Gem, Mineral, and Fossil Show by Stephen Czerkas, an artist who with his wife Sylvia operates a dinosaur museum in Blanding, Utah. Czerkas enlisted the help of paleontologists Philip Currie of the Royral Tyrrell Museum of Paleontology in Drumheller, Alberta, and Xu Xing of the Institute for Vertebrate Paleontology and Paleoanthropology in Beijing. He planned to publish a scientific paper about the animal, to coincide with a dinosaur story in the November 1999 issue of *National Geographic*. In August, Czerkas and Currie hired paleontologist Tim Rowe of the University of Texas, Austin, to perform a computed tomography (CT) scan of the fossil.

Things started to go awry when both *Science* and *Nature* turned the paper down. *National Geographic* went ahead with publicizing the creature. But in December, Xu Xing, back in China, located a piece of rock containing most of a fossil dromaeosaur in possession of a farmer in Liaoning. Studying the tail, Xu says he became "100% sure" that it was the counterpart piece from the other half of the rock sandwich that held the tail of *Archaeoraptor*.

On 4 April, Xu brought the fossil to Washington, D.C., where scientists meeting at the National Geographic Society examined the two specimens side by side and then issued a press statement saying that the specimen is "a composite of at least two different animals." Rowe says his CT scans show that *Archaeoraptor*'s legs may come from a third, unidentified animal.

From a paleontological standpoint, *Archaeoraptor* has now split like stock—creating two new publishable specimens instead of one. Czerkas and Xu plan to co-author a paper about the bird part, which Czerkas presented at the Florida meeting as "a new toothed bird from China." (Czerkas is still calling the bird *Archaeoraptor*, although Xu says it's time for a new name.) And Xu plans to write up the still-unnamed new dromaeosaur.

Rowe and his CT scans, meanwhile, were nowhere near Fort Lauderdale. Rowe says he called the organizers of the symposium in late February, offering to present a talk on his results, but was turned down. One of the organizers, Wyoming paleontologist Robert Bakker, claims there wasn't room on the schedule to accommodate Rowe's "11th hour" request. Other sources, though, say Czerkas vetoed Rowe's participation. Rowe had recently submitted a paper on his results to *Nature*. In late March, Czerkas wrote to *Nature* and to the University of Texas threatening legal action if *Nature* publishes the paper without his permission. Rowe says the collaborative agreement he entered with Czerkas and Currie clearly allows him to publish his results. Czerkas, however, says of Rowe: "He was hired help. It's my right to publish first."

Rowe says the *Archaeoraptor* fiasco is typical of what can happen when paleontology and profits mix: "All the fossils that have come through commercial hands that I look at with my new eyes have been severely tampered with." He says he warned Currie and Czerkas that preliminary scans indicated the specimen was "compromised" and might be a composite, but that Czerkas went ahead with the "publicity circus" at the National Geographic anyway. Czerkas responds that Rowe is operating from "20/20 hindsight." He says, "We all agreed at the SVP meeting [the Society of Vertebrate Paleontology, which met in Denver in October] that the most parsimonious interpretation was the tail belonged." It could not be determined from Rowe's CT scans whether the tail belonged with the bird body, Czerkas says; it was only Xu who came up with definitive evidence.

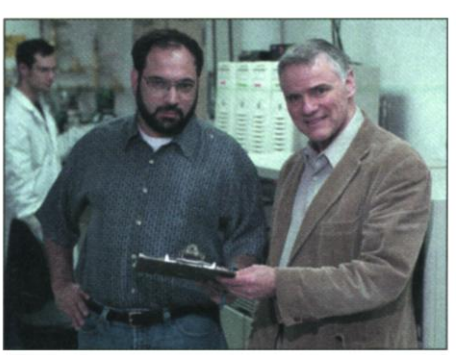
Anyone who wants more evidence had better work fast; Czerkas agreed to return the *Archaeoraptor* composite fossil to China on 25 May. **–CONSTANCE HOLDEN**

CREDIT: TIM ROUNDS

PLANT SCIENCE

Stealth Genome Rocks Rice Researchers

For the past 3 years, researchers from 10 countries, led by Japan, have been working on an ambitious effort to sequence the rice genome. Last week, many of the participants were stunned to learn that the biotech giant Monsanto is well ahead of them. Monsanto and collaborators at the University of Washington (UW), Seattle, announced on 3 April that they had almost completed a rough draft of the entire rice genome. Equally surprising, the company said it would turn its data over to the international consortium. "This is very big news," said Takuji Sasaki, director of Japan's Rice Genome Research Program, with more than a touch of understatement.



