"It was total serendipity," he says. Smith snapped some photographs, noted the location, and kept searching.

The next year, Smith and his fellow grad student Matt Lamanna assembled a crew to excavate the sauropod remains. They pulled out 6.5 tons in 3 weeks. Based largely on features of the vertebrae, they identified the incomplete skeleton as that of a titanosaurid, the dominant group of sauropods during the Cretaceous. They also came across a dig site about 10 kilometers away that may have been worked by Stromer. In a spoils pile they uncovered old boots, pieces of tin cans, and a piece of German newspaper printed in what looked like a pre–World War II typeface.

Stromer himself had discovered a titanosaurid in the area, which he named *Aegyptosaurus*. But the pronounced ridges on the freshly excavated 180-kilogram humerus, as well as a bony projection on the shoulder blades, suggested that the specimen belonged to a new genus. Smith's team named it *Paralititan*, after the term "paralic," which describes tidal environments like mangrove swamps.

To figure out how large *Paralititan* was in life, the researchers stacked its 1.7-meter-long humerus against that of *Argentinosaurus*, a South American titanosaurid that's the largest on record. Because the humerus isn't preserved in *Argentinosaurus*, the team first had to estimate its length from comparisons with other titanosaurids. *Argentinosaurus*'s humerus, estimated at 1.81 meters, makes *Paralititan* the next heaviest known titanosaurid, perhaps twice the size of Stromer's adult *Aegyptosaurus*.

The thought of *Paralititan* weighing as much as 100 tons raised a concern: Would it have sunk into the mangrove swamp? Team member Kenneth Lacovara, a coastal geologist at Drexel University in Philadelphia, crunched some numbers. Given feet 1 meter in diameter, there was no problem—a relief for the paleontologists, who didn't think the massive carcass could have floated in or been dragged there by predators. "I'm confident that this sauropod may have spent a fair amount of time in the mangrove," Lamanna says.

The researchers have also found new specimens and taxa of fish, sharks, turtles, marine reptiles, lizards, and other dinosaurs. They plan to go back next year to look for even more. Ultimately, a diverse array of Upper Cretaceous fossils from North Africa could help determine the relative positions of Africa, South America, and Europe.

Decades ago, Stromer first discovered that diversity, only to see his collection blown to pieces. "It's a great shame it was lost," says Paul Upchurch, a sauropod expert and biogeographer at Cambridge University, United Kingdom. "But now that Josh Smith and colleagues have shown that there still is material to be found there, at least we have a second bite at the cherry."

–ERIK STOKSTAD

CREDITS: (LEFT TO RIGHT) R. KOENIG; KEVIN LAFFERTY/USGS

AUSTRIAN UNIVERSITIES

Scientists Spar Over Reform Plan

VIENNA—The Austrian government earlier this week approved plans for a major shake-up of the country's university system. Proponents say the proposal, if approved by Parliament, would infuse fresh blood into a system that has become sclerotic. Some critics, however, are angry over a loss of permanent jobs, while others charge that the reforms will be half-hearted and underfunded.

Most Austrian researchers agree that the university system is ailing. Over the past few decades, it's been "too easy to get permanent positions without a real assessment of the achievements of the candidates," says University of Vienna quantum physicist Anton Zeilinger. Adds University of Innsbruck physicist Peter Zoller, "there are essentially no positions left for young people." Compounding the problem, most professors and assistants are civil servants, or *Beamte*, a status that confers lifetime employment and regular raises not tied to job performance.

Reform-minded. Minister Elisabeth Gehrer wants to overhaul university hiring practices to bring in fresh blood.

Particularly acute is the plight of young researchers. Whether they are allowed to do independent research is largely up to the senior professor supervising their work, says University of Linz physicist Reinhard Folk, who says "there is a lot of misuse of people." Arnold Schmidt, president of the Austrian Science Fund, the country's main granting agency, points out that many researchers are "too old" by the time they are permitted to do independent research. Such disheartening conditions, if allowed to fester, will cause Austria "to lose a whole generation of scientists," warns University of Graz neuropharmacologist Peter Holzer.

