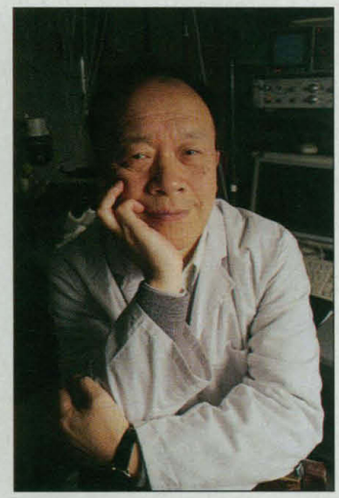
CHINESE ACADEMY OF SCIENCES

Institutes Reinvent Themselves As Part of Well-Funded Reform

BEIJING—Deng Maicun seems an unlikely leader of a revolution at the Chinese Academy of Sciences (CAS), which operates the country's premier network of research laboratories. The 39-year-old chemical engineer lacks a doctoral degree and admits he isn't at the cutting edge of research in his field. But as the new director of the Dalian Institute of Chemical Physics in northeastern China, he's a pivotal figure in a massive reorganization that aims to turn CAS into a lean, mean, merit-based research machine and into a model for research across the country.

The Dalian institute is one of 12 projects approved in November by China's governing body, the State Council, as part of a 3-year, $650 million effort known as the Knowledge Innovation Program. The sweeping initiative groups 40 of CAS's more than 120 institutes into nine megafacilities and turns Dalian and two other prominent institutes into test-beds for a slew of management reforms.* In addition to lopping 38,000 positions from the existing CAS staff of 68,000 by 2010 and eliminating lifetime tenure, the reforms are meant to relieve institutes of responsibility for nonresearch activities such as housing and medical care and to give scientists more authority over personnel decisions (see sidebar). The new program is also a vote of confidence in the leadership of CAS president Lu Yongxiang, a mechanical engineer who has promised to revamp operations so that institutes can better contribute to the world's store of knowledge and to the country's economic growth (*Science*, 30 January 1998, p. 649).



Well-placed. Wu Chien-ping is in line to head new Shanghai academy.

In time, the reforms should produce savings. But implementing them requires a large up-front investment. The new program represents a doubling of CAS's annual operating budget, although it falls short of CAS's initial request for $800 million. The funds will buy equipment and raise salaries for existing staff and up to 300 talented young Chinese scientists lured back from positions overseas. In addition, a large chunk will be used to cushion the blow to laid-off workers. The lavish support, CAS officials confess, puts them in the hot seat. "On one hand, we need the money badly to carry out in-depth structural reform," says CAS vice president Yan Yixun. "On the other hand, we feel a great amount of pressure because we cannot use a lack of money as an excuse if we fail to come up with tangible results."

The Dalian institute is the first of the CAS projects off the mark. In November, it received a down payment on a $9 million award meant to help it downsize from 800 to 150 fixed positions. Deng says his primary job is "to create a good living and research environment for the institute." And giving scientists a major voice in personnel decisions, he adds, is the key to cutting through the red tape and cronyism that stand in the way. This fall, a first-ever committee elected by researchers chose 10 laboratory heads to oversee the hiring or rehiring of staff. The laboratory heads, like the institute director, will be elected every 4 years, and those who serve two terms running will receive permanent positions. The rest of the research staff will be put on renewable 2-year contracts.

The new lab chiefs also represent the next generation of scientific leadership. The competition was limited to those 56 or younger, and youth ruled: Eight of the 10 heads are under the age of 40. At the same time, however, nearly all the jobs went to in-house candidates. Deng, who came up through the institute's ranks, says that tight deadlines prevented the institute from advertising the lab chief slots. As a result, only one outside scientist—who heard of the competition via word of mouth—even put in a bid. "We will do our best to invite outside applications for the next term," says Feng Aisheng, office

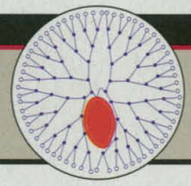
CREDIT: RAY CRANBOURNE

* Other megainstitutes include: in Shanghai, Applied R&D (electronics and materials); in Beijing, Mathematics, Information Science, Materials Science, and Earth Sciences; in Lanzhou, Natural Resources and Environment; in Shenyang, Advanced Manufacturing; and an astronomical observatory using facilities in Nanjing, Shanghai, Xian, and Yunnan. Other model projects include the Theoretical Physics Institute in Beijing and the Nanjing Institute of Geology and Paleontology.

