

ANTA01 Final Notes

Introduction to Anthropological Principles

Hominins – members of evolutionary group that includes modern humans

We know they exist because of fossilized footprints and skeletons through anatomical analysis

Anthropology – field of inquiry that studies human culture and evolutionary aspects of human biology – archaeology, linguistics, physical, biological, cultural anthropology are all subfields.

Culture – behavioral aspects of human adaptation, including tech, traditions, language, religion, marriage, social roles, etc.

Biocultural Evolution – the concept that biology makes culture possible through mutual interactive evolution

Cultural Anthropology – study of belief and behavior found in modern and historical cultures

Linguistic Anthropology – study of relationship between human speech and language and diff aspects of cultures

Archaeology – scientific recovery, analysis, and interpretation of the material remains of past societies

Physical anthropology – study of human biology within the framework of evolution with an emphasis on biology and culture

Paleoanthropology – study of anatomical and behavioral evolution as revealed in the human fossil record

Ethnographies – detailed descriptive studies about human societies

Scientific Method – hypothesis, developing research design, using empirical data, and verifying/falsifying the hypothesis. Through time this becomes a **theory** after extensive testing

Ethnocentric – viewing other cultures from the inherently biased principles of one's own culture

Development of Evolutionary Theory

Ethnocentric – viewing other cultures from the inherently biased principles of one's own culture

Natural Selection – Darwin's idea that genetic changes in the frequencies of certain traits in population are due to differential reproductive success between individuals. Alfred Wallace also reached same conclusion

Fixity of species – the idea that species once created never change, opposes evolution (Church)

Reproductively Isolated – cannot reproduce with other types of animals, thus fixing them into a **species**

Binomial Nomenclature – Carolus Linnaeus, species are referred to by genus and species (*homo sapiens*) in his **Systema Naturae**

Taxonomy – classifying organisms on basis of evolutionary relationships

Linnaeus – believed in fixity of species, classified plants and animals using binomial nomenclature *Systema Naturae*

Georges-Louis Leclerc – recognized that different regions had different flora/fauna, climate/env was a factor of change *Histoire Naturelle*

Eramus Darwin – all life comes from the sea, and species have to be descended from a common ancestor

Jean-Baptiste-Lamarck – dynamic relationship between animal/environment, if environment changed then animal activity changes too. His idea was that giraffes evolve to have longer necks to reach tree leaves.

Georges Cuvier - idea of catastrophism, view that earth's geological landscape is result of violent cataclysmic events

Thomas Malthus – *Principles of Population* in nature animals increase in population but food remains constant, and population is held in check by food availability

Charles Lyell – uniformitarianism, theory that earth's features are the result of long-term processes that continue to operate now as they did in the past

Mary Anning – collected marine fossils that lead to an understanding that the earth was ancient

Darwin – saw changes in the beaks of Galapagos finches and came to the idea of natural selection. Wrote *On the Origin of Species*

Natural selection depends on –

fitness, a measure of relative reproductive success of individuals

reproductive success, the number of offspring an individual produces and rears to reproductive age

and selective pressures, forces in environment that influences reproductive success

Directional Selection - Selection pressure acts at one end of population - Mean value shifts in one direction

Stabilizing Selection - Selecting pressure reduces numbers at both ends of population - Mean remains the same but number at each extreme is decreased

Disruptive Selection - Selection pressure increases numbers at both ends of population but decreases in the middle (Bimodal peaks)

Biological Basis of Life

Eukaryotic cell – single celled organisms, 1.7B years ago, found in multicellular organisms. It was carbs, lipids, nucleic acids, and proteins.