In response to these widespread complaints, education and science minister Elisabeth Gehrer last December proposed legislation that would abolish civil servant status for

ScienceScope

Endangered Abalone U.S. officials this week added the white abalone, a California mollusk prized for its taste, to the government's endangered species list. Four years ago, biologists warned that the abalone was on the verge of becoming the first totally marine organism known to have been driven to extinction by overfishing (*Science*, 25 July 1997, p. 486). In an unusual move, the National Marine Fisheries Service declined to identify the mollusk's "critical habitat," fearing that poachers might use the information to clean out the estimated 3000 abalone that remain on deep-water reefs off California.

Meanwhile, biologists are trying to raise the creatures in captivity. The Abalone Restoration Consortium last month reported that it had coaxed three captive abalones into producing 6 million fertilized eggs. Eventually, the group hopes to release 10,000 young abalones a year into the wild.

Whose Genome Next? These days, genomics—study of an organism or biological system by looking at many genes at a time—is considered cool by hip biologists. But with researchers jostling to get their favorite organism decoded next, the National Human Genome Research Institute (NHGRI) has decided it's time for a sequencing summit. NHGRI director Francis Collins says he has invited an array of experts to the National Institutes of Health campus near Washington, D.C., on 9 to 10 July "to develop rational guidelines [for sequencing priorities], instead of responding to the group yelling the loudest."

Large-scale international sequencing centers are currently busy polishing the human genome sequence and completing work on biomedically important species such as the mouse, rat, and zebrafish. But once those chores are done, says H. Robert Horvitz of the Massachusetts Institute of Technology in Cambridge, the sequencers should take on species that have clear relevance to evolutionary biology, biomedicine, and comparative genomics. That might put some obscure animals at the head of the line.

But don't forget an organism's PR appeal, says NHGRI adviser Maynard Olson of the University of Washington, Seattle. He would sequence primates next, even if they are not the scientific community's first choice, because the animals capture the public's imagination.

Contributors: David Malakoff, Elizabeth Pennisi

all new university professors and assistants. Under her plan, only senior professors would retain permanent positions. So-called assistants would be reclassified as doctoral students, 6-year postdocs, or junior professors. Gehrer also proposed making Habilitation—a lengthy apprenticeship necessary to apply for a professorship—optional in view of the extra-long postdoc stint contemplated under the plan. That would bring Austria in line with Germany, which is phasing out Habilitation over the next decade.

In April, Gehrer sent the legislation out for review. The reforms are on a fast track to take advantage of an expected wave of retirements over the next 5 years, when an estimated 500 professors—25% of those now working—will leave academia. But it hasn't worked out quite as Gehrer hoped: After the review process ended on 18 May, the plan came under fire from several directions.

Most deferential was the Federal Conference of Professors, which represents senior professors. It said the reforms were fine—except for the optional status of Habilitation. The Federal Conference for Academic and Artistic Personnel (BUKO), representing 7500 university assistants, also criticizes that aspect. "Habilitation will not be formally necessary, but it will probably be difficult to find a job without it," argues Folk, BUKO's chair. The changes "will still keep young scientists dependent." He suspects that the real intention is to cut costs—a view that Gehrer rejects. "Saving money is not a goal at all," she says. "The main goals are to achieve more mobility, higher quality education, and harmony with European standards."

Meanwhile, the Austrian Rectors' Conference has rejected the proposal. While supporting reform in principle, the rectors contend that the government has provided no clear funding for the plan, which they estimate will cost universities an extra $6 million per year to implement, partly from increased benefits to employees who are not civil servants. The rectors also objected to a proposed $76,000 cap on annual salaries for professors, arguing that it would reduce their ability to retain talented researchers.

The civil service union took perhaps the hardest line. Last week, it threatened a 1-day university strike, forcing 11th-hour negotiations between the union and the science ministry. The union won some concessions: The latest version of the legislation will allow universities to hire permanent "staff scientists" according to their needs and to grandfather researchers now undergoing Habilitation into permanent positions. In addition, the ceiling on professor salaries has been raised to $112,500.

