RANDOM SAMPLES

edited by CONSTANCE HOLDEN

New Tool for Predicting AIDS Onset?

There is a 10-year lag, on average, between infection with human immunodeficiency virus and the onset of AIDS. But that's just the average: Some people die within a few years of becoming infected, while others remain healthy for 15 years or more. And researchers have been feverishly searching for ways to predict these outcomes.

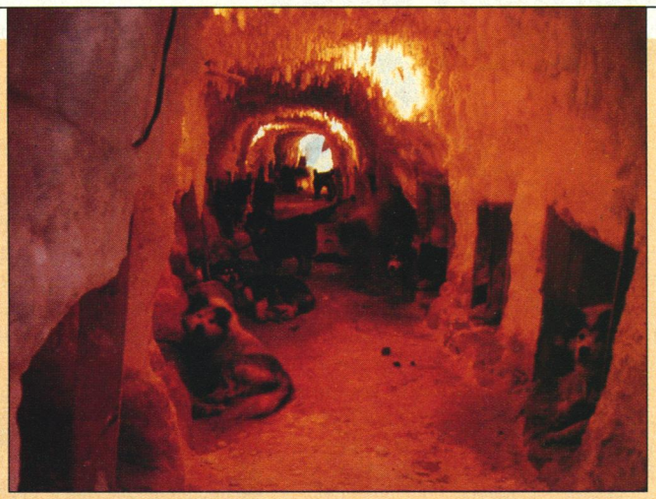
Now, Rockefeller University's David Baltimore, the Nobel Prize–winning retrovirologist, believes he and his co-workers may have found a useful new predictor: levels of HIV messenger RNA (mRNA) in the blood. The mRNA carries the genetic information needed for the virus to copy itself. More mRNA means faster replication and more HIV, and that, proposes the Baltimore group, makes patients get sicker sooner.

Researchers have used other methods to predict progression toward full-blown disease, notably the destruction of CD4 immune system cells. But that hasn't always correlated with the onset of symptoms. So they have been looking to HIV itself as a marker, quantifying levels of infectious HIV, HIV proteins, or HIV nucleic acids in the blood, since increases in the virus correlate with disease progression.

Baltimore, Kalle Saksela, Pablo Rubinstein and Cladd Stevens, writing in the 1 February *Proceedings of the National Academy of Sciences*, explain they may have found a better marker of disease progression: HIV replication. They believe mRNA is a more sensitive measure than other assays and may detect virus earlier than it would be seen otherwise.

When the researchers analyzed mRNA levels in 18 HIV-positive men being monitored at the New York Blood Center, they found that mRNA—but not CD4 counts—tightly correlated with progression. They further found that mRNA levels predicted the efficacy of the anti-HIV drug AZT, which suggests that this assay may help evaluate the worth of antiviral treatments.

Baltimore stresses that this small study should be interpreted cautiously. But he is now analyzing more than 150 patients, and he suspects the mRNA assay will pan out. Says Baltimore: "Replication in the blood looks at a specific viral state that I think is an indicator of the future."



BAS

Huskies in their digs. Saying goodbye to the icy continent.

Last Bark for Antarctic Huskies

Antarctica is not going to the dogs. Thanks to worries about canine viruses that could infect Antarctic seals, the icy continent will become a dog-free zone as of the end of February. At that time, the last 14 huskies in the area, owned by the British Antarctic Survey (BAS), will leave for warmer climes.

The dogs' departure brings to an end their long and distinguished south polar careers. First brought there by Anglo-Norwegian explorer Carsten Brochgrevink in 1898, they helped pull Roald Amundsen and his team in the first expedition to reach the South Pole in 1911. Although scientists retired most of the dogs in favor of snowmobiles during the 1970s, the BAS kept on two teams of seven huskies each for use in emergencies and for companionship.

But environmental groups were worried that canine viruses might be passed on to local seals, causing fatal diseases for which they have no defenses. So the groups successfully lobbied the 1991 Antarctic Treaty meeting in Madrid to ban dogs from the continent. The ban begins on 1 April, and Australia and Argentina have already removed their dogs.

