HEB 1200: Neanderthals and Other Extinct Humans

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Course time and location: T/Th 10:30-11:45, MCZ 529

Course description: Over the past 100,000 years why did modern humans survive while other human lineages went extinct? This seminar will compare modern humans to Neanderthals and other extinct humans using the genetic, fossil, and archaeological records. The course will also emphasize science outreach and engaged scholarship. Students will collaborate with Harvard Museum of Natural History and NOVA to create museum activities and videos for the public.

Prereqs: LS1b or permission of the instructor.
Fulfills HEB subfield requirement for human evolution.

Course objectives:

- Broad understanding of Neanderthal evolutionary history based on archaeological, fossil, and genetic records
- Synthesize and critique scientific literature
- Communicate scientific research to broad audiences

Assignments/evaluation summary: 240 points

Seminar (130 points total)
- Quiz (10 pts)
- Discussion leader (30 pts)
- Regular participation (40 pts)
- Review paper (50 pts)

Outreach (110 points total)
- Museum observations (10 pts)
- HMNH table script (10 pts)
- HMNH table reflection (20 pts)
- Video storyboard (20 pts)
- Expert focus group (10 pts)
- Public focus group (10 pts)
- Final video (30 pts)

Assignment details

Students will become experts on one of 10 weekly themes (e.g. diet, language, genetics). For their chosen theme, they will 1) write a review paper, 2) lead class seminar, and 3) create a publication quality 3-5 minute video for the public.

Expert topics:
- Bodies & brains
- Growth & energy
- Diet
- Artifacts
- Religion
- Language
- Social structure
- Genetics
- Extinction hypotheses
- Other extinct humans

On most Tuesdays we will have a seminar with student-led lectures and discussions. All class members will come to seminar prepared to discuss assigned readings. The student expert for that week's seminar will provide an introductory lecture and facilitate discussion. By the preceding Thursday, the expert must assign one reading relevant to the topic, in addition to the instructor picks on the syllabus.

On Thursdays we will work on two science outreach projects. First we will create "Neanderthal tables" – tables of artifacts and fossil casts that students discuss with visitors to Harvard Museum of Natural History. During the second half of the semester we will create 3-5 videos for the public with guidance from producers from NOVA Next. All videos will be posted on a class YouTube channel, which will be publicized by HMNH. **By enrolling in the class, students agree to have their videos publically accessible.** The instructor will assist in pitching high quality videos to NOVA and other media outlets for publication.

1) Museum observation:
   A short reflection based on observations of visitors to HMNH during the first weekend of class, Sept 8-9 (1-2 pages double spaced, 10 pts).

2) Quiz:
   A short quiz on general Neanderthal knowledge on Sept 18, to prepare students for Neanderthal tables at HMNH (10 points).

3) HMNH table script:
   Script for conversation at Neanderthal table displaying artifacts and fossil casts for visitors to HMNH (10 points).

4) HMNH table reflection:

Students will run tables in pairs during the weekend of Sept 22-23. While one partner is engaging with the public, the other will observe the exchange. After the table, students will write a reflection piece, including observations, with the goal of informing future outreach (20 points).

5) Discussion leader:

For their expert theme, students lead the class seminar. Responsibilities include: assigning one additional reading relevant to the theme on the preceding Thursday; providing a 20-30 minute lecture that covers more content than the readings; facilitating ~30 minute discussion of the assigned readings (30 points).

6) Review paper:

A research paper reviewing scholarship on students' expert theme. **5 bonus points awarded for submitting paper by the class covering that theme. 3 bonus points for submitting within a week of the seminar.** Regular credit for submitting by final exam date of **12/13**.

7) Regular participation:

Students prepare for and participate in class meetings. Instructor permission required for absences (40 points).

8) Video Storyboard:

A written or image-based flow chart for a 3-5 minute video on students' expert theme, designed for the public (20 points).

9) Expert focus group:

Students will "act out" their video plan to a focus group of science communication experts. They will write a debrief summarizing the feedback and proposing revisions (5 points presentation, 5 points debrief)

10) Public focus group:

Students will show draft videos to a focus group of the general public on Nov 8 or 9th. They will write a debrief summarizing the feedback and proposing revisions (5 points presentation, 5 points debrief)

11) Final video:

Publication quality 3-5 minute video that shows the general public what scientists know about a given theme for Neanderthals, *and how evidence supports this view* (30 points).

