Zerhouni, a radiologist and executive vice dean at Johns Hopkins University School of Medicine in Baltimore, Maryland, told members of the Senate Health, Education, Labor, and Pensions Committee that "disease knows no politics" and that NIH "must always remain factual," not "factional." Only Senator Paul Wellstone (D–MN) pressed Zerhouni on whether he agrees with President George W. Bush's decision to limit federally funded research to 78 approved lines of stem cells. "You can do a lot" with those lines, Zerhouni replied. However, he hinted that he might eventually make the case for more lines: "If it becomes evident through this research that there are pathways to develop cures and so on, I'm going to be the first one to assemble that information … and share that with everyone."

He said the director's "most important role … is to reestablish morale and momentum" as well as to recruit NIH institute directors. NIH has been run by acting director Ruth Kirschstein for more than 2 years, and five institutes do not have permanent directors. Zerhouni said he's interested in fostering "crosscutting initiatives" and promoting "access to new technologies," such as a DNA chip he brought along as a prop.

–JOCELYN KAISER

EVOLUTIONARY BIOLOGY

Timing Is Everything For *Wolbachia* Hosts

Wolbachia may be the most common infectious bacteria on Earth, but they are by no means ordinary. Among their accomplishments: They manipulate their hosts' sex life to boost their own reproductive success. Researchers have long wondered what sort of molecular trickery *Wolbachia* use to pull off this feat. Now they know at least one of their secrets: Like an auto mechanic, they can alter the timing of a key step of their hosts' reproductive cycle so that it either misfires or runs smoothly. The finding is "a really major advance," comments *Wolbachia* expert John Werren of the University of Rochester in New York state.

Wolbachia infect millions of species of insects, crustaceans, and other invertebrates, but they can't live outside their hosts' cells. To jump to the next victim, they infect developing eggs that will grow into adult hosts. Because males cannot pass the bacteria on in sperm, *Wolbachia* have evolved many sophisticated strategies to skew populations in favor of infected females (*Science*, 11 May 2001, p. 1093).

On page 1124 of this issue, researchers at the University of California, Santa Cruz, offer the first good glimpse of how *Wolbachia* do this in a species of wasp known as *Nasonia vitripennis*. In these wasps, as in many insects, the sex of the offspring is normally determined by a bizarre process: If an egg is fertilized by a sperm, the progeny will be female, but unfertilized eggs will divide and develop into male embryos. *Wolbachia* play havoc with *Nasonia*'s reproduction. When an infected male mates with a healthy female, the offspring will all be male, but if two infected wasps mate, the result will be a normal ratio of male and female offspring, all infected with the bacterium.

Skewing the sex ratio in this way works to *Wolbachia*'s evolutionary advantage. By making uninfected female wasps produce only sons, the bacteria reduce the number of uninfected female wasps in the population. That makes it more likely that *Wolbachia* from other females will get carried down from one generation to the next.

Researchers have been unable to expose how *Wolbachia* perform such manipulations largely because they haven't had the right tools, according to co-author William Sullivan. "You couldn't answer these questions 5 years ago," he says. "The technology just wasn't there." In recent years, however, Sullivan and others have figured out how to create movies of a developing embryo that reveal the activity of its proteins and genes. *N. vitripennis*'s eggs develop slowly, making them ideal for a starring role.

Once the wasp's egg is fertilized, its chromosomes go through a complex choreography. The compartments that contain each set of chromosomes (called the pronuclear envelopes) move to a special location in the egg known as the metaphase plate, then the envelopes break down, allowing the chromosomes to escape and find their correct place at the plate. Only then can they be duplicated as the egg divides into new cells.

