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Challenges to "Out of Africa"

LEAD STORY 232
Special report: Paleontology in China

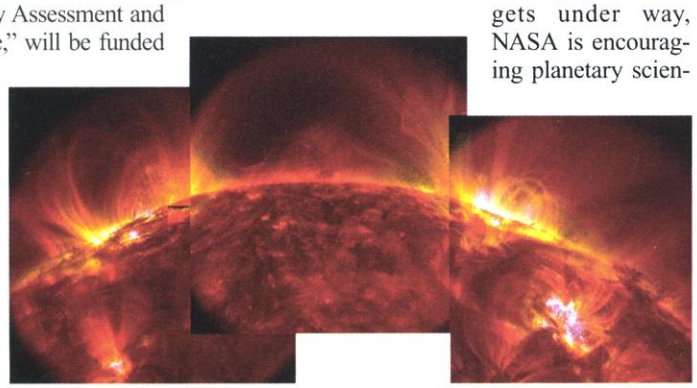
All four large projects recommended in the 1991 survey, for example, became reality, prompting envy from those in other fields that traditionally fare less well. In addition, political attacks on a new NASA solar program called Living With a Star (LWS) (*Science*, 28 July 2000, p. 528) have pointed up the value of having solid backing for any large scientific undertaking. "We need a national perspective," says Lou Lanzerotti, a physicist with Lucent Technologies in Murray Hill, New Jersey, who will chair the 12-member NRC panel. "A fairly broad spectrum of federal agencies, research communities, and industry are interested in this."

In addition to space-based programs like LWS, the panel will also examine ground-based research such as the National Science Foundation's (NSF's) space weather initiative. The committee will establish five subcommittees—each with up to 10 people—to examine theory, modeling, education, and public outreach activities as well as specific missions. The 2-year study, called "Solar and Space Physics: A Community Assessment and Strategy for the Future," will be funded primarily by NASA and NSF, with support from the National Oceanic and Atmospheric Administration and the Defense Department.

A deluge of data from a series of new spacecraft as well as from ground-based experiments studying the sun's current peak of activity have raised the profile of solar researchers. The LWS is supposed to build on that momentum by launching a series of spacecraft around the sun and Earth. But the program drew criticism last year from some members of Congress for being too applied, while some researchers complained about its scientific foundation and about NASA's plan to give substantial control to a Maryland contractor. "LWS popped up overnight, and now we're playing catch-up," says James Burch, a physicist with the Southwest Research Institute in San Antonio, Texas, who will serve on the NRC panel. "It was a little bit of the cart before the horse."

The first LWS mission, to study solar dynamics, is slated for 2006; future missions have yet to be defined. In November, NASA formed a standing committee, led by solar physicist Glenn Mason of the University of Maryland, College Park, to examine the detailed research that LWS should conduct. Mason and Burch say their respective panels will work together on a stronger research plan for LWS, with Mason's panel providing the specifics and the NRC group outlining the broader scientific strategy. Mason acknowledges that LWS has created rifts among scientists. "This is like a family fight over a future inheritance," he says. "The community will only have itself to blame if the program isn't done well." The NRC panel will also try to ease tensions between researchers who conduct primarily space-based work and those focused on ground-based efforts. NASA spends much more on the field than does NSF, but most goes to building hardware. "If you look at how much money is actually going to support scientists, the two agencies are much more balanced," says Robert Rosner, a University of Chicago astrophysicist.

As the solar and terrestrial physics effort gets under way, NASA is encouraging planetary scientists to adopt a similar broad-brush study. "This approach clearly is liked by members of Congress," says NASA space science chief Ed Weiler, who spent 20 years as program scientist for the Hubble Space Telescope. "So let's let the [NRC] decide what is best."



CREDIT: TRACE

**Sunny view.** Two active equatorial regions on the sun as seen by the 2-year-old TRACE (Transition Region and Coronal Explorer) satellite.

But the community is not unanimous that a survey makes sense. "I'm more and more concerned that the pace of events leaves the decadal model in the dust," says David Black of the Lunar and Planetary Institute in Houston, noting how capitalizing on the recent discovery of a possible ocean on Europa would not have been part of any long-range plan. At the same time, other scientists say that their relatively small field is capable of resolving disputes without a time-consuming and expensive study.

