

FYI #2 (also sent as e-mail)

Date: 3/8/06

From: "Harry V. Merrick"

Subject: 3.987 - FYI #2 - more about hominid tooth formation than you probably wanted to know

Hi,

I think an important part of your education in 3.987 should be for you to be aware of some of the amazing "high tech" studies that have been undertaken in palaeoanthropology, even if we don't manage to discuss them in detail in lecture and your text barely mentions them.

Remember on Monday I mentioned the age of the Taung australopithecine child at death and it's dental developmental sequence, the following article and abstract is a follow up. - This paper has a good general description of the technique of analyzing daily enamel formation increments, although it deals specifically with determining the ages of two more recent *Homo erectus* individuals.

The paper dealing directly with the Taung child is by Bromage, T.G. and Dean, M.C. 1985, Re-evaluation of the age at death of immature fossil hominids. *Nature* 317:525-527.

HM.

The following is an elegant analytical study.

Dean, Christopher, Meave G. Leakey, Donald Reid, Friedemann Schrenk, Gary T. Schwartz, Christopher Stringer & Alan Walker.
2001 Growth processes in teeth distinguish modern humans from *Homo erectus* and earlier hominins.
Nature 414:628-631 (| 6 DECEMBER 2001)

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Abstract: A modern human-like sequence of dental development, as a proxy for the pace of life history, is regarded as one of the diagnostic hallmarks of our own genus *Homo*. Brain size, age at first reproduction, lifespan and other life-history traits correlate tightly with dental development. Here we report differences in enamel growth that show the earliest fossils attributed to *Homo* do not resemble modern humans in their development. We used daily incremental markings in enamel to calculate rates of enamel formation in 13 fossil hominins and identified differences in this key determinant of tooth formation time. Neither australopithecines nor fossils currently attributed to early *Homo* shared the slow trajectory of enamel growth typical of modern humans; rather, both resembled modern and fossil African apes. We then reconstructed tooth formation times in australopithecines, in the 1.5-Myr old *Homo erectus* skeleton from Nariokotome, Kenya, and in another *Homo erectus* specimen, Sangiran S7-37 from Java. These times were shorter than those in modern humans. It therefore seems likely that truly modern dental development emerged relatively late in human evolution.