RANDOM SAMPLES

edited by CONSTANCE HOLDEN

Photosynthetic Organism Sequenced

A Japanese group is about to add one of the cyanobacteria—also known as blue-green algae, or pond scum—to the small but growing list of free-living organisms with a completely sequenced genome. It is the first sequencing of a photosynthetic organism, and, at 3.57 million bases, the sequence is longer than that of any of the three other organisms* sequenced to date.

Satoshi Tabata, a molecular biologist at the Kazusa DNA Research Institute, Kisarazu, Chiba Prefecture, says they completed the sequencing in February, but the computer work to identify genes and predict coding regions is likely to take until early summer. He presented preliminary findings at a workshop on photosynthetic organisms in Makuhari, Chiba Prefecture, Japan, last month.

Tabata says they picked *Synechosystis*, a one-celled organism, because it has long been used as a model in research on photosynthesis and has also proven to be a good subject for genetic engineering. The world's oldest known fossils—found in 3.5-billion-year-old rocks—also appear to be cyanobacteria, so the data should cast light on the evolution of photosynthesis.

Other researchers are eager for the data. "I'm extremely interested in seeing how this increases the understanding of photosynthesis," says Naotake Ogasawara, a molecular biologist at Nara Institute of Science & Technology. The new set of benchmark data supplied by this organism "will have revolutionary significance for the study of a variety of microorganisms," he adds.

Tabata says the sequencing effort began in October 1994, when the Kazusa DNA Research Institute opened. As a prefectural institute, Kazusa can get around the staffing restrictions that, says Tabata, "make this kind of large-scale sequencing really difficult to do" at national institutes and universities. Tabata, whose group includes eight researchers and 15 technicians, says until such restrictions are loosened, Kazusa is likely to remain Japan's leading center for sequencing work.

*Methanococcus jannaschii, Haemophilus influenzae, and Mycoplasma genitalium.

Environment Award Honors the Big Chill

Perhaps the most obscure part of the environment—the oldest, coldest, most deeply buried ice on Earth—is the target of this year's prestigious Tyler Prize for Environmental Achievement. Three European researchers, Willi Dansgaard of the University of Copenhagen, Claude Lorius of the French Institute of Polar Research and Technology, and Hans Oeschger of the University of Bern, have won the $150,000 prize for their pioneering analyses of climate change recorded at the top and bottom of the world, in the ice of Greenland and Antarctica.

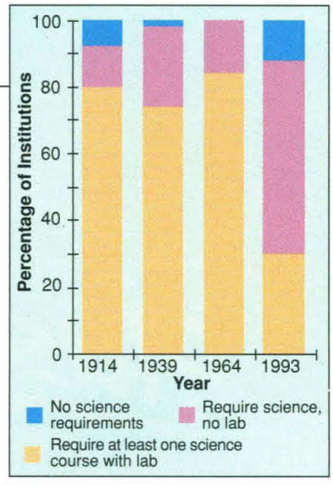
In the 1960s, one of the first deep ice cores was drilled at Camp Century, a U.S. military outpost in northwest Greenland, giving Dansgaard a chance to prove his theory that a 100,000-year isotopic record of climate change is preserved in glacial ice. Oeschger began his work on isotopes and the greenhouse gas, carbon dioxide, at about the same time, analyzing nuclear bomb debris in young ice. Their combined work documented the so-called "Dansgaard-Oeschger events," abrupt climate swings associated with changes in greenhouse gases (*Science*, 6 January 1995, p. 27).

Lorius took a different route to the deepest ice, joining forces in the early 1980s with Soviet drillers who were recovering the longest ice core in the world at the Vostok station in Antarctica. For many years the Vostok core provided the only ice record reaching back to the beginning of the last ice age, making the trace gas records retrieved by Lorius and his colleagues the longest available.

Today Vostok drilling is going deeper to document even older climate swings, even as records of the last ice age from the two ice caps are being tightly tied together for the first time. That was hardly imaginable back in the '60s, says Dansgaard: "I don't think anyone had the idea that [ice drilling] would be as valuable as it has been."

