edited by CONSTANCE HOLDEN

The El Niño That Won't Go Away

A textbook El Niño is a warming of waters in the tropical Pacific that occurs once every 3 to 7 years. But since when did the Pacific read textbooks? The National Weather Service's Climate Analysis Center (CAC) in Camp Springs, Maryland, has issued an advisory that there's "a strong possibility" that El Niño will return this winter for the third time in 4 years—which means more wild weather around the world.

El Niño watchers see a host of signs that the tropical Pacific is moving toward another warming episode. The prime one is the recent eastward shifting of the warmest waters toward the date line, far to the east of Papua New Guinea. Such a September shift preceded the El Niños of 1986 and 1991. Researchers also point to an atmospheric pressure imbalance in the tropical Pacific that has been favoring an El Niño for the past 6 months.

This confluence of signals has led to unusual congruity between human forecasters and El Niño computer models. The two have often disagreed, with the humans sometimes being misled by meaningless wiggles in the climate system (*Science*, 4 February, p. 607). The models are not unequivocal this time, says modeler Mark Cane of Columbia University's Lamont-Doherty Geological Observatory, but "on the whole ... yes, it looks like it's going to be warmer" this winter in the tropical Pacific.

That bodes ill for many. El Niño, among other things, typically dries up the Indian monsoon, drenches coastal Peru, and parches farmland in eastern Australia, where El Niño–induced drought has held sway for a record-breaking 4 years.

High-Tech Turnaround

Three years ago the Council on Competitiveness, a private policy group based in Washington, D.C., put out a report warning that the United States was falling behind the rest of the world in many core high-tech areas, such as automated manufacturing systems, optical computer technologies, and new materials.

Now, it seems, there's been a decisive turnaround. The 1991 report listed 22 areas—of 96 surveyed—where U.S. industry was judged to be either "weak" or "losing badly or lost" to the competition. But this year, the council offers a much more upbeat message: After surveying 160 organizations in both the public and private sectors, it reports that the losers have all advanced to "weak," and the 11 weaklings are now "competitive." The only area still in bad shape, according to the council, is electronic flat panel display systems, over which Japan has a virtual world monopoly.

"We found [the improvement] striking and surprising, especially since we were pessimistic last time around," says council president Daniel F. Burton Jr. The council ascribes the change to downsizing and restructuring, which have made industry more efficient and focused in its priorities. It also praises the government for showing more leadership—both organizationally, with the creation of bodies such as the Cabinet-level National Science and Technology Council, and fiscally, with the federal budget's emphasis on civilian technology programs.

Richard Lester, nuclear engineer at the Massachusetts Institute of Technology's Industrial Performance Center, says it's true "things have been really picking up in a number of areas," such as the U.S. share of global semiconductor sales. But he adds that it's difficult to separate out "what is attributable to real improvements" from advantages conferred by economic fluctuations, such as the disadvantage to Japan caused by the rise in the value of the yen.

Burton says the council is looking to get more specific answers in its next project: case studies of "what works and what doesn't" in six major industries.

MIKE SEXTON/ALL CHILDREN'S HOSPITAL

A lot like us. *Heterodontus francisi*, the horned shark.

Antecedents of Mammalian Immunity

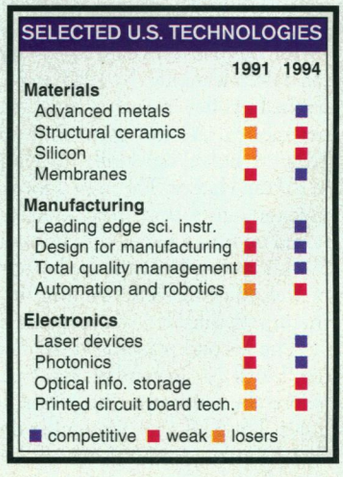
By perusing the genomes of living species that existed long before mammals, comparative immunologists can gaze back in evolutionary time to get a glimpse of the early history of the human immune system.

Many of these researchers have recently been focusing on sharks, which graced the planet before dinosaurs. With their cartilaginous skeletons, sharks are among the most primitive of existing vertebrates. Yet scientists have found that many precursors to the human immune system—such as distant relatives of the genes that produce human antibodies—turn up in shark genomes.

Now, in the 27 September *Proceedings of the National Academy of Sciences*, Jonathan Rast and Gary Litman of the University of South Florida and All Children's Hospital in Sarasota have provided further evidence of the antiquity of the mammalian immune system. They report that sharks may have T cell receptors. In scans of the genome of the horned shark, Rast and Litman have plucked out a number of genes that resemble those that make the proteins for this human immune cell receptor.

It had been a lingering question whether this sophisticated receptor, which enables immune cells to recognize viruses and other alien intruders, went as far back as sharks, says Litman. Relatives of other human immune proteins, members of the major histocompatibility complex (MHC), had already been found in sharks. Their presence, explains Litman, had implied the existence of a shark T cell receptor because in humans, MHC proteins hold antigens on other immune cells so T cells can bind to them.

Comparative immunologists are now turning their genetic fishing expeditions to even more ancient vertebrate species, such as lamprey and hagfish, which lack bony jaws, to try to determine whether the human immune system originated even further back. "Everyone's dying to know what happens in these jawless fish," says Simona Bartl of the University of North Carolina, Wilmington.



Vole Love

Fooling around may be hardwired—at least in voles. Emory University neuroscientist Thomas Insel and colleagues have found that the distribution of receptors for vasopressin, a brain chemical that mediates pair bonding, is very different in monogamous and polygamous species of the snub-nosed rodent.

