

Bone marks: Tools vs. teeth

A new method of analyzing tiny pits and grooves on broken animal bones, developed by anthropologists at Rutgers University in New Brunswick, N.J., promises to help clarify questions about the proposed hunting and scavenging strategies used by human ancestors nearly 2 million years ago.

Robert J. Blumenschine and Marie M. Selvaggio used a piece of sandstone to break limb bones taken from the carcasses of African gazelle, impala and wildebeest. They broke the bones so they could remove marrow with a stick, a technique Blumenschine suggests early human ancestors used to scavenge the remains at carnivore kill sites (SN: 3/9/85, p.155).

The resulting pits and grooves or "percussion marks" on the bones, usually found near the notches created by the impact of stone, look much like carnivore tooth marks at first glance, the researchers report in the June 24 NATURE. But when the broken bones are viewed under a scanning electron microscope, patches of distinctive parallel lines are found in and around percussion pits and grooves; a different line pattern is observed near hyena tooth marks on marrow bones, explain Blumenschine and Selvaggio. Minute percussion marks also differ from stone-tool cut-marks and scraping marks, thought to be signs of meat defleshing.

Percussion marks are likely to turn up among animal bones found at human ancestor sites in East Africa, predict the researchers, since the prehistoric inhabitants had access to stone similar to that used in their experiment. In previous investigations, they maintain, researchers probably have underestimated or overlooked the breaking of bones by early humans to obtain marrow. Percussion mark analysis also can test claims for a human presence in the New World up to 100,000 years ago based on tools allegedly shaped from bone (SN: 3/14/87, p.172).

The hard and soft of hominid diets

The wear patterns on the teeth of early hominids – the evolutionary family that includes modern humans – can reveal much about what these creatures ate. A report in the June 24 NATURE, based on scanning electron microscope images and a statistical analysis of bands of light on the grinding surface of hominid teeth, suggests that members of the now-extinct *Paranthropus* lineage ate hard foods such as nuts and seeds, while *Australopithecus* individuals probably preferred leaves and soft, fleshy fruits.

Frederick E. Grine of the State University of New York at Stony Brook and Richard F. Kay of Duke University in Durham, N.C., examined five molar teeth from a South African *Australopithecus* species that lived about 2.5 million years ago, as well as five molars from South African *Paranthropus* creatures that lived approximately 1.8 million years ago. The *Paranthropus* line, referred to by some anthropologists as the "robust australopithecines," died out about 1 million years ago (SN: 5/28/88, p.344). The *Australopithecus* species studied by Grine and Kay is considered pivotal in hominid evolution, but its place in the hominid family tree is unclear.

The large, flat teeth of *Paranthropus* long have been considered signs of a vegetarian diet, but there has been disagreement over precisely what was eaten and whether *Paranthropus* and *Australopithecus* species from the same region ate the same foods.

Patterns of wear and the frequency of pitting on the surface of *Paranthropus* teeth are similar to those previously observed among modern primate species that feed on hard foods such as date palm seeds, palm nuts and bark, say the researchers. The wear pattern displayed by *Australopithecus* is more similar to that of living primate species subsisting largely on leaves and fleshy fruits.

Good news from the dentist

Half of all American schoolchildren now have no decay in permanent teeth, continuing a remarkable decline in tooth decay first documented in 1980. In a study of almost 40,000 children this past school year, researchers at the National Institute of Dental Research (NIDR) also found 36 percent fewer cavities than in the previous survey. This decline leads NIDR Director Harald Løe to predict "the beginning of the end" for tooth decay.

The study showed that those U.S. children who do get cavities are getting fewer of them. Between 1980 and 1987 the average dropped from almost five decayed, missing or filled tooth surfaces to three, and those cavities that were found appeared mostly on rough tooth surfaces. This decay could be eliminated, dental officials say, by increased use of fluoride and adhesive sealant, a plastic film that dentists paint onto teeth.

The origins of this success story date to the early 1900s, when two dentists observed that residents of some western communities had permanently stained teeth; later study linked this to fluoride in their water supply. Eventually, smaller levels of fluoride were correlated with a reduction in tooth decay.

But the accomplishments announced last week could disappear, officials caution, if preventive efforts slacken. NIDR Chief Epidemiologist James P. Carlos cites three major factors behind the decline: fluoride in water, food and toothpaste; good dental habits; and high-level dental care. There is no evidence, he says, that dietary habits have changed.

Broader screening for hepatitis B

All pregnant women should be routinely screened for hepatitis B virus, according to a new recommendation from the Centers for Disease Control (CDC). The current practice of screening only women in high-risk groups for hepatitis B has failed to curb the disease in newborns, says the CDC in the June 10 MORBIDITY AND MORTALITY WEEKLY REPORT.

Hepatitis B virus is transmitted through the blood and can be easily passed from the mother's blood to the fetus. Each year, about 3,500 infants in the United States become carriers of the virus, which causes swelling of the liver. Of those, 25 percent die from cirrhosis or liver cancer, usually in adulthood.

Most of the 16,500 pregnant women each year who carry the virus are intravenous drug users or venereal disease patients. That's why the CDC in 1984 recommended prenatal testing for women in those groups. But since doctors often have difficulty identifying women at risk, "problems have been encountered implementing these recommendations," says the CDC.

Widespread prenatal testing would pinpoint women who carry the hepatitis B virus, enabling pediatricians to treat infected babies as soon as they are born.

Sunnier days for Accutane-like drugs

Accutane, the anti-acne drug that recently gained notoriety for causing birth defects in pregnant women, can lower the incidence of skin cancer in people highly susceptible to the disease, researchers report. The study is one of the first to demonstrate the possibility of preventing cancer with drugs.

Researchers at the National Institutes of Health studied five patients with xeroderma pigmentosum treated with high doses of the drug for two years. The disease leaves skin cells unable to repair ultraviolet damage; patients develop skin cancers at a frequency more than 1,000 times that of the general population.

As reported in the June 23 NEW ENGLAND JOURNAL OF MEDICINE, the number of tumors formed per year dropped 63 percent while the patients were treated, then rose again in the year following treatment cessation. The researchers suggest that less toxic forms of the drug may help prevent skin cancer in people with normal susceptibility to cancer.