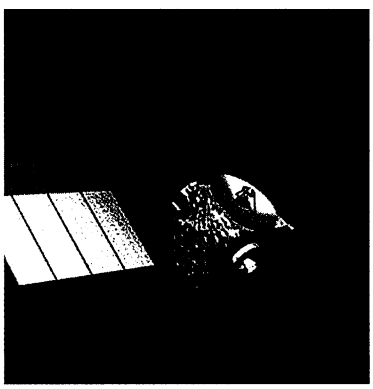
On 29 May, the Federal Cabinet approved the plan and sent it to Parliament, where the government is banking on its majority to pass the legislation by the end of next month. Even if that happens, many people view the reforms as a work in progress. They "are a step in the right direction [but] don't go to the heart of the matter," says Kim Nasmyth, director of the privately funded Institute for Molecular Pathology in Vienna. "The fundamental problem is that no one is in a position of power to organize resources and get professors to cooperate. Nobody is controlling the professors," he insists—and the new law won't change that. **–MIN KU**

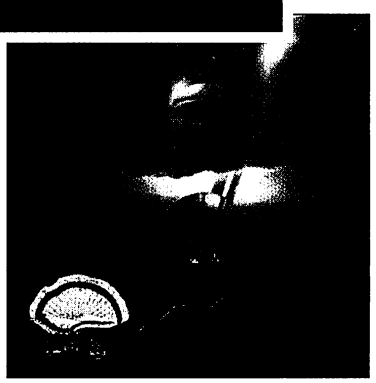
Min Ku is a science writer in Bern, Switzerland. With reporting by Robert Koenig.

SPACE RESEARCH

ESA Embraces Astrobiology

FRASCATI, ITALY—For years, European astrobiologists were a fragmented bunch, largely isolated from one another. That all began to change in April 1999, when some of Europe's top astrobio guns, relaxing over a beer in a bar after a geophysics meeting in The Hague, decided to band together. From that chance get-together emerged the 120-scientist-strong European Exo/Astrobiology Network, which met last week for the first time here in this central Italian city as well known for space research—it hosts a major institute of the European Space Agency (ESA)—as it is for its crisp white wines.





Life in ESA. The Aurora program will build on existing or planned missions such as Mars Express (*above*), scheduled for launch in 2003, and the Huygens probe, expected to land on Saturn's moon Titan in 2004.

CREDITS: ESA

The gathering proved to be more than a coming-of-age party for Europe's fledgling community of exo/astrobiologists. At the workshop, the ESA unveiled an ambitious agencywide strategy for exo/astrobiology called Aurora that the agency intends to present to its governing council this fall.

Aurora is envisioned as having two goals: searching for extraterrestrial life, such as fossil microbes on Mars, and precursor molecules to life on Earth; and laying the groundwork for future human space exploration. "If we decide it is right in 20 years' time to send people to Mars or an asteroid, we must find out now what knowledge and supporting technology we would need," says Didier Schmitt, head of life sciences at the ESA's Space Research and Technology Centre in Noordwijk, the Netherlands.

To support both goals, ESA argues that expertise must be drawn from both the Space Science and the Manned Spaceflight and Microgravity directorates, traditionally quite separate. Aurora will build on programs approved or under discussion in these directorates, assessing them through the prism of exo/astrobiology.

According to ESA, the solar system targets important for exo/astrobiology are Mars (ESA and member states already are preparing missions to Mars either alone or in collaboration), asteroids, Jupiter's moon Europa, and Earth's moon. In particular, the agency's science advisers are keen to see the agency begin a study on a Mars sample-return mission, although such a mission would be needed only if French plans to work with NASA on such a mission collapsed.

Having first broached the idea last November, ESA is moving with uncharacteristic speed to launch Aurora. It hopes to have a fleshed-out proposal to present to science ministers from member states this November. During a 3-year preparatory phase, ESA officials are looking to raise about $30 million for feasibility studies for a detailed exo/astrobiology program and to identify technologies needed to initiate programs. If Aurora becomes a fully fledged program, ESA will look to ministers for up to $130 million a year to fund it.

The network's leaders, who helped advise ESA on its plans, intend also to ramp up fundraising efforts at national research agencies and the European Commission for ground-based as well as space-based studies. "The time is right," argues the network's newly elected president, André Brack, a research director at the molecular biophysics laboratory of CNRS, the French national reseach agency, in Orleans. "Ten years ago, there were no good chemical and physical arguments for life being anything other