

not really his business."

Susan Pearson, the associate chancellor at UMass Amherst, and the administration's chief negotiator with the student union, remembers that when the union first began organizing in 1989, "people expressed fears about the negative effects on the relationships between faculty and students. None of that has materialized." She admits that the relations between union and administration, especially during contract negotiations, is "somewhat strained." The last contract, for example, took two years to nail down. But

Pearson also credits the union for having raised the pay and benefits for graduate employees "in ways that benefit the whole institution."

As the University of Michigan's Dirnbach sees it, "The administration's priorities are just different from those of the graduate employees. Nobody can look out for our interests the way we can."

Adds Miller of UMass Amherst, "We really feel that we're part of a national movement that is going to affect the course of academia. We think it's a great thing for higher education."

JEAN KUMAGAI

DOE Opens WIPP for Nuclear Waste Burial

Before dawn on 26 March, a truck rolled into the Waste Isolation Pilot Plant (WIPP) near Carlsbad, in southeastern New Mexico. The arrival of its radioactive cargo marked the controversial opening of the world's first deep geological repository for nuclear waste.

Dug out 655 meters underground in a salt bed, WIPP is intended for the permanent disposal of radioactive waste generated by the country's nuclear weapons buildup during the cold war. (See PHYSICS TODAY, June 1997, page 50.) Specifically, it's meant for both transuranic waste (items contaminated with radioactive elements of higher atomic number than uranium) and mixed waste (transuranic waste mixed with chemically hazardous materials such as solvents or lead).

Waste earmarked for WIPP is currently stored above ground at 23 sites in 15 states. Most of it is contaminated with plutonium-239, which has a half-life of 24 000 years. Since exploratory drilling began in the mid-1970s, the Department of Energy (DOE) has spent about \$2.5 billion on WIPP, and the total cost, including operating the site for 25 to 35 years, is expected to top \$19 billion.

Wendell Weart, a Sandia National Laboratories geologist who was the

chief WIPP scientist from 1975 to 1995, is "gratified that we, as a nation, finally had the gumption and guts to get on with the job. It's far safer to bury transuranic waste in WIPP than to leave it where it is."

Permit pending

The 26 March shipment, from Los Alamos National Laboratory, contained only radioactive waste, as did the next shipment, on 6 April. (Some eyebrows went up at the news that the first load included nonweapons radioactive waste from building a power supply for the Cassini spacecraft; see PHYSICS TODAY, October 1997, page 91. DOE explained that it couldn't be physically separated from weapons waste.) But to fill WIPP as planned, DOE still needs the go-ahead from New Mexico, which oversees mixed-waste disposal at the site under the federal Resource Conservation and Recovery Act (RCRA).

New Mexico had "encouraged DOE to wait" to open WIPP until after the RCRA permit became final, probably this fall, according to Nathan Wade, a spokesman for the state's environment department. "We think the government is a better environmental actor when it is subject to external regulation." The state permit is supposed to be based on WIPP's being empty, adds Wade, so making early shipments, though legal, "may jeopardize the permit we intend to

issue" because it will provide opportunities for dispute, and "pretty much everything so far has been challenged."

Indeed, legal challenges, combined with changing federal law, have delayed the site's opening by more than a decade. Public opinion remains divided over using WIPP, with polls conducted annually for the past nine years by University of New Mexico political scientist Hank Jenkins-Smith showing that the state's residents are closely split on the issue. Some state and city agencies also question aspects of WIPP. For example, at press time, DOE was still haggling over transport times with the city of Santa Fe, through which many WIPP-bound trucks must pass.

And some critics have vowed to keep fighting WIPP, citing safety as their main concern. For example, although Weart claims that "a room that we fill with waste would be cocooned in solid salt in 100 years," Don Hancock, of the Southwest Research and Information Center, doubts the waste will really be safely enclosed, arguing that salt is more likely to crack than to creep. He also worries about prospectors drilling for oil and gas in the general area, concerns that DOE dismisses.

Hancock and many other WIPP critics say they would agree to deep burial of nuclear waste—just not in WIPP. Says Hancock, "The WIPP site was chosen for political reasons, not technical ones. We hope that the [RCRA] permit will eliminate some of the waste coming to WIPP—prohibiting chemically incompatible, corrosive, explosive, and reactive wastes, for example. We think there are lots of risks beyond what the DOE has considered."

TONI FEDER

Physicist Wins Religion Prize

Ian Barbour, a physicist and theologian at Carleton College, is the 1999 winner of the Templeton Prize for Progress in Religion. Established by global investor John Templeton, the prize goes annually to "a living person who has shown extraordinary originality in advancing humankind's understanding of God and/or spirituality," and carries the world's highest monetary award (designed to beat out the Nobels). This year, it is worth \$1.24 million.

Barbour holds a 1949 PhD from the University of Chicago, and early in his career did research in high-energy physics. But after a few years on the physics faculty at Kalamazoo College, he began gravitating toward ethical

TRANSURANIC WASTE in drums is packed underground at the Waste Isolation Pilot Plant near Carlsbad, New Mexico. Still being excavated, the facility is planned to have a total storage volume of 175 000 cubic meters.



DOE