RANDOM SAMPLES

edited by CONSTANCE HOLDEN

NIH to Explore St. John's Wort

Researchers plan next year to start the first U.S. clinical trial of St. John's wort, a herb much touted of late for its alleged efficacy in treating depression. The 3-year, $4.3 million multicenter study is being funded by the National Institute of Mental Health (NIMH) and the Office of Alternative Medicine of the National Institutes of Health.

St. John's wort, or *Hypericum*, is widely used in Europe and is by far the most popular antidepressant in Germany. Promising results have been reported from a number of controlled studies. But this one, says NIMH director Stephen Hyman, will be "the first rigorous clinical trial ... that will be large enough and long enough" to tell whether St. John's wort works on clinical depression.

Psychiatrist Jonathan Davidson of Duke University, who will conduct the study, plans to enroll 336 patients who have been suffering from moderately severe depression for at least 2 weeks. They will be randomly assigned to take *Hypericum*, a placebo, or a serotonin reuptake–inhibiting drug such as Prozac. After 8 weeks of treatment, patients who respond positively will be followed for 18 more weeks to compare relapse rates.

M. P. GADOMSKI/PHOTO RESEARCHERS

Mood enhancer? *Hypericum perforatum.*

Davidson says the plant produces "very few" side effects, citing an analysis of 23 studies of *Hypericum* published in the 3 August 1996 *British Medical Journal*. The mechanism is still not known. Early research suggested that it operates like a class of antidepressants called monoamine oxidase (MAO) inhibitors. But German researchers have recently suggested that it inhibits the reuptake of several neurotransmitters including serotonin, according to an NIMH official.

There seems to be a lot of interest in St. John's wort even among those who do not count themselves as boosters of alternative medicine. University of Pittsburgh psychiatrist and depression researcher David Kupfer says that "although usually I find myself somewhat conservative about these issues," he and many colleagues feel "it is important that such a study be carried out." If the trial shows *Hypericum* fights depression, says Kupfer, "I am sure that a number of us would begin to investigate why it works."

Aggression and Heart Rate

Scientists have found another piece of evidence for the theory that "low arousability"—as signaled by, among other things, a slow heartbeat—may contribute to a person's propensity for aggressive behavior. Scientists say this could be because low arousability goes with fearlessness, or because such people will go to great lengths, including crime, for stimulation.

Psychophysiologist Adrian Raine of the University of Southern California (USC) in Los Angeles and colleagues found a correlation between a low resting heart rate as early as age 3 and aggressive (which correlates with antisocial) behavior at age 11.

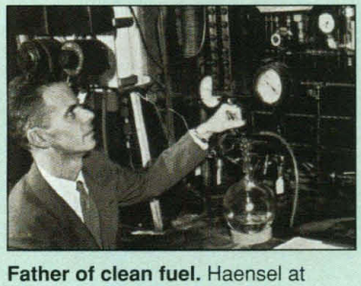
Heart data and temperament assessments were first obtained from nearly 1800 3-year-olds in Mauritius by USC psychologist Sarnoff Mednick in the early 1970s. When the children were 11, parents of 1130 of the children answered questionnaires about their aggression and "antisociality." The researchers report in the October *Journal of the American Academy of Child and Adolescent Psychiatry* that about two-thirds of the low heart rate (that is, an average of 123 beats per minute) subjects, but only one-third of those with high heart rates (129 beats) were classified as aggressive—a significant difference given the sample size, says Raine. The link "appears to be relatively specific to aggressive [as opposed to nonaggressive] forms of antisocial behavior," the authors write. It persisted after the researchers controlled for the possible effect of poverty and broken homes.

"It's interesting to see it's been a stable finding," says psychiatrist Robert Cloninger of Washington University in St. Louis, "[although] what you then do with it is a problem," as hypoarousability is only one of a host of possible factors in aggressive behavior.

Mednick says the Mauritius data were originally collected to test a theory, since disproven, that schizophrenia is related to an overresponsive nervous system. They were only recently analyzed for the antisocial behavior angle, he says. Now, researchers have a wealth of developmental information to examine as subjects move through their 20s—prime time for alcoholism and crime.

Haensel Wins Draper Prize

A chemical engineer who created a "revolution in mobility" has captured this year's Charles Stark Draper Prize offered by the U.S. National Academy of Engineering. The biennial prize, whose $450,000 value makes it the richest in the field, was awarded last week to Vladimir Haensel for developing a technology at the heart of refining gasoline that has also contributed to the plastics industry.



Father of clean fuel. Haensel at Universal Oil Products in the 1940s.

Working at Universal Oil Products Co. in Des Plaines, Illinois, in the late 1940s, Haensel found that platinum could serve as a much better catalyst than silica-alumina for turning crude oil into gasoline. The method, called platinum reforming or "platforming," led to much cleaner and cheaper gasoline.

The 83-year-old Haensel, who immigrated from the Soviet Union in 1928, has taught at the University of Massachusetts, Amherst, since 1980.

Planetary Chat

In an effort to tap into the public's curiosity about the Mars Pathfinder mission, a group that lobbies for federally sponsored research last week offered Web surfers a chance to chat online with Pathfinder scientists. But the scientists wound up preaching mostly to the choir.

For 2 hours on 7 October, University of Chicago physicist Tom Economou, University of Arizona, Tucson, planetary scientist Peter Smith, and astronaut-in-training Peggy Whitson, a biochemist, took questions from visitors at a new web site (www.sciencecoalition.org) set up by The Science Coalition, a Washington, D.C.–based alliance of 413 universities, businesses, medical groups, and sci-

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entific societies. The discussion ranged from the strength of the crystals in Mars rocks (unknown) to the hazards of manned missions to Mars (many) and the employment prospects for graduate students studying planetary science (gloomy). NASA's "faster, better, cheaper" philosophy could mean that "employment for space science may actually decline," says Smith, although "universities may benefit since [their scientists] can work for lower pay rates."

