RANDOM SAMPLES

edited by CONSTANCE HOLDEN

Koreans Make Gene-Therapy Debut

Korean biomedical researchers and clinicians have passed a major milestone: Last month, they conducted Korea's first gene-therapy trial. In the trial, a 33-year-old woman with advanced breast cancer was treated with four weekly injections of a retrovirus expressing interleukin-12 (IL-12). The trial was directed by Chan H. Park, an oncologist at Samsung Medical Center in Seoul, in collaboration with Sunyoung Kim, of the Institute for Molecular Biology and Genetics at Seoul National University, and immunologist Michael Lotze, co-director of the University of Pittsburgh's Human Gene Therapy Center.

Both Park and Kim trained abroad and have worked in the United States. But transferring their know-how to their home country was not easy. "This kind of complex operation hasn't been done in Korea before," says Kim. First, they had to send team members to Pittsburgh for training in the procedure, which involves isolating skin cells called fibroblasts from the patient, and genetically modifying them with the retrovirus containing the IL-12 gene. The modified cells are then irradiated, so they cannot multiply, and injected into the tumors.

An even greater challenge was blazing a trail through the regulatory jungle. "We do not have regulations specifically designed for gene-therapy trials," says Kim. It took 18 months to negotiate approval with not only Korea's Ministry of Health and Welfare, but the U.S. Food and Drug Administration (because the vector came from the United States).

Kim says future trials should go more smoothly. The government now has assembled several panels to hammer out standards and procedures for reviewing gene-therapy trials and for approving vector use and production.

Yeon-Soo Kim, a retrovirologist at Seoul's Yonsei University, hails the team's achievement as "very important for [Korea]." Yonsei's Kim adds that Korea still has a way to go to match fully the level of work done in the United States and Europe. But Kim thinks it may not take too long: "For the next human clinical trial, I hope we can use a viral vector or plasmid produced in Korea."

JAMES C. COKENDOLPHER/FRAN HEYL ASSOC.

Long lineage. Pollen-covered bee rummaging in flower.

Permian Pollen Eaters

Russia's Ural Mountains have yielded what may be the oldest evidence yet found for pollinivory (pollen eating) in insects. That would push back a crucial step in plant evolution, pollination via insects, by about 150 million years.

Plants got a whole new lease on life when they started providing insects with nectar and pollen in exchange for help with pollination. Most modern flowering plants (angiosperms) are pollinated in this way. And the question of when this relationship was established in preangiosperm plants has long intrigued paleobotanists. The record of pollinivory is sparse; the oldest widely accepted evidence was found in 110 million year old Lower Cretaceous rocks in Brazil and Russia.

Now Russian paleontologists Valentin Krassilov and Alexander Rasnitsyn, of Moscow's Palaeontological Institute, say they have discovered fossil pollen in the guts of 270 million year old insects preserved in the shale and sandstone rocks of Tchekarda, in the middle Urals near Perm, the geological home of the Permian Era. In the latest issue (vol. 29) of the journal *Lethaia*, the Russians report finding partly digested pollen, from various Permian seed plants, in the guts of three different fossil insects—precursors of bark lice, plant hoppers, and stone flies.

If insects first discovered pollen as a food source in Permian times, that sets the engine of plant-insect coevolution in motion far earlier than had been thought. According to the theory, pollen eating caused plants to compensate by increasing their pollen output. Cross-fertilization led to diversification of both plants and their insect predators, culminating in the evolution of the angiosperms.

Paleobotanist Bill Chaloner of the University of London is withholding judgment on the Russians' claims. The pollen they found, he says, was adapted for wind dispersal, and the bugs could have "inadvertently consumed the pollen while foraging other plant tissue." The Russians counter that the insects' mouthparts are adapted to pollen eating. As often happens in the world of paleontology, the jury may be out on this one indefinitely.

Who Needs Peer Review?

