Technology

Glass links for university computers

A web of hair-thin glass fibers that carry information as pulses of laser light will soon crisscross the campus of the University of Pittsburgh. In place of its current conventional telephone system, the university plans to install a fiber-optic network capable of carrying voice and video signals and transmitting high volumes of data at high speeds. This multimillion-dollar "campus of the future" project, a joint effort between the university and AT&T Information Systems, will make the university the world's first with an integrated fiber-optic system, university officials say. A similar communications system is already in place at Walt Disney World's Experimental Prototype Community of Tomorrow (EPCOT) in Orlando, Fla.

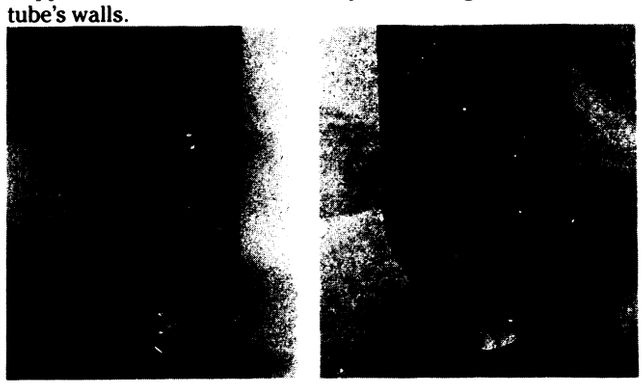
"Our goal, wherever practical, is to enable any student or faculty member anywhere on campus to reach into any library, classroom, computer or laboratory at the touch of a finger," says Wesley W. Posvar, University of Pittsburgh chancellor. For AT&T, the university is a "living laboratory" that offers a useful testing ground for new products and for developing information and communication technologies.

Nearby, Carnegie-Mellon University (CMU) is also developing a campus-wide computer network with fiber-optic cable links that will connect thousands of powerful personal computers (SN: 12/18/82, p. 393). For the CMU project, IBM Corp. is designing a new personal computer and the software that will allow the computers to communicate with each other. Richard M. Cyert, CMU president, says, "Although the computers in the Carnegie-Mellon network will be predominantly from IBM, it is our objective that computers from all major vendors be able to coexist within the system." Fiber-optic cables will transmit computer data but will not be used for the simple telephone calls and advanced video teleconferences that the University of Pittsburgh network will be able to carry.

Shuttle crystals: Space to grow

The space shuttle Challenger last June (SN: 7/4/83, p. 4) brought back a precious cargo for chemist Heribert Wiedemeier of the Rensselaer Polytechnic Institute in Troy, N.Y. — a finger-sized ampule containing metallic, gray, platelike crystals of germanium selenide (GeSe). The crystals (left), up to a centimeter in length, proved to be at least 10 times larger than crystals grown using a similar sublimation process on earth (right).

A small furnace on the space shuttle heated one end of the sealed tube to 600°C, causing the germanium selenide present to vaporize. The gas molecules migrated to the other, cooler end (only 500°C) and crystallized. Apparently, the largest crystals spontaneously grew in the middle of the ampule, without touching its sides and in the absence of any initial "seeds." Such a process, called "homogeneous nucleation," is rarely observed on earth. The large, central plates were prevented from crashing to the tube's sides when the shuttle landed because they were trapped in a network of other crystals that grew in from the tube's walls.



Gene Dzaman/RPI

Biomedicine

Steroids reassessed in spinal treatment

When an accident victim with a damaged spinal cord is rushed to a hospital emergency room, one of the first drugs a physician prescribes may be a corticosteroid, a chemical used for the last 15 to 20 years because animal studies have indicated that it reduces damage in the first days after injury. But scientists from nine U.S. medical centers who conducted the first large scale, double-blind study of steriods in humans with spinal cord injuries report that the drug's widespread use probably is based more on tradition than efficacy.

"I am convinced that steriods [in the standard doses given to spinal cord injury patients] have no beneficial effect at all," Michael B. Bracken, a Yale University Medical School researcher who collaborated in the study, told SCIENCE NEWS. Whether higher doses are beneficial remains to be seen, he says.

In their study, described in the Jan. 6 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, Bracken and colleagues compared the effects of the steroid methylprednisolone given in fairly low doses (initial injections of 100 milligrams with smaller subsequent injections given every six hours for 10 days) to doses 10 times larger. Despite the difference in dosage, a follow-up of the 330 patients six weeks after injury and again six months later showed no difference between the two groups in their recovery.

To be certain that the steroid has no effect at all, a second study is needed that includes a group of patients given only a placebo, says Arthur I. Kobrine of George Washington University Medical Center in Washington, D.C., in an accompanying editorial. Bracken says the nine participating hospitals hope to begin such a study in July.

Yogurt to soothe the savage stomach

Everybody may need milk — or at least the protein in it — but nobody needs the flatulence and diarrhea that strike milk drinkers who lack the enzyme to break down milk sugar (SN: 7/22/78, p. 58). Now, research from the University of Minnesota in Minneapolis indicates that yogurt, with its host of enzyme-producing bacteria, could serve as a substitute for the 80 percent of the world population that reacts adversely to milk.

Nearly all babies are born with the ability to metabolize milk sugar, but that ability fades in most adults aside from Caucasian northern Europeans and their descendents. Joseph C. Kolars and colleagues report in the Jan. 5 NEW ENGLAND JOURNAL OF MEDICINE that eight of the 10 lactase deficient adults they tested suffered indigestion and diarrhea after drinking milk, while only two reported the symptoms after eating yogurt.

Demonstrating kidney travel

Knowing precisely where to find the kidneys is crucial with the growing popularity of kidney operations performed by inserting needles or instruments through the skin (without otherwise opening the patient up surgically). Though it's widely known that kidneys move, how much they move has "never been systematically demonstrated," according to Bruce Hillman. That's why he and his colleagues at the University of Arizona in Tucson began taking multiple computed-tomography (CT) scans of an individual in various poses.

Ten patients were X-rayed with the scanners while lying face down, on their backs and on either side. By comparing a patient's scans, the Tucson radiologists confirmed that kidneys not only move front to back, but also up and down (towards the head or feet). "As I recall, the biggest motion we showed was a kidney that went closer to the feet by 10 centimeters (3.9 inches)," Hillman says, adding that "most movements were much smaller, but sufficient that you could miss the kidney with your needle if guided only by X-rays." Either real time fluoroscopy or ultrasound provide a more accurate alternative, he says.