Up the DNA staircase. "Nothing is more symbolic of contemporary biology than a double helix," says Richard L. Davidson, chair of the genetics department at the University of Illinois, Chicago (UIC). And so the university chose as the centerpiece of its new Molecular Genetics Building an illuminated staircase coiled into the shape of a DNA molecule. The architects, the Chicago firm of Dirk Lohan and Associates, had to make some compromises in designing the free-standing, cast-concrete staircase. Following DNA's shape exactly, with 10 or 11 bases per turn, would have made the steps like those in a castle turret—too tightly wound for safety codes. But the result, says UIC professor of genetics and medicine Carol Westbrook, is inspirational, "a constant reminder of what we work on here." University of Chicago surgical resident Kathy Spanknebel has a more lighthearted view: "It's vertiginous [but] fun to race on," she says.

MCSHANE-FLEMING STUDIOS



Slippage. Science and lab course requirements have declined.

Hands-Off Science in Higher Ed

Although educators and scientists agree that the best way to learn about science is to do it, fewer and fewer universities are requiring lab-based science courses, according to a report released last month by the National Association of Scholars.

The Princeton-based organization, which calls its purpose "for reasoned scholarship in a free society," studied the 1914, 1939, 1964, and 1993 undergraduate catalogs of the top 50 academic institutions identified as "America's Best Colleges" by the *U.S. News and World Report* in 1989. The report, *The Dissolution of General Education: 1914–1993*,* recounts a decline in required undergraduate science and math courses that has gotten particularly steep since 1964. Many colleges no longer require nonscience majors to take the same introductory courses that science majors take, allowing them instead to choose "baby bio" or "math for poets" courses with no math prerequisites or lab work, reports Rita Zurcher, co-author of the study.

Between 1964 and 1993, says the report, the proportion of schools requiring students to take a laboratory-based science course fell from about 80% to 30%. The loss of rigor means fewer hands-on opportunities for students who likely have few further chances to

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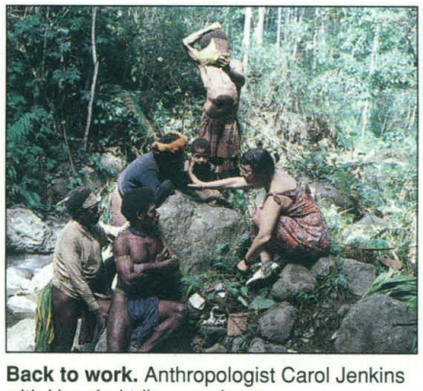
see how science is done, says Zurcher. Labs teach students how to analyze problems. They drive home the importance of detailed, accurate measurements, she explains: "It shows you how difficult and how necessary science is."

Jerry Gaff, who works on curriculum development at the Association of American Colleges and Universities in Washington, D.C., says things aren't as bad as the report makes out. Many schools actually have strengthened science and math requirements, he notes, adding that he thinks the schools evaluated are not representative of academia overall. He too decries "fluff" courses, but defends special science classes for nonscience majors because, he says, they are often better at supplying knowledge students can use in their everyday lives.

Anthropologist Exonerated

A government investigation of a medical anthropologist accused of "patenting" the genes of a tribe in Papua New Guinea (PNG) ended 2 weeks ago when the government issued a public statement supporting the researcher. But not before the anthropologist, Carol Jenkins of the PNG Institute of Medical Research, had been pulled off a jet bound for El Salvador, where she planned to attend a World Health Organization meeting, and threatened with deportation from the country.



TRAVIS JENKINS

Back to work. Anthropologist Carol Jenkins with Hagahai tribe members.

Jenkins, who has been working with the Hagahai tribe since it was discovered a decade ago, had been accused last fall by a small Canadian group, the Rural Advancement Foundation International, of stealing Hagahai genes (*Science*, 17 November 1995, p. 1112). Jenkins and the U.S. National Institutes of Health had, in fact, not patented genes but a virus-infected cell line taken from Hagahai blood, and she had agreed to share her half of any royalties with the tribe. Nonetheless, she says the accusations, which led to local newspaper articles urging the government to bring this "theft" before the World Court, threatened to put an end to her long-term studies on the spread of AIDS in PNG.

