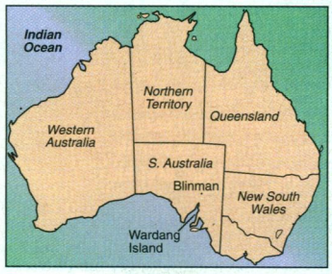
RANDOM SAMPLES

edited by CONSTANCE HOLDEN

Rabbit Biocontrol Project in Disarray

An impatient rabbit-hater may have sabotaged Australia's most important biological control project in 4 decades by deliberately spreading a rabbit virus—and possibly provoking immunity in the rabbit population.

Scientists with the Australian New Zealand Rabbit Calicivirus Disease (RCD) Project were testing the virus as a way to curb the country's rampaging rabbit population on South Australia's remote Wardang Island and were not planning to release it before 1997.



Gone awry. Australian bunny containment effort backfires.

But the virus got out. Bushflies apparently spread it to rabbits at Point Pearce on the adjacent mainland (*Science*, 27 October, p. 583). Then, after scientists had killed the infected rabbits, officials confirmed two other outbreaks, at Yunta, 200 km inland, and Blinman, 400 km from Point Pearce. While the virus was probably inadvertantly brought to Yunta by visiting journalists, virologist Harvey Westbury of the Australian Animal Health Laboratory at Geelong says "it seems someone has spread it deliberately" at Blinman. He suspects Australian farmers, who detest the crop-devouring rabbits.

Westbury says that now—the Australian spring—is the worst possible time for an epidemic because most rabbits are born in spring. While RCD kills almost all adult rabbits, those under 8 weeks develop only mild infections and then become immune to the virus. Worse, immune females can transmit protective antibodies to their offspring, thus producing a large cohort of RCD-resistant rabbits, thoroughly undermining the control program.

A spokesperson for the animal health laboratory says the picture is being additionally confused by spurious reports of other RCD outbreaks which are probably in reality only the annual spring epidemic of another rabbit disease, myxomatosis. No one is sure what will happen next. "Most of our projections are theoretical," says Westbury. "We just don't know what effect the [RCD] virus will have on wild rabbit populations. The Wardang Island field trial was designed to provide [the] data."

Crypto-Ecosystem in Romanian Cave

A cave in Romania believed to have been sealed from the outside world for more than 5 million years is yielding up a treasure-trove of unusual invertebrates, including spiders, water scorpions, earthworm-eating leeches, and bacteria. Many appear to be unique to the cave, and they seem to subsist on an unusual source of energy: hydrogen sulfide in ground water.

The so-called Movile cave was discovered in 1986 but remained unexplored until after dictator Nicolae Ceausescu's death in 1990. University of Cincinnati biologists have been studying it thanks to Romanian graduate student Serban Sarbu, who was a biologist at a nearby speleological institute when the cave was discovered in Dobrogea, between the Danube River and the Black Sea.

Biologists Thomas Kane and Brian Kinkle say that so far they have identified 50 invertebrate species, 33 of which they believe are unique to the cave, including a depigmented version of the pill bug. The scientists believe the cave is a self-contained ecosystem sustained by bacteria that act as food for the other species by oxidizing hydrogen sulfide—just as plants use sunlight for energy. Similar systems exist at deep-sea vents.

The cave provides a model "to understand food web structure and organization and to test ecological theory," says Kane.

CRISTIAN LASCU AND SERBAN SARBU

Only in Romania. Cave contains offbeat creatures such as this pale pill bug.

As a first step, Kinkle is trying to identify the bacteria, which form mats on all the cave's surfaces. "This is the only cave we know about where bacteria are in such abundance," he says.

Like cave-dwelling species elsewhere, the larger creatures in Movile have no eyes or very small ones, little pigmentation, and enlarged appendages and antennae compared with outside kin, says Kane. Based on geological data, the scientists surmise that their ancestors might have retreated to the cave millions of years ago when the climate turned very cold and dry. They may have been trapped inside when the water level rose again, says Sarbu.