Nucleus – an organelle that exists in all eukaryotic cells, contains DNA and RNA, surrounded by cytoplasm

Ribosomes/Mitochondria – essential to protein synthesis (manufacturing proteins). Mitochondria contain mtDNA mitochondrial DNA

Somatic Cells – all other cells in body except reproduction

Gametes – reproductive cells (eggs and sperm), joins to form **zygote**

G-C A-T – Guanine, Cytosine, Adenine, Thymine the foundational bases to DNA (the bridges). The sides are sugar/phosphate groups

Protein – important molecules that help the body function (hemoglobin, hormones, etc.) made out of amino acids, 20 in total.

Messenger RNA (mRNA) – RNA that's assembled on DNA bases, carrying DNA code to ribosomes during protein synthesis

DNA triplets – specify an amino acid, for example (CGA) is amino acid arginine

mRNA triplets – code specific amino acids during protein synthesis, called **CODONS**. In this the GCAT -> GCAU (U<>T)

tRNA triplets – encode for proteins, called **ANTICODONS**

Gene - A sequence of DNA bases that specifies the order of amino acids in an entire protein, a portion of a protein, or any functional product (e.g., RN A). A gene may be made up of hundreds or thousands of DNA bases organized into coding and noncoding segments

One-Gene One-Protein hypothesis – the fundamental model for biology before, but with recent sequencing has been invalidated

Genome – the entire genetic makeup of a individual or species

Noncoding DNA – DNA that does not direct production of proteins, but may produce other molecules, JUNK DNA 98%

Exons - Segments of genes that are transcribed and are involved in protein synthesis.

Introns – segments of genes that are initially transcribed then deleted

Regulatory Genes – molecules that only act to control the expression of other genes (direct embryonic development, etc.)

Homeobox genes – a type of regulatory gene, one time called Hox directs segmentation of the body during embryonic development

All humans have 22 pairs of autosomes and 1 pair of sex chromosomes (23 in all)

Chromosome – discrete structures composed of DNA + proteins that are found in nucleus, visible only during phases of cell division, they are two strands of DNA molecules joined together at a constricted area called a **centromere**, due to DNA replication

Autosome – all chromosomes except sex chromosomes

Sex Chromosomes – the X and Y chromosomes

Mitosis – cellular division in somatic cells

Meiosis – produces gametes, specialized cells produce sperm/eggs (which have 23 chromosomes instead of 46 pairs, because they need to join in procreation).

Nondisjunction – failure to separate in chromosomes, one daughter cell gets two and another gets none

Trisomy – unites with a normal gamete resulting in 45 or 47 chromosomes instead of 46

Genetic Drift – the random changes of genetic material as matter of chance through different generations

Founder effect is the loss of genetic variation that occurs when a new population is established by a very small number of individuals from a larger population

Bottleneck effect – a restriction in genetic variability with a decrease in population size resulting from random factors (e.g. disease)

Gene flow – interexchange of genes between populations making the populations more similar

Blending Inheritance – alleles blend towards a combined appearance

Particulate Inheritance – alleles only inherit one real function

Alleles – alternate forms of a gene (smooth/wrinkled)

Homozygous – possessing two of the same allele | **Heterozygous** – possessing two different alleles

Phenotype – the observable or detectable phenomenon

Genotype – the genetic makeup of an individual

DNA was founded mainly by Gregor Mendel, Francis Crick, James Watson, and Rosalind Franklin

Processes of Macroevolution

Classification – the biological ordering of organisms into categories such as orders, families and genera to show evolutionary relationships

Homologies – structures similar in animals descendent from a common ancestor

Analogies – independently developed similar traits that are based on common function

Homoplasy – the separate development of similar characteristics

Evolutionary Systematics – an approach to classification and evolution which presumed ancestors and descendants are traced in time by analysis of homologous characters

Cladistics – an approach to classification that attempts to make a rigorous evolutionary interpretations based solely on analysis of certain types of homologous characters (those considered to be derived characters).

Clade – lineages that share a common ancestor

Ancestral/Primitive – a characteristic seen in two organisms is inherited in both of them from a distant ancestor

Derived/Modified – characteristics that are derived and modified from the ancestral condition and diagnostic of evolutionary lineages

Shared derived Relating to specific character traits shared in common between two life-forms and considered the most useful type of characteristic for making evolutionary interpretations.

