

**The Human Fossil Record (Palaeoanthropology) [3230: 474: 001]**  
**MWF 9:55-10:45**

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Prerequisite: Human Evolution (3230:151); or permission of instructor

Textbook: TBA for Fall 2011

Requirements: There will be 2 exams in this class and a research paper completed by the end of the semester. The mid-term exam will cover early hominid evolution, and the final will cover *Homo* evolution. The two exams will include both human fossil identification (i.e., lab exam covering pertinent morphology), and take-home essay questions. The research paper topic will be the student's choice; however, a list of potential topics is located at end of syllabus. To make sure the students are keeping up with the topic, periodic assignments about the research paper will be due during the semester (counting towards the ultimate paper grade). These assignments include topic approval, an annotated bibliography, paper outline, paper draft, presentation of the paper to the class, and the final paper. The presentation should be in the form of a short podium presentation for professional meetings (modeled after American Association of Physical Anthropologists); length depending on number of students in class.

Course description:

This special topics seminar will provide an in-depth coverage of the human fossil record beginning with the earliest potential traces of the hominid lineage (~ 6-7 million years ago) and ending with the hypotheses of modern human origins and the cultural "explosion" surrounding the European Upper Paleolithic.

The course will be divided into two sections, the first on the earliest hominids and the australopithecine radiation. Before delving into the fossil record, we will cover the basics of paleontology, taxonomy, geology (as it relates to fossil preservation), taphonomy, dating techniques, and skeletal changes associated with the major shift to bipedal locomotion. When covering the fossil record, both a chronological and geographic approach will be taken, detailing the similarities and differences in australopithecines from Eastern and Southern Africa. Aside from examining the skeletal evidence for human evolution, we will cover the "major players" in the history of the discovery of the human fossil record (Dart, the Piltdown hoax and how that affected the scientific acceptance/denial of *Australopithecus africanus*; Leakey, how the advent of radiometric dating revolutionized the idea of the antiquity of humans), and provide a brief overview of the archaeological record (i.e., what did the first identifiable stone tools look like, how old they are, who made them?).

The second part of the course will cover the evidence for human evolution from the earliest beginnings of the genus *Homo* to the ultimate colonization of the Old World, and all presumed different fossil hominid species within the last 2 million years. In this section, we will critically examine the fossil and archaeological evidence used to support migrations outside of Africa (e.g., why the Acheulian culture may have "allowed" the migration), who left Africa, how quickly/slowly it took these hominid ancestors to colonize the Old World. We will also examine how individual paleontologist's views of species, variation and speciation influence the taxonomy of the human fossil record (e.g., lumpers versus splitters). Specific species/groups to cover include *Homo habilis*, *Homo rudolfensis*, *Homo erectus*, "archaic" *Homo sapiens*, Neandertals, anatomically modern *Homo sapiens*, and all the recent splitting that has been done in the fossil record (i.e., are *Homo ergaster*, *Homo antecessor*, *Homo heidelbergensis* valid species?). In this section, will be continue to approach the fossil record chronologically, geographically, historically and briefly examine the archaeological record as well (who made what tools, what the tools were, evidence for controlled use of fire, hearths, art, burial of dead).

### Grading:

Grades will be based on the performance on the two exams, the written paper, class participation and the presentation of the paper.

Midterm:	25%
Final:	25%
Paper:	40% (includes the assignments during the semester)
Participation:	10% (in labs & discussion, and general class attendance)

### Course Calendar:

This is a weekly plan of the topics we will cover in class; note that because I would like to have discussion time that these topics are fluid and could change. The only times set in stone on this plan are the times for the exams (mid-term, final) and the class presentation. Periodically Friday classes will be held in Olin 272 for lab and/or discussion. Extra readings for discussion if not listed will be determined during the semester.

