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Theories in Physical Anthropology  
Anthropology 422 (070:422:01)

S. Cachel  
Spring, 2021

**This syllabus is available from the class Sakai site, accessible via the Rutgers Sakai portal (<http://sakai.rutgers.edu/portal>). Use your Rutgers Net ID and password to login to Sakai. Then click on this course among the list of courses that you are registered for. The syllabus is listed under the “Resources section of the class site, and is labeled “422 syb 2021.”**

**Course Venue:** This virtual course is being given asynchronously. Each class will include a PowerPoint presentation and an accompanying sound recording. The PowerPoint will be listed under the Resources section of the class Sakai site. The sound recording will be listed under the Media Gallery section of the class Sakai site. The course material will be put on the class Sakai site on Tuesday and Thursday afternoon. An email Sakai Announcement will be delivered to your Rutgers email address when the course material is posted.

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Office Hours (Spring Semester): Wednesday, 1-2 P.M, via Zoom. The Zoom code and password will be sent to you via email during the first week of class.

### **Course Description:**

This is a course in physical anthropology that introduces students to the formal definition of science and theories in science. This course analyzes several topics that are rich in theoretical arguments, and that have been areas of contention for over 150 years, since the inception of anthropology as a science. These topics include the assessment, categorization, and importance of human biological variation; what is disease? what is adaptation? human genetic differences in behavior, responses to medical treatment, and life-history variables; attempts to reconstruct the cognitive status and social behavior of fossil humans, from the earliest human species to the Neanderthals; and the continuing course of human biological evolution. These topics are placed within the context of the history of evolutionary anthropology from the 19<sup>th</sup> through the 21<sup>st</sup> centuries.

### **Course Objectives and Goals:**

Students will investigate contrasting theoretical approaches in physical anthropology in a short paper, and will individually explore a theoretically contentious area in a longer paper. Students will investigate cooperation and competition in small groups, which will illustrate problems of social interaction in non-verbal animals. Students will investigate a number of

current topics in physical anthropology, while learning to frame these topics in an historical perspective.

### **Required Texts:**

1. G. Cochran & H. Harpending. 2009. *The 10,000 Year Explosion. How Civilization Accelerated Human Evolution*. Basic Books. (paper).
2. P. Gluckman et al. 2016. *Principles of Evolutionary Medicine*. 2<sup>nd</sup> ed. Oxford. (paper).

All texts are available from the University Bookstore. Additional readings will be posted on the class Sakai site under “Resources.”

**Scholarship:** The Rutgers School of Arts and Sciences mandates that instructors immediately report all cases of suspected plagiarism and cheating to the Academic Deans.

The class Sakai site is accessible via the Rutgers Sakai portal (<http://sakai.rutgers.edu/portal>). Login using your Rutgers net I.D. and password. Class announcements will appear here. You must regularly check your Rutgers email account to see these announcements directly after they are emailed out. Necessary course material is downloadable from this site (e.g., the syllabus, assignments, pdf files of papers, etc.)

**Attendance Policy:** Students are expected to keep up with all classes and class readings, and to submit coursework on time. If you are having difficulty keeping up or completing coursework, you must use the University absence reporting website to indicate the dates and reasons for your absence. An e-mail is then automatically sent to instructors. The URL for this website is <https://sims.rutgers.edu/ssra/>. In cases where students miss classes and coursework for periods longer than a week, this website will automatically direct them to consult a Dean of Students for assistance, and will help to verify the circumstances of their absence. If you are experiencing health or family problems because of the coronavirus, contact the Academic Deans immediately.

### **Course Requirements:**

**Four video responses** each account for 5% of the final grade, for a total of 20%. Each response will answer several questions that I will pose on the Assignments section of the class Sakai site. Each response will be turned in at the Assignments section of the class Sakai site. **Two papers** are required. One, approximately 5 pages long, is due on February 26<sup>th</sup>, and will account for 20% of the final grade. The second paper, due on May 3<sup>rd</sup>, approximately 10 pages long, will account for 30% of the final grade. Detailed instructions about the papers will be given during the first class session, and appear at the end of this syllabus. **A final exam** accounts for the

remaining 30% of the final grade. The format of the exam will be short essays. You will be given several days to submit the exam via the Assignments section of the class Sakai site.