Traditional evolutionary systematics illustrates the hypothesized evolutionary relationships using a phylogeny, more properly called a **phylogenetic tree**. Strict cladistic analysis, however, shows relationships in a **cladogram**

Biological Species Concept – a group of individuals capable of fertile interbreeding but reproductively isolated from other such groups

Speciation – the process in which species diverge, and a new species arises (e.g. baboon and river)

- Allopatric speciation (isolated geographically and diverge into 2+ species)
 - Parapatric speciation (limited overlap in ranges)
 - Sympatric speciation (overlapping ranges)
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Fossils – traces or remains of organisms that are found in geological beds on the earth's surface

Taphonomy – study of how bones and other materials come to be buried in the earth and preserved as fossils

Epoch – categories of the geological time scale

Adaptive Radiation – the rapid expansion and diversification of life-forms into new ecological niches

Sexual selection – selection process that only happens on one sex, usually due to reproductive attractiveness (plumage, etc.)

An Overview of the Primates

Primates – mammalian order of monkeys, lemurs, lorises, apes, and humans

- **Limbs and Locomotion** – a tendency towards an erect posture, for sitting, leaping, standing, and bipedal locomotion
 - **Generalized Limb Structure**
 - **Prehensile hands/feet**
 - **Retention of five digits**
 - **Opposable thumbs**
 - **Nails instead of claws**
 - **Tactile pads at end of digits**
 - **Teeth** – lack of dietary specialization (omnivorous), teeth are 2.1.2.3 for old world, 2.1.3.3 for new world monkeys
 - **Rely heavily on vision and less on smell** – color vision (except nocturnal), depth perception, expansion in complexity of brain
 - Human and ape DNA diverged 6-7 MYA in lineage
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Separation from monkeys (apes and humans):

- Generally larger body size

- No tail
- Shorter and more stable lower back
- Arms longer than legs
- Anatomical differences in shoulder joint
- More complex behavior
- More complex brain
- Increased period of infancy

Depletion – due to habitat destruction, human hunting, and live capture for export/local trade

Primate Behavior

Behavioral ecology – the study of the evolution of behavior emphasizing the role of ecological factors as natural selection

Social structure may be influenced by:

- Body size
- Basal metabolic rate
- Diet
- Distribution of resources
- Predation
- Dispersal
- Life history
- Activity patterns
- Human activities

Primate social strategies

- Dominance
 - o **Dominance hierarchies** are individuals are ranked relative to one another in a social group
- Communication
 - o Facial expressions, vocalizations, stares, yawns, etc.
 - o **Grooming** is indicative of submission or reassurance
 - o **Displays** are repetitious behavior serving to communicate emotional states
- Aggressive interactions
 - o **Affiliative behaviors** – amicable associations between individuals
 - o Often used to establish dominance, territories
 - o Chimpanzees are very violent in regards to this
- Affiliation and Altruism

K-selected adaptative strategy whereby individuals procure relatively offspring and care for them increasing survival rate

R-selected a reproductive strategy that emphasizes relatively large numbers of offspring and reduced parental care

Culture

- Apes can make and use tools
- Apes have communicative and cultural abilities
- Apes can care for their offspring

Frugivore= primarily eat fruits : Spiders, monkeys **Folivore**= primarily eat leaves Howler monkeys **Insectivore**= primarily eat insects

Gumnivore= primarily eat plant gum

NOVA Movie Guide

Tropics Fossilize Poorly? Due to climate being too wet, lots of oxygen and water leads to decomposition at a high rate

Coasting Out Africa? This hypothesis suggests people were once inhabitants of Africa who developed various traits (fishing, etc) which led them to leave and expand. The evidence for this was the flint used to create stone tools, as thousands of stone were found. A Nubian point was found to back this evidence too; which was found in Oman.

