RANDOM SAMPLES

edited by CONSTANCE HOLDEN

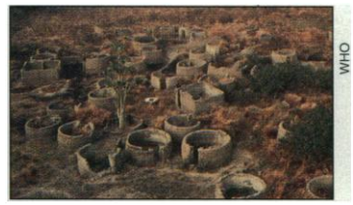
River Blindness Control Pays Off

The campaign to wipe out river blindness, or onchocerciasis, in West Africa is one of the world's most celebrated humanitarian success stories. And it seems the Onchocerciasis Control Program (OCP) is also turning out to be a major boost to the region's economy: By opening up farmland and improving the productivity of the labor force, the program will generate around $2 billion for West Africa, according to a World Bank analysis to be published later this month.

Since its inception in 1974, the OCP has saved an estimated 250,000 West Africans from blindness, caused when the *Onchocerca volvulus* worm burrows into the eye. The worm is transmitted by the black fly that lives along waterways. To control the scourge in West Africa, OCP sprays insecticide along the fly's river strongholds and treats infected Africans with annual doses of the drug ivermectin. The control operation, due to continue until 2012, will cost $571 million over its lifetime.

But if the program is costly, the returns are handsome, says World Bank economist Bruce Benton, who has analyzed the OCP's total costs and benefits based on its performance to date. By 2012, 25 million hectares of fertile farmland that was previously uninhabitable because of the disease, along with 13 million "person-years" of labor that would have been lost to blindness, will have become available. Benton says this translates into an increase in production that might be worth as much as $3.7 billion over the cost of the project, and create a whopping 20% annual rate of return on the investment over the project's lifetime.

"The magnitude [of the economic benefit] was unexpected. It's fantastic," says World Health Organization (WHO) health economist David Evans. "It shows that it's possible [for health projects] to compete very favorably with traditional development projects."



WHO

Toll of river blindness. Abandoned village in Volta River Basin.

Buoyed by the success of its first major health project, the World Bank in collaboration with WHO and other aid organizations now plans to extend the boundaries of onchocerciasis control. Starting next year, those organizations will launch a new program to control river blindness in an additional 16 African countries.

New Blood for *The Lancet*

It's spring, and with it comes a fresh crop of journal editors. Both *Science* and *Nature* recently announced turnover at the top, and now *The Lancet*, Britain's prestigious medical journal, has named a new chief. Richard Horton, a physician and writer, will become editor in July, succeeding Robin Fox, who held the post for 5 years.

Richard Horton

Horton, who at 33 will be the journal's next-to-youngest editor (founding editor Thomas Wakley was 27), got his medical degree from the University of Birmingham in 1986. After 5 years of practice, he cast his lot with journalism. He joined *The Lancet* in 1990.

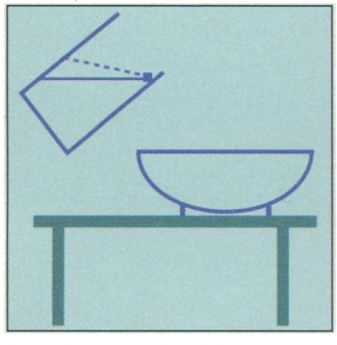
Horton feels strongly about the ethical responsibilities of those who convey scientific knowledge to the public. Scientists sometimes go overboard trying to "squeeze every implication and conclusion out of their research findings that they can," he says. Editors can help them avoid "hyperbole." Horton, who has also just been elected president of the newly formed World Association of Medical Editors (WAME), also worries that "medical editors aren't clearly accountable to anybody." So WAME's first order of business is "a practical code of ethics."

Relative Horizontality

Psychology's famous water-level test—which involves drawing where the water level should be in a tilted container—has long intrigued researchers. It seems simple, but many grown-ups can't do it. And there's a pronounced sex difference: Men get it right much more often than do women.

Now researchers have chalked up another peculiarity of the test: Waitresses and bartenders, who spend a lot of time handling fluid in tilted glasses, do very badly on it. This finding, Heiko Hecht and Dennis Proffitt write in the March issue of *Psychological Science*, "is, to our knowledge, the only documented case in which performance declines with experience."

