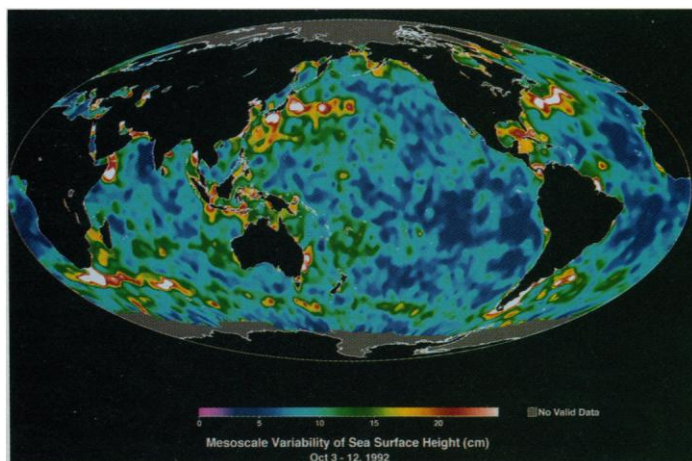


SDI Backs Down Over Reactor Interference

Ever since the first critic attached the derisive moniker "Star Wars" to the Strategic Defense Initiative (SDI), some scientists have objected to its science-fiction vision of a high-tech space shield. But now researchers have a more immediate complaint. The project is planning to launch at least one Russian-built TOPAZ II nuclear reactor into orbit in 1995 or 1996, to test its performance and ability to power a nuclear electric propulsion system. Space scientists are worried that radiation from the reactor will seriously interfere with orbiting science satellites, including the \$617 million Compton Gamma Ray Observatory, launched last year.

Early this month the American Astronomical Society sounded the alarm with an analysis predicting that a TOPAZ II reactor at its initial planned orbit of 1600 km would interfere with Compton observations about 30 times a day, each time effectively "blinding" for an entire orbit the observatory's Burst and Transfer Source Experiment, which is looking for faint—and still unexplained—gamma ray bursts from unknown sources. Since Compton only orbits 16 times a day, that could put at least one of its main experiments essentially out of commission for 6 months or more, while the TOPAZ slowly spirals out to a higher orbit of 6000 km, where it poses less of a problem.

After initially arguing that the scientists should simply adjust their instruments to compensate for the radiation, SDI officials have now backed down a bit. Last week the SDI office released a statement promising to work with the high-energy astrophysical community to achieve "little or no interference" with space-based observatories. Among the options now on the table: lightening the TOPAZ spacecraft to put it in a higher orbit, or improving its shielding. And although to date plans have been for a Delta 2 booster, SDI officials are now considering the more powerful Atlas 2 rocket,



Mapping the bumps on the deep blue sea. The ocean has its weather, too, as shown by one of the first images from a new French/U.S. oceanography satellite, TOPEX/Poseidon. Based on a 10-day radar survey of the world ocean, the image reveals bulges hundreds of kilometers wide in the ocean surface—clues to vast streamers and eddies that appear and dissipate in a matter of weeks. Like storm systems in the atmosphere, these eddies tend to flow around extremes in pressure—in this case highs, evident where the sea surface rises by a foot or so. Eddies are known to cluster near strong currents like the Gulf Stream, off the eastern United States, and the Kuroshio, near Japan—"They're nature's way of shedding energy and angular momentum" from such currents, says deputy project scientist Ed Christensen of the Jet Propulsion Laboratory. Data from earlier radar mapping satellites took months of processing to show such features. But TOPEX/Poseidon, the first dedicated oceanography satellite to fly since Seasat in 1978, should let researchers watch the ocean's weather as it happens.

which could take the reactor out of the lower orbit where it could cause the most mischief. Officials are hoping to make a decision on the launch vehicle next spring, after an 11 January deadline for proposals.

Getting Vaccinated for Breakfast?

Will warding off hepatitis one day be as simple as eating a banana? That's the hope of plant molecular biologist Charles J. Arntzen and his colleagues, who believe that transgenic plants may emerge as cheap vehicles for delivering vaccines to children in developing nations.