If they were not following the coast, what were people following into Arabia?

The people were following rivers into Arabia because they were curious as they were constant sources of fresh water and food.

For the approx. 100Ky/o specimen from China, what part of the mandible was considered particularly informative about its ancestry?

The jaw was considered particularly informative about its ancestry because of the angle of the chin and the size.

What material only in Asia to make tools? Why didn't we find tools of this material in archaeological records?

Bamboo, unavailable in other parts of the world, was used in Asia to make tools. We don't find tools made of this material in the archaeological record because bamboo absorbs water very well and leads to bamboo warping, distorting, and discoloured

Evidence for interbreeding of humans, Neanderthals, and Denisovans?

The chin size and the angle suggests that there must've been interbreeding between humans, Neanderthals, and Denisovans. DNA played a big role in finding what type of person it was. It was also recorded that the finger bone of the Denisovan was also evidence.

What is the EPAS1 Gene in Tibetan people? Where does it come from?

The variant of the epas 1 gene comes from the Denisovans due to interbreeding. It inhabits the hemoglobin and allows more oxygen

What did hybridizing do to immune system of some humans?

It strengthened the white blood cells in our immune system that kill bacteria and infected cells; more HLAs were created. Variety was created due to interbreeding between these species - we acquired immunity from multiple species combining into one system which helps fighting off disease

POST MIDTERM CONTENT

Early Hominids

Artifact – something made or modified by humans (e.g. arrowhead)

Feature – non-portable artifact, cannot be excavated without being destroyed (e.g. hearth)

Ecofact – natural item that is not made or modified by humans (e.g. antlers)

Genus – higher level of taxonomy (includes multiple species) always capitalized

Species – the species within the genus – always lowercase

e.g. Humans are *Homo sapiens*

Hominini – group that includes all species more closely related to *Homo sapiens* than to any living great ape

Specifically human Features

- Extremely large (relative) brain – around 5x average for body mass
 - Bipedalism
 - Very small canines
 - Relatively flat faces (orthognathic vs prognathic) (ortho = flat, prog = non-flat)
 - Ability to modify raw materials into tools
 - Chin
 - Ability to both learn and invent language
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Two evolve theories – Bipedalism first is true

Brain first – most distinctive, and should have been longest time

Bipedalism first – freed hands for tool use

Pitldown Man – discovered by Charles Dawson in South England (pieces of skull). Found human cranium on top of ape mandible.

Supported brain-first theory. Exposed to **be a hoax** using fluorine dating. Skull is older, lower jaw was modern but just dirtied!

Ardipithecus Ramidus (Ardi) 4M yago – 45% complete skeleton of an early hominin

- **Chimp sized brain**
- **Foramen Magnum** (big spinal hole) was like a human
- **They had the same human pelvic shape** which allows muscles to act as abductors instead of extensors (balance)
- **Opposable big toe** (unlike human)
- **Canines** were intermediate btwn human and chimp

Australopithecus Afarensis (Lucy) 3M yago – 50% complete skeleton of an early hominin

- Short iliac blade (pelvis)
- Knee angled below the body (similar to humans)
- Thought to have fallen from a tree, but unreliable due to...
- **Taphonomy** – study of all of the events from organism's death to discovery as a fossil
- Volcanic ash records indicate that there **was** a bipedal hominid
- Smaller canine than Ardi

Paranthropus boisei (Robusts) 2M yago – Robusts, Zinj (Dear boy)

- Gigantic molars
- Did not lead to modern humans (parallel?)
- Saggital crest (extra chewy muscle thingy)

Lomekwian – Kenya - first stone tools discovered (3M+ years ago), now understood to be Australopithecus made by smashing rocks

Homo Habilis – handyman hominid, originally thought to make the first tools (now false).

- Precise grip
- KNM-ER 1470 (is this a H. habilis?) we'll say maybe.

