals

- Features
    - Bigger skull/teeth
    - Shorter limbs
    - More robust
    - More muscle
- Culture
    - Language
    - Tools, fire, hunting
    - Buried their dead
- Bred with homo sapiens

How homo sapiens spread in the old world

- Interbred with other human ancestor populations (homo erectus and homo neanderthalensis, etc)
- Evolved in Africa and moved out of Africa into other places around the globe

Micro vs macro evolution

- Macro
    - Origins of new species and diversification across millions of years of geological time
    - Ex. the emergence of homo sapiens
- Micro
    - Changes that occur within a species over a “short” period of time
    - Results in increased variation
    - Does not result in a new species
    - Individuals/groups differ because of different proportions of genes

Four ways that humans can respond to environmental stress

- Genetic
- Developmental adjustment
    - In warmer regions, people are more slender whereas in colder regions people have more body mass
- Acclimatization

    - More tan in a sunny place
    - In a high altitude your respiration adjusts
- Cultural practices/technology
    - Body modifications
    - Inventing winter coats, scuba suits, space suits, allow us to survive in harsh environments

Four forces of evolution (genetic change)

- Mutation
    - Random changes in the genetic code produce new alleles
    - E.g. Lactose intolerance
- Gene flow
    - Population expansion due to migration of outsiders from another population
    - E.g. colonization of the americas, slave trade
        - Forced gene flow, still the introduction of new traits into a population that otherwise would not have met
- Genetic drift
    - Bottleneck effect
        - A sudden reduction in the population size randomly changes gene frequencies from one generation to the next
        - E.g. natural disasters, widespread disease
    - Founder effect
        - Gene frequencies change when a small population establishes itself as separate from the larger population
        - E.g. “New France”
            - Colonizers from france moved to Quebec
            - Rare genetic traits such as high cholesterol
- Natural selection
    - Some variants are beneficial to environmental changes
    - E.g. Humans with type O blood were more susceptible to the plague
        - Low frequency of type O blood in areas of the world that were affected by ancient plague outbreaks

Continuous distribution

- Traits change imperceptibly from one member of the population to the next
- Many, many phenotypes

Clinal variation

- Gradual change in the variation of phenotypes from one geographical region to another

Evolutionary drivers of human skin colour adaptations

- Location on the globe
- Darker skin is advantageous in regions where there is a lot of sun
    - Melanin shields and protects the skin from sun damage
    - Melanin protects from the breakdown of folate
- Lighter skin is advantageous in northern latitudes where there is less solar radiation
    - Allows for healthy vitamin d production
    - Melanin limits vitamin d production

Bioarchaeology

- The study of human skeletal remains and the means by which individuals died
- Studies bones, teeth, hair, skin, nails, coprolites, etc.

Goals

- Cultural behaviours
    - Diet, religion, health care
- Social stratification
    - Burial practices, dietary differences
- Division of labour
    - Men vs women, young vs old
- Warfare/violence
    - Social conflicts, weapons
- Migration and ethnicity
    - How people move around the landscape, relatedness

Skeletal determinations of sex

- Men have narrower pelvises

Paleopathology

- The study of trauma, diseases, and disorders in ancient human remains
- Types of observable pathology:
    - Syphilis
        - Sexually transmitted
        - Skin lesions, rash, and then bone changes
        - Sunburst lesions on frontal bone of skull
    - Leprosy
        - Bacterial infection
        - Skin lesions and loss of sensation

        - Bone is resorbed at the nose, fingers, and toes
- Osteological paradox
    - Health is not always based on the presence or absence of disease evidence
    - Health/disease can exist with or without skeletal evidence

Paleodiet

- Studies dietary practices of ancient populations
    - What we think is acceptable to eat
    - Access to food
    - Religious diets
- Stable isotope analysis
    - Measure carbon and nitrogen in the skeleton
    - Tissues analyzed are bone, collagen, teeth, and hair

Distinguishing characteristics of all primates

- Prehensile hands with five digits
    - Opposable thumbs and toes
    - Nails, not claws
- Skull features
    - Large brains relative to body size
    - Forward-facing eyes
- Typically single offspring
    - Long infant dependency
- Socially learned behaviours

Why did primates evolve

- Exploiting a new ecological niche - life in trees
    - Protection from predators
    - Insect predation and consumption of plant parts

Evolutionary body trends

- Increase in brain size
    - Relative to body size
    - Increase in complexity
- Reduction in the projection of the face
- Less reliance on smell, more on sight
- Less teeth

Major categories of primates

- Strepsirhini (prosimians)
- Haplorhini (most primates)
    - Catarrhini
    - Platyrrhini

Prosimians

- Better sniffers
- More reliant on smell
- Worse vision
- Some are nocturnal
    - E.g. Lemurs and lorises

New World monkeys (platyrrhini)

- Small body size
- Some have prehensile tails (used to grasp)
    - E.g. Spider monkeys, howler monkeys
- Rafted using debris to float across the ocean

Old World monkeys (catarrhini)

- Ischial callosities
    - Big ol' butts
- Example
    - Baboons

Lesser apes (catarrhini)

- Long arms
- Monogamous (no sexual dimorphism)
- Most vocal primates
    - Mating and warning calls
- Example
    - Gibbons

Great apes (catarrhini)

- Orangutans
    - Largely solitary
    - Sexual dimorphism
    - Flanged and unflanged
- Gorilla

    - Sexual dimorphism
    - Social structure
- Chimpanzees
    - Closest living relative to humans
    - Hierarchical, male-dominated, aggressive behaviour
    - Tool use and hunting
- Bonobos
    - Egalitarian, female-dominated, less aggressive
    - Sex for conflict resolution and social cohesion

When did humans last share a common ancestor with…

- Chimps
    - 7 million years ago
- All great apes
    - 18 million years ago

Why do we study non-human primates

- Critically evaluate popular, pseudo-scientific, and anti-scientific ideas about humans, other primates, and the past
    - E.g. bigfoot
- To better understand the conditions under which evolutionary changes occur
    - Natural selection
    - Variability in biological adaptation to conditions
    - Relationship between diet and primate biology
- To observe how ancestor primates may have lived (window to our past)
    - Reconstruct their lives and behaviours
    - Group size, food strategies, settlement strategies, social/political behaviours
- To save non-human primates from the threat of extinction
    - Habitat destruction, bushmeat trade, illegal trade
    - Advocacy for endangered species
    - Environmental protection