## **COURSE SCHEDULE, TOPICS, & READINGS**

Week of January 19 Introductory

What is Science? Theories in Science; Thomas Kuhn and the Sociology of Science; Science as a Series of Paradigm-Shifts and Revolutions and Science as Narrative; Is the Sociology of Science Scientific?

### **First Topic: Human Biological Variation—Its Meanings, Its Limits, and Its Presence Through Evolutionary Time.**

Week of January 25 The Origins of Evolutionary Anthropology; Religious Upheavals of the 19th Century and the Rise of Anthropology; Evolutionary Anthropology in the 19<sup>th</sup> Century I: Vitalism; Romanticism; Catastrophism; Evolutionary Social Anthropology (Still Alive in Europe)

Class Sakai site: Ruse, 1999

Week of February 1 Evolutionary Anthropology in the 19<sup>th</sup> Century II: the Idea of Natural Selection Appears, but is Almost Neglected by Evolutionary Theorists; T.H. Huxley and the Origins of Physical Anthropology; Cartmill's Historical Analysis of Paleoanthropology; Sherwood Washburn and The New Physical Anthropology

Class Sakai site: Ruse, 2012

Gluckman et al. pp. 327-339

Historical and Theoretical Context—Anthropometry; Racial Typologizing; Ernst Haeckel as the Continental Interpreter of Darwinism; Aryanism; "Racial Hygiene" and German Medical Science; Typologizing versus "Population-Thinking": Two Divergent Biological Philosophies About the Meaning of Variation; Defining Species; the Type Specimen

Week of February 8 Race and Human Variation; Race and Paleoanthropology

Class Sakai site papers: 1. S. Ousley et al. 2009. 2. M. Wolpoff. 2009.

### **Second Topic: Evolutionary Medicine**

Week of February 15 What is Disease? What is Adaptation? Phenotypic Plasticity; The Evolutionary Perspective on Disease

Gluckman et al., pp. 3-18; 19-48; 79-96; 97-129; 161-175; 205-236

**1<sup>st</sup> Video: “The Gene Doctors”**

**Turn in response answers to questions that appear in the Assignments section.**

Week of February 22 Evolutionary Psychiatry; Medicine and Evolutionary Principles

Gluckman et al., pp. 237-259; 261-286; 303-326

**2<sup>nd</sup> Video: “Vaccines: Calling the Shots”**

**Turn in response answers to questions that appear in the Assignments section.**

Historical and Theoretical Context—the Anthropological (i.e., Evolutionary) Perspective in Medicine; Its Similarity to Epidemiology; Treatments and Ethnic Differences; Pharmacogenetics; Senescence; the Co-Evolutionary Arms Race with Pathogens; Contemporary Evolution; Mental Illness and Environmental Misfitting; the Environment of Evolutionary Adaptedness

February 26 **Paper 1 due!**

**Third Topic: Reconstructing Cognition and Sociality in Fossil Humans**

Week of March 1 **3<sup>rd</sup> Video: “Inside the Animal Mind I”**

**Turn in response answers to questions that appear in the Assignments section.**

Reconstructing Social Behavior in Fossil Humans

Class Sakai site: Cachel, 1997

Exercise in defining animal tool behavior from list of purported behaviors (Assignments section of the class Sakai site)—Chat Forum on Sakai over tool behavior definitions. Everyone must participate in the Chat Forum

Week of March 8 **4<sup>th</sup> Video: “Inside the Animal Mind II”**

**Turn in response answers to questions that appear in the Assignments section.**

Animal Tool Behavior; “Folk Physics for Apes”; Inside the Animal Mind (How Do We Get Inside the Animal Mind?); Why Might People be Resistant to the Idea of “Animal Minds”?

Week of March 15 **NO CLASS—Spring Break**

Week of March 22 Huxley's *Evolution and Ethics*; Sociobiology: A Revolution in the Biological Sciences; 2010: E.O. Wilson Changes His Mind—Complex Sociality Can Arise Without Kin Selection; Another Revolution? Ideas on the Origins of Complex Sociality

Class Sakai site: Cachel 2006, Chapters 9 &10

Week of March 29 Evolutionary Progressivism Persists; Does Complex Sociality Require Complex Cognition?

Class Sakai site: Cachel 2006, Chapter 16

Historical and Theoretical Context—Primate "Sociology" and Human Evolution; "Chimpocentrism" and Human Evolution; Do "Chimpanzee Cultures" Tell Us Anything Important or Anything Different from Data Collected from Other Mammal Species? Are Neanderthals Cognitively Different From Modern Humans? Archaeological Signatures of Modern Behavior; Certain Aspects of Cognition (e.g., Language) are Invisible to Archaeology—Should They be Used to Define Modern Humans?

