some women might consider keeping their pregnancy rate low. "The number of children people have is a personal decision," Harris says. "But it seems to me it's important to know whether pregnancy does lead to an increased risk for diabetes."

Although some women develop a temporary, mild form of diabetes during pregnancy, the California scientists did not determine the incidence of such "gestational diabetes" among women in the study. Many of the women bore their children before doctors began screening for gestational diabetes, Barrett-Connor says. Scientists know that women who get gestational diabetes run an increased risk of Type II diabetes as they age, she adds.

Barrett-Connor and her colleagues speculate that pregnancy puts a strain on the mother's beta cells, a strain that can lead to Type II diabetes much later, especially if the woman is overweight or has inherited poorly functioning beta cells. During pregnancy, the researchers suggest, pancreatic beta cells must produce more insulin to keep the developing fetus nourished with a constant supply of glucose. At the same time, the mother's body tissue must become resistant to insulin to ensure that the extra glucose load goes to the fetus. Scientists know that Type II diabetics have chronically high blood insulin levels and are insulin resistant, the California researchers note.

*– K.A. Fackelmann*

# Nonexistent technology gets a hearing

Sooner or later, the Age of Nanotechnology – in which scientists will use molecule-sized machinery to control the structure of matter even at atomic levels – will arrive. That message emerged in Palo Alto, Calif., last weekend at the first major U.S. conference devoted to the topic.

Traditionally, making chemicals and materials has meant trying to control huge crowds of atoms and molecules so that their mob activities yield the desired products. Nanotechnology, as envisioned by conference chairman and engineer Eric Drexler, would mean getting personal with molecular individuals. Drexler has spent years arguing that designing machines on the nanometer (one-billionth of a meter) scale for directly assembling molecular and atomic components is possible at least in principle, despite the impossibility of building such machines now. The existence of molecular machinery (enzymes) inside cells proves such structures can be built in nature, he notes. Drexler heads the Palo Alto-based Foresight Institute, whose stated mission is to "prepare for future technologies."

Many conference participants agree that nanotechnology ("nano" comes from the Greek word for dwarf) will someday fulfill its seeming potential. Others question that prognosis.

The seeds of nanotechnology already are germinating in existing research fields. Physicist John S. Foster of IBM's Almaden Research Center in San Jose, Calif., told conferees of his group's success in using the tip of a scanning tunneling microscope to crudely position individual molecules on a surface (SN: 2/13/88, p.106). Crystal engineer Michael D. Ward of Du Pont Co. in Wilmington, Del., reported progress in designing electrically charged molecular components that, like many large biological molecules, consistently self-assemble into specific structures (SN: 3/18/89, p. 166). Others spoke of making proteins from scratch and of molecular versions of electronic and computer components.

Researchers admit these successes provide but a shadowy hint of the nanotechnology envisioned by Drexler. Making nanoscale structures using Ward's methods would require stopping the self-assembly process after only a small number of components have come together, an impossible feat now. Still, Drexler says, "if the scientific argument for nanotechnology is sound, there's a lot at stake." Responsibly managed nanotechnology projects, according to Drexler and others at the conference, could include nanomachines that extract pollutants from the atmosphere or that reverse biological fiascoes such as cancer, perhaps by traveling into diseased cells and repairing them. Mismanaged or in hostile hands, nanotechnology might instead reveal itself as another word for catastrophe, warns political scientist and environmentalist Lester Milbrath of the State University of New York at Buffalo.

The mere possibility of developing such far-reaching capabilities makes nanotechnology a real issue today, says Ralph Merkle, a computer scientist at Xerox's Palo Alto Research Center. "We should start thinking about this technology now."

*– I. Amato*

# The quick recipe for a soup of black gold

In the standard geologic recipe for crude oil, buried organic molecules must simmer for millions of years before they transform into raw petroleum. But oceanographers have found spots on the seafloor that circumvent such a long cooking time. Near superhot vents, organic sediments turn into petroleum-like oil in less than 5,000 years, two researchers report.

"This is the youngest oil we know of on the Earth," says Bernd R.T. Simoneit of Oregon State University in Corvallis. He and Borys M. Didyk of the Chilean national petroleum refinery in Concon suggest this fast oil-formation process may have generated commercially important reserves that remain undiscovered.

Simoneit and his colleagues first discovered oil seeping out of the seafloor in the early 1980s while exploring the Guaymas Basin in the Gulf of California. Seafloor spreading in the region is slowly opening the gulf, generating volcanic activity that heats the crust and causes hot fluids to spew out of ocean-bottom chimneys. Investigators have found similar oil seeps near Antarctica, off the coast of California and elsewhere.

During dives in the submersible *Alvin*, Simoneit's group removed vent chimneys from the Guaymas Basin for analysis. Chemical studies revealed that oil in the chimneys contains hydrocarbons closely resembling those in petroleum. Now, carbon-14 dating indicates the oil is extremely young, Simoneit and Didyk report in the Nov. 2 NATURE.

From laboratory experiments, scientists know that oil forms fastest when buried organic molecules cook at high temperatures. Didyk and Simoneit suggest the Guaymas oil develops so quickly because hydrothermal-vent fluids percolate up through a thick blanket of sediments and alter the buried organic molecules. These fluids can reach temperatures of 350°C.

After the oil forms in the Guaymas Basin sediments, it migrates up to the seafloor and then into the water. Scientists on *Alvin* reported seeing suspended globules of oil as large as dimes.

Yet there may exist some locations where young oil does not escape, Didyk and Simoneit suggest. If a thick layer of sediments trapped the oil, this fast production process might create a significant reservoir, either on land or under the ocean floor.

Conventional theories hold that oil reservoirs form only in quiet, stable basins where sediments can accumulate over millions of years. But Didyk and Simoneit propose that reservoirs may develop in areas where thermal activity has heated sediments and formed oil over thousands of years.

Richard Millerer, a geochemist with the Department of Energy in Washington, D.C., agrees that such reservoirs may exist. "I'm not optimistic that's the case, though," he says. Millerer and others contend it would be difficult to find structures that would trap migrating oil in a geologically active region.

*– R. Monastersky*

*News of the week continued on p.300*