Late assignments

In most cases extensions will be granted *provided students request extensions at least 3 days prior to the assignment due date.* Late submissions without prior permission will be penalized.

Academic Integrity Policy

Discussion and the exchange of ideas are essential to academic work. For assignments in this course, you are encouraged to consult with your classmates and to share sources. However, you should ensure that any work you submit for evaluation is the result of your own research and creation (writing or video production). You must also adhere to standard citation practices in this discipline and properly cite any books, articles, websites, lectures, etc. that have helped you with your work.

Syllabus subject to change. Each seminar will contain at least one additional reading, assigned by student experts.
Rely on course website for up-to-date assignments and deadlines.

Week 1

9/4 Seminar: Course Introduction

9/6 Seminar: Neanderthal Crash Course 1

Alex, B. "Everything Worth Knowing - Neanderthals." *Discover Magazine*, July/August 2018, pp.38–39.

Roebroeks, W. & Soressi, M., 2016. Neandertals revised. *Proceedings of the National Academy of Sciences*, 113(23), pp.6372–6379.

Madison, P., 2016. The most brutal of human skulls: measuring and knowing the first Neanderthal. *British Society for the History of Science*, 49(3), pp.411–432.

King, W., 1864. The Reputed Fossil Man of the Neanderthal. *Quaterly Journal of Science*, I, pp.88–97.

9/8 to 9/9 Weekend assignment: 1-hour observations in HMNH

Week 2

9/11 Seminar: Neanderthal Crash Course 2

Speth, J., 2004. News flash: Negative evidence convicts Neanderthals of gross mental

incompetence. *World Archaeology*, 36(4), pp.519–526.

Chapter 2, "The Neandertals in time and space." pp. 9-39. *Thin on the ground: Neandertal biology, archeology, and ecology* by Steven Churchill, Wiley Blackwell 2014.

9/13 Outreach: Workshop on museum outreach

Guest: Wendy Derjue-Holzer, Education Director, Harvard Museum of Natural History

DUE: HMNH Observations by start of class

Week 3

9/18 **QUIZ:** Content from Neanderthal crash course readings & lectures

Seminar: Bodies & brains

Holliday, T.W., 1997. Postcranial evidence of cold adaptation in European Neandertals. *American Journal of Physical Anthropology*.

Pearce, E., Stringer, C. & Dunbar, R.I.M., 2013. New insights into differences in brain organization between Neanderthals and anatomically modern humans. *Proceedings of the Royal Society B: Biological Sciences*, 280(1758), pp.20130168–20130168.

9/20 Outreach: HMNH Table prep

DUE: HMNH Table script by start of class

9/22 to 9/23 Weekend assignment: Run HMNH Tables in pairs

Week 4

9/25 Seminar: Growth & Energy

Steegmann, A.T., Cerny, F.J. & Holliday, T.W., 2002. Neandertal cold adaptation: Physiological and energetic factors. *American Journal of Human Biology*, 14(5), pp.566–583.

Martin-González, J.Á. et al., 2012. Differences between Neandertal and modern human infant and child growth models. *Journal of Human Evolution*, 63(1), pp.140–149.

9/27 Outreach: Intro to science communication

Readings/videos: TBD

Week 5

10/2 Seminar: Diet

Henry, A.G., Brooks, A.S. & Piperno, D.R., 2014. Journal of Human Evolution. *Journal of Human Evolution*, 69(C), pp.44–54.

Sistiaga, A. et al., 2014. The Neanderthal Meal: A New Perspective Using Faecal Biomarkers K. Hardy, ed. *PLOS ONE*, 9(6), p.e101045.

10/4 Outreach: Video production workshop

Guests: Ana Aceves and Arlo Perez, Video producers from NOVA Next

Watch before class: NOVA Next video clips (TBD)

Week 6

10/9 Seminar: Artifacts

View stone tools made by Neanderthals found at the archaeological site of Abri des Merveilles, now stored in the Peabody Museum collections.