Week	Topics	Readings—TBA according to book choice
1	Introduction to course Plio-Pleistocene World (lecture) Lab Olin 272: Humans as Primates	
2	Plio/Pleistocene World (con't); Mechanics of Paleontology	
3	Mechanics of Paleontology (con't) Miocene Hominoids Lab Olin 272: Biped vs. Quadruped Anatomy	
4	Miocene Hominoids & late Miocene ?hominids Discussion Friday in Olin 272 <u>Research topic due 9/19.</u>	
5	South African Australopithecines Discussion or Lab Friday Olin 272: Early hominids/SAfr Australopithecines	
6	East African Australopithecines Lab Friday Olin 272: East vs. SAfr. hominids	
7	Australopithecine paleobiology, taxonomy, phylogeny Discussion Friday Olin 272 <u>Research topic: annotated bibliography due (≥5 references)</u>	
8	<b>MID-TERM EXAM essays handed out</b> <b>Mid-term lab practical—FRIDAY</b> Aust. paleobiology, taxonomy, phylogeny (con't) Discussion Wednesday	
9	Early <i>Homo</i> Discussion Friday Olin 272	
10	Early <i>Homo</i> — <i>Homo erectus</i> Discussion Friday Olin 272	
11	<i>Homo erectus</i> Lab Friday Olin 272: early <i>Homo</i> & <i>Homo erectus</i>	

12	Middle Pleistocene “archaics” Discussion Friday Olin 272	
13	Neandertals & MHO Lab Olin 272: Neandertals & ‘Modern’ humans <u>Research paper draft due 11/21.</u>	
14	Modern Human Origins Discussion Wednesday Olin 272: Genetics & MHO ‘debate’	
15	Paper Presentations; Written paper DUE 12/5 @ noon Final Exam essays: handed out on last day of class	
	<b>FINAL EXAMS DUE: 2 pm December 12</b>	

### Paper Topics List: Possible Suggestions

1. Single vs. multiples species of *Australopithecus afarensis*
  - a. i.e., high degree of SSD vs. multiple species
  - b. what is the null in an unknown assemblage?
2. Turnover-Pulse Hypothesis
  - a. Climatic “forcing” for 2.5 mya turnover of African fauna
  - b. E Vrba
3. Running as the savannah bipedal model
  - a. Lieberman
4. Ecological vs. sexual modality for origins of bipedality models
  - a. Environmental
  - b. Lovejoy
5. Age of South African deposits
  - a. What is the problem with karstic cave formations
  - b. How to solve
  - c. How does this influence species identifications
6. Is ‘*Paranthropus*’ a valid genus
  - a. Do we think convergence
  - b. OR do we think single origin of ‘robust’ australopithecines
7. Lumper vs. splitter for species designations in:
  - a. *Homo erectus*
  - b. ‘archaic’ *Homo sapiens*
  - c. ? *Homo habilis*
8. Hominin vs Hominid
  - a. cladistic vs gradistic definition
9. What is a hominid?
  - a. Question about *Sahelanthropus* or *Orrorin*
  - b. How do we classify African apes that do not necessary show strong bipedal features?
  - c. Do we go on dental traits?
10. Cultural or archaeological question
  - a. What are the earliest traces of lifestyles of hominids?
  - b. Early hominid behavioral ecology
11. When/who had 1<sup>st</sup> in a series of ‘cultural’ innovations
  - a. Shelter, fire, clothing, burials, art, music etc.
  - b. What kinds of technology innovations are there?
  - c. First times of initial manufacture, types of flaking and differential uses of raw materials

12. Neandertals
  - a. Cold 'adaptation'?
  - b. Culture: shelter, clothing, fire, art, burials
  - c. Are they among us? (see next)
13. Modern human origins debate
  - a. Fossil record: what does the anatomy 'say'
  - b. Genetics: what do nuclear, mitochondrial and Y-chromosome 'say'? Are the various genetic systems in agreement?
  - c. Regionality?
14. Piltdown
  - a. Who did it
  - b. Why important in the history of Paleoanthropology
15. Vagrancies of the Middle- to Late-Pleistocene African fossil hominid record
  - a. why is this a problem for the MHO debate
16. Taphonomy
  - a. How these issues affect site formation and assessment
17. Early *Homo* mess
  - a. Is there good evidence for splitting? Lumping?
  - b. How to divide out the record?
  - c. Do you divide?
18. Paleodietary reconstructions
  - a. What is examined
  - b. What are the diets
  - c. How do isotopic studies work
19. Middle- to Late-Pleistocene tool use/technology
  - a. Manufacture
  - b. Behavioral ecology
  - c. Site distribution
20. Boule reconstruction of Neandertals and images of Neandertals in
  - a. Popular literature
  - b. Movies
  - c. Museums
  - d. Modern pop culture (i.e., Geico commercials)
21. *Ardipithecus* locomotion
  - a. Morphology
  - b. Locomotion reconstruction
  - c. Is the published material good enough, or is more needed