Oldowan tool kit – butchering and carving toolkits, but very basic tools – more better designed for scavenging than other things

Homo Erectus (2MYA – 500kya)

Eugene Dubois – wanted to proving Darwin right – wanted to discover the intermediaries between Humans and Apes. Thought origin of humans were in Asia. Travelled to Indonesia

Homo Erectus from Trinil – Pithecanthropus erectus, skull cap is well in the middle between chimpanzee and neandertal

Peking Man – 780,000 years ago – one of the first Homo Erectus fossils

- Some Asian specimens have a Saggital keel, or lump (most do not)
- Some suggest African should be a new species due to no keel and sloping forehead

Nariokotome boy – a Homo erectus ergaster fossil found in Kenya (1.6m yago). May have died through dental abscess septic shock

Republic of Georgia – found a fossil here that had same lower jaw as Nariokotome boy

Chopper – hard hammer percussion

Hand axe – soft hammer percussion

Why are hand axes not in Asia?

- Bamboo may have been used, doesn't preserve
- Lots of resources needed, 3kg rock = 1 handaxe, so it may have not been feasible

Controlling Fires – helps you to cook different underground storage tubers, gave the homo erectus the advantage to traverse the world

Broca's Area – prefrontal cortex area needed for speech, expansion is necessary but erectus didn't have large enough

Thoracic vertebra – gives more breath control, erectus didn't have large enough

Homo naledi – dated 414K in South Africa (Rising Star Cave) – perhaps deliberate body disposal?

Homo Floresiensis – found Asia/Australia much smaller than modern human (1 meter tallish)

Island Rule – larger things become small, smaller things become large – dividing size is Rabbit sized approx..

Encephalization Quotient (EQ) – actual brain size versus expected brain size (we have around 5.3x EQ)

Microcephaly – pathologically small cranial size

Bodo a specimen in East Africa – evidence of defleshing on the zygotic bone. Used in **Secondary Burial**

Arago Cave/Atapuerca Sima de los Huesos – bone disposal spots (burial sites?)

Shovel shaped incisors – Asian heritage trait, incisors that have a shovel like shape

Levallois technique – **the prepared core technique** striking the sides of a core stone to chip off a flake that can be used

Schoeningen wooden spears – well preserved tree spears that were not oxidized (decayed)

Three Age System

- **Stone Age**
 - o **Paleolithic** (old stone age)
 - o **Mesolithic** (middle stone age)
 - o **Neolithic** (new stone age)
- **Bronze Age**
- **Iron Age**

Neandertals

Actually **overlapped** with our own species at some periods

Features:

- Sloping forehead
- Occipital bun
- Midfacial prognathism
- No chin
- Big curved brow ridges
- Cranial capacity larger
- Very big nasal aperture
- Shorter distal extremities (shorter legs)

Gibraltar (English colony) is the last place that Neandertals survived

Shanidar – Burial site with flower pollen, might suggest that there was some afterlife idea

- Altruistic idea, someone blind/deaf/one armed lived long enough to become old-ish

Moula-Guercy – cases and evidence of neandertal cannibalism

- In Spain mandibles with toolmarks suggest survival cannibalism

Chatelperronian tool

- Associated with later Neandertals
- Include more blade tools and bone tools (similar to modern humans)
- Appeared around the same time modern humans appeared

Neandertals **can** produce the same range of sound as modern humans

- Hyoid bones allow the same range of sounds
- Thoracic vertebra was scaled similarly to a modern human's

Modern Humans (Homo sapiens)

Models for humanity

- **Multiregional continuity**
 - o **Gene flow** – important for humans to be one single species (sapiens)
- **Out of Africa**
 - o Everyone came from a population from Africa

The truth is that **a mixture of both happened**

- Intermediates outside of Africa
- Earliest art and tools are in Africa
- Genetic variation is mostly in Africa
- Shared genetic material between Neanderals and non-Africans (and Denisovans, etc.)

