

gested watermelon-sized seeds. That's a new item on the menu of Cretaceous birds. Specimens in Spain contain crustaceans, and North American fossils dined on fish, but *Jeholornis* is the first proven seed eater. "The main importance is that it increases our knowledge of the ecological diversity of early Cretaceous birds," says paleontologist Tom Holtz of the University of Maryland, College Park. Adds would-be time traveler Chiappe: "Bird watching back then would have been a lot of fun."

—ERIK STOKSTAD

INTELLECTUAL PROPERTY

U.S. Asks for Delay in Harvard Theft Case

BOSTON—Government prosecutors surprised a court last week by seeking a 6-month delay in proceedings against two biologists accused of stealing research secrets from Harvard University. Observers say the move, which left the judge flabbergasted, suggests that the government is not yet ready to take its case to trial.

Jiangyu Zhu and Kayoko Kimbara were jailed last month after an FBI complaint alleged that they conspired to steal research materials and secrets when the two, who are married, left the lab of cell biologist Frank McKeon at Harvard Medical School in 1999. Released on bail, they appeared on 17 July at a 10-minute hearing here in U.S. District Court. The prosecutors and defendants have both agreed to a 180-day continuance, which prosecutor Robert Wallace says will allow the two sides "to discuss the case and see if [there is] any resolution." He declined further explanation of why the government supports a delay.

"This is an extraordinarily unusual request," said presiding Judge Robert Collings, adding that he had

not encountered anything similar in 20 years on the bench. The government normally has 30 days after an arrest to seek an indictment.

The FBI complaint charges the couple with shipping material of significant commercial value to Japan and mailing reagents and other materials from Harvard to Zhu at the University of Texas, San Antonio, where he had a brief postdoctoral appointment. Their intent, says the complaint, was to use

Harvard trade secrets for their own profit (*Science*, 28 June, p. 2310). Last week, Nagoya, Japan-based Medical and Biological Laboratories Co. revealed that Zhu sent the company genetic material and asked it to make an antibody that might hinder rejection of transplanted organs.

In a statement, the company said it created the antibody and sent it to Zhu's Texas lab in February 2000. The company, which employs a colleague of Zhu's, says it was not contacted by the U.S. Department of Justice, which declined comment. But Harvard spokesperson Donna Burtanger praised the lab's conduct, saying that "they cooperated fully and sent everything back" to Harvard. The company also said that it has tightened up oversight of interactions with outside researchers.

In a statement released by Zhu and Kimbara's lawyers on their behalf, the researchers say that "the government did not have the benefit of hearing our position—that no crime was committed—before it acted." Spokespeople for both sides declined to say if the FBI ever interviewed the two scientists. The researchers, the statement adds, "have no interest whatsoever in wrongfully commercializing their work."

Zhu, a Chinese citizen, and Kimbara, a Japanese national, are restricted in their movements and are on administrative leave from their jobs pending investigations by their current employers, Zhu at the University of California, San Diego (UCSD), and Kimbara at Scripps Research Institute in La Jolla, California. UCSD spokesperson Kim McDonald says "nothing [Zhu] has done here leads us to question his work," and Scripps spokesperson Robin Clark says that Kimbara "will be given the opportunity" to return if the investigation finds no wrongdoing.

Zhu and Kimbara were mobbed by Japanese television reporters and photographers on entering and leaving the courthouse. A similar case last year involving researchers at the Cleveland Clinic Foundation in Ohio (*Science*, 18 May 2001, p. 1274) also received intensive coverage in Japan. The two cases have raised concern in Japan that Japanese researchers are ill prepared to cope with stricter U.S. laws on intellectual property.

—ANDREW LAWLER

NUCLEAR FUSION

Chemistry Casts Doubt On Bubble Reactions

A controversial claim that scientists had detected signs of fusion in a rapidly collapsing bubble may have further imploded this week. A new experiment that measures the energy budget of a collapsing bubble for the first time indicates that so-called bubble fusion is highly unlikely to occur.

