team of researchers at Duke University Medical Center in Durham, N.C., implicated that gene in half of the late-onset cases they studied (SN: 8/14/93, p. 108). Hardy says *presenilin-1* may figure in 20 percent of the late-onset cases.

Duke's Margaret A. Pericak-Vance, who reported the initial link with the *apo E-IV* gene, says, "If it's true, it's intriguing." She adds that the study must be replicated by others to make certain the association doesn't occur by chance. Pericak-Vance and a coworker found no link between the gene and late Alzheimer's in an unpublished study of 300 patients and some family clusters.

Hardy argues that the *presenilin-1* variation he and his colleagues have identified does not cause late-onset Alzheimer's. The variation lies on a portion of the gene that does not code for protein. He suggests that another section of the gene triggers the disease.

The variation does, however, provide a distinctive, readily identifiable pattern that researchers can track through successive generations, as well as locate in individual patients. This predictable association between Alzheimer's disease and the variation indicates that it lies close to the gene segment that causes the disease.

"What we're looking at is a marker," Hardy says. "There's something else that's biologically relevant that we need to find." *—S. Sternberg*

Artificial materials imitate nature's own

Nature has a knack for making materials. Bones and teeth, for instance, display extraordinary properties—high strength, light weight, and unusual molecular architecture—that scientists find hard to replicate. Even more remarkable is the ability of biological processes to assemble these complex composites from inorganic materials.

Using a process of molecular self-assembly inspired by the way bones form, chemists Peter T. Tanev and Thomas J. Pinnavaia of Michigan State University in East Lansing have managed to coax a silicon compound into forming tiny onion-like beads, called vesicles, that are layered in concentric shells.

"We're aiming to mimic the way nature puts together organic and inorganic components, as in teeth and bones," says Pinnavaia.

"By using a biological type of assembly, we've been able to make a new type of porous material."

The newly fabricated material resembles zeolites, naturally occurring mineral compounds that serve as catalysts for a wide range of reactions. Scientists want to customize such materials, tailoring the size and shape of their pores to specific chemical purposes.

"Materials that have holes as part of their structure, such as zeolites, play an important role in commercial processes, particularly in refining petroleum and in reducing industrial pollutants," Pinnavaia says. "The chemistry of assembly of these porous silica vesicles resembles what goes on during biomineralization."

The new vesicles—which form clusters resembling a bunch of grapes—measure between one-millionth and one-billionth of a meter in diameter, the chemists report in the March 1 SCIENCE.

Tests show that this silica remains stable at a wide range of temperatures, has a large surface area and pore volume, and can be produced using methods that are environmentally benign, the chemists say.

"The ability to make complex self-assembled materials like this is a significant advance," says Thomas Bein, a chemist at Purdue University in West Lafayette, Ind.

"This is one of the first examples of an organized, porous material with a vesicle structure," says Galen D. Stucky, a chemist at the University of California, Santa Barbara. "That's an important contribution."

With further development, such biomimetic materials hold the promise of spawning improved building materials, novel protective coatings, and components for automobiles and microelectronics. *—R. Lipkin*

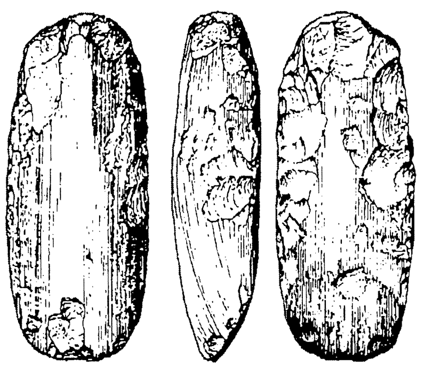
Polynesian tools tout ancient travels

Archaeologists have long assumed that prehistoric inhabitants of Polynesia, an approximately 3,000-mile-long swath of islands in the South Pacific, rarely traveled far from their tropical homes. In particular, cultural traditions and languages diverge sharply between western and eastern Polynesia, denoting a long-standing isolation of these regions from one another, many investigators argue.

A new study, however, indicates that prehistoric Polynesians made long-distance voyages across the west-east barrier in order to obtain a fine-grained basalt suitable for tool production. Polynesian settlers of various island groups, or archipelagos, regularly navigated vessels to and from faraway sources of this volcanic rock, contend Marshall I. Weisler of the University of Otago in Dunedin, New Zealand, and Patrick V. Kirch of the University of California, Berkeley.

"This is one of several projects starting to find evidence of such interarchipelago contacts," asserts Barry V. Rolett of the University of Hawaii in Honolulu. "It's one of the most exciting developments in the study of Polynesian prehistory in the last 20 years."

Weisler and Kirch



Front, side, and back views (left to right) of a basalt tool from Ofu Island.

Ancient Polynesians transported fine-grained basalt from a rich quarry on the western island of what is now American Samoa to islands situated 60 to 1,000 miles east, Weisler and Kirch contend in the Feb. 19 PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES. This activity began between 2,000 and 3,000 years ago, the scientists estimate.

They analyzed the chemical composition of sharpened basalt tools found on American Samoa, on nearby Ofu Island, and on Mangaia Island in eastern Polynesia. Each artifact was placed under special X-ray equipment that delivered a nondestructive radioactive beam, enabling the researchers to calculate the amounts of certain trace elements in the basalt.

Fine-grained chopping and slicing basalt tools from American Samoa have a different chemical signature from those of the coarse-grained basalt artifacts found on Ofu and Mangaia Islands, Weisler and Kirch hold. Moreover, fine-grained basalt implements excavated on the latter two islands display the elemental insignia of basalt from American Samoa, they found.

Radiocarbon dates indicate that Polynesians imported basalt from distant archipelagos in the west for about 3,000 years, up until around A.D. 330, according to Weisler and Kirch.

Ongoing work in the Marquesas Islands, on the eastern fringe of Polynesia, is also uncovering chemical evidence of ancient basalt imports, says Rolett, who directs that project.

Long-distance expeditions probably occurred regularly in prehistoric Polynesia, although more evidence will be needed to convince traditionalists to give up the theory of largely isolated islanders, remarks Thomas J. Riley of the University of Illinois at Urbana-Champaign. *—B. Bower*