Omo I – (ethopia) first Anatomically Modern Human (AMH)

Lagar Velho – Neandertal and Human Love child? Has chin but neandertal body proportions

Blade – a tool type flake that is at least twice as long as it is wide (large amount of sharp edge for material ratio)

1-4% of nuclear DNA of Non-Africans come from Neandertals

Neandertals and humans did interbreed and contribute to modern human gene pool!

HUMANS AND NEANDERTALS WERE NOT A SEPARATE SPECIES - THEY ARE THE SAME SPECIES, maybe Neandertals subspecies

Leaky Replacement Model - Local inbreeding led to sharing of genes between local populations and ancestors of all modern humans

Endogamy – mating within some group (e.g. cultural group, religious, etc.)

Lighter skin – synthesis of vitamin D (needs more)

Darker skin – protection against UV rays and avoiding skin cancer

Race - geographically patterned phenotypic variation within a species

- Idea of race does not have **biological reality**

Should we study race?

Yes	No
Adds to understanding of human past	No biological basis for race studies
Forensic applications and aids to identify dead	Cannot agree on composition of racial groupings (e.g. Asian)
Medical applications – not all groups have equal risks or responses to diseases	Lends legitimacy to racist interpretations of human differences
Intellectual freedom – and common typology	Emphasizes differences rather than similarities

Archaeology

Upper Paleolithic Era

- More refined stone
- Increased use of other materials than stone
- Varied diet
- Larger and permanent habitation sites
- Longer distance trade of materials

- Personal items
- Elaborate rituals
- Creation of art

May have happened due to: Threshold intellectual capacity, key tech breakthrough, and language

REFINED STONE AND INCREASED USE OF OTHER MATERIAL

Lomekwian – Kenya - first stone tools discovered (3M+ years ago),

Chatelperronian – tool industry in Neandertals, added blades and bone tools to Mousterian

Aurignacian 40K YAGO - tool industry that had even more blade tools and (anatomically modern humans) AMHs in Europe

Gravettian 25K YAGO – smaller blade and denticulate knives (little serrated knives)

Solutrean 20K YAGO – leaf shaped projectile points and very very thin

Magdalenian 14K YAGO – very small microblades (replacable), increased use of non-stone materials. Ivory, bone, antler tools

Atlatl – spear thrower, extends the length of the arm essentially

VARIED DIET

More tools means more access (fish, rabbits, digging, etc.)

- Taproots and other food

LONGER PERMANENT HABITATION SITES

Mammoth bone huts in Ukraine

Dolni Vestonice in Czech republic

LONG DISTANCE TRADE

Obsidian is only produced in volcano, but was found up to 500KM from source

PERSONAL ITEMS

Magdalenian necklace using lions tooth

ELABORATE BURIALS

Sungir in Russia had burials involved with jewellery, family, and disks

ART

Cave scratches, cave paintings, powder and pigments (Indonesia, 40K YAGO). Another place is Chauvet (33K YAGO) in France

Shaft of the Dead Man – a representation of a person (very rare)

Vemis of Willendorf – Austria, 25K YAGO

This art could have been for: **Storytelling, sympathetic magic, or trophies**

GETTING TO OTHER PLACES

Australia – always needed a boat to get here

Mungo Man – 40K YAGO, lacks robust features from modern Australian aboriginals

North America

- **Clovis First** hypothesis, estimated as 13,200 years ago (disproved using ice sheets theory)
- Came from Asia, using the Bering land bridge
- Used Clovis point tools
- **“Overkilling hypothesis”** Humans moved southwards due to overkilling animals and prey
- Fluting tips (taking a bit off the base of the blade, helps to fasten shafts)

Monte Verde – wet site (organics) more than 16K from land bridge, but still stone tools. Also had organic remains (seaweed that was chewed – Quid)

Meadowcroft Rock Shelter – better preserved pre-Clovis tools and easier to excavate. Also more big-game hunting tools

What's another theory?