The BAS dogs set off by plane in December to their final assignment on Alexander Island, just west of the Antarctic Peninsula, where they will help a mapping team do ground surveys. The scientific team will also be driving stakes into the Uranus glacier to enable scientists to monitor its movement.

After completion of this last assignment, the animals will be flown to new homes in Canada or the United States. But they will be missed. The dogs have been "a great morale booster" for frozen homesick scientists, says Janet Thomson of the BAS mapping section. "There will be a lot of long faces when they leave."

Out of the Cold, Onto the Newsstand

Now that cold fusion has faded from the front pages, it's tough to find reliable news on this seemingly unreliable subject. But the January mail may have brought a solution: an invitation to subscribe to the first monthly magazine dedicated to cold fusion.

"*Cold Fusion*" will debut this April. The title has quotes surrounding it because a nonfusion mechanism may be causing the observed energy-producing effects, says Eugene Mallove, editor of the new publication. Mallove was a news officer at the Massachusetts Institute of Technology (MIT) until 1992 when he and the institution parted ways over his ardent espousal of cold fusion. The publisher is Wayne Green, who puts out *Byte*, *CD Review*, and other trade magazines.

The aim of the magazine, says Mallove, is to publish "the latest findings in the cold fusion field in a broad-based way, to both those interested technically and those who may be interested in the economic potential of the field, which we view as rather extraordinary." Green and Mallove hope the magazine will speed communication in the field, whose researchers have had trouble getting articles into peer-reviewed journals, as well as bring cold fusion researchers around the world together with vendors of cold fusion equipment. The number of researchers pursuing the dream is estimated to be somewhere in the hundreds.

The magazine's maiden issue will contain articles by scientific visionary Arthur C. Clarke and Nobel physicist Julian Schwinger of the University of California, Los Angeles, who has proposed a new theory for cold fusion's mechanism. It will also carry a story by Dennis Cravens, an instructor at Vernon Regional Junior College in Texas whose garage-based cold fusion research, says Mallove, was highly praised by Martin Fleischmann, the codiscoverer of the putative phenomenon.

Whatever the magazine may be, it won't be pessimistic. "We'll let you know what's going on in various research labs," the brochure promises, "and who the players are, both pro and con.... That noise you hear isn't the death rattle of cold fusion, it's the excited typing of papers by successful research lab teams and the depositing of legal fees by their patent attorneys." The magazine

won't be cheap, either: it carries a cover price of $10 or, for bargain-hunters, $98 for a 1-year subscription.

El Niño Says Adios, as Computers Predicted

For the past two winters, El Niños, unusually warm water in the tropical Pacific Ocean accompanied by atmospheric disruptions, have generated worldwide spells of drought, heavy rains, and temperature extremes. But now that's history, according to El Niño watchers—a vindication for computer models that predicted the vanishing act and a comeuppance for some human observers who went against the model forecasts.

El Niño's warm water, which tends to reappear every 3 to 7 years around late December, won't be back soon. "It's been fading away, and I don't think it's going to resurge this year," says Vernon Kousky of the U.S. Weather Service's Climate Analysis Center (CAC) in Camp Springs, Maryland. Until late last year, when winds brought cooler waters to the tropical Pacific, says Kousky, "we couldn't be sure it was going to die."

Human forecasters may not have been sure what El Niño was up to, but since the end of last summer two of the most sophisticated computer models that predict El Niños had been calling for normal if not slightly chilly conditions in the tropical Pacific this winter (*Science*, 29 October 1993, p. 656). As late as October, an advisory from the CAC noted indications in the Pacific of "a strong potential" for El Niño's return. Kousky thought the odds favored it, but the CAC's computer model, which factors in winds and subsurface ocean conditions, called for a normal to cooler-than-normal Pacific in early 1994, as did a similar model at Columbia University's Lamont-Doherty Earth Observatory.

That the computers were right is not as comforting to modelers as might be expected, however. Although the CAC model may have picked up crucial clues that the subsurface heat fueling El Niño was petering out, "it could have been something different" that cooled the tropical Pacific, says CAC's Ants Leetmaa. "There are subtleties out there we don't understand."