Proffitt, a psychologist at the University of Virginia, says the study first occurred to him 15 years ago when "I encountered the first male with a Ph.D. ever to get the problem wrong." He was a psychopharmacologist "who spends most of his day swishing things around in test tubes." Proffitt reasoned that the man's lab work had taught him to use an "object-relative" approach—relating the water level to the angle of the container—rather than an "environment-relative" approach that would have related it to a horizontal plane. The experiment finally took shape when



Draw the water level. Average error for waitresses was 27 degrees *(dotted line)*.

Hecht, Proffitt's graduate student, got a job in Munich, site of the Oktoberfest, where waiters carry a half-dozen beer steins in each hand.

Hecht gave the test to six groups: Oktoberfest waitresses, male bartenders, male truck drivers, housewives, and male and female graduate students. The results: Experience counted—badly. "Waitresses and bartenders taken together made larger errors than all other subjects," the authors report. The magnitude of the difference was similar to the difference between the sexes. Among the waitresses and bartenders, 32.5% gave correct answers, as opposed to 52.5% for the truck drivers and housewives. (Grad students did better.)

Proffitt says the results confirm that "the more likely you are to evaluate the situation relative to the container, the more likely there would be error." Psychologist Lynn Liben of Pennsylvania State University, who has been studying the water-level problem for 20 years, says the study helps show that it's "not a simple relationship between experience in the real world and what that means in terms of conceptual representation of that world."

Poisoning the Greenhouse

Remember when some scientists suggested that fertilizing the ocean with iron might counteract global warming? Well, now another idea for combating the greenhouse effect—a "manmade volcano"—has bitten the dust.

Because huge volcanic eruptions like that of the Philippines' Mount Pinatubo in 1991 cool Earth for several years, some atmospheric chemists suggested

(continued on page 505)

(continued from page 503)

that a sulfurous gas, similar to that spewed by Pinatubo, might be effectively deployed to keep Earth cool. Released near the surface, the gas would diffuse into the stratosphere, where sunlight would convert it into sulfuric acid droplets, creating a sun-blocking shield—the same thing that happened to Pinatubo's emissions. No one doubted that the basic mechanism would work, but even its proposers wondered what the side effects might be.

Turns out there's one hitch, say atmospheric modelers Steven Taubman and James Kasting of the Pennsylvania State University: The scheme would foul our own nest. In the 1 April issue of *Geophysical Research Letters*, the two report that in their model, the manmade volcano would have to be huge to counteract the 4°C warming that may develop in the next century or two. More than 6 billion tons of carbonyl sulfide, equivalent to 300 Mount Pinatubo eruptions, might have to be released each year at the surface to get the desired effect, say Taubman and Kasting.

That much gas would produce some drastic side effects: Aside from producing global acid rain and serious losses of protective stratospheric ozone, the researchers say, such a scheme would likely turn Earth's surface into a gas chamber. The required surface concentration of carbonyl sulfide, a known poison, would likely lead to "inflammation of the respiratory tract, headache, dizziness, blurred vision, and even death." Plants wouldn't like it either, the authors add.

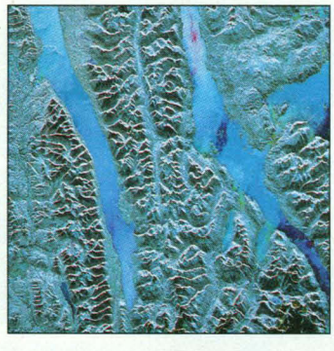
So much for that quick fix, but there are others waiting in the wings. Trucking sulfur dioxide into the stratosphere in 747s is one. Boeing should be interested.

Satellites in Stereo

Last week, an Ariane IV rocket took off from Kourou in French Guyana carrying ERS-2, the second dedicated Earth observation satellite launched by the European Space Agency (ESA). The newcomer will join ERS-1, launched in 1991 and still going strong. With two working satellites in orbit, researchers will be able to get much improved 3D radar images of Earth, capturing views of the same area from two angles.