Class Sakai site: Green *et al.*, 2010

#### **Fourth Topic: “Contemporary Evolution”; We Are Still Evolving!**

Week of April 5 Has Human Evolution Stopped? What is Domestication? The Consequences of Domestication; Have We Domesticated Ourselves?

Cochran & Harpending, pp. 1-128

Week of April 12 Expansions, Migrations, and Contacts; Genes in An Historical Perspective

Cochran & Harpending, pp. 129-224

Week of April 19 Historical and Theoretical Context— Population Histories and Population Differentiation—New Uses for DNA & Molecular Data? DNA Variation; Race and DNA Variation; The Relatedness of Modern Humans; Archaeolinguistics (Population Histories, Archaeology, and Linguistics); the Mapping of Human History Through Genes; Is A New General Synthesis Emerging in Anthropology? What Are Some Unexamined Assumptions and Problems?

Week of April 26 20<sup>th</sup> Century Catastrophism and Human Evolution; the Neanderthal Morass (Extinction? Evolution *in situ*? Genetic Swamping?—How to Test for These Processes); Neanderthals Are Us! The Death of Mitochondrial Eve; Is It Racist to Discuss the Death of Mitochondrial Eve? Progressivism is Alive & Well in Human Evolutionary Studies

Future Developments: The Death of “Chimpocentrism”? What Happens When the Study of Human Evolution Reveals Fundamentally Non-Modern Hominins? What are the implications of the discovery of multiple species of *Homo*, some sympatric, and some very recent?

**May 3 Paper 2 due!**

**EXAM.** The exam will be given during the Final Exam period, which begins on May 6<sup>th</sup>. You will be given several days to answer the exam’s essay questions, which will appear in the Assignments section of the class Sakai site.

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### **Instructions for Papers**

#### **Paper 1 (due Feb. 26<sup>th</sup>), worth 20 % of the final grade**

Compare two (2) papers with similar or the same topics published in the *American Journal of Physical Anthropology* from current issues (i.e., within the last five years) of the *AJPA*. This journal is the official organ of the American Association of Physical Anthropologists. It is the oldest journal in the English-speaking world dedicated to a comprehensive coverage of all the topics studied in physical anthropology. Issues appear every month. Papers are available online via the electronic version of the *AJPA*, accessible through the Rutgers Iris system. Older material can be retrieved through the JSTOR System, also available online through the Rutgers Iris system. Which papers you choose within these time ranges will depend on your own individual interests. Because you will spend a fair amount of time reading these papers, it is best to choose papers with topics that appeal to you, or that you feel comfortable handling.

It is not necessary to read and comprehend everything in these papers. Concentrate on how the theory or methodology of these two papers differs. Attempt to be objective, and concentrate on such issues as the following: What topics are covered in the two papers? If the same topic is dealt with, how does the coverage differ? Are different topics covered? Is the scope of the topics different? What interactions occur with archaeology and social anthropology, or disciplines outside of anthropology? What is the influence of evolutionary thought on the topics that are covered? What claims are made about the usefulness of physical anthropology, the importance of natural selection or other evolutionary processes, evolutionary laws, etc.? What are the professions and affiliations of the authors? Are there international influences (detected by author's affiliations, permission to conduct research or study in foreign museums or labs, acknowledgments, etc.)? This might allow you to say something about the rise of academic physical anthropology, especially in the United States.

Clearly identify the articles that you are using in a special section at the very beginning of your paper or within the first paragraph. The paper should be about 5 pages in length (double-spaced, typed, 12 point font), and referenced according to the current system used in the *AJPA*. That is, give references in the body of the text by author's name and year of publication in parentheses, and not by footnotes. See section on "Examples of scientific referencing," below.

**Paper 2 (due May 3<sup>rd</sup>), worth 30 % of the final grade**

Pick one of the major topics that we have dealt with in class, and show how this topic is developed through time by various researchers, utilizing the critical and historical perspectives that you have gleaned from class discussions, readings, and your own work on Paper 1.

