

BL 208. Biological Anthropology  
November 6, 2009

Evolution is a subject that stimulates controversy, in part because evolutionary history does not leave a perfect trail of evidence, and human perceptions are conditioned by cultural heritage. Therefore, it is understandable how evidence on deep-time events, such as the origin of life, would provide opportunities for debate on the interpretation of scanty evidence. However, one might also imagine that consensus on events taking place in the recent past might be within reach. One example concerns the relationship between modern humans and their European contemporaries, the “Neandertals.” As this video illustrates, competent scientists can interpret quite differently the same body of evidence.

Video: Neanderthals on Trial

Several examples in this video exemplify why attempting to prove something is not the best scientific approach. In contrast, attempts to reject hypotheses have proved most useful in advancing scientific knowledge. If hypotheses can't be rejected by evidence, you still haven't proved anything – but you have provided support for the validity of that hypothesis. Take notes. I have provided some questions as a guide.

1. For how many years did Europe “belong to the Neandertals”?
2. Although much work has been done on Neandertal DNA since this video was made, answer these questions based on the video presentation.

Samples of mitochondrial DNA (mtDNA) from world-wide samples of living humans differ (on average), in how many mutations?

Samples of Neandertal mtDNA differs from modern human populations (on average), in how many mutations?

This mtDNA evidence, used to estimate times of divergence, suggests that

- (a) Neandertals and modern humans diverged how many years ago?
  - (b) the lineage of modern humans can be traced to Africa how many years ago?
3. What evidence suggests that Neandertals and modern humans belonged to different species?

4. A child's skeleton was discovered near Lisbon, Portugal and dated at 25,000 ybp (years before present). (Later, read Growing Up Neandertal, p. 316-317 in your text, and check figure 12.18a.

What anatomical feature indicated that the child from Portugal might have had genes from both Neandertals and modern humans?

What was the alternative explanation for this anatomical feature?

5. What evidence from Shanidar Cave, Iraq, suggests that Neandertals were "human?" (Later, read Burials in your text, p. 323-325).

6. What was the hypothetical function of occipital buns?

What kind of evidence supports this idea?

Were you convinced that this hypothesis is correct?

7. Based on the arguments presented in the video, do you think that Neandertals represented a separate species or represented a differentiated group of *Homo sapiens*?