The controversy involves a peculiar phenomenon known as sonoluminescence. If you zap a tub of liquid with sound waves in the right manner, you can "crack" the liquid, creating bubbles that contract so violently that they glow with light. Earlier this year, *Science* published a paper by engineer Rusi Taleyarkhan of Oak Ridge National Laboratory in Tennessee and five colleagues reporting the detection of neutrons that the researchers claimed were generated by a fusion reaction inside a sonoluminescing bubble in a solution of acetone. The claim was greeted with skepticism even before it was published (*Science*, 8 March, pp. 1808 and 1868).

The chemistry that goes on inside the bubbles is a mystery—particularly in single-bubble sonoluminescence, in which a solitary bubble is trapped by the acoustic waves. Single-bubble reactions are so small that "it's very tough" to detect the products that the bubbles create, says Lawrence Crum, an acoustician at the University of Washington, Seattle, and one of the first people to study single-bubble luminescence.

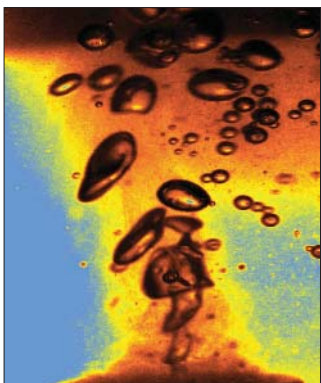
But Kenneth Suslick and Yuri Didenko, sonochemists at the University of Illinois, Urbana-Champaign, report in the current issue of *Nature* that they have used fluorescent dyes to measure the amounts of hydroxyl radicals (OH) and nitrite ions (NO₂⁻) produced during single-bubble sonoluminescence in water—the products expected when the extreme conditions in the bubble shred water, nitrogen, and oxygen molecules. From the concentrations of these molecules created by different single-bubble sonoluminescence experiments, Suslick and Didenko were able to figure out the conditions that led to those reactions—and where the energy goes when the bubble collapses. "You get the first measure of the energy balance, a feeling for how much energy goes in and where it comes out," says Suslick. "Chemical reactions are a major mechanism for the dissipation of energy," he adds, noting that the experiment roughly matches theorists' expectations.

Suslick's work implies that—especially in a volatile liquid such as acetone—much of the energy of the collapsing bubble is dissipated by tearing molecules apart, so such an experiment is highly unlikely to

Image not available for online use.

Image not available for online use.

Legal steps. Kayoko Kimbara (top) and Jiangyu Zhu on the day of their hearing in Boston.



No nukes? Sonoluminescent bubbles look bad for fusion.

voices rule the acoustic waves.

initiate fusion. “They’re saying, ‘We understand what’s going on inside the bubble,’ and if this is what you believe the science is, you should be suspicious of the Taleyarkhan paper,” says Crum. The authors of that paper could not be reached for comment. But for now, at least, skeptical

—CHARLES SEIFE

CLIMATE PREDICTION

Signs of Success in Forecasting El Niño

El Niño, the sleeping giant of climate, awakened earlier this month, according to government scientists. Six months ago, those same researchers went out on a limb when they recognized stirrings around the Pacific as likely signs that El Niño’s warming of tropical waters would soon return after a 4-year absence. Their early-January forecast appears to be holding up; if the warming trend continues, El Niño’s often disastrous weather shifts around the globe should crest around the end of the year. A full year’s warning of El Niño’s peak would be much better than forecasters achieved last time. But soon will come the next test: Will this El Niño develop into a weak-to-moderate warming this winter, as now predicted, or another barnburner like last time?

El Niño forecasting has a long and

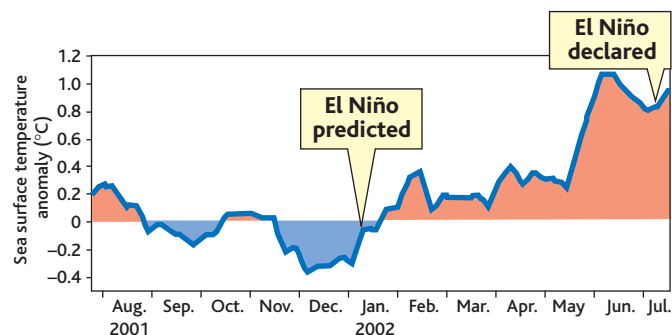
Pacific warming for the first time in 1986, but forecasters’ optimism was short-lived. It was only with the 1997 super-El Niño that human and computer forecasters had some measure of success, and even then they were criticized for a months-late alert and gross underestimation of the event’s huge scale (*Science*, 13 October 2000, p. 257).

