Physical Anthropology
Anth 215

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PALEOANTHROPOLOGY

Geology/Paleontology/Archaeology/Taphonomy/Paleoecology

Rarity of fossils
Fossil sites for early humans
Limitations of fossil record:
- -general outline
- -preservation
- -fragmentation
- -distortion
- -teeth & bones
- -sample size

taxonomic relationships/principle of evolutionary systematics
Piltdown fraud
evolutionary changes

1. economy of hypothesis--simplest explanation often most correct
2. accurate dating
3. total morphological pattern

morphology vs. phylogenetic relationship
exceptions: parallelism & convergence

Dating techniques:
Relative dating (geological, archaeological, paleontological)
- geology/stratigraphy
- superposition
- typological & morphological cross dating
- contemporaneity of fossils: FUN = fluorine, uranium, nitrogen

Absolute- chronometric
- Radioactive decay

K^{40} (potassium) -- Ar^{40} (argon)
C^{14} (carbon) -- N^{14} (nitrogen)
U^{238} (uranium) -- Pb^{206} (lead)
U^{235} -- Pb^{207}
Rb^{87} rubidium -- Sr^{87} (strontium)

half-life: potassium-40: 1.3 billion years; carbon-14: 5,730 yrs.

Paleomagnetism/amino acid racemization/protein clocks

Pleistocene 1.8 mya- 10,000 ya

glaciations- interglacials
pluvials-interpluvials

Villafranchian (*Equus, Bos, Elephas*)
Calabrian (microscopic marine animals)

Era	Period	Epoch	Time	Glacial Sequence	
			Years ago	Scandinavian	Alpine
CENOZOIC	QUATERNARY	HOLOCENE	10,000		
		UPPER PLEISTOCENE	40,000	WEICHSEL (glacial)	WÜRM
			75,000		
			100,000	EEMIAN	RISS WÜRM
		MIDDLE PLEISTOCENE	125,000	Cold phase	RISS
			175,000	Warm phase	
			225,000	SAALE (glacial)	
			265,000	Warm phase	MINDEL RISS
			300,000	ELSTER (glacial)	MINDEL
				HOLSTEIN	
			380,000	ELSTER glacial	
			400,000		
			430,000	CROMERIAN	GÜNZ - MINDEL
			500,000	MENAPIAN glacial	GÜNZ
		LOWER PLEISTOCENE	750,000	Uncertain Geological Sequences	
			1.8 million		
	TERTIARY	Pliocene	5 million	Hominids (Australopithecines) present	
		Miocene	25 million	Hominoidea (apelike creatures) Dryopithecines flourish . . . Probable appearance of hominids	
		Oligocene	35 million	Anthropoidea and appearance of Hominoidea	
		Eocene	53 million	Prosimians flourish; possible appearance of Anthropoidea	
		Paleocene	65 million	Appearance of Prosimii	

CENOZOIC
- Quaternary
  - HOLOCENE
  - PLEISTOCENE
- Tertiary
  - PLIOCENE
  - MIOCENE
  - OLIGOCENE
  - EOCENE
  - PALEOCENE