Arntzen, of Texas A&M Institute of Biosciences and Technology in Houston, and his colleagues have reported initial progress toward this goal in a paper ("Expression of Hepatitis B Surface Antigen in Transgenic Plants") in the 15 December *Proceedings of the National Academy of Sciences*. There, they describe obtaining a recombinant form of the hepatitis B sur-

face antigen by inserting the gene for it into tobacco plants. Since the recombinant product and antigen derived from human serum have very similar properties, the researchers say the next step is to determine the immunogenic activity of the unpurified protein when plants are fed to test animals. Say the authors: "We view our recent experiments as a successful first step" in a long-term effort to develop low-cost "edible vaccines." Arntzen envisages that a plant-borne dose of vaccine could ultimately cost less than 10 cents—compared with \$10 or more a dose for the current injectable vaccine.

The researchers have picked the banana as one of their first candidates for a delivery vehicle because that's the "first solid food that kids get in many parts of the developing world," says Arntzen. Lettuce may be the next candidate. "We think this is an economically viable way to deliver high-tech vaccine technology to the Third World," he says.

Review Demanded on Canadian Blood

Since French government officials were convicted for distributing HIV-contaminated blood (*Science*, 30 October, p. 735), there has been mounting pressure in Canada for a public inquiry into why some 1000 Canadians 730 of them hemophiliacs—became infected with the human immunodeficiency virus (HIV) through contaminated blood and blood products over the past decade.

Canada's blood supply is now regarded as one of the safest in the world, but critics such as the Canadian Hemophilia Society charge that health officials moved too slowly in implementing both HIV screening programs and procedures to treat blood products used by hemophiliacs.

Although the U.S. Food and Drug Administration approved an HIV screening procedure in March 1985 and put it into effect almost immediately, the Canadian Red Cross took 8 months to get a nationwide screening program in place. In the interim, at least 50 Canadians contracted HIV through blood transfusions. Similarly, although the government recommended in November 1984 that all products used by hemophiliacs be heat-treated to destroy HIV, it took 8 months to implement that program fully, during which time untreated products continued to be used.

Such delays have been attributed to the cumbersome bureaucracy of the Canadian Blood Committee, and the Red Cross's fear that AIDS talk would scare off potential blood donors. The committee was finally replaced last year by what the government promises will be a faster-acting body, the Canadian Blood Agency.

But critics want more reassurance. So, a government committee is considering a fullscale investigation into the Canadian blood management system. Health officials have resisted the idea, insisting that there was no negligence. "Hindsight is 20-20," Canadian Red Cross chief George

Weber recently told the committee, observing that yesterday's actions "are being judged by today's standards and state of knowledge of the disease."

Takeout Cold Fusion

Once upon a time, anyone wanting to experiment with cold fusion had to be a tinkerer: To take a flier, you had to be able to put together just the right assemblage of palladium, heavy water, and sensitive instruments. On the other hand, you didn't have to be particularly well funded: Cold fusion "pioneers" Stanley Pons and Martin Fleischmann did their first experiments on an apparatus they built from scratch for a few thousand dollars. That's history, of course: Today, an entrepreneurial Japanese outfit has made it possible for any well-heeled researcher to try his hand at cold fusion.

For \$560,000, Advanced Film Technology Inc. (AFTI), a subsidiary of the Japanese telecommunications giant Nippon Telephone and Telegraph (NTT), will sell you a specially coated palladium plate and a vacuum chamber equipped to detect the signatures of fusion. Just add some deuterium (heavy hydrogen) and heat one side of the plate, says the developer, NTT physicist Eiichi Yamaguchi. After several hours, fusion products—in this case helium plus a few protons and other charged particles, but no neutrons—will emerge. At least so goes the claim.

That's a different scheme from the electrochemical cells made famous by Pons and Fleischmann. In those cells, an electric field drew deuterium atoms into the interstices of the palladium, where fusion was supposed to take place. Yamaguchi's device relies instead on gradients of temperature and distortion to force the deuterium close to the palladium nuclei and trigger fusion.

Yamaguchi is one of many Japanese researchers now in pursuit of cold fusion, but he insists his setup is the "definitive method" because of the sensitive instruments and the sealed apparatus. Still, to

date there's been only one taker outside NTT: the Japan Atomic Energy Research Institute, home of Japan's hot fusion tokamak research, which hopes to test Yamaguchi's claims.

What if the cold fusion kit doesn't live up to its billing? No matter, says electrochemist Kingyo Itaya of Tohoku University. The equipment could easily be used in other kinds of solid-state research—which may reassure some investigators unwilling to bet a cool half-million on cold fusion.