**Examples of such major topics are the following:** Incorporating evolutionary processes into physical anthropology; The “New” Physical Anthropology; Why did it take about 100 years to incorporate evolutionary processes into physical anthropology? Typologizing versus population-thinking in physical anthropology; Is adaptation a significant or a trivial topic of study? Why was there a 30-year gap (from about 1965-1995) in incorporating studies of human adaptation into physical anthropology, as opposed to "human biology?" Is the study of human biological variation or adaptation inherently racist? Why does the modern physical anthropological perspective resemble the perspective of epidemiologists, and not the perspective of other medical sub-disciplines? Why is there resistance to pharmacogenetics? Why is sociobiology or evolutionary psychiatry sometimes considered alarming or offensive? Are hominins buffered from natural selection, or influenced by evolutionary processes that do not affect other animals, especially when complex sociality, intelligence, or language occur? What is the relationship between thought and language? Can the comparative study of non-human primate social behavior and ecology reveal particulars of human evolution that would otherwise be impossible to reconstruct using palaeontology or archaeology? Can other animals be used to do this type of reconstruction? What evolutionary processes are associated with the appearance of anatomically modern humans? Does DNA analysis of modern humans (mtDNA & nuclear DNA) reveal everything we need to know about modern human origins, migrations, and dispersals? What allows hominins to disperse from the tropics? What determines the first permanent human settlement in temperate regions or high latitudes? Is there a link between anatomical and behavioral modernity? If not, then why does the anatomy evolve? The relationship and interaction between anatomically modern humans and archaic *Homo sapiens* populations, especially the Neanderthals; Can fossil human social organization be inferred from the behavior of modern humans or other animals? What limits does archaeology have for such inferences?

The above list is not exhaustive. You should probably decide about your topic before the end of March, because 30% of your final grade will be determined by your work on this paper. Check with me if you are having trouble choosing a topic.

As you write this paper, think about the following points: What influence does society, general currents in anthropological thought, the careers of researchers, and the academic background of researchers have on the theoretical origins and development of a topic? Develop a general appreciation for how the intellectual milieu, the character of individual researchers, controversy, and publicity can influence the outcome of scientific theory and debate.

The paper should be about 10 pages in length (typed, double-spaced, 12 point font), and referenced according to the current system used in the *AJPA*. Except for textbooks used in this class, do not use textbooks to write your paper. Books written expressly as textbooks are not primary resources. Do not use footnotes for referencing! I will not read a paper referenced with footnotes! Cite the references by using the author's name and the date of the article or book in parentheses in the body of your text. Papers in edited volumes are cited by the author of the paper, not by the name of the editor. Direct quotations need exact page references. A paper published only in electronic form (i.e., available only from a Website) needs the URL of the Website, as well as the complete DOI (document identification number) of the paper. Use only Websites maintained by universities or research institutes. List the references that you cite (and *only* the references that you cite) in alphabetical order at the end of the paper. When you write your first paper, it might be a good idea to take note of how papers are referenced in the *AJPA*.

**Examples of scientific referencing.** These three examples, which I've just invented, come from three different kinds of sources. The sources are real. Note how the examples are referenced both in the text and in the list of references.

1. First published in 1967, the Napier and Napier classification of major primate locomotor categories was later modified to include knuckle-walking (Napier and Napier, 1985). [citation of a book]
2. Energetic analysis of nut-cracking behavior by wild chimpanzees in the Tai Forest (Ivory Coast) demonstrates that the benefits of this behavior outweigh the costs by a 9:1 ratio (Gunther and Boesch, 1993). [citation of an article in an edited volume]
3. "The location of large primates on the neocortex curve where small relative changes in brain size are associated with large relative changes in isocortex size...may explain the multiple facets and rapid rate of human evolution." (Finlay and Darlington, 1995:1583). [a direct quotation, from an article published in a journal]

These references will be listed in a separate section at the end of your paper and will be cited as follows:

## References Cited

[begin a new page and list the references in alphabetical order]

- Finlay, B.L. and Darlington, R.B. 1995. Linked regularities in the development and evolution of mammalian brains. *Science* 268:1578-1584. [paper published in a journal]
- Gunther, M.M. and Boesch, C. 1993. Energetic cost of nut-cracking behaviour in wild chimpanzees. In *Hands of Primates*, H. Preuschoft and D.J. Chivers, eds., pp. 109-129. Wien: Springer-Verlag. [paper published in an edited volume]
- Napier, J.R. and Napier, P.H. 1985. *The Natural History of the Primates*. Cambridge, MA: The M.I.T. Press. [book]