Neuroscience Institute Breaks New Ground

Bai Lu of the U.S. National Institutes of Health (NIH) flew to Shanghai in the spring of 1996 looking for someone to help him and two other Chinese-born, U.S.–trained neurobiologists set up a joint lab there. His success resulted in regular exchanges and a string of papers. But the trip did much more than create a scientific partnership: It planted the seeds for a new institute that aims to become not only a world-class research facility but also a model for how China can manage science more creatively. "It's a rare opportunity for China to forge ahead in neuroscience," says Mu-ming Poo, a 50-year-old biologist at the University of California, San Diego, who will serve as the institute's part-time director. "But it has to be done right."

The Chinese Institute of Neuroscience (CIN), which won final approval from the government in November, will be unlike any existing institute. Although housed initially at the Shanghai Brain Research Institute, CIN will be independent of its host and enjoy considerable autonomy from its parent, the Chinese Academy of Sciences (CAS). Its budget will allow up to 30 senior scientists to operate their labs to Western standards, including a start-up package approaching $300,000, plus $100,000 a year in running expenses and salaries three or four times the norm in China. The money comes from an un-



manager at the institute.

Although senior scientists recognize the need to make room for fresh talent, some say that a rigid adherence to age restrictions is counterproductive. Yi Baolian, 60, a member of the selection committee, wasn't happy about being removed as head of a key national research project involving scientists at nearly a dozen institutes. "There was only 2 years left, and it was such a big project," he says. "Why couldn't they let me keep my position? Or they could find me an assistant if they think me too old." After losing on appeal, Yi says he has offered to help coordinate work among the various partners.

Moving target. Dalian's Deng Maicun seeks greater mobility for scientists.

CREDITS: (TOP TO BOTTOM) DICP/CAS; UCSD

The proposed Shanghai Academy of Life Sciences (SALS) appears to be furthest along in figuring out how to create a CAS megainstitute. Tang Zhangcheng, former director of Shanghai's Institute of Plant Biology and deputy head of the academy's preparatory committee, says a key to success is streamlining the duties of the director: "In the past, directors had too much to worry about, from seeking research funds to taking care of a funeral." Once the reforms are in place, he adds, "institute directors will have no pretext for not doing their job."

The structure of the SALS, still under review by CAS, would bring together eight biology-related CAS institutes—in biological chemistry, cytology, physiology, brain research, medicines, plant biology, insects, and biological engineering. The research portfolios of each institute would remain independent, but SALS would oversee operating budgets and handle such support functions as real estate, libraries and information networks, and the care of laboratory animals. The current director of the brain research institute, Wu Chien-ping, is in line for the top post at SALS.

To allow the institutes to focus on their core task—producing good science—some usual mixture of sources: CAS, the Ministry of Science and Technology (MOST), and the Shanghai municipal government. Most striking of all, however, is the government's commitment to a hands-off management policy: The institute can recruit throughout China and can set its own administrative policies on everything from ordering supplies and equipment to letting grad students burn the midnight oil.

"The vice premier [Li Lan-qing] promised us that people would have complete freedom to move," says Lu, 41, who heads the synaptic plasticity unit at NIH's National Institute of Child Health and Human Development. "It's also important that scientists set the rules."

Although the new institute will be run strictly on merit, its origins rest on old ties. The idea for a joint lab came from Yi Rao, a neurobiologist at Washington University in St. Louis, Missouri, and Lu's colleague at Shanghai Medical University. The third partner, Lin Mei of the University of Virginia, Charlottesville, is a former colleague of Linyin Feng of the Shanghai brain institute, who manages the lab. The success of that collaboration led the brain institute's director, neurophysiologist Wu Chien-ping, to ask the trio to think about creating a Western-style research institute. Lu brought in Poo, his mentor in the late 1980s at Columbia University and a leader in studying the mechanisms of synaptic formation and activation, to draw up a proposal.

