Early humans make their marks as hunters

The earliest undisputed remains of *Homo sapiens*, dating to around 100,000 years ago, come from caves at the mouth of South Africa's Klasies River. For the past 15 years, a heated debate has centered on whether those ancient coastal humans occasionally hunted in simple ways, such as driving their prey over cliffs, or obtained meat solely from carcasses left by lions and other predators.

A new analysis of animal bones previously unearthed at the Klasies River site suggests that *H. sapiens* exhibited much more hunting prowess than either side of the debate has given them credit for.

"Early modern humans at Klasies River mouth were active hunters," contends anthropologist Richard G. Milo of Chicago State University. "Their behavior appears to have been as near-modern as their anatomy."

Milo conducted a microscopic study of the frequency and distribution of butchery marks on more than 5,400 animal bones found among *H. sapiens* remains in a Klasies River mouth cave. He presented his analysis at the annual meeting of the Paleoanthropology Society in St. Louis last week.

Nearly one in five of the animal bones bears incisions typical of butchery, Milo says. That proportion far exceeds a prior estimate for the same material reported by Lewis R. Binford of the University of New Mexico in Albuquerque.

Butchery marks appear on bones from animals of all sizes and congregate at major skeletal joints, where a fresh kill would have been most easily cut into pieces. The prime body parts, such as upper legs, found in the cave indicate ready access to carcasses by hunters, Milo notes. The remains display few signs of carnivore chewing or gnawing.

In addition, the broken tip of a spear point is embedded in a neck bone from an extinct giant buffalo, one of the largest Stone Age game animals in southern Africa. Deep gouges in five vertebrae from other ancient creatures may represent stab wounds inflicted by human weapons, according to Milo.

Early *H. sapiens* at Klasies River probably formed coordinated hunting groups that exploited the behavior and habits of their prey, Milo proposes. In his view, hunting parties drove animals into pits studded with pointed stakes and may have run smaller game off nearby cliffs.

"This is a very important study," remarks Alison S. Brooks, an archaeologist at George Washington University in Washington, D.C. "Milo has exploded the argument that Middle Stone Age people were not competent hunters and did not produce projectile points."

Brooks theorizes that the folk at the Klasies River mouth ambushed animals from carefully chosen hiding spots and then thrust spears into them.

Other evidence suggests that human ancestors living in Africa between 400,000 and 90,000 years ago made sophisticated stone tools and other items linked to modern cultural behavior (SN: 12/2/95, p. 378). In Europe, wooden hunting spears have recently been dated to 400,000 years ago (SN: 3/1/97, p. 134). — *B. Bower*

Showy comet lives up to its billing

Halley's comet captured the public's imagination but proved disappointing as a spectacle. Hyakutake's limited engagement left scientists hungering for more. Hale-Bopp, however, has satisfied both audiences.

"This is the first time we've had a comet with a lot of notice that really did live up to expectations," says Brian G. Marsden of the Harvard-Smithsonian Center for Astrophysics in Cambridge, Mass. Hale-Bopp's closest approach to the sun, on April 1, sped the melting of the comet's nucleus, making the tail longer and wider. The comet should remain bright for a few weeks, but the waxing moon may obstruct the view, Marsden said.

While Hale-Bopp's fiery performance unfolds, astronomers are compiling an inventory of its ingredients. The list consists mainly of common molecules like water and carbon dioxide, but it includes some never before detected in a comet, says Harold A. Weaver of Johns Hopkins University in Baltimore. These molecules—formic acid, sulfur dioxide, cyanoacetylene, H_2CS—and new isotopes of hydrogen cyanide and carbon monosulfide may have existed in other comets but in such tiny proportions that they were hidden behind more abundant ones. "You need a very bright comet like Hale-Bopp to detect them," says Weaver.

The comet's next appearance is tentatively scheduled for 4397.

— P. Smaglik

I. Griffin/Astronaut Mem. Planetarium & Observ.

Cell death protein triggers diabetes

In the grisly film *The Silence of the Lambs*, serial killer Hannibal Lecter becomes angry with a jail mate and uses formidable powers of persuasion to convince him to commit suicide by swallowing his tongue.

While diabetes may never become the subject of an Oscar-winning movie, researchers are finding that this autoimmune disorder may stem from a Lecter-like strategy: Immune cells in the body seem to induce suicide in the insulin-producing islet cells of the pancreas (SN: 2/1/97, p. 72).

A new study unexpectedly reveals that the suicide method chosen by the troubled islet cells depends on a cell surface protein called Fas. Furthermore, this finding suggests that scientists who have been pursuing a novel transplant approach to cure diabetes may need to modify their plan.

Researchers have recently found that Fas commands the cells that bear it—usually immune cells, not islet cells—to commit suicide when a cell bearing a protein called Fas-ligand (FasL) interacts with it. In this way, certain FasL-covered tissues, such as those of the eye and the testes, stay free of patrolling immune cells (SN: 10/21/95, p. 263). Even some cancer cells display FasL, thereby killing immune cells that target tumors (SN: 2/8/97, p. 88).

Inspired by these observations and hoping to create islets that would not be rejected by the immune system when transplanted, several research groups have rushed to genetically engineer mice to display FasL on the surface of pancreatic cells.

"The idea was to protect islet cells from attack by immune cells," says Alexander V. Chervonsky of Yale University School of Medicine. Mice of a diabetes-prone strain known as NOD, for example, were expected to become resistant to the disease when engineered to bear FasL on their islet cells.

Yet Chervonsky and his colleagues report in the April 4 CELL that mice of most FasL-bearing NOD strains develop diabetes frequently. Moreover, when injected with diabetes-causing immune cells, the FasL mice developed the disease even more quickly than normal NOD mice.

While probing these puzzling findings, Chervonsky's group discovered that the immune cells induce the islet cells of the mice to make Fas. Consequently, the islet cells, now carrying both Fas and FasL, trigger suicide among themselves. The resulting cell death leads quickly to diabetes.

The scientists next found that diabetes in NOD mice that haven't been genetically engineered seems to result