Matters came to a head after Jenkins was taken from her plane and summoned before Gabriel Dusava, PNG secretary for foreign affairs and trade. Following that meeting, which was also attended by members of the tribe, the government issued a press release clearing her of any charges and agreeing that her research had been conducted with the "full consent" of the Hagahai.

Now Jenkins, with the aid of Stanford University law professor Henry Greely, will be helping PNG government officials draw up a policy on how to handle future patent applications and research on indigenous populations. Ironically, she expects "zero" profits for the Hagahai or the other patent holders on the cell line: "What biotech company would touch this now?"

Nature v. Culture: A Lesson From the Guppy

Guppies may be largely driven by their genes, but like other creatures that gather in schools—children—the fish are prone to peer pressure. Like kids who aren't interested in a toy until their friends declare it's "cool," female guppies disdain dowdily colored males—until another female shows she's interested in those not-so-snappy dressers.

ANNE HOUDE

Who's sexier? High-orange and low-orange male guppies.

Female guppies from the Paria River in Trinidad, experiments have shown, have an innate predilection for males with a lot of orange coloring—the more orange covering the body, the more attractive. But females also imitate one another in mating behavior. What, then, will a female guppy do if she sees a colleague hankering after a not-very-orange male? Which will win out—genes or social learning?

Biologist Lee Dugatkin of the University of Louisville, Kentucky, answers this question in the 2 April *Proceedings of the National Academy of Sciences*. He reports that first, he established that if a female is exposed to two males, one more orange than the other, she'll go for the more orange guy almost 90% of the time. Then he allowed a female to watch a second, "model" female flirting with a not-very-orange male. When the original "focal" female was then exposed to two males, she too picked the less orange one—but only if the two males differed from each other by 12% to 24% in amount of orange color covering the body. If the less colorful male was 40% less orange, genes took over, and the female went for the more orange male.

Dugatkin says this is the first experiment where it has been possible to "titrate" the relative contributions of genes and environment in an animal's mate-selection decisions. Anne Houde, a behavioral ecologist at Lake Forest University in Chicago who first established that female guppies prefer orange, confirms that Dugatkin's is "probably the first experiment of its kind. ... He's gotten down to a quantitative level and shown just how powerful" are the opposing forces in shaping mate-seeking behavior.

Nobelist Charged With Child Sex Abuse

Daniel Carleton Gajdusek, 72, a National Institutes of Health (NIH) researcher who shared the 1976 Nobel Prize in physiology or medicine, was arrested on 4 April at his home in Middletown, Maryland. State authorities have charged the scientist with "child abuse" and "unnatural and perverted sexual practice," alleging that he sexually abused a teenaged boy he had brought to the United States from Micronesia. Gajdusek was booked into Frederick County jail in Maryland and, as of 5 April, bail was set at $1 million.

Gajdusek has been chief of the Laboratory of Central Nervous System Studies of the NIH's National Institute of Neurological Disorders and Stroke since 1970. He has also traveled frequently to New Guinea and Micronesia in connection with his research on neurological diseases, including the spongiform encephalopathies—one of which is currently in the news in the form of "mad cow disease"—work that garnered him the Nobel Prize. According to a statement by Federal Bureau of Investigation (FBI) agent Patricia Ferrante, Gajdusek has, over the years, brought 56 children from Micronesia and New Guinea to live with him, with four of them currently in residence.

Authorities have had their eyes on Gajdusek for some time. In August 1989, according to Ferrante, he was investigated by the Pedophile Section of the Montgomery County police, but the investigation was dropped for lack of evidence. Larry Foust of the FBI office in Baltimore says the agency developed an interest in Gajdusek in the course of an investigation of child pornography on the Internet. According to court papers, the FBI subsequently obtained an interview with one of the Micronesian children Gajdusek had sponsored, now a 23-year-old college student, who recounted episodes of sexual molestation which continued until about 2 years ago. On 15 March the student is said to have had a telephone conversation with Gajdusek in which the latter acknowledged being a "pedophile." Gajdusek left the country immediately afterward, and was arrested on his return.

A scientist who knows Gajdusek but prefers to remain anonymous says "everyone who knew him knew" that he sponsored many children. But the scientist says he is "stunned" by the charges.