Neuroscientist Pleads Guilty to Embezzling

While combing through travel vouchers during an annual audit last February, an accountant at Indiana University-Purdue University at Indianapolis (IUPUI) found that a prominent neurobiologist had taken several more business trips than his research grant allowed. Upon further examination, auditors found far more disturbing discrepancies. The upshot: Last June, National Science Foundation (NSF) and

university officials concluded that Charles L. Schauf, former chairman of the IUPUI biology department, had misappropriated nearly \$70,000 from grants he had from NSF and the Multiple Sclerosis (MS) Society.

Last week, the case came to a head: Schauf pleaded guilty to two criminal charges—one count of embezzling research grant funds from the university and one count of mail fraud—in U.S. District Court in Indianapolis. Court documents allege that Schauf went on a spending spree between March 1988 and April 1992, using grant money to buy items for "personal use" that included a computer, photographic equipment, computerized stock market services, a glass-enclosed butterfly desk ornament, and 84 copies of a physiology textbook he co-authored. A report from NSF's inspector general says that Schauf (who is not referred to by name) was able to "misuse" \$47,350 of NSF monies and \$21,841 of MS society monies because "he was in a unique position of trust" during his 6 years as department chair (he resigned in February), where he supervised researchers' grant accounts. Department chairs at IUPUI can no longer act as account supervisors, says David Stocum, dean of IUPUI's School of Science.

Federal investigators noted that "virtually all" of Schauf's research, which included studies on animal nerve electrophysiology and on human demyelinating diseases, had ended by August 1989, even though his grants ran through 1992.

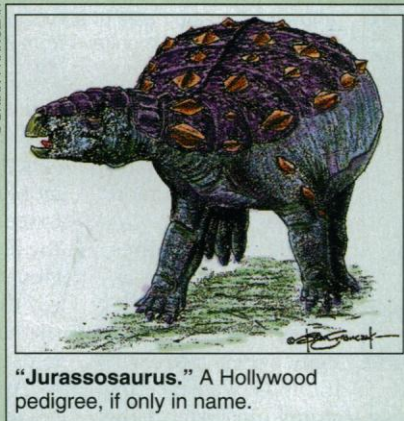
Schauf did not return phone calls from *Science*, and his lawyer, David K. Margerum of the Indianapolis-based firm Burris, Margerum, and Kiplinger, says his client has not authorized him to speak to *Science*.

Schauf, who has signed a statement for NSF admitting to misuse of funds, has since repaid all the stolen and misused money. But his troubles are not over yet: He could face a prison term of 12 to 18 months.

Paleontology's 'Jurassic' Windfall

When director Steven Spielberg wanted to do a little something for the cast of his upcoming movie, *Jurassic Park*, the usual trinkets or parties just didn't seem right. So instead, he named a recently discovered dinosaur after them, gaining the privilege through a \$25,000 donation to the Institute of Vertebrate Paleontology and Paleoanthropology in Beijing.

The newly christened animal is a 10-foot-long armored plant eater that died 170 million years ago. It is by far the earliest ankylosaur yet found and appears to represent a new genus and species. The Chinese paleontologist who characterized the dinosaur after its remains were spotted in 1980 hadn't come up with a name for it yet, so when Spielberg sent word through the Bedford, Massachusetts-based Dinosaur Society that he was looking for a beast to adopt, the Chinese were happy



"Jurassosaurus." A Hollywood pedigree, if only in name.

to oblige. Henceforth, the squat, club-tailed animal will be known as "Jurassosaurus nedegoapeferkimorum," a jawbreaker constructed from the first letters of last names of the film's stars—starting with Sam Neil, Laura Dern, and Jeff Goldblum. It will be described by Dong Zhiming of the Beijing institute in a forthcoming paper in the Chinese journal *Vertebrata Pal Asiatica*.

Jurassic Park, set for release next summer, is about an ill-fated dinosaur theme park populated with animals created by inserting ancient DNA into modern reptile eggs. Eager to get his dinosaur details right, Spielberg hired John "Jack" Horner, curator of paleontology at the Museum of the Rockies in Bozeman, Montana, to be the film's principal scientific adviser. Beyond ensuring that the on-screen paleontologists talk and act like real ones, Horner worked with the film's puppeteers on realistic dinosaur motion. He couldn't do anything about the genetic engineering premise or the scene of an improbably bloody baby dinosaur emerging from an egg. But overall, Horner promises, "it's going to be great."