- Pacific Coastal Route Hypothesis

Kennewick man – 9200 YAGO, Washington State

NAGPRA – if you find remains of indigenous people, you have to respect it (cannot study)

Ainu People of Japan – forms of skull might have been close to Kennewick man... but actually Kennewick **was** indigenous

Pleistocene: time epoch stretching from 1.8 MYAGO up to 10K YAGO

- Large part during ice age is uninhabitable due to large sheets of ice

Holocene – time epoch starting 10K YAGO continuing to the present

Mesolithic - cultural period in Europe at the end of the Pleistocene and before the beginning of the Agricultural Revolution

Franchithi cave – discovered deposits ranging from Paleolithic to Mesolithic to Neolithic

- Neolithic fish hooks
- Large fish bones from Mesolithic
- **Neolithic Celts** (used for chopping wood)
- **Pottery** – Venus, pots for cooking, etc.

Agriculture

Started primarily 12K-8K YAGO

We can identify agriculture through:

- Tool types
- Settlement patterns
- Domesticated animals
- Domesticated plants

Tool Types

- Sickle (wooden handle w/bitumen shards)
- Grinding stone

Settlement Patterns

- More sedentary
- Higher population density
- Sesklo (Greek town) 500-800 dwellings

Domestication

- **Artificial Selection:** selective breeding of those animals or plants that have characteristics that are considered desirable for humans
- **Dogs** were first domesticated near 18K years ago
- **Cats** had at least two domestication events (although cats all come from one species)
- **Domestic traits for Animals**
 - o Size changes (decreases)
 - o Changes in defensive/offensive characteristics
 - o Pathological changes
 - o Population changes (more females)
 - o Geographic distribution
- **Domestic traits for plants**
 - o Geographical distribution
 - o Seed size changes (increases)
 - o Changes in seed dispersal mechanisms (Teosinte, Teosinte mutants, eventually Maize, Corn)
- **Flotation** – recovering organic remains such as seeds (water, letting heavy things sink and retrieving seeds)

Ju/'hoansi – bushmen, etc. were a hunter-gatherer society studied and understood meat wasn't vital and no one was struggling for food

Natufian – culture in **Fertile Crescent (Middle East)**, created and cultivated wild wheat in Zagros mountains

- **Einkorn** (not cultivated), **Emmer** (cultivated)
- **Domestication small of diet**
- **Increased food production, population**
- **Irrigation leading to more food**
- **Greater population increase**

Tehuacan Valley – domesticated corn (**Coxcatalan Cave**)

How did Agriculture start?

Diffusion/Migration hypothesis

- Arose in one area for local reasons and spread to rest of the world
- **But** not true, probably developed separately around the world

Oasis hypothesis

- Drying happened in Holocene
- Led to sedentary concentrations of humans in oases and produced more food to support sedentary population
- **But** no evidence of drying and earliest sites aren't oases

Readiness hypothesis:

- When people were intellectually ready and had accumulated enough understanding of plants/animals they began domesticate
- **But** no human evolutionary change w/advent of agriculture and doesn't explain rapid spread

Ecological hypothesis: (Binford, Flannery)

- Population growth -> need to increase carrying capacity -> agriculture -> sedentism **FEEDBACK CYCLE**
- **Carrying capacity** – max population of specific organism that can be maintained at a steady state

Was adoption of agriculture our greatest mistake?