Poo knew what he wanted. "It had to be a new institute, the appointments had to be merit-based, and there had to be steady support," says Poo. The government's response to the proposal, submitted this summer, came with unprecedented speed. CAS officials liked the idea but didn't have sufficient resources to bankroll it. So government officials created a new administrative entity that allowed them to invite other partners. MOST and Shanghai city quickly joined the team.

"In addition to the increased funding, the status gives us a lot more freedom," says Mei. "The existing rules don't apply." By November everyone had signed off, and the U.S.–based scientists began spreading the word. The project has also received a boost from the first-ever Gordon Research Conference in China, a 5-day session held last fall in Beijing that was co-chaired by Lu and Wu.

Mei credits Wu with shepherding the new institute through the many layers of bureaucracy. Wu, in turn, says that Poo's participation made it an easy sell. "The proposal came from a world-renowned neuroscientist," he notes, "which greatly increased its chances of success." Marc Caron, a Howard Hughes Medical Institute investigator at Duke University, calls Poo "a superstar, scientifically," and Carla Shatz, an HHMI investigator at the University of California, Berkeley, notes that Poo's "talent and energy level will be a real shot in the arm for Chinese neuroscience."

A team approach. Mu-ming Poo, upper left, will head the institute, which grew out of a joint Shanghai neurobiology lab set up by, from left, Bai Lu, Yi Rao, and Lin Mei.

Poo plans to spend 3 months a year in China and to leave day-to-day scientific operations in the hands of a strong deputy. He says the government's pledge of 10 years' support allows plenty of time to build up the institute. He's also confident that its track record—measured in top-flight journal publications and graduate students trained—will warrant continued government support as well as private funding. And he hopes that success will be infectious. "We may be an isolated island [of excellence] now," he says. "But if we succeed, I hope other institutes will follow in our footsteps." **–JEFFREY MERVIS**

With reporting by Li Hui in Beijing.

support functions will be spun off. Outside companies are expected to take over such nonresearch services as transportation, and a separate office is planned to handle state issues such as Communist Party affairs, trade union membership, and family planning. Institutes would no longer provide apartments or medical care for their employees, although they would still partially subsidize the cost of housing and health insurance.

CAS plans to appoint the directors of all the new megafacilities as well as the heads of individual institutes. But it is treading carefully around a proposal to create an outside board of directors that would set broad policy for the Shanghai academy and serve as a model for other clusters. "The government needs to think it over, and that takes time," says CAS's Yan, noting that the proposal involves the use of state assets.

But time is a precious commodity. The government grant covers only the first of a scheduled three phases of reform through 2010. And funding for the rest of the restructuring depends on a successful transition to a more productive, merit-based system of managing research. Deng knows that the clock is ticking and that his youth and lack of scientific stature are seen as disadvantages. But he believes his 10 years' experience as a manager has prepared him for the task.

"Good scientists do not necessarily make good administrators," he says. "To enliven research, the most important thing is to allow a freer mobility of researchers. And I promise to make that happen in my institute." **–LI HUI**

Li Hui writes for *China Features* in Beijing.

GENETICS

Which Jefferson Was the Father?

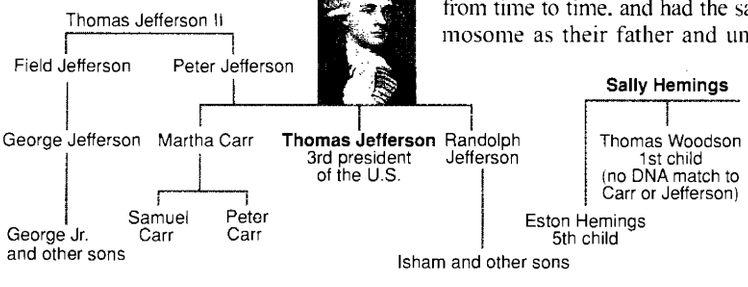
The claim that Thomas Jefferson fathered at least one child by his slave Sally Hemings got a big boost in credibility last November when scientists published some stunning new data. A U.S. pathologist and a group of prominent European molecular biologists announced in *Nature* that they had found DNA sequences in the Y chromosome of the Jefferson family that matched DNA from the Hemings family. The finding set off a flood of news reports declaring that the third U.S. president had, as rumored, fathered an illegitimate child by Sally Hemings. But now the authors of the report say the evidence for that is less than conclusive.