ERS-2 was originally intended to take over from its predecessor, but because ERS-1 showed no signs of failure, ESA's program board approved money to operate both in tandem for the next 12 months, says Stefano Bruzzi, mission manager at ESA's Paris headquarters. Researchers hope this will allow them to capitalize on the stereo images, which are produced with a technique called synthetic aperture radar (SAR) interferometry.

Both satellites are equipped with radars which send down microwave pulses and, from the reflected signal, measure sea surface altitudes, the height of ocean waves, and wind speed and direction. The new ERS-2 also has added features: an ozone monitor designed to produce a global ozone map every 3 days and an improved infrared radiometer that, in addition to measuring sea surface temperature, can use reflected visible wavelengths to analyze the state of vegetation covering land.



ESA

Gaining dimension. ERS-1 image produced from two different passes over Fireland, Argentina.

But it is the fact that both have identical SAR instruments that will give a boost to interferometry. ERS-1 pioneered the technique, but for each image researchers had to wait at least 3 days for the satellite to pass near the same area a second time, and in that interval extremes of weather or other changes of surface conditions can spoil the image. "SAR interferometry only works when the target remains exactly the same," says engineer Claudio Prati of the Polytechnic School of Milan. With two satellites, "one will follow the other with only a 1-day time interval," and that means "better results," says Prati.

Low Expectations

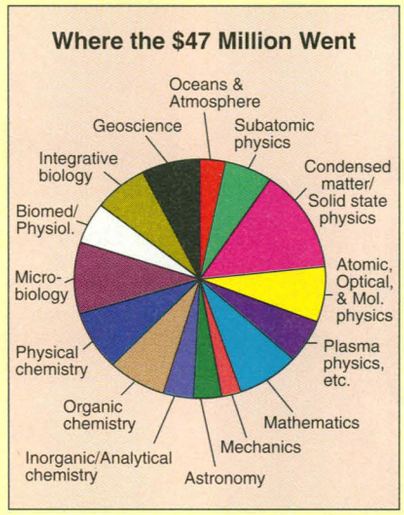
Numerous polls have shown that elementary school teachers feel less well-equipped to teach science than most other subjects. But judging from a recent poll sponsored by Bayer Corporation, knowledge is not necessarily seen by teachers as a crucial qualification.

A telephone poll of 1000 teachers conducted this spring revealed that only 36% of grade school teachers consider themselves "science literate"—defined as able to "understand stories about science on TV and in magazines." Yet according to the poll, 56% "said they felt qualified to teach science." And that's the ones who feel "very" qualified, says Bayer spokesperson Lew Borman. Almost everyone in the sample felt at least "somewhat" (as opposed to "a little" or "not at all") qualified to teach science.

An inquiry to Research Communications Ltd. in Dedham, Massachusetts, which conducted the poll, revealed that the pollsters themselves are not sure what to make of the result. Says survey analyst Anne Castleton, "My guess is teachers are saying to themselves, 'Well, they don't need to know that much in sixth grade.' "

Swan Song for ISF?

The International Science Foundation (ISF), the rescue effort that funds formerly Soviet scientists, has issued its second—and possibly last—annual report. The foundation, put together by Hungarian-born financier George Soros, has handed out about $47 million in 3554 long-term basic research grants since early 1993 (see chart). The median grant size is $10,000; the largest are two grants of $69,000 apiece for ocean and atmospheric science. Much of the money has gone to Moscow. Of the 51 institutions housing the top grant-getters, 35 are in the Russian capital. And the largest number of grants—87—in one place landed in the chemistry department of Moscow State University.



In addition to providing basic sustenance for researchers, the ISF effort has introduced ex-Soviet scientists to a new and unfamiliar practice: peer review. Of some 60,000 scientists who have been involved in reviewing proposals, about one third were from the former Soviet Union, which means, says ISF Director Gerson Sher, that "20,000 reviewers had some experience maybe for the first time in evaluating their colleagues' work."

The ISF's future is now precarious—the Russian government has expressed interest in offering matching funds for 1996, but further Soros contributions are contingent on matching funds from the United States. So far, that hasn't materialized.