Klein, R.G., 2009. *The Human Career* Third, Chicago, London: The University of Chicago Press. p. 481- 504

Finlayson, C. et al., 2012. Birds of a Feather: Neanderthal Exploitation of Raptors and Corvids M. D. Petraglia, ed. *PLOS ONE*, 7(9), p.e45927.

10/11 Outreach: Video goals and brainstorm

Meet in Bok Center Learning Lab.

Week 7

10/16 Seminar: Religion

Pettitt, P., 2002. The Neanderthal dead: exploring mortuary variability in Middle Palaeolithic Eurasia. In *Before Farming*. pp. 1–26.

Jaubert, J. et al., 2016. Early Neanderthal constructions deep in Bruniquel Cave in southwestern France. *Nature*, 534(7605), pp.111–114.

10/18 Outreach: Storyboard development

Meet in Bok Center Learning Lab.

Week 8

10/23 Seminar: Language

Dediu, D. & Levinson, S.C., 2013. On the antiquity of language: the reinterpretation of Neandertal linguistic capacities and its consequences. *Frontiers in psychology*, 4, pp.1-17.

10/25 Outreach: **Expert focus group**
Live action video demo for focus group of science outreach experts.

DUE: Storyboard at beginning of class

Week 9

10/30 Seminar: Social Structure

Lalueza-Fox, C., Rosas, A. & Estalrrich, A., 2011. Genetic evidence for patrilocal mating behavior among Neandertal groups. *Proceedings of the National Academy of Sciences*, 108(1), pp.250–253.

Estalrrich, A. & Rosas, A., 2015. Division of labor by sex and age in Neandertals: an approach through the study of activity-related dental wear. *Journal of Human Evolution*, 80(C), pp.51–63.

11/1 Outreach: **No class meeting**
Work on filming draft videos

DUE: Expert focus group debrief

Week 10

11/6 Seminar: Neanderthal DNA

Prüfer, K. et al., 2014. The complete genome sequence of a Neanderthal from the Altai Mountains. 505, pp.43–49.

Racimo, F. et al., 2015. Evidence for archaic adaptive introgression in humans. *Nature Reviews Genetics*, 16(6), pp.359–371.

Hawks, J. "Neandertal sex acts are beyond counting." 21 March 2016. *John Hawks weblog*. http://johnhawks.net/weblog/reviews/neandertals/neandertal-dna/neandertal-sex-acts-beyond-counting-2016.html

11/8 Outreach: **No class meeting**
Screen draft videos to public focus groups today or Friday

Public Focus Group A from 12-1 pm

11/9 Public Focus Group B from 12-1 pm

Week 11

11/13 Seminar: Extinction hypotheses

Shea, J. & Sisk, M., 2010. Complex Projectile Technology and Homo sapiens Dispersal into Western Eurasia. *PaleoAnthropology*, 2010, pp.100–122.

Staubwasser, M. et al., 2018. Impact of climate change on the transition of Neanderthals to modern humans in Europe. *Proceedings of the National Academy of Sciences*, 42, p.201808647.

Alex, B. "Blame Your Subpar Fitness on that Neanderthal DNA." 13 July 2016. *Discover online*. http://blogs.discovermagazine.com/crux/2016/07/13/blame-your-subpar-fitness-on-that-neanderthal-dna/#.W4xys35rzR0

11/15 Outreach: **No class meeting**
Revise and reshoot videos

DUE: Public Focus Group debrief

Week 12

11/20 **No class meeting**

Week 13

11/27 Seminar: Other extinct humans

Reich, D. et al., 2010. Genetic history of an archaic hominin group from Denisova Cave in Siberia. *Nature*, 468(7327), pp.1053–1060.

Alex, B. "Meet the Denisovans" Dec 2016. *Discover*.

Aiello, L.C., 2010. Five years of Homo floresiensis. *American Journal of Physical Anthropology*, 46, pp. 167-179.

11/29 Outreach: **No class meeting**
Revise and reshoot videos

Week 14

12/4 **Celebratory screening of final films**
Time, Location TBD

12/13 **DUE:** Review papers