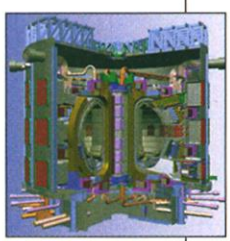
Sullivan and postdoc Uyen Tram observed this process using dyes that attach to proteins that help destroy the walls of the male and female pro-

CREDITS: (TOP TO BOTTOM) ITER; J. WERREN

Out of sync. Parasitic bacteria delay a key chromosomal movement in *Nasonia* wasps.

ScienceScope

ITER Reconsidered Four years after bailing out due to cost concerns, the U.S. government is considering rejoining a slimmed-down international fusion power project. Secretary of Energy Spencer Abraham last week told an international conference that President George W. Bush was "particularly interested" in the International Thermonuclear Experimental Reactor (ITER) and had asked the Department of Energy (DOE) "to seriously consider American participation" in the $4 billion project (*Science*, 3 May, p. 823).

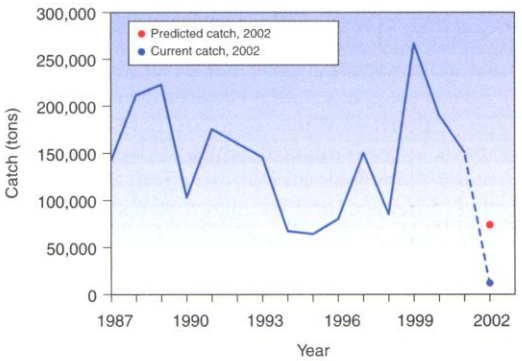


Fusion advocates welcomed the speech, as did potential partners in Japan, Russia, Canada, and Europe. But DOE science chief Ray Orbach cautioned that it will take a while "to do due diligence on the scientific issues" and decide whether ITER, or some other domestic fusion project, would be the United States' best bet. Fusion researchers are due to meet in Colorado this summer to hash out the issues, and they hope to issue a consensus recommendation by the end of the year. ITER planners, meanwhile, hope to select a site for the planned machine at about the same time. Finding funding for any fusion project, however, could be difficult.

Bigger Rebates? The United Kingdom wants to expand the reach of its R&D tax credit in a bid to spur commercial science. The government last month unveiled a budget proposal to increase existing tax credits for small firms and—for the first time—give large companies a tax break for R&D spending.

Currently, companies with fewer than 250 employees can deduct 100% of their R&D expenses. Under the new plan, these small firms would be able to deduct 125%, with large players getting a new 25% rebate. Analysts estimate that the breaks would cost the treasury about $585 million.

Government officials hope the rebates will help persuade multinational firms to shift some of their R&D operations to the island. Indeed, large pharmaceutical companies may be the biggest beneficiaries of the change, says Daniel Abrams of the U.K.'s BioIndustry Association, because small biotech outfits already benefit from other subsidies. Parliament, which must approve the new credits, is expected to consider the change later this year.



Here today ... Researchers can now predict the ups and downs of the Argentinean flying squid.

aficionados but no surprise to a team here at the British Antarctic Survey (BAS). Using a model based on ocean temperatures and currents, BAS researchers predicted the dearth of squid off the Falkland Islands.

In contrast to many other fish stocks that are reeling, overfishing is not to blame for this year's pathetic catch of the Argentinean flying squid. The culprit is poor hatching and nursery conditions last year, says BAS biologist Paul Rodhouse, who developed the model with BAS's Claire Waluda. The model's success may help gird the industry for future off years, and it may serve as a template for predicting catches of other short-lived species, such as anchovies, in the South Atlantic and elsewhere.

A key hurdle the researchers had to overcome in modeling the flying squid is its short life-span: only 1 year. The larvae hatch near the River Plate estuary off the coast of Argentina in July and then, after maturing, swim several hundred kilometers south to cooler, plankton-rich waters near the Falkland Islands. There they are caught by international fishing vessels using lines between February and June. Those that elude capture attempt to return to their breeding grounds, where they spawn and die. The fact that the population goes from larvae—"no squid at all"—to fully grown adults in only a few months makes sampling and predictions based on the previous year's catch difficult, says Robin Cook, a modeling expert at the Fisheries Research Services in Aberdeen, U.K. Indeed, last year's catch is mostly irrelevant, says Rodhouse, who compares the squid to the desert locust: "It doesn't make any difference how many you kill. When the environmental conditions are right, they return as a plague."