David Culver, a biologist at American University, says the cave's unique ecosystem makes it a "biodiversity hotspot. ... It's very lucky that the discoverers recognized it and remarkable that they pushed the exploration."

Nerves of Steel

Chronic hard-core offenders indeed seem to be exceptionally "cold-blooded," researchers have found. Tests of autonomic arousal—including heart rate and particularly skin conductance (which translates to sweaty palms)—show that they have low levels of autonomic responsivity. Researchers have linked this to a propensity for criminal behavior in several ways: Chronic underarousal is linked both with thrill-seeking behavior and with having a high fear threshold, which would make fear of punishment less of a crime deterrent.

In a recent and highly publicized study, psychologist Adrian Raine and colleagues at the University of Southern California now claim to have established the corollary to this finding, reporting in a paper in the November *American Journal of Psychiatry* that high arousability may be a biological "protective" factor against crime.

Raine and colleagues started their study in the late 1970s, testing 101 15-year-old males in three schools in Britain on resting heart rate, skin conductance, and "electrodermal orienting"—the autonomic nervous system's way of "paying attention" to intermittently presented tones, reflected by slowed heart rate and raised skin conductance. When the subjects were followed up 15 years later, the researchers found that of the 34 who exhibited antisocial behavior as adolescents, half had been convicted of crimes by the age of 29 while the other half had given up their errant ways.

The researchers determined that even when the groups of subjects were controlled for socioeconomic status and academic performance, those who desisted from crime had higher arousal rates than those who straightened up after adolescence. Thus, the authors claim that "this is the first study to report biological protective factors against crime development."

The reaction to Raine's work

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Real Time and Remote

The world of virtual electronic laboratories is drawing nigh. And Lawrence Berkeley National Laboratory is helping the future happen by making its high-voltage electron microscope (HVEM), the most powerful such instrument in the United States, available for remote experiments over the Internet.

Computer scientist Bahram Parvin has created software to overcome the major obstacle to using the microscope on-line: a time lag that prevented an observer from making real-time, continuous responses to the changing conditions in dynamic experiments—known as "in situ" microscopy. In such experiments, "you stimulate a subject with temperature, pressure, or a buffer" that makes it "drift" and change shape, says Parvin. Ordinarily an operator has to adjust the instrument constantly to keep a specimen in focus. For remote use, he says, "you need to have the instrument be smarter to compensate for all the changes and to hide the latency that exists in the Internet."

Materials scientist Mike Kassner of Oregon State University, who uses the HVEM to study metal fatigue at the near-atomic level, hails the new development as "the wave of the future." He says it will save him both travel money (about $500 per trip) and time. "I can do more experiments" staying in Oregon while a collaborator sets up the experiment at the microscope. The facility will be available for remote experiments in January. Scientists who want to apply can download a proposal from the World Wide Web site **http://ncem.lbl.gov/ncem.html**.

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among other scientists is mixed. Psychologist David Lykken of the University of Minnesota says he puts more stock in research that differentiates subjects when they are in an aroused state—as in awaiting an electric shock—because it differentiates the people who show no anticipatory fear response. University of Wisconsin psychologist Terrie Moffitt, however, calls the study "a rigorous test of the arousal hypothesis."

Behavior Geneticists Shun Colleague

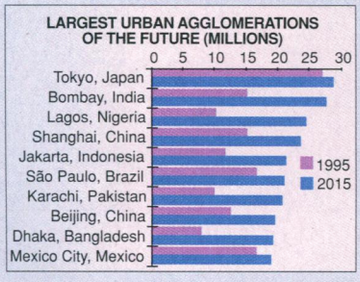
Although its controversial former president has agreed to stay away from the next meeting of the Behavior Genetics Association, two BGA officers, including the president-elect, have resigned their posts to protest his speech about race, genes, and crime.