Yes	No
Early agricultural populations had high dental caries and nutritional capacity	Can lead to more things (trade, division of labor, etc.)
Significant increase in human populations	Significant increase in human population

Civilizations

1. Densely populated settlements
2. Food and labor surplus controlled by an elite
3. Social stratification
4. A formal government
5. A system of recordkeeping
6. Specialization of labor
7. Monumental public works

DENSELY POPULATED SETTLEMENTS

Dolni Vestonice – 27K YAGO, Czech republic 25-50 people

Sesklo – 9K YAGO, Greece 500-800 people

Teotihuacan – 2K YAGO – up to 100K people

Food Controlled By Elite – stored and controlled (e.g. granaries)

SOCIAL STRATIFICATION

egalitarian society: similar members of the society have equal rights, privileges, responsibilities, and wealth

stratified society: there are levels (strata) in the society that differ in terms of their rights, privileges, responsibilities, and wealth (e.g., classes)

We can examine if societies were stratified through:

- Housing (uniform vs grand)
- Methods of honoring, disposing the dead

- Representation in art

Narmer Palette – an important piece of Egyptian art

Code of Hammurabi – first written code of laws on a tablet

Rosetta Stone – text in Egyptian hieroglyphics, demotic, and Greek

Quipu – knots and strings to keep records of employments

Specialization

Catalhoyuk – 9K YAGO Neolithic site, building of bricks (special!)

Mohenjo-daro – 4K YAGO early Indus river valley, built of bricks

Shang Civilization – 3.6K YAGO early metal working specializes in Bronze

Ancient Wall of Jericho – oldest monumental public work (not really a civilization item though)

When did Civilization start?

Lewis Henry Morgan – **Unilinear Evolution** (Savagery –pottery--> Barbarism –alphabet--> Civilization)

Joseph Tainter's taxonomy for origins of civilization

- **Managerial** – managing irrigation, flood control, etc.
- **Internal Conflict** – control of communication or production
- **External conflict** – joint protection from outside threats

Ziggurat of Ur -4000 years ago

- Includes a Ziggurat
- Ur was a large city-state in Southern Mesopotamia, modern Iraq
- It served as a basis of temples
- Associated with ancient Sumerians
- Partially reconstructed by Iraqi government

Great Pyramid at Giza 4500 years ago

- A great pyramid, smaller pyramids and mastabas
- A tomb for the Pharaoh Khufu
- In Egypt, near Mediterranean sea at Giza
- Associated with Ancient Egyptians

Mohenjo-daro – 4600 years ago

- City in the Indus Valley
- Included bathing rooms
- Citadel and communal bathes

Knossos – 4K years ago

- City in the Island of Crete (Greece)
- The Labyrinth at Knossos
- Trading network and government structure

Teotihuacan – 2.2K years ago

- Early Mesoamerican city in Mexico
- Contained moon pyramid, sun pyramid, avenue of the dead, and feathered serpent pyramid
- Contains sacrificial events

Machu Picchu – 1.4K years ago

- An Inca city in Peru
- Royal retreat? Temple complex? Prison?
- Intihuatana – hitching post of the sun

Monk's Mound – in Illinois USA, aboriginal burial mounds

Cahokia – Mississippian city peaking around 1200 AD, 5-20K population

Great Zimbabwe – 800~ years ago Great enclosure in Zimbabwe

Angkor Wat – 1100 AD, centerpiece of Khmer civilization

- Originally a earthly abode for Vishnu
- Can scan by using LIDAR to remove tree cover

EXAM QUESTIONS

Excavation Question

- context is destroyed between artefacts and other artefacts
- excavation plan helps preserve
- horizontal and vertical sense to preserve context and layering
- do NOT mention breaking stuff

- Choose a site and explain it – Great Pyramid of Giza

- What does site include **Pyramid**
- When does it date to? **4.5K years ago**
- Where is the site? **Giza, modern Egypt near the Mediterranean sea**
- Who is it associated with? cultural group **The ancient Egyptians**
- Why is the site there? **Burial tomb for Pharaoh Khufu**

- Essay question

- Reasons why we should study race
 - o Adds to understanding of human past
 - o Forensic applications and aids to identify dead
 - o Medical applications – not all groups have equal risks or responses to diseases. For example, sickle-cell anemia
 - o Intellectual freedom