Rodhouse and Waluda zeroed in on sea temperature in the nursery area in July to predict the catch 8 months later. Last July, temperatures were 1.5° Celsius warmer than average, driving a shift in currents that swept larvae into the open ocean. "While they are small, they are at the mercy of the currents," says Waluda.

CREDITS: (TOP TO BOTTOM) SOURCE: BAS; C. GILBERT/BAS; ROBERT F. BUKATY/AP

The duo predicted a catch of 73,000 tons this year, near the bottom of an annual catch that fluctuates wildly between 60,000 and 290,000 tons a year. With only a few weeks to go this season, the haul has barely reached 10,000 tons—a severe economic loss considering that the squid fetches $3000 per ton.

The model's success may help fishery managers cope with future disastrous years by suggesting, for example, how many vessels should be licensed. In addition, this type of model could work for other fisheries—such as a squid fishery off the coast of South Africa—that are susceptible to the vagaries of currents, says Jean-Paul Robin, an expert on cephalopod fisheries at the University of Caen, France. In the meantime, managers at the South Atlantic squid fisheries are steeling themselves to this coming July's readings—and the omen they will offer. **–ADAM BOSTANCI**

SCIENTIFIC COMMUNITY

U.S. Science Academy Elects New Members

The U.S. National Academy of Sciences last week elected 72 new members—11 women and 61 men. Among them was J. Craig Venter, the controversial leader of a private venture that last year completed a rough draft of the human genome. Some members were prepared for a challenge to Venter's election, but none materialized. The new members and their affiliations at the time of election* are:

Harvey J. Alter, National Institutes of Health (NIH); **Boris L. Altshuler**, NEC Research Institute and Princeton University; **Kathryn V. Anderson**, Cornell University and Sloan-Kettering Institute; **Barry C. Barish**, California Institute of Technology (Caltech); **Jacqueline K. Barton**, Caltech; **Adriaan Bax**, NIH; **Zdenek P. Bazant**, Northwestern University; **Philip A. Beachy**, Howard Hughes Medical Institute (HHMI) and Johns Hopkins University School of Medicine; **Manuel Blum**, Carnegie Mellon University; **John Bongaarts**, The Population Council; **Patrick O. Brown**, HHMI and Stanford University School of Medicine; **Carlos J. Bustamante**, HHMI and University of California (UC), Berkeley; **William C. Campbell**, Drew University; **Harvey**

* For more details, go to www.national-academies.org.

ScienceScope

Neutron Plans Unveiled European researchers will make their case next week for a powerful accelerator designed to produce neutrons to probe the structure of proteins and designer materials. On 16 and 17 May, leaders of the European Spallation Source (ESS) project will meet in Bonn, Germany, to unveil their plan to the research community, the media, and—most importantly—politicians who will decide whether to fund the long-discussed facility. "It's like a motor show where we'll pull the sheet off our wonderful new model, and we want to hear the audience gasp," says Robert Cywinski, a physicist at the University of Leeds, U.K., and chair of the European Neutron Scattering Association.

An expert commission gave ESS its blessing in 1996 (*Science*, 9 May 1997, p. 891), but political support was slow to follow. Since then, planners have redesigned the machine so that it would leapfrog over two sources under construction in the United States and Japan. ESS "would allow [Europe] to keep [its] position on the world stage for 30 to 40 years," Cywinski says.

But ESS backers first need to find an estimated $1.5 billion. Construction could begin in 2004, with completion set for 2011. Five sites are competing for the project: Yorkshire and the Rutherford-Appleton site near Oxford, U.K., Lund in Sweden, and Jülich and Halle in Germany.