Instant rice. The sequencing effort by Mahairas (left) and Hood should lead to a completed rice genome years earlier than expected.

Monsanto's clandestine achievement is impressive. Not only is rice the first plant to be sequenced in rough form, but at 430 million bases it is also the largest genome ever sequenced—more than twice the size of the recently published *Drosophila* genome (*Science,* 24 March, p. 2185). If the company lives up to its promise to make the sequence public, the International Rice Genome Sequencing Project could complete its work in just 2 or 3 years—and for half the estimated cost of $200 million. As a result, "public institutions committed to doing crop science research for developing countries' crops will have access [to the genome] much sooner, and without restrictions," says microbiologist Gary Toenniessen, director of the Rockefeller Foundation's food security program.

But because Monsanto (now a division of Pharmacia Corp.) kept the project secret—presumably to keep competitors in the dark while it got a first look at the sequence—few outsiders have seen the data, so it's hard to judge their quality or utility. And because there are few precedents for free public use of corporate data, some scientists are wondering whether the offer might be too good to be true.

The rice sequence is the fruit of a collaboration between Monsanto and Leroy Hood, now president of the Institute for Systems Biology. The company gambled that a sequencing approach developed in part by Hood would quickly decode the rice genome. If so, the results could be useful for engineering rice, and they may also help in understanding corn and other crops in which Monsanto is interested. Hood's approach is a refinement of the strategy being used by the publicly funded Human Genome Project. It entails fragmenting the genome, putting the pieces in bacterial artificial chromosomes for copying, and working out the nucleotide sequence of each BAC one at a time. The refinement developed by the Hood team, led by UW's Gregory Mahairas, is a "very ef-

ficient" way to determine which BACs to sequence, and in what order.

The result, announced in simultaneous press briefings last week in Beijing and Tokyo, is a map that covers some 80% of the rice genome at least four times over—a good enough draft to enable gene prediction programs to find many of the estimated 30,000 genes, Mahairas says. Neither the UW team nor Monsanto would reveal how long the project took or how much it cost. Mahairas would only say that "the whole approach worked very, very rapidly."

Sasaki, who has seen the data, says the quality of the sequence varies from BAC to BAC, but "it's still very valuable." Rod Wing, a molecular biologist at Clemson University in South Carolina who has been scrambling to determine the optimal set of rice BACs for the sequencing consortium, is more circumspect: "We're going to have to look at the data very closely" to determine how best to use both the public and Monsanto sets. Some partners may take up where Mahairas left off, using the Monsanto BACs directly in their sequencing efforts; Wing, on the other hand, is considering using the company's data to make the sequencing of his own BACs more efficient.

Although some researchers wonder whether Monsanto will be as forthcoming with the data as promised, Hood insists it will. He describes the project as a "win-win situation": Monsanto gets a jump start on finding the genes with commercial value, and the consortium saves several years and perhaps as much as $100 million.

Rockefeller's Toenniessen holds out Monsanto's data-release policy as a model for other public-private collaborations. Some details are unclear, but as early as next month, the consortium will have access to much of Monsanto's data. Once a piece of Monsanto sequence goes into the consortium's public database, anyone—even competitors—can use it, no strings attached, says Sasaki. Until then, however, other academic researchers who want to use Monsanto's sequence must agree to give the company an option to negotiate nonexclusive rights to license any patents derived from its use. "It would be nice if other companies followed suit and made their fundamental genomics information available under similar circumstances," says Toenniessen.

DuPont, for example, has a private rice database, as does Novartis. Neither has released these data, but Novartis did help to launch the public rice effort by supporting Wing's research. Says Michael Bevan, a plant molecular geneticist at the John Innes Centre in Norwich, U.K., Monsanto's actions "certainly put other companies on the spot." **–ELIZABETH PENNISI**

With reporting by Dennis Normile in Tokyo, Pallava Bagla in India, and Li Hui in China.