In responding to letters in this week's issue of *Nature*, lead author Eugene Foster—a retired pathologist in Charlottesville, Virginia—and co-authors make it clear that the data establish only that Thomas Jefferson was one of several candidates for the paternity of Eston Hemings, Sally's fifth child. However, they argue that, because Jefferson was Hemings's owner and lived with her at the Monticello plantation outside Charlottesville, "the simplest explanation" is that he was indeed the father.

Meanwhile, the Jefferson data have taken on a political spin. Reed Irvine, director of the conservative organization Accuracy in Media, based in Washington, D.C., claims that the news media purposefully distorted the results of Foster's study. In his current newsletter, Irvine says the news was released with "impeccable timing" to give comfort to President Bill Clinton on the eve of the U.S. national elections last November. Irvine thinks that journalists used the report to suggest that Jefferson "also had a problem with sex," thereby minimizing Clinton's affair with Monica Lewinsky.

Foster describes the conspiracy theory as "ridiculous," but he and his colleagues decided, he says, that they needed to respond publicly to several other points made by critics. One of these is Herbert Barger of Fort Washington, Maryland, a genealogist and husband of a Jefferson family descendant. He helped locate living members of the Jefferson family and persuaded them to donate blood to the DNA study. Not only did the authors neglect to mention his help, Barger says, they completely ignored a plausible theory he advanced.

Barger argues that the most likely father of Eston Hemings is not Thomas Jefferson, who was 65 at the time Eston was conceived, but Jefferson's brother Randolph, 12 years his junior, who lived 20 miles away. Other candidates, Barger suggests, are Randolph's sons, all of whom lived near Monticello, visited from time to time, and had the same Y chromosome as their father and uncle. Barger



CREDITS: (TOP) NASA; (BOTTOM) STOCK MONTAGE

Paternity dispute. DNA analysis ruled out Samuel and Peter Carr, but established that one of the Jeffersons was the father of Eston Hemings.

ScienceScope

See You in Court Six women—including a scientist and several technicians—say that Lawrence Livermore National Laboratory discriminates against its 3000 female employees by paying them less than men and denying them promotions. On 23 December, they filed suit in California state court against lab director C. Bruce Tarter and the Board of Regents of the University of California, which operates the nuclear weapons facility for the Department of Energy. "The regents and management at the lab have known about this problem for a very long time and have simply refused to take appropriate action," claims lead plaintiff Mary Singleton, a chemist who worked at Livermore for 22 years before retiring in 1997. Lab officials aren't commenting on the suit, which will get a first hearing later this year.

An AXAF By Any Other Name NASA has given its tongue-twisting Advanced X-ray Astrophysics Facility a more user-friendly name. The $2 billion space observatory, due to be launched this spring, has been christened the Chandra X-ray Observatory, after the late University of Chicago astrophysicist and Nobel laureate Subrahmanyan Chandrasekhar. An Idaho high school student and a California teacher independently suggested the name, which means "moon" or "luminous" in Sanskrit.

Tritium to Go Some researchers and arms control advocates aren't happy with Energy Secretary Bill Richardson's decision to use two commercial nuclear power plants to produce the tritium gas needed to keep U.S. nuclear weapons potent. On 22 December, Richardson announced plans to start producing tritium by 2005, if needed, at the Tennessee Valley Authority's (TVA's) Watts Bar and Sequoyah plants in Tennessee. The plants would rebuild the U.S. stockpile, which has been dwindling by 5% per year since production ended in 1988. But critics say the move undermines a long-standing policy against using civilian reactors to make military materials. It also dashed the dreams of some scientists, who had hoped Richardson would reopen a mothballed research reactor in Washington state or build a new linear accelerator in South Carolina (*Science*, 4 April 1997, p. 28). Richardson said that the TVA facilities were the cheapest option and would allow the government to buy tritium on an as-needed basis.