RANDOM SAMPLES

edited by CONSTANCE HOLDEN

Comet Shoemaker-Levy: A Disguised Asteroid?

What makes a comet? Looks, for one: If an object is shrouded in dust, it's a comet. By that measure, the fragments of Shoemaker-Levy, which recently splashed into Jupiter, qualified. Strictly speaking, though, comets are supposed to have water, which is why they are called "dirty snowballs." And in that respect Shoemaker-Levy has come up dry.

In most active comets, the water is easy to spot because its vapor, generated by the sun's heat, is what drives the dust outward. But Shoemaker-Levy never revealed any signs of water. Since its discovery last year, spectra of light from its fragments have shown no sign of the hydroxyl ion, a clue to water. Astronomers had rationalized that the comet might simply be too far from the sun to have its ice thawed. But things got plenty warm enough—thousands of degrees—when the fragments plowed into Jupiter at 200,000 kilometers per hour. Yet there was no sign of water in the impact debris.

That absence is leading some researchers to speculate that Shoemaker-Levy was really an asteroid, a rocky body with no ice. "I'm leaning toward an asteroid," one whose fragments were embedded in debris from its breakup, says Harold Weaver, a comet specialist at the Space Telescope Science Institute in Baltimore. Weaver did finally detect a cometary emission—from magnesium—using the Hubble Space Telescope to observe one of the largest pieces, fragment G, when it was just 10 hours from impact. Such metals only show up when comets are nearly grazing the sun. But whatever was ripping magnesium from the fragment as it sped in through Jupiter's magnetosphere couldn't drive off enough water to be detectable. Given the elusiveness of water, Weaver would welcome a better reason than fuzziness to call Comet Shoemaker-Levy a comet.

D.E. CREWS

Modern living in Samoa. Public health nurse does blood pressure check.

Heart Attacks and Ethnicity

American Samoans, many of them nourished on New Zealand mutton and sedentarily employed in tuna canneries, "are among the largest people in the world," says anthropologist Douglas E. Crews at Ohio State University.

Their high rate of diabetes reflects their obesity problem. Yet Samoans seem to have a rate of heart disease one-third lower than the rate in the United States. Crews reported that finding 12 years ago, and now he and a group of British colleagues have come up with a result that may partly explain it: Most Samoans have a gene that has been linked, at least in whites, to low incidence of heart disease.

Crews and colleagues in Manchester and London have examined DNA segments of 375 people from four groups: blacks from Nigeria, whites from Britain, Polynesians from Samoa, and Yanomami Indians from Brazil. They looked at the distribution of two versions of a gene for an enzyme, the angiotensin converting enzyme (ACE), that plays a role in regulating blood pressure.

There were "significant ethnic differences" in the occurrence of the polymorphism, the authors report in a forthcoming issue of *Journal of Hypertension*. The Samoans (83%) and the Yanomami (71%) usually had a gene pairing, II, associated with low risk of heart disease. Nigerians and whites, in contrast, had the highest rates of another pairing, DD, that is known to be "a potent risk factor for myocardial infarct," says Crews.

Biological anthropologist Ryk Ward of the University of Utah points out that even if larger studies confirm the differences between ethnic groups, the mechanism is far from clear. While ACE is related to blood pressure, "no one has found a consistent or clear-cut relation" between the DD allele and high blood pressure, says Ward.

It's a tricky business. But Crews and colleagues say their results "clearly suggest that ethnic origin should be carefully considered" in looking at the relation of the ACE genotype to disease.

SAT Pulls Up Scores

The Scholastic Assessment Test (SAT)—the redundantly renamed Scholastic Aptitude Test—is pulling up its sagging scores to go along with its new image. Scores will be "recentered." That is, they'll all go up, especially the low ones, starting in the fall of next year, according to the test's owner, the College Board.

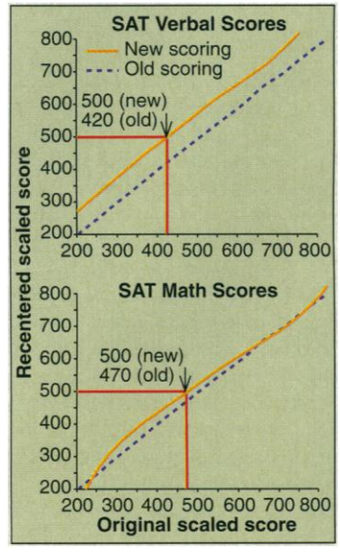
The board is thus putting a decisive end to the much-lamented decline in SAT scores. That's supposed to be good news for the 1-million-plus college-bound teens who take the test each year, but some critics see the move as another sign of the "mediocratization" of U.S. education.

SAT math scores have largely recovered from the big SAT decline of the '70s. But the verbal ones haven't. So about 74 points are being added to verbal scores and 25 to the math scores. And the average for both will be 500. "The main reason we're doing this is to make it easier for students to understand their scores in relationship to each other and to the national average," explains Fred Moreno of the College Board. "Kids are confused" even though they're always supplied with percentile rankings, he says. The board also claims the change "will help to reflect more accurately the diversity of students now taking the test."

Some scholars have sharply criticized the recentering. "Everybody had a clear notion of what [the scores] meant," says political scientist Charles Murray of the American Enterprise Institute. As for the "diversity" rationale, Murray and Harvard psychologist Richard Herrnstein say an analysis they conducted shows that the score decline is connected not with demographic changes but with a deterioration in educational standards.

Statistician Gary Marco of the Educational Testing Service, the test's designer, says even he "wouldn't lean that heavily" on the diversity argument. Rather, he says, the change will yield "better measurement within the middle range and at the lower end" by according a wider range of points to the low scorers.

