RANDOM SAMPLES

edited by CONSTANCE HOLDEN

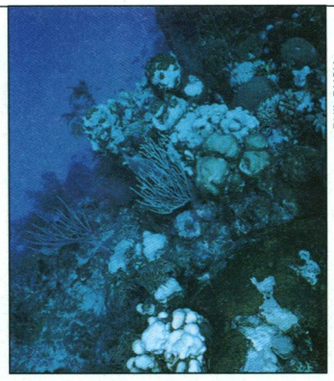
Reef Bleaching Spreads in Caribbean

Coral reefs in the western Caribbean have what may be the worst dose yet of a familiar affliction: coral bleaching. Bleaching occurs when changes in water conditions drive out the symbiotic algae that live within the coral, robbing them of color and nourishment. Unless the algae return, the tiny reef-building animals that make up the other half of the symbiosis starve to death.

Bleaching has been reported with increasing frequency around the world since it was first observed in the Caribbean in 1964. It occurs in summer months when the average water temperature exceeds the seasonal average by 1°C. Lab studies show that other environmental stresses, like increased ultraviolet light, can enhance the bleaching response. In 1987, temperatures in the Caribbean rose high enough to cause the first reported episode of bleaching throughout a large region. And a large part of the Caribbean was in hot water again this summer. While hurricanes in the eastern Caribbean protected reefs there by stirring up cooler, deeper water, in the western Caribbean water temperatures exceeded 30°C, the trigger point for bleaching, for nearly 2 months, according to marine biomedical researcher Ray Hayes of Howard University.

Reports are still coming in. Bleaching was seen at Belize for the first time this year, and one of Hayes's colleagues, reef ecologist Thomas Goreau of the Global Coral Reef Alliance, says 70% of the coral off Jamaica was bleached by the beginning of October. Recovery depends on "how warm the water was, for how long, and the species of coral," he says.

Scientists still don't fully understand why warmer water temperatures lead to bleaching. Nor is there a consensus on what causes the temperature to rise. A National Science Foundation–sponsored meeting of reef scientists concluded in 1991 that global warming was not the culprit, but coral reef ecologist Peter Glynn at the University of Miami says "we need more data" before a role for climate change can be dismissed.



PHIL BUSH

Losing algae. Different kinds of coral bleach at different rates.

Schizophrenia: All Eyes On Chromosome 6

Schizophrenia researchers have inched closer to their long-sought and elusive goal of finding genetic markers for the disease. Four different research groups, basing analyses on at least three independent databases, have converged on the same conclusion: Chromosome 6 carries a gene that puts some people at risk for schizophrenia. Three of the groups published their findings last week in *Nature Genetics*.

Possible genetic markers for schizophrenia have come and gone, but geneticist Eric Lander of MIT's Whitehead Institute believes that the latest findings mean researchers are on to something real. The locus may account for only a fraction of schizophrenia cases, he says, but "together [these papers] constitute confirmation ... that there is a region on chromosome 6 that shows more sharing [among schizophrenics] than you would expect by chance," he says.

Included in the work is a second report from the largest data base ever established for schizophrenia research—a collection of 265 Irish families assembled by psychiatrists Dermot Walsh of Ireland's Medical Research Board in Dublin, F. Anthony O'Neill of The Queens University in Belfast, and Kenneth Kendler of the Medical College of Virginia (MCV) in Richmond. The new analysis of these families was carried out by molecular biologist Richard Straub and mathematician Charles MacLean of MCV. It confirms an earlier study by Kendler's ex-collaborator Scott Diehl, now at the National Institute of Dental Research, who caused a furor when he published chromosome 6 results on his own, without naming Kendler as a co-author (*Science*, 12 May, p. 792).

The chromosome 6 locus, even if it is confirmed, is by no means the end of the story. Another study in the batch, led by H. W.

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All About AIDS

This just in from the National Institute of Allergy and Infectious Diseases (NIAID): HIV causes AIDS.

Although that may seem like old news, NIAID has received so many calls from people who question that conclusion or need ammunition to field skeptics' questions that staffers have put together a detailed pamphlet making the HIV case. "We found ourselves constantly trying to send people references," says NIAID Director Anthony Fauci. "We decided to put it all in one document."

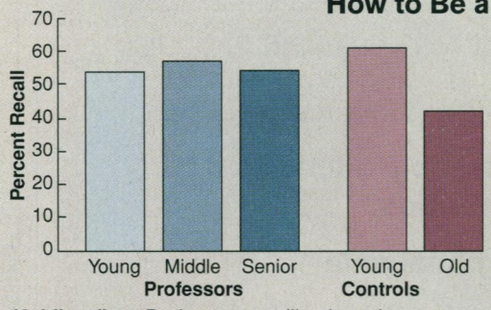
Titled "The Relationship Between the Human Immunodeficiency Virus and the Acquired Immunodeficiency Syndrome," the 61-page, reference-jammed booklet only makes passing mention of one of the main reasons for its existence: Peter Duesberg, the University of California, Berkeley, retrovirologist who has been the leading critic of what he calls "the HIV hypothesis" (*Science*, 9 December 1994, p. 1642).

"If public health messages on AIDS prevention are diluted by the misconception that HIV is not responsible for AIDS," the booklet concludes, "otherwise preventable cases of HIV infections and AIDS may occur, adding to the global tragedy of the epidemic." To obtain the pamphlet, e-mail NIAID at folkers@nih.gov.