Who needs traditional peer review? That's a question physicist Paul Ginsparg, of the Los Alamos National Laboratory (LANL) in New Mexico, thinks has been raised anew by the fuss over a recent report claiming that space itself has a built-in orientation.

In 1991, Ginsparg started the LANL electronic preprint archives, which provides an instant distribution system for physicists' work. Some scientists feared that without peer review, the archive would drown in bad science. But Ginsparg cites the recent ruckus as evidence that his "open, anarchic peer review" might actually help quash bad science. If the space-orientation paper, by Borge Nodland of the University of Rochester in New York and John Ralston of the University of Kansas, Lawrence, had gone into his system before publication, says Ginsparg, it might have been shot down promptly, with no public fanfare.

Published in the 21 April *Physical Review Letters*, the paper got remarkable media coverage, thanks in part to a barrage of press releases. But many scientists, evoking comparisons to cold fusion, quickly pronounced it almost certainly wrong (*Science*, 25 April, p. 530). Nodland says he and Ralston didn't post their preprint to the LANL archives until 20 April, in deference to the journal's publishing process. Within 9 days of the posting, readers had pointed out what they viewed as potentially serious flaws in the analysis.

Nodland defends the paper, saying the electronic attacks were "hasty and not well thought out." But in Ginsparg's view, "the conventional referee process is rarely stringent enough. ... Everyone can benefit from the much greater scrutiny that any important article will receive in the open-distribution sector."

R. Michael Barnett of Lawrence Berkeley National Laboratory in California points out, though, that things aren't always that simple: Ginsparg's arrangement works well for a "headline story," but inadequate science in other papers may slide by unnoticed.

Berkeley Cooks Up Powerful Magnet

The demise of the Superconducting Super Collider in 1993 didn't kill all dreams of making souped-up particle accelerators. Researchers at Lawrence Berkeley

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National Laboratory in California announced last month that they have created a record-setting dipole magnet, the sort used in high-energy accelerators to bend the path of charged particles as they career around a ring at close to the speed of light.

In test runs, the new magnet hit a peak of 13.5 teslas—about a quarter of a million times stronger than Earth's magnetic field. That tops the previous record of 11.03 T, set by a Dutch group in 1995. And it is more than 50% stronger than the superconducting magnets planned for the Large Hadron Collider, the world's highest energy particle accelerator, due to be built at CERN in Switzerland.

"It's quite an achievement," says physicist Bill Sampson, of the Brookhaven National Laboratory in Upton, New York. The new magnets, he says, have "tremendous potential" for boosting energies in particle accelerators, and would bring physicists closer to generating the conditions needed to detect a long-sought quarry: the Higgs boson, a primordial particle thought to have existed only during a fraction of a second after the big bang.

At the heart of the new 7-ton magnet is a superconducting alloy of niobium and tin capable of conducting ultrahigh electric currents. Few teams have explored this alloy because it is brittle and difficult to manipulate. The Berkeley researchers, led by materials scientist Ron Scanlan, overcame this problem by putting niobium and tin strands separately—while both were still ductile—into a copper cable. They then wound the cable into coils, and baked them at about 680 degrees C for 10 days, melding the niobium and tin. The coils were then wrapped in stainless steel and assembled into a single magnet before they were cooled down—not a simple process, but a lot easier than trying to coil 22.5 kilometers of a brittle, glasslike ceramic.

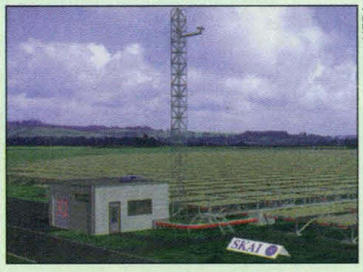
Down the road, the Berkeley researchers hope to use their new strategy to create similar magnets from brittle, high-temperature superconductors, in order to cut the expensive cooling costs associated with today's low-temperature magnets.

World's Largest Radio Telescope

In their quest to image ever-fainter and more ancient galaxies, radio astronomers in six countries are laying plans for the world's largest radio telescope.