Old hands warn that surveys are no panacea. John Bahcall, the Princeton University astronomer who led the influential 1991 NRC survey, agrees that, "in principle, a survey is a good idea. But ultimately it depends on the strength, will, and leadership in the community to make difficult decisions." In other words, the conclusions of the new NRC panel may be less important than demonstrating that it can speak with one voice.

–ANDREW LAWLER

HUMAN GENOME

## NIH Considers Paying to Use Private Database

Officials at the National Institutes of Health are negotiating terms under which NIH scientists can have access to the controversial genome database offered by Celera Genomics of Rockville, Maryland. If the talks are successful, some NIH scientists may soon have their own Celera accounts, at an initial cost of up to $15,000 per user per year.

Some NIH staffers are flabbergasted that such a deal might be in the works—partly because NIH is funding genome sequencing projects that are releasing data free of charge through GenBank, a public database NIH runs. Several NIH scientists have requested access to the Celera database, however, and NIH officials say they've received complaints that academics using Celera's data have "scooped" intramural researchers on discoveries.

National Cancer Institute director Richard Klausner confirms that NCI staffers ran an informal evaluation of the Celera database. "A variety of intramural scientists who are expert" in this field "felt that the database that they were looking at was very useful and very powerful, and that it would add value" to public data, he says. The reviewers, according to members of the team, included NCI staffers J. Carl Barrett, Neal Copeland, Michael Dean, Dean Hamer, Nancy Jenkins, David Munroe, Stephen O'Brien, and Louis Staudt. Klausner says he doesn't know how many other institutes might be interested, but "whatever we do will be available across the NIH."

Celera spokesperson Heather Kowalski declines to comment on the reported negotiations. But she says the current rate for an academic subscription to the genome database—which includes mouse and human sequences

and gene-reading software—is $7000 to $15,000 per user per year, although the term "user" is not well defined. In contrast, pharmaceutical companies pay $5 million to $15 million per year.

Klausner says he isn't aware of any legal barrier that would prevent NIH scientists from becoming Celera subscribers, nor does he see a problem in spending public money to get access to data that may be freely available through GenBank. "We would [only] do this if it is cost-effective and valuable to enhance the public research," Klausner says. Anthony Fauci, director of the National Institute of Allergy and Infectious Diseases, also says his scientists should "have access to all scientific resources that the extramural people" can use. Steven Hyman, director of the National Institute of Mental Health, agrees: "If any of my scientists were to ask, I would sign up without compunction." Like Klausner, Hyman sees no problem in paying for the data twice: "We do it all the time" with scientific journals, he argues: "We pay for the research, we pay for publication costs, and then we pay for the journal subscription for our scientists. We do it without complaining. ..."

Insiders say it's impossible to guess how or when the negotiations will end. At present, the company is trying to answer 15 detailed questions from NCI scientists about fees and access. The company's responses, according to one NCI scientist, could make or break the deal. **–ELIOT MARSHALL**

PALEONTOLOGY

## New Fossil Fills Gap In Bird Evolution

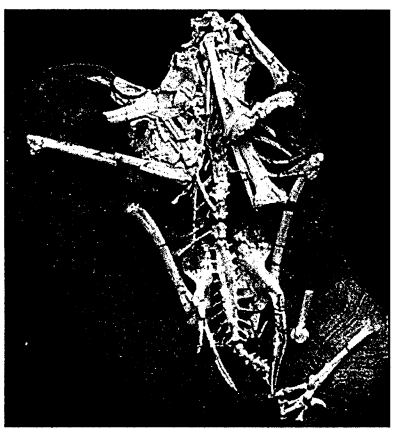
Early birds have never had it so good. Paleontologists who study bird evolution are reveling in new finds from around the world, especially China (see special Focus section beginning on p. 232), that provide ever more evidence of dinosaurian ancestry. Meanwhile, evidence bearing on an equally puzzling question—the origin of modern birds—has been frustratingly scarce. But an 80-million-year-old bird from Mongolia may be about to change all that.