JEFF HESTER/ARIZONA STATE UNIVERSITY

Star hatchery. An image from the Hubble Space Telescope reveals giant columns of cold gas and dust in the Eagle nebula, 7000 light-years away, where knots of dense gas are collapsing and forming young stars. Ultraviolet light from nearby hot stars is eroding the columns, exposing the star-forming knots, or EGGs (evaporating gaseous globules), which appear as finger-like projections.

How to Be a Sharp Senior



Holding firm. Professors—unlike those in reference samples—showed no decline with age in a general test of prose recall.

Want to keep your wits for as long as possible? Be a Berkeley professor. At least that's one possible interpretation of a study by psychologist Arthur Shimamura and colleagues at the universities of California at Berkeley, Richmond, and Michigan at Ann Arbor.

Researchers have found that intellectually active people develop dementia at a later age than others, and some studies suggest that they also compensate better for normal deterioration in mental faculties. But Shimamura says there were few data on the degree to which that pattern holds for "extraordinary IQ individuals." As it turned out, his brainy subjects provided what Duke University psychologist Lynn Hasher calls "the most dramatic example [yet]."

The researchers divided 72 Berkeley professors into three age groups: 30 to 44, 45 to 59, and 60 to 71. The subjects took a series of tests including reaction time, associational memory, pattern memory, and prose memory. Scores were compared with data from standard groups of young and old subjects.

The researchers report in the September issue of *Psychological Science* that the professors showed much less cognitive decline with age than the general population. On reaction time, which taps what Shimamura calls "the basic mechanics of cognitive function," the older professors showed slowing, but not as much as the controls. And on "prose recall"—remembering passages played to them on tapes—their performance didn't slip at all.

To psychologist Deborah Burke of Pomona College in California, the findings challenge the view that "general across-the-board slowing accounts for intellectual decline." The fact that the professors showed no age-related decline in prose recall—despite changes in reaction time—"shows that it's not that simple."

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Moises of Kiel University, has already shown new directions for other researchers, says co-author Irving Gottesman, a psychologist at the University of Virginia. The only study that looked at markers covering most of the human genome, it not only hit on two locations on chromosome 6, but supported an earlier sighting on chromosome 22 and found two new candidates, on chromosomes 9 and 20.

Early Warning Neuron

When someone hurls a rock at you, you duck. When a bird swoops down on a locust, the insect jumps. For humans, locusts, and many other animals, collision avoidance is a valuable response. But how is it triggered? That's a tricky problem because most animals lack binocular vision, and so have no good way to gauge either the absolute size or the distance of an object—they only have the size of the image it projects on the retina.

But that is apparently enough information to solve the problem. Neuroscientist Gilles Laurent and colleagues Nicholas Hatsopoulos and Fabrizio Gabbiani at the California Institute of Technology report on page 1000 that locusts have a specialized neuron that can warn of an impending collision based on changes in the size of an object's image on the retina.


G. LAURENT

Ready to jump. Motion-sensing neuron triggers action.

Laurent group recorded the electrical activity of a motion-sensing neuron in locusts while the creatures watched images of objects hurtling toward them on a computer screen, and derived a mathematical algorithm that describes the neuron's response. The neuron first becomes excited by the rapidly growing image of the approaching object on the locust's retina. Instead of increasing continuously, however, the activity "peaks prior to collision," says Laurent. Once the image becomes very large, inhibitory forces take over, and the neuron quiets down.

That peak of neural activity is potentially more useful to the animal than a continuous crescendo would be. It provides a clearly defined signal, like an automated early warning, that precedes the impending collision. And the warning may well trigger action: The neuron's activity peak is precisely correlated with the cocking of a leg muscle in preparation for a jump.

Other animals, even humans, may have neurons that do similar computations. Several years ago, for example, Barrie Frost's group at Queen's University in Ontario, Canada, found neurons that perform a similar role, although apparently using a different algorithm, in pigeons' brains. But Laurent's group took their analysis further, says neuroscientist Larry Abbott of Brandeis University, by mathematically describing how a single neuron translates an expanding image into the message, "Do something or you're going to be hit."

Thumbs Up for Solar Mission

The decision remained up in the air until last Friday. But the international team that put together the Solar and Heliospheric Observatory (SOHO) has finally decided to launch the billion-dollar satellite on its mission to monitor the sun on or about 23 November.

Fingers are crossed: If the satellite is not ready to go by then, the contractor for the satellite's launch vehicle, Lockheed Martin, won't have another launch slot available until next October, says SOHO project scientist Art Poland of the National Aeronautics and Space Administration's (NASA's) Goddard Space Flight Center. Tests of some ground-based systems on the satellite, which was designed and built by the European Space Agency, still have not been completed. If any glitches turn up, Poland says, the project will have to be shelved for almost a year.

Assuming all goes well, SOHO will soon be heading for the so-called "L_1 Lagrangian point" 1.5 million kilometers from Earth, between Earth and the sun. The gravitational pulls of the two bodies are in balance at that point, enabling SOHO to hover there for an uninterrupted solar view. Its 12 instruments will "for the first time ... begin to put together the pieces of the sun-Earth jigsaw puzzle," says Richard Harrison of the Rutherford Appleton Laboratory in the United Kingdom and a principal investigator on SOHO.


NASA

Systems go. SOHO heads for Lagrangian point (artist's impression).

One set of instruments will do helioseismology, monitoring vibrations on the sun's surface for clues to its interior. Others will photograph features of the sun's atmosphere, such as the magnetized threads of plasma that arc through it. And still others will keep track of the bursts of particles that the sun launches toward Earth. "This is the first time we are going to be able to study the sun from its deep interior all the way to the Earth," says Poland. SOHO fans will be able to follow the project on a real-time basis at **http://sohowww.nascom.nasa.gov**.