Developments to Watch

EDITED BY OTIS PORT

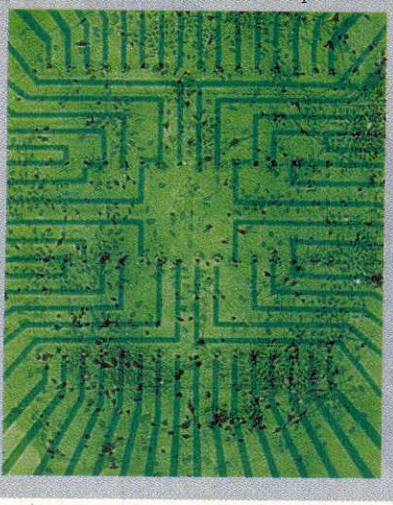
SNARING LIGHT IN A CRYSTAL TRAP

LAST JANUARY, TWO RESEARCH teams startled the scientific world by briefly stopping photons of light—those speedy critters that normally zip through space at 186,000 miles a second. Even though the photons were halted for no more than a millionth of a second, that's long enough to store interim number-crunching results in a superfast optical computer. Trouble is, both teams corralled their photons in a gas—one using a hot rubidium gas and the other employing an ultracold sodium gas. A solid trap would be easier to work with, pundits noted at the time.

Now, light has been stopped in an exotic crystal by a group led by physicists Philip R. Hemmer at the Air Force Research Laboratory and M. Selim Shahriar at Massachusetts Institute of Technology. First, they took an yttrium-silica crystal laced with the element praseodymium and chilled it to a frigid -268C. That helped slow light to a molasses-like 45 meters per second and allowed it to be stored for half a millisecond before being regurgitated. Not a world record, but it's adequate for optical computing. The team, which submitted a report to *Physical Review Letters*, hopes to extend the storage time to as long as tenths of a second.

SPEEDIER WAYS TO SPOT BIO SCARES

SCIENTISTS ARE SCRAMBLING FOR BETTER WAYS TO DETECT ANTHRAX BACTERIA BECAUSE existing tests can take hours if not days. Mayo Clinic and Roche Diagnostics Corp. have just announced a test that spots the genetic fingerprint of anthrax within an hour of a sample's arrival at a lab. Pretty good, but researchers at Georgia Institute of Technology and Emory University aim to bypass labs and produce results in the field. Just drop a sample in a test tube containing a DNA-sensitive chemical, and the liquid will turn blue in only 45 minutes if anthrax is present, says Dr. Anthony F. Holler, CEO of ID Biomedical Corp. in Vancouver, Canada. ID has applied the technology in a test for another microbe, antibiotic-resistant staph bacteria. In a couple of years, the Georgia group wants a kit that constantly monitors the air for multiple biochemical-warfare agents.



Meanwhile, at the University of North Texas, biologist Guenter W. Gross aims to build within six months the first prototype of a hybrid sensor combining living cells and silicon circuits (photo). Like a canary in a coal mine, the biochip will detect hazards, including biochemical threats. *Geoffrey Smith*

TO CATCH WATER IN A DESERT, WATCH THE BEETLES

HOW DO STENOCARA BEETLES thrive in Africa's Namib Desert, where rain hardly ever falls? By milking the early morning fog that briefly blows in from the Atlantic a few days a month—using a novel collection system on their backs. People in arid regions have been harvesting fog for water since Roman times, but the beetle's system is much more efficient than even the newest man-made collectors, according to Oxford University zoologist Andrew R. Parker and Chris Lawrence, a researcher at QinetiQ Ltd., the commercial arm of Britain's defense-research agency.

The hard sheath over the beetle's wings has a waxy surface dotted with tiny non-waxy bumps. These hydrophilic, or water-loving, bumps grab moisture from the air. When a droplet grows larger than a bump and touches the slippery surroundings, it rolls off, down to the beetle's mouth. One way to duplicate the beetle's technique would be to print little water-loving dots on water-repellent tent materials, the researchers suggest in the Nov. 1 issue of *Nature*. More sophisticated materials might boost the efficiency of dehumidifiers and air conditioners.

STENOCARA: *Its wings inspired new materials*

(TOP TO BOTTOM) CENTER FOR NETWORK NEUROSCIENCE, U. OF NORTH TEXAS; NONE; COURTESY QINETIQ

INNOVATIONS

■ A better sunscreen from bugs that never see the sun? That's what Sederma, a French cosmetics company, is developing. Using microbes gathered from so-called hydrothermal vents almost a mile down in the Pacific Ocean, Sederma is brewing a secret potion for a "smart" tanning lotion and other skincare products, according to the Nov. 2 issue of *New Scientist* magazine. As the sun rises higher in the sky, the potion will respond to hotter temperatures by increasing its protection against harmful ultraviolet rays.

■ The American Physical Society's annual plasma physics meeting, which ended on Nov. 2, had encouraging news for fusion-energy proponents. Using a powerful new IBM supercomputer at Lawrence Berkeley National Laboratory, a research team from Princeton University's Plasma Physics Lab ran the most detailed simulation yet of a commercial tokamak reactor. Fusioneers have worried that bigger tokamaks would require a much stronger magnetic-field "bottle" to confine the superhot plasma that fusion requires. But the new simulation indicates that the task could be easier than previously supposed. Still, the fusion era remains more than a decade in the future.

■ People with high cholesterol are at risk of developing atherosclerosis. Many try to prevent this outcome by taking cholesterol-reducing drugs. But those who can't may be able to ward off hardening of the arteries by gulping vitamin E and aspirin. In experiments with mice at the University of Pennsylvania School of Medicine, the combination reduced the production of plaque in blood vessels by more than 80%, according to a report in the Oct. 16 *Circulation*, published by the American Heart Assn.