Anthropology

Bruce Bower reports from Kansas City, Mo., at the annual meeting of the American Association of Physical Anthropologists

Pelvic angle to Neanderthal dispute

Debate over the evolutionary importance of the Neanderthals, who lived from about 125,000 to 30,000 years ago, has intensified over the past year. The traditional view holds that modern humans are closely related to the Neanderthals, probably as direct descendants. But recent genetic studies suggest that anatomically modern humans emerged from Africa around 200,000 years ago, spread throughout the world, and replaced the Neanderthals. More evidence that the two groups took separate evolutionary paths came with the report that modern humans inhabited the Qafzeh cave site in Israel 90,000 years ago, long before Neanderthals are known to have been in that region (SN: 2/27/88, p.138).

The argument for the replacement of Neanderthals by modern humans also gets a boost from an examination of the only complete Neanderthal pelvis, recently discovered by Yoel Rak and his colleagues at Tel-Aviv University in Israel. The pelvis, says Rak, is part of a skeleton found in a burial site at the 60,000-year-old Kebara cave not far from Qafzeh and is fundamentally different from its counterpart in the modern human skeleton. The Neanderthal's pelvic outlet is distinctively shaped, and the sockets for the thighbones are pushed back compared with those of modern humans.

While this weakens the case for a close evolutionary relationship in which Neanderthals and modern humans interbred and exchanged genes, Rak says the new specimen does not support the notion, based on the analysis of previously discovered partial pelvises, that the Neanderthal pelvic outlet was bigger than that of modern humans. Such observations led to speculation that Neanderthals had longer gestation periods and bigger babies than modern humans.

"The two different pelvic configurations have to do with posture and locomotion, not gynecology," says Rak.

He adds that anatomically separate Neanderthal populations probably lived throughout Europe, the Middle East and other areas. The "classic" Neanderthal face, marked by heavy brow ridges, receding cheekbones, large nose and protruding jaw, is most evident in western European fossils, says Rak. In Israel and Asia, Neanderthal skulls have a more "confused," modern-looking set of features.

If regional Neanderthal populations ever crossed paths, holds Rak, "I deeply believe they would have stayed separate and not interbred."

But other anthropologists at the meeting said that Near and Middle Eastern variations in Neanderthal facial anatomy point to some genetic mixing with modern humans at the crossroads between Africa and Europe.

Arthritic origins in New World?

Scientists have diagnosed the earliest known cases of rheumatoid arthritis from the bones of six people who lived between 3,000 and 5,000 years ago in what is now northwestern Alabama.

The existence of the crippling joint disease before A.D. 1800 had previously not been established anywhere in the world, says anthropologist Kenneth R. Turner of the University of Alabama in Tuscaloosa. Rheumatoid arthritis, he adds, may be a transmissible disease that spread from the New World to the Old World in the late 18th century.

The remains of the early arthritis sufferers were identified in a collection of human bones excavated about 50 years ago along the shores of the Tennessee River. At first, Turner and his colleagues noticed bone loss near hand, arm, leg and foot joints typical of rheumatoid arthritis damage. They then took X-rays of the bones and observed that the nature and pattern of the bone damage is nearly identical to what is found in X-rays of modern rheumatoid arthritis patients.

Biology

Multiplicity and HIV's clinical course

A study of four people infected with the AIDS-causing HIV virus has found that, over a four-year period, the viruses isolated from the patients became more virulent – something scientists have suspected for some time. Researchers at the University of California at San Francisco said last week that the later isolates killed more white cells and multiplied faster than those taken from patients early in infection. Emergence of these more virulent viruses corresponded with clinical appearance of AIDS symptoms, say the scientists, who conclude the increased virulence occurred inside the body rather than during laboratory procedures.

Reporting in the April 1 SCIENCE, Jay A. Levy and others suggest that tracking HIV isolates as they change *in vivo* will help explain the symptomatic course of the disease. Further studies, they say, "should provide information on the genes that determine the virulence of HIV-1, and identify potential targets for antiviral therapy." The California study reiterates the problems caused by HIV's many isolates and its ability to mutate rapidly. A recent study of a specific feline leukemia virus, which also causes fatal feline immunodeficiency syndrome, led scientists to conclude that current laboratory procedures may not be isolating the more virulent strains of HIV, thus misleading researchers (SN: 2/27/88, p.133).

Tightening up with endothelin

Once thought to be an inert wrapping through which blood flows, the endothelial cells lining blood vessels have attracted much scientific attention – first in terms of fatty buildup caused by atherosclerosis, more recently as the source of substances that can constrict or relax the vessels and thus affect blood pressure. Japanese researchers now report the isolation of a "novel" 21-amino-acid peptide, which they call endothelin and describe as "one of the most potent vasoconstrictors known."

Scientists from the University of Tsukuba and the Fermentation Research Institute in Ibaraki and the University of Tokyo isolated the substance – which causes constriction of artery strips in the laboratory – from cultures of pig endothelial cells. The researchers report in the March 31 NATURE that, after DNA cloning and sequencing experiments, they discovered that endothelin does not belong to any previously known family of peptides. It is, however, similar in structure to neurotoxins known to affect the tiny channels that allow sodium ions to cross membranes. Because the endothelin-induced vessel constriction depends on calcium flow into cells, the scientists hypothesize that the new peptide acts on calcium, rather than sodium, channels.

As John Gordon at British Biotechnology Ltd. in Oxford points out in an accompanying editorial, the Japanese results are the latest in a series of endothelial-function studies. Once "regarded as a sort of nucleated dialysis bag that lines the blood vessels," the endothelium is now known to play a more active role, says Gordon. Late last year, scientists reported on the activity of endothelium-derived relaxing factor (EDRF), which *prevents* constriction of blood vessels (SN: 11/28/87, p.342). At the time, scientists proposed that when atherosclerosis deposits stop EDRF from reaching muscle fibers in the walls, blood vessels may open and close in spasms – causing blood pressure problems.

But how endothelin will fit into the complex picture of blood vessel activity in the body remains unclear, says Gordon. He cites unanswered questions about the exact site of endothelin production, as well as whether the laboratory results can be extrapolated to the *in vivo* situation. The Japanese group suggests that endothelin, with its longer-lasting effects, may have broader influence on the body's blood pressure, as opposed to EDRF's short-lived, more localized control.