Mouse Tale at End? It's official: Mice, rats, and birds used in laboratory research are no longer animals—at least according to a major federal animal welfare law. In a big win for the biomedical research community, Congress this week approved a massive farm bill that includes language exempting the animals from regulation under the Animal Welfare Act. President George W. Bush is expected to sign the bill, ending a decade-old struggle by animal activists to force the U.S. Department of Agriculture to regulate the use of the most common laboratory animals (*Science*, 22 February, p. 1439). The bill also orders the National Academy of Sciences to conduct a 1-year study of the use and regulation of mice, rats, and birds in research.

Animal advocates, however, say they will carry the fight to a new arena: the states. John McArdle of the Alternatives Research and Development Foundation in Eden Prairie, Minnesota, says activists will work to pass state laws that require researchers to consider alternatives to animals in experiments and to treat all animals humanely.

among the four lab strains. One had 36 copies of the nucleotide A where others had only 35—an almost meaningless difference. Another had 37 copies at that same spot; but that strain also lacked one of the plasmids, making it easy to tell apart anyway. At all the other markers, the four lab strains and the Florida strain were identical.

Theoretically, more variation may emerge when the Ames strains from all 15 labs are put through the same 53-marker test. But the scant differences found so far "offer only slim hope that something useful will come out," says Rosenberg. Still, says Keim, the study shows that full-genome sequencing could be a useful forensic tool. And in cases such as bioterror crimes, the price tag—some $125,000 for a bug's genome—is hardly an issue: "A lawyer's sneeze costs more than that." —MARTIN ENSERINK

ARCTIC RESEARCH

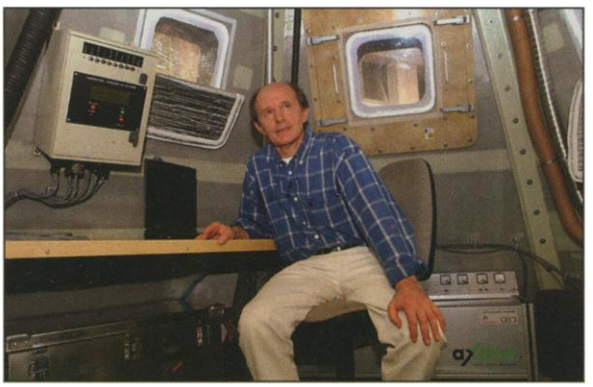
A Man and His Dog, Adrift But Equipped

PARIS—An aimless wanderer usually can't be expected to produce good science. But French physician Jean-Louis Etienne—who in 1986 was the first person to reach the North Pole alone on foot—is wandering with a purpose. He's drifting on the Arctic ice, collecting a wealth of hard-to-obtain data for a half-dozen research teams across France.

On 11 April, a helicopter dropped off the adventurer and his dog Lynet at the North Pole, along with what they will call home until July: The 9-cubic-meter Polar Observer, which resembles the Mercury space capsules from the 1960s. The gas-heated, hydrogen- and solar-powered capsule, fitted with a range of scientific instruments, is perched on an ice floe that wind and marine currents are driving across the Arctic Ocean.

For the researchers lucky enough to have equipment along for the $1 million ride—financed by the Midi Pyrénées regional council, Gaz de France, Unilever, and several other public and private sponsors—the mission is a unique opportunity to corroborate satellite data and fill holes in their knowledge. For example, Gérard Brogniez, an expert on atmospheric optics at the University of Lille, and his colleagues have outfitted the capsule with photometers for measuring visible, infrared, and ultraviolet (UV) light. Part of the data will allow them to determine the concentration of aerosols such as nitrous oxides and water vapor in the lower atmosphere that absorb infrared rays and contribute to the greenhouse effect. And data on how much energy the ice soaks up will help researchers predict global climate changes that are influenced by energy gains or losses at Earth's surface. The intensity of UV light that reaches the surface, meanwhile, serves as a proxy for the ozone layer's thickness. Normally these measurements are made by satellite and verified by ground stations—something that is not generally feasible in the Arctic Ocean. "The ice pack is always moving, and you can't put expensive equipment there," says Brogniez.