CREDITS: (LEFT TO RIGHT) K. PAJIK/AP PHOTO; G. HOLLOPETER AND A. DEPACE

NEUROSCIENCE

Hot Pepper Receptor Could Help Manage Pain

Bite into a hot pepper, and the pain that engulfs your tongue and palate really does feel like a burn. Several years ago, scientists uncovered the apparent reason: a cell-surface protein that in cultured cells responds both to heat and to capsaicin, the active ingredient in chili peppers. But cultured cells don't experience pain, and researchers weren't sure of the molecule's importance in animals. Now, genetically altered mice that possess an amazing tolerance for hot sauce have demonstrated that the protein plays a key role in several kinds of pain. The finding may eventually aid in the development of new pain-killing drugs.

Hot stuff. Mice lacking the VR1 receptor are impervious to the burn of hot peppers and are less sensitive to high temperatures.

In work described on page 306, neuroscientists Michael Caterina, David Julius, and Allan Basbaum of the University of California, San Francisco, Martin Koltzenburg of the University of Würzburg, Germany, and their colleagues genetically altered mice to remove the receptor that responds to heat as well as to capsaicin and other so-called vanilloid compounds. The mice behaved normally in most respects, but showed less sensitivity to high temperatures and drank capsaicin-laced water freely. Their neurons also failed to respond to normally noxious stimuli.

Those traits, Julius says, show that the receptor is not only "an essential part of vanilloid sensitivity" but also plays an important role in several other kinds of pain. Indeed, neurosurgeon James Campbell of The Johns Hopkins University School of Medicine in Baltimore says that the receptor is a promising drug target. "If we go after these receptors, we may be able to control [certain kinds of] pain," he says.

Researchers knew that neurons containing the capsaicin receptor, dubbed VR1 (for vanilloid receptor 1), respond to capsaicin and other painful stimuli in culture. But it was only after Julius and Caterina decided

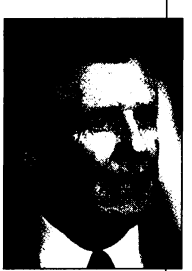
ScienceScope

Looking East Germany's Max Planck Society, which recently completed an expansion into the former East Germany, is now stretching even farther eastward. Society officials announced last week that they will set up a joint "junior research group" with Poland's Academy of Sciences.

The collaboration between Germany's premier basic-research organization and Warsaw's year-old International Institute of Molecular and Cell Biology is seen as a possible model for joint efforts in other fields and with other central European countries. The new research group will be led by a scientist under age 35—chosen after a global search—and will include several Polish postdocs and young researchers. Max Planck, which will pay for salaries and equipment costs, has set up similar groups in France, Israel, and China.

"We want to show that outstanding biology can be done in Poland," says Polish biochemist Maciej J. Nalecz, the director of the Polish academy's Institute of Experimental Biology. "We also want to keep outstanding biologists in Poland." In a reciprocal move, Poland hopes to set up its own satellite research group at the Max Planck Institute of Molecular Cell Biology and Genetics in nearby Dresden.

Vaccine Trial Convinced that vaccines caused his grandson's autism, Representative Dan Burton (R–IN, below) said last week he will ask the National Institutes of Health and other health agencies to investigate his theory.



Burton, who chairs the House Committee on Government Reform, held a 7-hour hearing on autism and vaccines on 6 April. It included testimony from parents, a touter of vitamin cures, and a practitioner who said that stretching the heads of autistic children relieves symptoms. Also on hand was Andrew Wakefield of the Royal Free and University College Medical School in London. In 1998, Wakefield and colleagues published a paper—since refuted by larger studies—that linked one kind of autism to measles, mumps, and rubella vaccination. But when an infectious disease specialist testified that the link was highly unlikely, Burton accused him of conflict of interest because his research was funded by a vaccine maker.

Such badgering drew attention. "I'm troubled by this hearing," said Henry Waxman (CA), the committee's ranking Democrat. "This was structured to satisfy the chair's point of view."