

Neandertal Hunters Get to the Point

On the slope of a desert plateau in Syria, excavations have uncovered what seems to qualify as an archaeological smoking gun confirming the manufacture and use of spear points by Neandertals.

The evidence for this controversial proposition consists of an inch-long piece of a sharpened, triangular, stone point embedded in a neck bone of a wild ass, an extinct ancestor of donkeys. When intact, the point had extended an estimated 2 1/2 inches and was attached to a shaft or a handle, according to a scientific team led by Eric Boëda of the University of Paris X in Nanterre. As a Neandertal thrust the spear into the ancient creature's neck, both the point's tip and its base broke off, the researchers assert.

Initial measurements of radioactive decay in soil at the Syrian site yield an estimated age of more than 50,000 years for the new find. Stone points, ranging in size from less than 1 inch to several inches long, have turned up at many Neandertal sites located in Europe and the Middle East.

However, ambiguous evidence for the points' use in hunting had led some researchers to theorize that Neandertals obtained meat primarily by scavenging carnivore leftovers. In this view, they may have used the stone points for cutting carcasses abandoned by the predators.

Human ancestors preceding the Neandertals hunted with wooden spears (SN: 3/1/97, p. 134). Stone points added a deadly edge.

"Regardless of whether this weapon was thrown or simply hand-held, it would have been much more efficient and lethal than a simple wooden thrusting spear," Boëda's group concludes in the June ANTIQUITY.

The researchers excavated the Syrian site, Umm el Tlel, from 1991 through 1998. In the latest field season, they discovered the partial spear point poking into the cavity of the horse-like creature's neck bone. Only a forceful thrust—which

severed the stone's tip as it penetrated the animal's flesh and broke off its base once the point poked through the bone—could have wedged the weapon into that position, the team holds.

A strong, uneven force produced scarring on the base and sides of the stone artifact, indicating that it was bound to a shaft or handle, they say.

Neandertals probably stabbed the animal as it stood, Boëda and his coworkers theorize. Penetration of the spear point into the spinal cord would have caused immediate, irreversible limb paralysis. If the ass had been lying down because of injury or illness, the hunters would have stabbed it in the rib cage rather than the neck.

The extent to which Neandertals used

sharpened, triangular stones as spear points remains unknown. John J. Shea of the State University of New York at Stony Brook suspects, however, that the razor-edged stones often served as spear points. Shea argues that both ancient *Homo sapiens* and Neandertals living in the Middle East killed wild horses and goats with stone-tipped spears (SN: 8/1/98, p. 72).

"You don't get much better evidence for hunting with spears than the new Syrian discovery," Shea comments.

In an article that they have submitted for publication, Shea and his colleagues report that stone spear points they fashioned Neandertal-style easily penetrate the rib cages of goat carcasses. "These stones are effective spear points," Shea argues. —B. Bower

Malaria disrupts the immune system

More than most diseases, malaria repulses attempts by people to build immunity against it. Neither prior exposure to the disease nor vaccination protects reliably. Scientists have suggested that *Plasmodium falciparum*, the protozoan responsible for the most severe form of malaria, disrupts the human immune system as it infects red blood cells.

British researchers now report that malaria indeed manipulates certain immune cells in the blood, apparently crashing one sector of the immune system as though it were a faulty computer. Although their malaria study was confined to laboratory dishes, it confirms suspicions that the microbe has immune-disabling potential and sheds light on the puzzling mechanism by which malaria invades the human body.

When confronted with a foreign microbe, immune-system components called dendritic cells normally activate workhorses called T cells. Immunologist Britta C. Urban of John Radcliffe Hospital in Oxford, England, and her colleagues report in the July 1 NATURE that red blood cells infected by the malaria microbe bind to dendritic cells and severely disable them. When exposed to a common bacterial component, these impaired dendritic cells showed only one-tenth the normal immune response of healthy cells.

Immune cells often retain a memory of disease-causing agents, priming the system to fend off a later onslaught of the same disease. Urban came up with the idea of studying dendritic cells—which

play a key role in immune memory—in part because a century of research had not explained why the human immune system often fails to gear up against subsequent malaria infections.

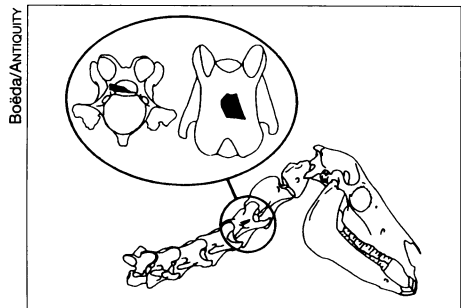
Earlier experiments established that red blood cells infected with the malaria microbe display on their surface at least 50 special proteins, which they use to bind to cells on blood-vessel walls. The new study shows that these proteins also render dendritic cells incapable of priming T cells, says study coauthor David J. Roberts, a hematologist at the same hospital.

"It's a way in which malaria invades the immune system and might explain why people get repeated infections," he says.

"It's an interesting [study]," says W. Ripley Ballou, a vaccine specialist at the Walter Reed Army Institute of Research in Washington, D.C. "Dendritic cells, as an area of investigation, are hot right now."

Understanding how surface proteins induce infected blood cells to bind to dendritic cells may help in designing a vaccine, Roberts says. Unfortunately, with such a variety of surface proteins, "it's a nightmare [trying] to make a vaccine out of this," Ballou says.

The new findings also suggest that infected red blood cells may be interfering with the function of vaccines, he says. Many people in regions where malaria is endemic show no symptoms but still carry the disease. For a vaccine to be effective in them, doctors would have to treat the participants with antimalarial drugs before vaccination to clear malarial parasites from their bloodstream, Ballou says. —N. Seppa



Position of ancient spear-point fragment embedded in the neck bone of a wild ass. Close-ups show artifact from above (left) and below (right).