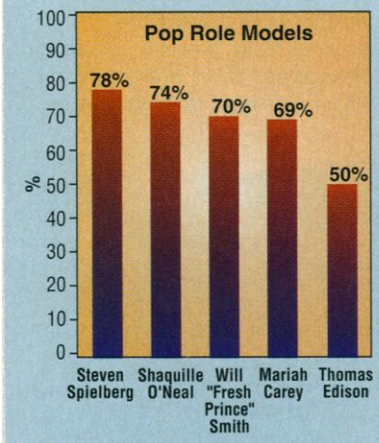
The Grim Reaper Plays By Quirky Rules

While death, the universal leveler, will surely get us all in the end, a key question for policy makers is what our risk of death is in any given year, and how that risk changes with age. Some scientists hoped that the laws governing death would be universal among animals, enabling data on other species to shed light on the biology driving humans to their fates. Those hopes have now been dashed by death's familiar handmaidens: flies and worms.

Until recently, there was a universal law of aging, proposed by 19th-century British actuary Benjamin Gompertz, which held that the risk of death grows exponentially as we age, until finally it reaches 100%. But recent studies of human census data cast Gompertz into doubt, suggesting the risk of death stops growing exponentially and may even level off after the age of 85 or so (*Science*, 15 November 1991, p. 936). If that were true, it would mean that, over age 85, your risk of death in any year may be high, but the odds wouldn't change much from year to year.

It is hard to draw conclusions from sketchy human census data, however. So James Carey of the University of California, Davis, and James Curtsinger of the University of Minnesota turned to animals they could grow a lot of: fruitflies. They reported in 1992 that the risk of death clearly levels off at old ages for two species of fruitflies (*Science*, 16 October 1992, p. 398). Their findings raised the question of whether studies of large populations of other species might expose Gompertz's law as universally wrong, a fluke resulting from studies in which the numbers were too small. But on page 668 of this issue, Thomas Johnson and his colleagues at the University of Colorado report that, in large populations of nematode worms, Gompertz seems to hold. The risk of death increases exponentially until the oldest worm dies.

The take-home message from Johnson's work, says Minnesota's Curtsinger, is that "there's certainly not going to be a universal pattern." And that means that neither flies nor worms—nor any other critters—are guaranteed to reflect the biology of aging in *Homo sapiens*.

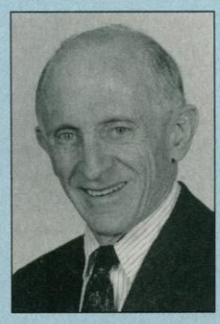


Work to do. In a Lemelson-commissioned survey, 350 teenagers were asked to select from a list of 12 names people they would like to emulate.

Nurturing New Entrepreneurs

Jerome H. Lemelson, described by the Massachusetts Institute of Technology (MIT) as "America's most prolific living inventor," is trying to reinvent the innovative spirit among U.S. college students. He's pumping $10 million into a national program on "invention, innovation, and creativity," including a lucrative new award: the $500,000 Lemelson-MIT prize "for innovation and invention." It will be awarded for the first time next spring.

Lemelson, 70, has two master's degrees in engineering from New York University and spent 40 years as a one-man operation, spinning new ideas straight from his brain onto patent applications. MIT says that with 500 patents, he's the fourth most prolific inventor in American history, after Thomas Edison, Elihu Thompson, and Edwin Land. One of his earliest inventions was a lighted tongue depressor; his most lucrative invention, he says, is a system for computerized image analysis.



Lemelson

Lemelson's eponymous prize is one part of a $6.5 million program being launched at MIT, administered by economist and innovation maven Lester Thurow. Other components include an endowed professorship (Thurow is the first occupant of the seat), research fellowships, and undergraduate awards. Lemelson has already launched a $3.5 million program to stoke the fires of invention at Hampshire College in Amherst, Massachusetts, by fostering the creation of "E-teams" (E for entrepreneurial) to develop marketable inventions, ranging from new applications of artificial intelligence, to applying genetic and behavior theories to the design of better dogs as companions for disabled persons. Lemelson envisages a national network of E-Teams. Says he: "I think this is the solution to our productivity problems."

Lemelson has plenty more plans up his sleeve. Last week, having recently moved to Nevada from Princeton, New Jersey, he gave the state $100,000 to establish an Office of Science and Engineering Technology.