Anthropology

Bruce Bower reports from the annual meeting of the American Association of Physical Anthropologists in New York City

Hominid growth slows to an ape's pace

In the past couple of years, the assumption of many paleoanthropologists that early human ancestors had a prolonged infancy period similar to that of modern humans has been questioned by studies based on two types of tooth analysis. One avenue of this dental work, says B. Holly Smith of the University of Michigan in Ann Arbor, shows that the pattern of tooth eruption in early hominids, or human-like creatures, is more like that of apes than humans.

In an update on a report in NATURE last year, Smith discussed tooth formation in 15 early hominid juvenile jaws compared with dental development in living apes and humans. Two robust australopithecine species, members of a group that split from the human lineage and eventually became extinct, share a unique tooth eruption pattern "that is only superficially human-like," says Smith. "The pattern resembles neither humans nor apes." Smith adds that *Australopithecus afarensis*, thought by many investigators to be the earliest known hominid, has an ape-like eruption sequence, as do *A. africanus*, *Homo habilis* and *H. erectus*, all widely considered to be in the human lineage.

Smith's work, suggesting a relatively short maturation period in early hominids, is in agreement with a recent study of the timing of early hominid tooth growth by Timothy G. Bromage and C. Christopher Dean of University College in London, England (SN: 10/26/85, p.260). They used an electron scanning microscrope to count ridges on the enamel surface that, according to studies of modern humans and other mammals, form at the rate of about one per week. Australopithecine and early *Homo* juvenile teeth displayed rapid, ape-like growth.

The two lines of dental evidence suggest, says Smith, that prolonged care of slowly developing infants and cultural arrangements to deal with this necessity did not emerge until relatively late in human evolution.

The data also indicate, notes Smith, that tooth formation in modern humans and apes under three years of age "is not nearly as different as we thought it was. Clear differences only emerge at later ages."

Sizing up Neanderthals

The collection of Neanderthal fossils uncovered at a site in Krapina, Yugoslavia, is Europe's largest and earliest such assemblage — dating to around 100,000 years ago. Individuals at the site have often been portrayed as smaller and more primitive than western European Neanderthals, who disappeared around 40,000 years ago. This may not, however, have been the case, according to Rachel Caspari of the University of Michigan in Ann Arbor.

Last summer, Caspari partially reconstructed one of the largest Krapina skulls, thought to be that of a male. Its cranial capacity, she says, falls well within the range for western European male Neanderthals. The Yugoslavian skull has a few features that appear to be more primitive than those of its western European counterparts, but these differences may represent geographic variations, notes Caspari. Unfortunately, there are no comparably well-preserved Neanderthal skulls from later in the central European fossil record to compare with the Krapina skull.

Caspari's contention was supported by a reexamination of fossil bones from Krapina conducted by Erik Trinkaus of the University of New Mexico in Albuquerque. Trinkaus's sample was composed of 466 bones from below the skull, including 97 newly discovered specimens. The bones are from at least 10 adults and five juveniles, he notes, but the actual number of individuals may approach 25. The size and shape of the remains fall within the range of variation for later Neanderthals in western Europe and the Near East, says Trinkaus.

Earth Sciences

Joanne Silberner reports from Santa Barbara, Calif., at the Seismological Society of America meeting

Great quake body count

According to the 1907 San Francisco Board of Supervisors, 478 people died as a result of the great earthquake and fire of 1906. According to City Archivist Gladys Hansen, at least 2,500 people died.

To identify people who were injured in the quake but who died outside of San Francisco, Hansen has gone through local and out-of-town newspapers and city and hospital records along the ferry and train routes. In addition, she contacted historical and genealogical societies for information.

"The original estimate was low because the city had to regain its position," Hansen says. Politicians did not want the event seen as a great blow to the city. In fact, she notes, they spoke of the great fire, not the great quake, since a fire is something that can be fought or prevented.

Hansen checks the names she collects against the 1905 city directory, and if the names don't appear there they go into the "missing" rather than the "known dead" file. Her job, she says, is hampered by the fact that many poor or non-English-speaking people were not included in the directory; nor were women unless they had a job or were widowed. In addition, evidence disappeared in the conflagration — the fire was hot enough to incinerate bodies.

Dating earthquakes

In figuring out the history of the earth, geologists generally use pickaxes, hammers and mechanical equipment. Gordon Jacoby of the Lamont-Doherty Tree Ring Laboratory in Palisades, N.Y., uses trees.

Several years ago, he and a Lamont colleague looked at the growth rings of trees from a seismically active part of Alaska and suggested that a strong earthquake in 1899 had moved the land on which the trees stood to a more protected environment where they grew more quickly (SN: 2/5/83, p.90). Now Jacoby, Lamont colleague Paul R. Sheppard and Kerry Sieh of the California Institute of Technology in Pasadena suggest, based on tree ring evidence, that an 1812 earthquake thought not to have been along the San Andreas fault actually was. If this is the case, they note, it brings into question the current understanding of how the fault works.

The width of tree rings depends on their growth rate — in particularly bad years, they may lay down no rings at all. Jacoby and his colleagues looked at cores taken from 65 trees along the fault in Wrightwood, Calif. They compared the rings to 30 trees in the area but not on the fault, and found "dramatic and extended" growth suppression in trees along the fault beginning in 1813, indicating that something had happened between the 1812 and 1813 growth seasons. The area had not been settled in 1812, and there are no records of the quake in Wrightwood.

Two quakes were felt 60 miles away at San Juan Capistrano in December of 1812. One knocked down a mission building, killing several dozen worshippers inside. Because San Juan Capistrano is about 50 miles from the San Andreas, seismologists have thought that these were not San Andreas earthquakes.

But a quake that affects the fault in Wrightwood is a San Andreas quake, and an 1812 San Andreas quake skews the suspected periodicity of the fault. Geological evidence based on changes in streambed paths indicates that the Wrightwood area experienced an earthquake in 1550, plus or minus 50 years, and people living in the area in 1857 reported a quake. An 1812 Wrightwood quake, as the tree ring evidence indicates, suggests that ruptures more frequent than every few hundred years are possible on that part of the fault.

Alternatively, Caltech's Sieh suggests, Wrightwood may be at an overlap of two fault segments, and can rupture along either one.