Described in this week's issue of *Nature*, the Late Cretaceous fossil is the best preserved close relative of modern birds found in more than a century. "This specimen is paramount for understanding the origin of modern birds," says Luis Chiappe of the Natural History Museum of Los Angeles County. For starters, he notes, "it's saying that our picture of the early evolution of birds is certainly more complicated than we thought."

The most primitive bird known, *Archaeopteryx*, flapped over Jurassic lagoons some 150 million years ago. By the early Cretaceous a more advanced group of birds had appeared. Called the Enantiornithes, or "opposite" birds, for the way their foot bones grew, they flourished for 70 million years before going extinct. Many have been discovered in the last 2 decades. Unfortunately, the fossil record is much more limited for their successors, the Ornithurae—the group that includes living birds—which are thought to have emerged roughly 65 million years ago. Paleontologists had relatively complete skeletons for only two, *Hesperornis* and *Ichthyornis*, both discovered in the 1870s.

Now Julia Clarke of Yale University and Mark Norell of the American Museum of Natural History (AMNH) in New York City unveil *Asparavis*, a new fossil bird from the Ukhaa Tolgod region of Mongolia. Not only is the specimen a long-coveted ornithurine, but it is also breathtakingly well preserved. The skeleton is three-dimensional, rather than smashed flat—highly unusual for fragile birds—and so the anatomy stands out in sharp relief.

*Asparavis* is already turning up some surprises. For example, it appears to have a mosaic of primitive and advanced traits. Clarke and Norell have found 27 features that make *Asparavis* an ornithurine and link it with modern birds, such as its 10 fused sacral vertebrae. But they also found 12 traits that were thought to be unique to Enantiornithes. If those traits aren't diagnostic of that group, the dozen or so fragmentary fossils classed as Enantiornithes by those features may not actually belong to the group—and that could upset the standard idea that Cretaceous enantiornithines were much more diverse than ornithurines. "It's not as simple a picture as we thought," Clarke says.



CREDIT: (FOSSIL) MICK ELLISON/AMNH

**Relief.** This three-dimensional fossil may clarify origins of modern birds.

No matter how these features shake out, paleontologists are thrilled to have such a complete bird to work with. "You don't see birds that old in that good condition," notes Jim Kirkland of the Utah Geological Survey in Salt Lake City. "This fossil will be an incredible focal point for what we will know about bird relationships." And that would be something to crow about. **–ERIK STOKSTAD**

## ScienceScope

**Texan to NIH?** Rumors reached a fever pitch in Washington this week that the Bush transition team had tapped a director for the National Institutes of Health, but the supposed candidate denies all. John Mendelsohn, president of the University of Texas M. D. Anderson Cancer Center in Houston, told *Science* in a statement that although "It would be an honor to be considered" for the NIH post, "no one has approached me about it" and "I love my job."

Mendelsohn, who is said to have links to the Bush family, has worked at the University of California, San Diego, and Memorial Sloan-Kettering. But observers noted that if offered the NIH job, he would have to mull whether he is willing to give up positions on the boards of biotech ImClone Systems and Enron, the giant Houston-based energy company, and become a politico. And one biomedical research lobbyist expressed concern that a clinical oncologist might not "resonate with" NIH's mostly basic research grantees—and might also add to NIH's already heavy slant toward cancer research.

**Prion Payoff** The uproar over Germany's first cases of mad cow disease is paying dividends for researchers on the tiny Baltic Sea island of Riems. This week, molecular biologist Thomas C. Mettenleiter, who heads Germany's Federal Research Center for Animal Viral Diseases, said that the center will open an Institute for New and Emerging Animal Infectious Diseases on Riems and will "significantly expand its research."

Riems has housed German animal-virus research laboratories for 90 years, and officials expect the new institute to open this spring in a refurbished lab with 17 employees, including seven scientists. In the past 2 months German officials have discovered seven cows infected with bovine spongiform encephalopathy, a prion disease that has struck more than 179,000 cows in the United Kingdom and hundreds on the continent.

**Contributors: Jocelyn Kaiser, Robert Koenig**