The speech, given by psychologist Glayde Whitney of Florida State University last June at the association's annual meeting in Richmond, Virginia, decried what he sees as "ideologically based dogma" hindering research and called for studies to determine whether some of the discrepant contribution to crime by blacks in the United States and elsewhere has genetic roots (*Science*, 7 July, p. 35). The remarks caused an immediate furor among the membership. The BGA board sought to resolve the controversy by scheduling a special meeting on 5 November in Washington, D.C., "to discuss the possibility of removing Mr. Whitney from the [BGA] board." But that move spurred some members to compare the committee to a lynch mob. After some behind-the-scenes diplomatic maneuvering, new BGA President James Wilson of the University of Colorado's Institute for Behavioral Genetics canceled the meeting "for the good of the association." This outraged some board members, including geneticists Wim Crusio and president-elect Pierre Roubertoux, both of France's National Center for Scientific Research, who both resigned from the BGA Executive Committee. Crusio, in a message to BGA members, explained that he objected to "the misuse of the Presidential Address to further political goals."

Whitney says that in exchange for being allowed to stay on the BGA board he has agreed "to physically stay away from next year's meeting" and not to identify himself with the BGA the next time he writes something inflammatory. Will that satisfy the critics? "It helps," says Wilson, but whether it will end the matter remains to be seen.

Cities as Disease Vectors

Cholera returned to Peru in 1991, and plague broke out in Surat, India, last year. But the worst is yet to come, says a United Nations report scheduled for release early next year: The resurgence of such diseases is largely due to the rapid growth of urban areas without good sanitation, and such areas are growing rapidly.



"Most aid agencies and development banks still give a low priority to water and sanitation," says the *Global Report on Human Settlements*, produced by the U.N. Centre for Human Settlements in Nairobi, Kenya. Agencies prefer to dwell more on air and water pollution than on "inadequacies in water supply, sanitation, and drainage ... although this latter group of problems usually has a far greater toll on ... health."

Diseased cities are taking a heavy toll not only on health but on the economies of poor countries. Peru's cholera epidemic, for example, cost "an estimated $1 billion in losses from reduced agricultural and fisheries exports and tourism."

The problem is getting worse, says the report. The world's urban population is expected to double, to 5 billion, in the next 30 years. Global warming may further exacerbate the problem by spurring the spread of tropical diseases (*Science*, 3 November, p. 731).

The worst-off cities are growing the fastest. By 2015, New York and Los Angeles will be off the list of the world's 10 biggest cities, leaving Tokyo the only one in a developed country, says the report.

New Life for Student Pugwash

First there was the million-man march. Now there's the million-person pledge: A student group is trying to get a million students and young professionals to pledge to use their education and work in science and technology in "socially responsible ways." Such is the ambitious goal of Student Pugwash USA, the offspring of the Pugwash Conferences on Science and World Affairs, which received the 1995 Nobel Peace prize along with its co-founder, physicist Joseph Rotblat. Although the campaign will extend to the year 2000, organizers hope to deliver "a good chunk" of the signatures to Rotblat at the Nobel ceremonies on 10 December in Norway, says Sandra Ionno, who heads the USA branch. The pledge is being distributed directly on U.S. campuses and via the World Wide Web at **http://www.spusa.org/pugwash/pledge.html**.

The pledge states that "individual responsibility is the first step in the path to peace" and asks signatories to consider the ethical implications of their work and education. The intent is to follow the lead of Pugwash founders such as Rotblat, who 50 years ago worked on atomic weapons and now advocates severe curbs on them. Anne Cahn, a Student Pugwash board member and former member of the U.S. arms control and disarmament agency in the Carter Administration, notes that "although the danger of catastrophic nuclear war ... has abated, there's still a lot of reasons out there [such as disease and global warming] for young people to think about what kind of work they want to do."

Organizers of the pledge are hoping not only to stir up moral feeling but to invigorate Student Pugwash itself. Started in 1979, it has remained relatively small, comprising 50 high-school and college groups and some 175 affiliates. But they hope that the combination of the Peace Prize publicity and the international access they enjoy with the Internet will enhance both Student Pugwash and its mission.