Etienne's polar peregrinations are also a boon to paleoclimatologist Denis-Didier Rousseau's team at the University of Montpellier. The group has tracked pollen from Mediterranean plants such as grapes and olive trees several thousand kilometers to Greenland. But "there are no data on the transport of pollen over the Arctic Ocean," says Rousseau, who has provided the Polar Observer with a device resembling a weathervane equipped with pollen-trapping filters. Filling this gap, he says, should help refine models of global wind patterns. It also should aid work on the distribution of fossil pollen in sediments and at archaeological sites. "We must have a good knowledge of the present if we want to study the past," he says.



Catch his drift? Explorer Jean-Louis Etienne will collect valuable data from the comfort of this high-tech igloo.

CREDIT: CHRISTOPHE ENA/AP

As *Science* went to press, Etienne and his canine companion were drifting south-southeast of the North Pole, having covered nearly a quarter of the estimated 500-kilometer journey. In a recent Web dispatch (www.jeanlouisetienne.fr, in French), Etienne describes a typical evening inside the cozy capsule: "The blizzard is blowing this evening at 30 kilometers per hour. It plays the evacuation vents and air intakes of the Polar Observer like an organ. Nice and warm, I am going to be able to sleep peacefully." If their nights and days continue uneventfully, in July Etienne and Lynet should end up near the coast of Greenland, where a Russian icebreaker plans to pick them up. —MICHAEL BALTER

ScienceScope

Case Closed U.S. prosecutors have dropped most of their charges against one of two Japanese researchers accused of scientific espionage—leaving him with hefty legal bills. Biologist Hiroaki Serizawa last week pleaded guilty to giving false information to FBI agents. But prosecutors in Akron, Ohio, dropped charges that he had conspired in 1999 with a friend, Takashi Okamoto, to smuggle Alzheimer's disease research materials out of the United States (*Science*, 18 May 2001, p. 1274).

Serizawa's troubles began after Okamoto gave him vials containing "DNA constructs" and other "trade secrets" taken from Okamoto's former lab at the Cleveland Clinic in Ohio. Some vials were shipped to Japan, sparking the charges. Japanese officials have found no trace of the vials, but the United States has asked them to extradite Okamoto to Ohio to stand trial.

Serizawa has said that he never knew what was in the vials, and the government conceded that the material did not constitute trade secrets. But rather than face an expensive trial, Serizawa pleaded guilty to the lesser charge, which carries a maximum 5-year jail term. Prosecutors let Serizawa, who lives in Kansas City, Kansas, retain his green card and continue as a permanent U.S. resident. However, he was denied tenure last month at the University of Kansas Medical Center in Kansas City. Friends and colleagues, meanwhile, are raising funds to help him pay an estimated $250,000 in legal bills.

Genomics for All The World Health Organization (WHO) could become a broker between the genome haves and have-nots. A new report surveys the genetic research landscape internationally and calls for WHO to help developing nations benefit from genomics. It concludes that WHO could carve a useful niche by setting up ethics guidelines to protect research volunteers, building research and training programs in poor nations, and examining new gene-based therapies for developing-world diseases. Such steps would help developing nations "be ready" to exploit future advances, says lead author David Weatherall, a geneticist at Oxford University, U.K.

WHO's General Assembly is expected to consider the ideas at its 13 May meeting in Geneva, Switzerland. Even if approved, however, donors—including governments, drug firms, and philanthropies—will have to be convinced that the plan is worth the estimated $20-million-a-year price tag.

Contributors: David Malakoff, Philipp Weiss, Gretchen Vogel, Eliot Marshall, Melissa Mertl