# RANDOM SAMPLES

edited by JOHN TRAVIS

## Fullerene Superconductors Heat Up

In 1991, fullerenes, already on their way to becoming a versatile new framework for molecule-building chemists, were wed to another scientific hotbed when AT&T Bell Laboratories discovered that some of these carbon molecules could superconduct. Now researchers appear to have unearthed another superconducting fullerene—and it's the hottest one yet.

For the last 2 years, fullerene superconductors have remained little more than a research curiosity; as far as practical promise is concerned, even the best ones could hardly hold a candle to either the old standard low-temperature superconductors or the avant garde high-temperature versions. Indeed, none of the fullerene superconductors, so far, had worked above about 33 kelvins (K) or could withstand exposure to air.

In this month's *Solid State Communications*, however, Yi-Han Kao and colleagues from the State University of New York at Buffalo report making a new fullerene that is stable in air for at least 40 days and shows signs of superconductivity above 60 K. That's much closer to the technological benchmark of 77 K, the point at which cheap liquid nitrogen can be used to cool the materials.

How did Kao's group do it? Even he isn't sure. The physicist points out that earlier superconducting fullerenes had been doped with electrons by evaporating alkali metal ions from materials such as rubidium and cesium into fullerene films. Kao's version is doped instead with iodine monochloride molecules, which donate mobile positive charges to the complexes.

"It definitely looks interesting," says Arthur Hebard, one of the AT&T Bell Laboratories researchers who made the first superconducting fullerenes. He points out, however, that Kao's group have only indirectly detected superconductivity, by observing how the fullerenes behaved in a magnetic field. Moreover, he cautions that the Buffalo researchers' claims rest on a minute effect in a small portion of their samples. Kao says his group is now working to increase the superconductive portion of their samples, and if they succeed the fullerene thermostat could well take a turn for the hotter.

COURTESY OF MARK J. CARLOTTO/

## A Face-Off on Mars

Although the silence from Mars Observer was deafening, and the atmosphere inside the Jet Propulsion Laboratory (JPL) was one of quiet gloom during the crisis over its missing spacecraft, outside things were a bit noisier. Two days after JPL lost contact with Observer, picketers were marching in front of the building, protesting that NASA had purposely blacked out the craft. Why would the beleaguered space agency do such a thing? To cover up evidence of extraterrestrial intelligent life, of course. "NASA Face Up To It" read one sign, as the picketers claimed that the agency was afraid to take new images of the famous martian "face" that the Viking mission had photographed back in 1976.

Pictures beamed back from Viking that year showed a huge, mile-wide rock formation on the Red Planet that looks somewhat like a somber, sphinx-like face. To some observers, computer-enhanced analysis of Viking's pictures suggested the face wasn't natural, but deliberately constructed, and thus another obvious remnant of an ancient civilization.

Psychologists agree that the face is an artifact—but one created by the eyes of the beholders, not by martians. They say it's a textbook illustration of the natural human tendency to see faces given minimal detail. "The human visual system is organized to see [features] in random patterns, and faces are particularly salient," says University of Rochester psychologist David Williams.

To this point, NASA has not bothered to respond to the recent protest. They're still too busy searching for Mars Observer to look for a mysterious countenance.

## U.K. Changes Mind About Malaria Vaccine

The rehabilitation of Manuel Patarroyo seems to be complete. The Colombian immunologist has endured 6 years of intense skepticism since 1987, when he claimed to have produced an effective malaria vaccine. But last spring the *Lancet* published positive results from a vaccine trial (*Science*, 19 March, p. 1689), and now the U.K. Medical Research Council (MRC), which had previously voiced doubts about the safety of Patarroyo's vaccine, has come across with an endorsement of sorts: Last month, MRC gave the go-ahead for a vaccine trial in the Gambia.

It's an about-face for the MRC, which in 1991 turned down a request from one of its own laboratories in the Gambia to fund a similar field test. The 1991 proposal, submitted by malaria specialist Brian Greenwood, who heads the MRC's Gambia labs, received glowing external scientific reviews—but was thrown out by the MRC on the grounds that Patarroyo had provided insufficient data on vaccine safety and its consistency across different batches. Some scientists suspected, however, that the decision was influenced by the controversy surrounding Patarroyo, who at the time was widely criticized for rushing into field trials involving thousands of Colombians without submitting much of his earlier data for detailed scientific review.

Robert Lang, secretary of the MRC research board that reviewed the new proposal, says that additional chemical analyses have removed the council's skepticism about the vaccine's consistent quality. But now it's Greenwood's turn to be skeptical. He believes that the real reason for the MRC's change of heart is that Patarroyo's work, especially after the *Lancet* article, is now gaining mainstream acceptance.

In the hiatus since Greenwood submitted his original proposal, other trials have begun, but the MRC effort will target very young children, infants aged 6 to 11 months. That's important, Greenwood explains, since malaria's highest death toll in Africa is among children around 2 years old. If a small pilot study already under way goes as planned, the full trial in 600 Gambian infants should begin early next year.

## Gordon Conferences Picks New Head

Earlier this year, 73-year old chemist Alexander M. Cruickshank decided to step down after 24 years as director of the Gordon Research Conferences. The conference trustees had a difficult task replacing Cruickshank, who built the meetings into a financially-secure international effort that draws 14,000 scientists annually. After a prolonged search, and perhaps influenced by Cruickshank's success, the trustees have picked another chemist: Carlyle B. Storm, who since 1985 has been at Los Alamos National Laboratory pursuing research on the sensitivity of explosives and on

the preparation of novel energetic materials with high nitrogen content. Before that, Storm spent more than a decade teaching at Howard University. He will take over the helm of the Rhode Island-based conferences in the fall.