The $150 million telescope, now being dreamed up by radio astronomers from Australia, Canada, China, India, the Netherlands, and the United States, would combine images from 34 detectors spread out over a square 250 kilometers on a side. "If you want to detect ... hydrogen [from which galaxies probably condensed] in the early history of the universe," you need a very large collecting area, says Harvey Butcher, director of the Netherlands Foundation for Research in Astronomy.

The Square Kilometer Array Interferometer (SKAI) will have a total surface area of 1 kilometer square, 75 times more than the biggest comparable radio interferometer, the Very Large Array in New Mexico. And it would see even further than the Hubble space telescope because of the interferometer design, in which data from far-flung detectors are combined to produce very high resolution images.



NFRA

Big idea. A large field of small, flat radio receivers, part of the Dutch-Australian design proposal.

While the telescope's planners have settled on the size and number of the detectors, almost everything else is still under debate. Ideas range from suspending receivers from balloons to building 200-meter radio dishes in natural geological depressions (*Science*, 17 November 1995, p. 1146).

In the most unconventional design, by a Dutch-Australian team, each detector would consist of hundreds of thousands of small, linked radio receivers. They would detect specific objects by measuring phase differences—slight differences in the timing of radio waves reaching individual receivers, which depend on the radio source's position in the sky.

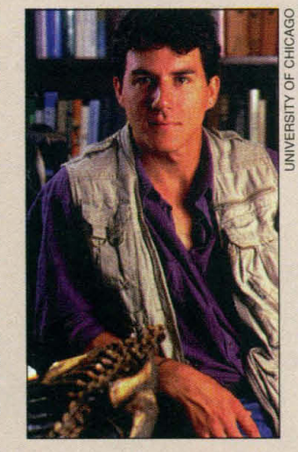
It will be a few years before the group settles on the final design and location of SKAI. Then the participating institutions need to get funding from their governments. But they hope to begin construction by 2005.

Dino Glamour

Last month, dinosaur expert Paul Sereno of the University of Chicago found himself on the list of "100 people for the new century," published in the 21 April *Newsweek*. Now he's on an even more exclusive roster: *People* magazine's list of this year's "50 Most Beautiful People in the World." He's profiled in the 12 May issue, along with stars like Tom Cruise and relative unknowns such as Westchester County (NY) District Attorney Jeanine Pirro.

Like the other dazzlers, Sereno has a beauty secret to share: "Go out in the middle of the Sahara for 4 months without showering ... it does your skin wonders."

Sereno told *Science* he felt "very tentative" about cooperating when he was approached by *People*. "But they sent an intelligent writer." So, he says, "I'm hoping it does science a modicum of good."



UNIVERSITY OF CHICAGO

Desert beauty. Paleontologist Paul Sereno.

Eco-Pioneering at RPI

Rensselaer Polytechnic Institute (RPI) in Troy, New York, has become the first university in the country to offer a Ph.D. in ecological economics.

Program director Sabine O'Hara says that in addition to standard courses, the new program has at its core three new ones: environmental economics (a policy-oriented course that deals with how economic value is attached to environmental goods such as clean air or unspoiled wilderness); natural-resource economics (which explores, for example, how global warming may relate to industrial and agricultural productivity); and ecological economics (a systems approach to economic analysis that places economics in the larger natural world). The new program already has 12 Ph.D. candidates.

One of the chief gurus of ecological economics, Herman Daly of the University of Maryland's School of Public Policy, says, "I think it's quite remarkable that [RPI has] managed to pull together a Ph.D. program." Although the field has been gaining ground in public-policy and resource-management circles, ecological economics is "still being fiercely resisted" by many conventionally trained economists, says Daly.

The University of Stockholm is seriously contemplating a Ph.D. program in the field, but O'Hara says that only a few U.S. schools are considering such new degree programs, and "the limiting factor for all of them seems to be lack of cooperation from their economics colleagues."