The coalition billed the forum as a chance to tout the wonders produced by university-based research, but more than half of the 23 questioners identified themselves as university-connected. That's an indication that the coalition has yet to create a groundswell of popular support, says Jack Crowley, the director of the Massachusetts Institute of Technology's Washington, D.C., office and a founding member of the coalition. The group will attempt to advertise planned future forums more widely. Says Crowley: "The moment my brother the insurance salesman appears at one of these things, we'll know we've penetrated the population."

Cost of Frozen Mice Becomes Burning Issue

The rising cost of cryo-preserving newly developed mouse strains is sending a chill through the research community. Unless cheaper ways are found to freeze mouse embryos, scientists may soon find themselves throwing away potentially valuable genetic resources.

The issue was aired last month during a symposium at Jackson Laboratory in Bar Harbor, Maine, to mark the 25th anniversary of frozen mice. The ability to preserve eight-celled mouse embryos by cooling them way down in liquid nitrogen and other coolants has allowed researchers to retain unusual strains without having to maintain active breeding colonies. But the population explosion among frozen mice is putting a strain on the system.

Where once there were only a few dozen important new varieties each year, genetic engineers can now mass-produce thousands of unique mouse strains annually. "We face the daunting task of storing the embryos of thousands, if not hundreds of thousands, of new strains," says Larry Mobraaten, who manages the lab's collection of more than a million frozen mouse embryos.

Cryo-pioneers. First mice from frozen embryos, 1972.

It can cost up to $25 to surgically remove, prepare, and store a single mouse embryo. That adds up to $12,500 for the recommended 200 to 500 embryos from a single strain, notes John Critser of the recently formed Cryobiology Research Institute in Carmel, Indiana.

So the search is on for cheaper alternatives and more efficient storage methods. At the meeting, researchers reviewed studies of freezing two- and four-celled embryos (lowering labor costs by collecting embryos when they are bunched together), oocytes (mouse eggs), sperm, and even ovaries and testes, the tissues that produce the reproductive cells. While some results are promising, none of the approaches is yet ready to replace conventional embryo freezing. In the meantime, says Mobraaten, researchers should develop criteria for deciding which strains to save and avoid duplication by promoting an emerging international network of embryo libraries.

Bill to Release Seaborg Journal

It may take an act of Congress for Nobelist Glenn Seaborg to get his diary back. Seaborg, discoverer of plutonium and former chair of the old Atomic Energy Commission (AEC), is the subject of Senate Bill 1232, an attempt to rescue his journal from 14 years of control by government censors.

Seaborg kept a detailed journal during his AEC tenure from 1961 to 1971, and its more than 15,000 pages passed secrecy checks virtually unscathed at the time of his departure. But in 1983 the Department of Energy (DOE) borrowed it to help write the history of the AEC. When it was returned several years later, there were large portions blacked out and many documents removed completely. Over the following years the journal was repeatedly reviewed by the DOE, which deleted more material with each pass.

"The security classification of information became in the 1980s an arbitrary, capricious, and frivolous process, almost devoid of objective criteria," wrote Seaborg in 1994 (*Science*, 3 June 1994, p. 1410). He noted the lack of consistency among different censors and cited puzzling deletions, such as code names of weapons tests that were public information and an account of a Halloween outing with his children.

Seaborg says that over the years he has been unable to persuade the agency that the papers had already been cleared; indeed, he was threatened with legal action if he didn't cooperate with seizures of his home copy of the journal, which has also been expurgated. "I think it's about the worst thing that's ever happened to me," he says of the whole affair.

Seaborg finally took his case to Senator Patrick D. Moynihan (D–NY), former chair of the Commission on Protecting and Reducing Government Secrecy, who introduced the bill on 26 September. "It's something that struck a chord with the senator," says a Moynihan aide. The bill directs the DOE to return the journal to Seaborg in its original form, although Moynihan hopes the department will quietly return it—leaving Seaborg free to publish it in its entirety.

Secrets of Old Faithful

Geyser dynamic. Fissure narrows to 11 cm at 6.8 m. Below 14 m is "ductus incognito."

A video camera has given geologists their first look into the plumbing of a geyser—Old Faithful in Wyoming's Yellowstone Park—capturing evidence for better models of how geysers work. The work could also be relevant to volcanic eruptions which, like geysers, are powered by expanding gas bubbles.

Reporting in the October issue of *Geology*, James Westphal, a geologist at the California Institute of Technology in Pasadena, and his colleague, Susan Kieffer, describe how they placed a miniature video camera in a watertight casing, which they insulated with ice to keep from overheating, and lowered it about 7 meters below the surface. At that point, Westphal found that the width of Old Faithful's shaft constricts from 20 centimeters to just 11. Further down, the shaft opens into a large chamber containing a "wildly boiling" mixture of steam, water, and what look like carbon dioxide bubbles. Down at about 10.5 meters jets of superheated boiling water come rushing nearly horizontally from the chamber wall.

The shape of Old Faithful fits a standard hypothesis about how geysers work, Westphal says. The idea is that the jet fills the cavern from below, and water is slowly forced through the constriction. When the pressure in the lower chamber gets high enough, it forces the overlying water to come burbling out of the shaft. That's a signal that a geyser is on the way: This uncorks the lower chamber, allowing steam and carbon dioxide gas below to expand and erupt. "Now we understand clearly how the eruption process works," Westphal says. Steven Ingebritsen, a geologist at the U.S. Geological Survey in Menlo Park, California, agrees that the work "fleshes out nicely" one geyser model. An alternative model relies on a zone of fractured rock, not a constriction, to control eruptions.