## Good Booze and the Higgs Boson

For those who have trouble grasping some of the subtleties of particle physics, it may or may not help to know that the Higgs field mechanism acts like Margaret Thatcher. It did help U.K. science minister William Waldegrave, who in April challenged physicists to explain the still undiscovered particle called the Higgs boson to him on a single sheet of paper, offering a bottle of vintage champagne for the best explanation. The Thatcher analogy was among five winners announced last week (Waldegrave couldn't settle on just one).

High energy physicist David Miller of London's University College played upon Waldegrave's political upbringing to get the message across. Miller explains the Higgs mechanism—which gives particles their mass—by describing a cocktail party of political party workers. If the former U.K. prime minister were to walk into the room, she would immediately be surrounded by a cluster of people. As she moved through the room, she would attract the people she came close to, while those left in her wake would return to a more even spacing. The political party workers represent the Higgs field, which confers mass to particles by concentrating around them in much the same way as the workers clustered around Thatcher.

Physicists hope to prove this theory by observing the Higgs boson, which is predicted to result from a slightly different clustering effect in the Higgs field. To visualize this variation, suggests Miller, imagine that, instead of Thatcher, a juicy political rumor passed through the room. Some of the political busybodies would flock to learn the details and then fan out to spread the gossip, each of them becoming the center of another cluster. As the rumor circulated, a wave of clustering distinct from the kind inspired by Thatcher would pass through the room. And that's a Higgs boson.

The physicist says he first developed a "politically incorrect" version of the analogy to explain the Higgs boson to a group of baffled science reporters—describing the progress of an attractive woman through a room of male science writers. As that seemed to work well, he decided to customize the explanation for the science minister. But whether or not the prizewinning effort inspires Waldegrave to win increased funding for U.K. physics remains—much like the elusive Higgs boson—to be seen.

**BIOPHARMACEUTICAL INDUSTRY DOWNSIZING**

| Firm | Projected job cuts (by 1994) | % of Ph.D.s in cuts | Reason |
|---|---|---|---|
| Bristol-Myers Squibb | 2100 | * | Economic worries |
| Centocor | 1000 | 2 | Disappointing data on lead drug, Centoxin |
| Ciba-Geigy | 500 | 10 | Economic worries |
| Johnson & Johnson | 3000 | * | Economic worries |
| Marion Merrell Dow | 1100–1300 | * | Economic worries |
| Merck | 2100 | 3 | Economic worries |
| Searle | 2250 | * | Economic worries |
| SmithKline Beecham | 35 | 9 | Restructuring of animal health research group |
| Synergen | 85 | * | Disappointing data on lead drug, Antril |
| Syntex | 2000† | < 1 | Economic worries |
| Upjohn | 1100 | < 1 | Economic worries |
| Warner-Lambert | 2700‡ | < 1 | Economic worries |

*Company unable to provide estimate. † Estimate by July 1995. ‡ Estimate by 1996
Sources: The Pharmaceutical Manufacturers Association and *Science*

**Hunkering down.** Last month, pharmaceutical giant Johnson & Johnson announced they would eliminate 3000 jobs through early retirement by 1994. They're not alone. Many pharmaceutical companies are planning to "downsize," and that's bad news for some of their scientists. Perhaps the biggest reason for the draconian belt-tightening has been the fear of drug price controls mandated by the federal government to reduce the cost of health care. Other economic forces are also hurting the industry. For one, the government is increasing the discount at which pharmaceutical firms must supply drugs to the Medicaid program. This, it's estimated, will cost the industry an extra $2.6 billion through 1995. A second blow to many large pharmaceutical firms is the recent elimination of tax credits for doing business in Puerto Rico. In the last two decades no fewer than 30 firms, including Abbott Laboratories, Merck, and Pfizer, have opened manufacturing plants in Puerto Rico and the lost tax break will cost them about $3.75 billion over the next 5 years. The table above shows what the money crunch will mean to a large sample of the industry.

## Species Protection Moves at Snail's Pace

If you look closely among the hot springs dotting a 5-mile stretch of southwest Idaho's Bruneau River, you might find the latest example of political interference in the Endangered Species Act (ESA): the Bruneau Hot Springsnail.

According to a report* issued last month by the General Accounting Office (GAO), the U.S. Fish and Wildlife's Service (FWS), under pressure from various Idaho politicians, waited 7 years after first proposing the snail as an endangered species to offcially list the creature. Yet the ESA mandates a decision after 1 year.

*"Endangered species: Factors associated with delayed listing decisions," GAO, August 1993.

The GAO reported that FWS first proposed to list the snail as endangered in August 1985, but several parties, including the former Governor of Idaho, two former Idaho congressmen, and the Idaho Water Resources Board persuaded the service in April 1988 to instead draw up a "conservation agreement" to protect it. These people, the report stated, were concerned that listing the snail as endangered would prevent the agricultural use of water from the aquifer that feeds the springs. Finally, this January, a lawsuit filed by two conservation groups charging FWS with violating the ESA forced the service to list the creature as endangered.

Many other endangered animal listings creep along at a snail's pace, GAO reports. Delays in listing five other species, such as the Louisiana black bear, ranged from 5 months to 6 years, but they didn't always stem from political tugs of war. Some delays were due to FWS's limited staff size and the need to gather more biological data on the animals.

According to Representative George Brown (D–CA), the GAO study "demonstrates that extraneous factors—economic impact or lack of staff, for example—too often intrude on the scientific process of implementing the Endangered Species Act." Conservationists hope to avoid this kind of run around by persuading Congress to revise the ESA—a political brouhaha likely to happen next year.


**Bear facts.** The Louisiana black bear waited five extra months to be listed as endangered.