Lecture 21
Place of Neanderthals & Genetics

- Cold adaptations
- Cognitive abilities
- Linguistic abilities

Neanderthals

- Feldofer Cave
- Neander Valley, Dusseldorf, Germany
- 1856

Mousterian Tradition
La Chapelle-aux-Saints, SW France

- Marcellin Boule (1911-1913)

Neanderthal Anatomy

- Large bodied, heavily muscled
- Short stature
- Bipedal, dense bones

Extinctions?

Homo neanderthalensis
Homo sapiens
Mitochondrial Eve Hypothesis

- Wilson et al. 1987
- 200,000 ya
- Africa
- Single-origin

Mitochondria & mtDNA

Mt-DNA

Faster mutation rate
Maternal Mode of Inheritance
Fewer base pairs
Lots of it
Mt-DNA Results

• Wilson et al. 1987
• 147 individuals
• African origins

Mitochondrial “Eve”

• One woman among roughly 10,000

Criticisms

Small sampling of mtDNA genome
Methodology
African sample
O out-group
Parsimony
Gene history vs. population
Other Genetic Studies

- Microsatellite DNA (coalescent time: 156,000 ya)
- Alu sequences (102,000 ya)
- Y-chromosome (100-150 ya)
Lake Mungo 3

Weird Science?

The Neanderthal Genome Project
Max Planck Institute for Evolutionary Anthropology
2006
38,000 ya Neanderthal
Nuclear DNA

Svante Pääbo

Neanderthal Genes

FOXP2 locus
Entire Nuclear Genomes of Three Neanderthals
44,000-38,000 ya
Vindija Cave, Croatia
Smaller DNA segments from Neanderthals in Spain,
Germany, & Russia

2010 Study

Lewin Ch 27

- What aspects of Neanderthal anatomy imply and adaptation to cold environments?
- Why did so much resistance arise against accepting Neanderthals as a form of ancient human when they were first discovered?
- How is the current taxonomic status of Neanderthals best described?
**Lewin Ch 28**

- How has the history of the interpretation of Neanderthals’ place in human evolution influenced the modern debate over the origin of modern humans?
- Why is the same fossil evidence often interpreted differently by different anthropologists?
- What is the strongest evidence in favor of (1) the multiregional evolution hypothesis and (2) the single-origin hypothesis?
- What additional fossil evidence would help to resolve the current debate?

**Lewin Ch 29**

- Why is mitochondrial DNA a potentially useful tool for tracking recent evolutionary and population events?
- What are the limitations of mitochondrial DNA in inferring phylogenetic history?
- What is the significance of the coincidence of the coalescence times of mitochondrial and nuclear genes?
- What further genetic evidence might clarify the validity of competing hypotheses for the origin of modern humans?