

RANDOM SAMPLES

edited by CONSTANCE HOLDEN

Don't Call It Shop

The National Science Foundation (NSF) wants to throw "vocational education" into history's dustbin, replacing it with a program that offers rigorous science and math instruction to high school and college students headed for technical jobs. To that end, NSF last month awarded 58 grants totaling \$26.9 million over 3 years to kick off its Advanced Technological Education (ATE) program.

"This program disavows vocational education," says Luther Williams, associate NSF director for education and human resources. "It says, 'Come and learn the science and mathematics that you will need for the 21st century rather than a remedial version that doesn't take the academic subjects seriously.'"

The biggest grants went to create three multimillion-dollar centers of excellence based at community colleges in Iowa, Ohio, and Texas. They will focus on environmental education, advanced manufacturing, and distance learning. NSF also made 38 project grants to colleges and universities to develop technical curricula and improve teacher training, and 16 planning grants to regional educational consortia.

The program moves NSF beyond its traditional educational roles of training future scientists and improving public literacy, assigning it "a new mission to address work-force skills," says Williams. It also fosters cooperation among high schools, community colleges, universities, and industry by encouraging proposals that address all segments of the technical education pipeline.

Congress created the ATE program in 1992 as a way to funnel money to local programs that address national problems. And lawmakers like it: This year Congress tripled the \$2.5-million increase that NSF requested for the program in 1995, raising its annual budget to \$23.3 million. Even so, Williams says \$100 million a year is needed to do the job right.



J. P. LOCKWOOD/USGS

Under the Volcano

One of the most dangerous volcanoes in the world has enhanced its deadly potential. Nyiragongo, a steep 11,400-foot cone in Zaire, has had several minor eruptions in recent months. But the newly heightened risk comes from the volcano's neighborhood, where 500,000 Rwandan refugees fleeing civil war set up camp last summer. An international group of scientists is seeking funds for equipment and staff to predict eruptions.

Preparing for a lava flood? Rwandans are camping in the shadow of Nyiragongo, a volcano that is simmering menacingly.

Nyiragongo rises 12 miles north of the town of Goma, and its young lava beds underlie several Rwandan refugee camps. The crater holds a lake of highly fluid lava—which spilled out of a crack in 1977, killing as many as 500 Zairians—and produces deadly carbon dioxide gas. In 1991 those threats prompted volcanologists to designate Nyiragongo a Decade Volcano, one of 15 around the world considered to be high risk and worthy of study in the '90s. But attempts by Zairian scientists to round up funds to better monitor the volcano never got far.

This summer, the refugee influx and minor eruptions by Nyiragongo and another area volcano added urgency to the situation. In August, 10 scientists from Zaire, France, Japan, and the United States met in Goma to assess the problem. They concluded that Nyiragongo's lava lake is unlikely to reach a dangerous level in the next few months. But eruptions are becoming more frequent, and "in the long term, [the danger is] very, very real," says Jack Lockwood of the U.S. Geological Survey Hawaiian Volcano Observatory. He and a colleague have asked the U.S. State Department to come up with \$45,000 to pay for an observatory and a Zairian technician, and to consider funding baseline geophysical measurements and a means of relaying data by radio. The French scientists are pressing their government to pay for video cameras to monitor the lava level.

Volcanologist Jean-Louis Cheminée of the Institut de Physique du Globe in Paris also hopes to find money to convene an international meeting in Goma next spring to make plans for installing a permanent seismic monitoring network.

Physicist Wins Bower Award

Called by its sponsors "the richest American prize in science," the Bower award from The Franklin Institute in Philadelphia has this year been awarded to Chen Ning Yang, Albert Einstein Professor and director of the Institute for Theoretical Physics at the State University of New York, Stony Brook.



C. N. Yang

Yang, who shared a Nobel Prize with T. D. Lee in 1957, is getting \$250,000 for his formulation, with Robert Mills, of the "Yang-Mills" theory describing subatomic interactions. Published in 1954, the equations, says the institute, "laid the foundation and provided the fundamental principles and fundamental equations for the whole of particle physics."



Saturn's moon. Two faces of Titan.

Piercing Titan's Shroud

As the only moon in the solar system with enough gravity to hold on to a substantial atmosphere, Saturn's Titan—bigger than Mercury at 5150 kilometers across—orbits in a nearly impenetrable orange hydrocarbon fog. Even two Voyager spacecraft that passed by in the '80s couldn't pierce it, leaving theories of methane oceans untested by observation.

Now the sharpened eye of the Hubble Space Telescope and the haze-penetrating ability of the sun's near-infrared wavelengths have been combined to produce the first images of Titan's surface. No oceans have been sighted, but Titan does sport an Australia-sized bright spot that researchers think is probably ice (above left).

False-color images of Titan were released early this month at the meeting of the American Astronomical Society's Division for Planetary Sciences by Peter Smith of the University of Arizona and his colleagues. Smith said ground-based radar observations show that the bright spot is also bright at radio wavelengths—suggesting an icy or rough surface, as a smooth ocean would be radar-dark. "Why the ice is exposed, I don't know," says Smith, since the organic goo of Titan's haze would presumably have settled onto the moon's surface and darkened it. Smith speculates that an impact may have broken through the surface, or that some process removes dark material from icy highlands.

Further upgrades of the Space Telescope and ground-based radar will sharpen this first fuzzy view of Titan in preparation for 2004, when the Cassini spacecraft will go into orbit around Saturn with a full complement of haze-piercing instruments, including a Titan lander.