Are SAT users happy? Harvard University, for one, doesn't seem to feel strongly about the matter. "We can use it this way and we used it perfectly well before," says Admissions officer Marlyn McGrath Lewis. "We simply need to arm the readers of folders with the [conversion] table."



$1 Million for the Blue Planet

The Japanese have created a number of of big-money international scientific prizes in recent years. Among these is the Blue Planet prize, actually two environmental awards given by the Asahi Glass Foundation, each carrying with it 50 million yen (about $500,000). This year's scientific prize, announced on 25 July, goes to geologist Eugen Seibold, director of the Geological-Paleontological Institute at the University of Kiel, for his investigations of ocean sedimentation processes, ocean biodiversity, and ocean-atmosphere interactions. A second prize, for "development and implementation," goes to Lester Brown, founder of Worldwatch Institute, a Washington, D.C. think tank that analyzes global environmental, population and resource trends. An awards ceremony will be held in Tokyo in November.

Academia's Lonely Crowd

The treasured collegial atmosphere on U.S. campuses today is sadly frayed at the edges, a victim of resource shortages, heightened competition, and the heavy politicization of many of the topics of academic discourse.

That's the message from Stanford education professor William Massy, who calls the phenomenon "hollowed collegiality." Massy and colleagues Andrea K. Wilger and Carol Colbeck have done a survey of some 300 faculty members at 20 colleges and universities. The result, they write in the July/August issue of *Change* magazine, is "a strong element of atomization and isolation among faculty. ... [A] central element of academic life" is that "faculty work alone."

The authors identify five elements in this sad state of affairs: increasing specialization, which makes it "virtually impossible [for faculty] to discuss their work with one another;" a "veneer of civility" (avoidance of conflict "at all costs"); generational splits aggravated by jealousy over such things as salary differentials; personal politics (some faculty "perceive each other as good or wicked depending upon their ideological stance,"); and competition for scarce resources.

The groves of academe have not all turned into jungles. The researchers did find some happily functioning departments: those supporting "effective teaching." It seems that where faculty really care about teaching, other positive elements are also present, such as "frequent interaction among faculty, tolerance of differences, generational equity, workload equity ... consensus decision-making ... [and] a high level of participation in ... departmental work."

Looking in the Dark

SACKETT/MORRISON/HARDING/BOROSON/NOAO

Edge of darkness? Computer model of halo around spiral galaxy NGC5907.Galaxy disk *(inset)* and foreground stars have been masked out.

A close look at a spiral galaxy may have brought some of the universe's mysterious "dark matter" out from the shadows.

Spiral galaxies spin as if they are surrounded by haloes of unseen material, whose gravity speeds the rotation of stars and gas in the galaxies' outer reaches. Now Penny Sackett at the Institute for Advanced Study in Princeton, New Jersey, and her colleagues have found a luminous halo where this dark matter should be—suggesting that some dark matter might be nothing more than small, faint stars.

Sackett's group used a detector mounted on the Kitt Peak National Observatory 0.9-meter telescope to take photos of the NGC5907, a disk-shaped galaxy that is seen on edge. By using computers to subtract the light from the galaxy itself and from other stars, they were able to detect a faint halo above and below the galaxy. In the 11 August *Nature*, they report that the halo's shape matches the expected distribution of the galaxy's dark matter. That alone is an intriguing finding, implying that the dark matter somehow provided a template for the formation of its halo of stars. Even more intriguing is the possibility that the stars themselves are the dark matter.

Astronomer John Tonry of MIT observes that the halo's color will resolve whether it really can account for the galaxy's missing mass. Sackett's team is now trying to determine the color: The more reddish the halo appears, the more likely it is to be made up of small, old stars, which pack far more mass for a given amount of light than brighter, bluer stars.

Tonry adds that even if the dark matter in galaxy NGC5907 turns out to be stars, that explanation may not hold for the dark matter cosmologists believe fills the space between galaxies. Says Tonry, "There may be two culprits."

Out "FOX"ing Cholesterol Tests?

Forget cholesterol. Now it's hydroperoxides to worry over—or it could be if a new test developed by British scientists pans out.

While high levels of low-density lipoproteins or LDL are linked with high risk for heart disease, they are a very rough indicator. Many scientists believe that lipid hydroperoxides, which are oxidized cholesterol particles, may be a more sensitive signal. But there hasn't been a good test for them.

In this month's *Analytical Biochemistry*, Simon Wolff, Jaffar Nourooz-Zadeh, and colleagues at University College London report that they have developed the first simple bioassay to detect lipid hydroperoxides in plasma samples. Called FOX, for Ferrous Oxidation in Xylenol orange, it was developed to test an old hypothesis: that artery-blocking plaques are formed by high levels of LDLs combined with high levels of oxidation (caused by smoking or by lack of dietary antioxidants). This creates hydroperoxides, which damage blood vessel linings, causing inflammation and ultimately atherosclerosis.

Current cholesterol tests may be beside the point if trouble only occurs when the cholesterol starts oxidizing, notes Wolff. But the lack of a cheap, sensitive assay for hydroperoxide has prevented a test of the hypothesis. Now there's FOX, which relies on the hydroperoxides' ability to oxidize iron to a form that converts a dye from orange to purple. The intensity of the purple is proportional to the amount of lipid hydroperoxides in a plasma sample.

A good deal more data will be needed to see if the test is valid for assessing heart disease risk. Lipidologist Gilbert Thompson, at London's Hammersmith Hospital, points out the need to "correlate hydroperoxide levels with independent evidence of atherogenesis" before hydroperoxides replace cholesterol as a household word.