Sex appears to induce the release of vasopressin in all species of voles. But in monogamous prairie voles, it also rapidly elicits the first signs of long-term bonding: Within a day, the creatures show preference for their mates and will fend off rivals. What's more, those behaviors can be elicited by an injection of vasopressin alone. Vasopressin won't elicit the bonding impulse, however, in the promiscuous montane vole.

To learn whether this behavioral difference can be traced to brain differences, the researchers used radioactively labeled vasopressin to map the distribution of the chemical's receptors. What they found, they report in the September *Journal of Neuroscience*, was that vasopressin affects different brain circuits in the two species. While the love-'em-and-leave-'em montane vole showed more vasopressin activity in the lateral septum, which is implicated in aggression and other behaviors, the faithful prairie vole had high numbers of receptors in the thalamus and olfactory regions.

Vasopressin researcher Daniel Dorsa of the University of Washington says the finding is "interesting in that for such closely related animals their brain is quite different and so is their behavior." Insel, who did the research while at the National Institute of Mental Health, says these differences "could be an important clue as to the physiological basis of monogamy."

Insel is presently looking at vasopressin's role in primate bonding. If it proves to be influential there as well, the work could have implications for human disorders such as autism, where the ability to form attachments is impaired. The aim, says Insel, "is not to come up with love potions, but to try to understand normal social attachment and ... to determine where to look for the pathophysiology of abnormal attachment."

THOMAS INSEL

Bonded. Prairie and montane voles evolved different love styles.

The research adds to a larger emerging picture, says Michael Kuhar, chief of neuroscience at the National Institute on Drug Abuse: "This work offers more evidence that social behavior has an important basis in biology."

Lasker Awards

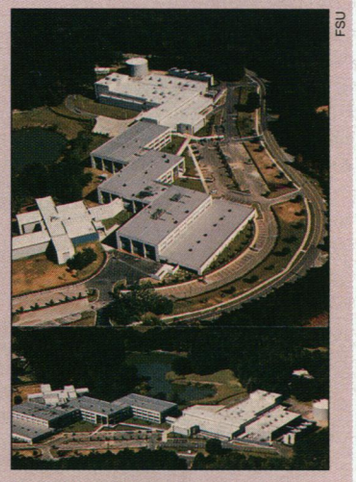
Two out of three of this year's Lasker awards have been collared by scientists at the University of California, San Francisco. The prestigious biomedical research awards, the first to be given since the death of their founder Mary Lasker early this year, were announced on 29 September.

The basic research award went to Stanley B. Prusiner, professor of neurology and biochemistry, for discovering prions, a class of disease-causing agents implicated in several rare neurodegenerative diseases. John Allen Clements, professor of pulmonary biology, got the clinical research award for developing an artificial lung surfactant for premature babies with respiratory distress syndrome.

A "special public health award" went to the man many scientists say should have gotten a Nobel Prize: Maclyn McCarty, professor emeritus at Rockefeller University, who established 50 years ago that genes are made of DNA. The award commemorates the golden anniversary of a feat that many researchers believe is more fundamental to modern biology than even Watson and Crick's discovery of the structure of DNA 10 years later.

Florida Magnet Lab Opens

Four years after Florida State University beat out the Massachusetts Institute of Technology (MIT) for the honor of hosting the world's largest magnet laboratory, the giant installation was scheduled to be officially dedicated this week. But the ribbon-cutting for the new National High Magnetic Field Laboratory (NHMFL) is likely to signal a new round of competition between the two schools—this time for National Science Foundation (NSF) dollars. MIT's Francis Bitter National Magnet Laboratory's funding as a "national user facility" is due to run out on 30 September 1995, at which time the NHMFL is to become the only holder of the title. But "we're not about to close our doors," says Robert Griffin, director of the MIT lab. To stay open, though, it will have to get money from the same program that feeds the Florida facility: NSF's Division of Materials Research (DMR). Will there be enough for both? "Budgets are always limited," says DMR's deputy director Adriaan de Graaf. "We are receptive to proposals from MIT... but I don't know what the outcome will be." With scarce dollars flowing southward, the NHMFL has been drawing some topflight talent. But according to Griffin, only two of MIT's 150 magnet researchers have been lured away.



FSU

Attracting dollars. Magnet lab.

Smart Shopping At Sears

Watch out, Michael Jordan, your celebrity endorsements might be in danger. That is none other than Harvard University chemist Dudley Herschbach winking at you on the television set. He's one of four "geniuses" enlisted by Sears to peddle home appliances in the department store chain's latest advertising campaign.

The tongue-in-cheek commercial suggests that it's a tough call determining who's smarter, the person who buys home appliances at Sears, or Herschbach, who won the Nobel Prize in chemistry in 1986. Three similar ads feature Princeton University astrophysicist Ruth Daly, Chicago neurosurgeon Gail Rousseau, and a 13-year-old college graduate now writing software for Nintendo.

The ads began airing in early July, and "consumers have really responded," says Sears spokesperson Tim Conway. The company boasts that it made more money on home appliance sales in the last week of July than during any other week in Sears' 108-year history.

Conway says Sears may shoot more commercials with a fresh slate of high-powered minds. The new promoters of home appliances, meanwhile, are enjoying their brief stint on the world's stage. Jay Leno has mentioned the ads on *The Tonight Show*, and hundreds of colleagues have peppered the scientists with congratulatory e-mail and phone calls. Daly admits she had some qualms about looking foolish in front of her peers, but has found that "the response has been very positive." Indeed, she says, "it's good PR for my field."