data to make that statement." Foiled in his attempt to solicit the nominees' views on climate change, McCain declared that "I will oppose your nominations until I get an answer" and stalked out of the hearing.

Senator Ron Wyden (D–OR), who chaired the hearing of the Senate Commerce, Science, and Transportation Committee, tried to mollify the stunned witnesses by assuring them that he supported their nominations. Indeed, this week the panel approved both nominees, with McCain the sole dissenter. Still, Wyden echoed McCain in expressing his "disappointment" with their grasp of the issue. "The science behind climate change is no longer in question," he said pointedly. Olsen, noting that her background is in neuroendocrinology, promised to "become more knowledgeable" on the subject in the coming months.

–JEFFREY MERVIS

PALEONTOLOGY

Fossil Bird From China Turns Tail, Spills Guts

If paleontologists could take a field trip back in time, many would head straight for the ancient lakebeds of what is now northeastern China. Back in the early Cretaceous, some 120 million to 125 million years ago, these shores buzzed with strange life that has come to light only in the past few years: feathered dinosaurs, odd mammals with hindlimbs like those of reptiles, and primitive flowering plants (*Science*, 12 January 2001, p. 232). Birds teemed too, as more than a dozen unearthed species and hundreds of specimens attest.

Now the record of early avian life has gotten even richer. In the 25 July issue of *Nature*, two Chinese paleontologists describe one of the most primitive birds ever discovered, *Jeholornis*. The bird's peculiar tail underscores the now-common theme of kinship with dinosaurs. "This is a critical specimen that combines features that are typical of dromeosaurs with things that are typical of more advanced birds," says Luis Chiappe of the Natural History Museum of Los Angeles County. So well-preserved is the turkey-sized specimen that even its last meal is plain to be seen.

Prodded by memories of *Archaeoraptor*, a birdlike dinosaur from the same region that was shown to be a fake assembled from two creatures (*Science*, 14 April 2000, p. 238), paleontologists Zhonghe Zhou and Fucheng Zhang of the Institute of Vertebrate Paleontology and Paleoanthropology in Beijing took care to make sure that the new specimen was genuine. After examining how bones matched up between the several slabs, they concluded that "the possibility of a composite specimen … can be ruled out." Zhou and Zhang note that, unlike *Archaeoraptor*, the new specimen was completely prepared in the lab.

What makes *Jeholornis* unique among birds from the early Cretaceous is its tail. Birds usually have short tails tipped by a few vertebrae fused into a rodlike pygostyle. In contrast, the 42-centimeter tail of *Jeholornis* consists of at least 22 individual bones, just like a dinosaur's tail. This kind of tail also adorns the end of the most famous fossil bird, the 145-million-year-old *Archaeopteryx* from Germany, as well as that of *Rahonavis* from the late Cretaceous in Madagascar. Finding a third example in China shows how far-flung such long-tailed early birds were, says Cathy Forster of the State University of New York, Stony Brook.

Despite its antiquated tail, *Jeholornis* sported an advanced shoulder girdle capable of powering flight. That fits with the notion that early birds evolved their front limbs first, Chiappe says, and only later modernized their tails into part of the flight gear. A computer analysis of 201 anatomical features placed *Jeholornis* with *Rahonavis* as the closest relatives of *Archaeopteryx* in the bird family.

Jeholornis also has something to say about what fueled its airtime. Inside its chest cavity lie the fossils of more than 50 undi-



Stuffed. Remains of *Jeholornis* include fossilized seeds (*right*) from the bird's last meal.

CREDITS: (LEFT TO RIGHT) IVPP; NASA

ScienceScope

Pluto or Bust? Space scientists are rethinking one element of a new planetary research plan released last week by the National Academy of Sciences (*Science*, 19 July, p. 317). After initially expressing full support for the plan, the American Astronomical Society (AAS) now says NASA should delay a proposed 2006 launch for a Pluto mission if it would hurt other science projects.



Pluto advocates say a delay would cause the spacecraft to miss a Jupiter gravity assist and arrive after the planet's atmosphere has frozen. But AAS officials say recent studies suggest that the freeze might never occur and that better propulsion systems could make up for a delay.

Space scientists hope to win Senate support this week for an early Pluto voyage. But the project's fate won't be set until after Congress finishes its spending bills this fall.

Hanging On Argentinian scientists, whose research budgets dried up after the country's economy tanked in December (*Science*, 29 March, p. 2356), have gotten some good news. The secretary of science, Julio Luna, has won Treasury approval to use up to $14 million designated for research loans as direct grants. The money—from an international loan—will allow the cash-strapped Agencia Nacional de Promoción Científica y Tecnologíca, or "the Agency," to catch up on delayed grant payments and even start a new competition, says an Agency official. To the relief of many, Luna has also killed a plan to merge the Agency with CONICET, a larger science body whose review system has been criticized by scientists. The government also recently gave researchers permission to buy imported supplies and equipment.

The downside: Agency grants—once worth up to $50,000 annually—have lost 70% of their value due to the peso's slide. Still, University of Buenos Aires ecologist Osvaldo Sala says that the funds will be particularly helpful to scientists whose labs "have run out of money."

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."

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.

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 (NO_2^-) 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

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