This time around, some forecasters seem to have gotten the onset of El Niño right. At the National Weather Service’s Climate Prediction Center (CPC) in Camp Springs, Maryland, meteorologist Vernon Kousky and a half-dozen colleagues put out a monthly “diagnostic discussion.” Their Web site report* sorts through observations from ships, islands, satellites, and buoys across the Pacific and evaluates forecasts from more than a dozen models run by CPC and others. Last fall, while most of the tropical Pacific was at near-normal temperatures, the CPC group started talking about a warming trend that would likely continue into 2002, although as a group the models dithered from month to month between calling for normal and somewhat warmer conditions.

On 9 January, while the crucial central tropical Pacific was still normal, the CPC group came out with its first solid prediction: “It seems most likely that warm-episode conditions will develop in the tropical Pacific during the next 3–6 months.” That didn’t contradict the majority of model forecasts, and it fit what CPC researchers had been seeing in the changing circulation of atmosphere and ocean.

Not everyone agreed, however. “A lot of us felt they were too quick” to call for an El Niño, says meteorologist Anthony Barnston of Columbia University’s International Research Institute for Climate Prediction (IRI) in Palisades, New York. On its public Web site,† the IRI group started in January

with a 60% probability of an El Niño developing and built more or less steadily to a June forecast with a 90% chance. At the same time, the models were developing a consensus for an El Niño peaking at weak-to-moderate warmth next winter. “Overall, the models are doing better this time around,” says Barnston, who main-



Good call. Early this year, government scientists correctly predicted an El Niño warming while the tropical Pacific was still near normal.

checked history. In the 1960s and even early '70s, monitoring of the tropical Pacific was so spotty that full-blown El Niños could pop up around Christmastime without warning. A simple model of tropical Pacific winds and currents successfully predicted a

* www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/index.html

† iri.columbia.edu/climate/ENSO/currentinfo/QuickLook.html

‡ iri.columbia.edu/climate/ENSO/currentinfo/SST_table.html

Museum Stays Nanjing city officials have agreed to revise plans for boosting tourism to accommodate a science museum being built by the Nanjing Institute of Geology and Paleontology.

The institute, part of the Chinese Academy of Sciences, spent 4 years winning approval for a three-story, \$3.6 million museum that would display fossils and other artifacts. But in February, city officials ordered the institute to halt work on the building, to be completed next year, because it interfered with plans to enhance a nearby 1400-year-old Buddhist nunnery (*Science*, 24 May, p. 1379). Last month the city backed off, however, saying it will develop new beautification plans that take the museum into account.

Yang Qun, deputy director of the institute, says he’s “glad that the government has reiterated its support” for the museum.

NIMH Short List The search is winding down for a new director for the National Institute of Mental Health (NIMH), which has lacked a permanent leader since Steven Hyman returned to Harvard in December 2001. A search committee has forwarded four names to National Institutes of Health (NIH) director Elias Zerhouni, sources tell *Science*. They are Edward Scolnick, executive vice president for science at Merck & Co. Inc.; Thomas Insel, a former NIMH researcher who is now at the Yerkes Regional Primate Research Center at Emory University in Atlanta (see p. 506); Dennis Charney, who leads NIMH’s intramural program on anxiety disorders; and David J. Kupfer of the University of Pittsburgh.

The front-runner is said to be Scolnick, a former NIH cancer researcher now on NIMH’s advisory council. But rejoining the government would mean a hefty pay cut.

Forgive and Take In an unusual deal, Russia has agreed to forgive \$98 million in Armenian debt in exchange for control of four state enterprises, including a pair of scientific institutes. The biggest prizes are the Hrazdan thermal power station and the Mars joint-stock company, a circuit-board manufacturer. But the inclusion of two Yerevan-based electronics research labs irks some observers. “This is a new form of neocolonialism,” grouses an official of a science foundation in Yerevan. The parliaments of both countries are expected to ratify the deal this fall.

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