PAKISTAN

Shake-Up in Nuclear Weapons Program

NEW DELHI, INDIA—Pakistan has removed its two top nuclear scientists as part of a major reshuffling of the country's nuclear weapons program. Observers see the move as a signal that the military government is trying to conform to global norms on the management of nuclear material as well as distance itself from a controversial figure regarded as the "father of the Islamic bomb."

Glory days. Abdul Qadeer Khan was honored in 1998.

On 10 March the government announced that Abdul Qadeer Khan, head of the country's major nuclear weapons research lab, and Ishfaq Ahmad, head of the Pakistan Atomic Energy Commission (PAEC), were being made special science and technology advisers to the chief executive, General Pervez Musharraf. The government is also combining separate nuclear weapons research programs at the lab and commission under a new entity, the National Defense Complex (NDC), leaving the commission to manage civilian nuclear activities.

"It's a positive step forward in many respects," says David Albright, president of the Institute for Science and International Security, a Washington, D.C.–based arms control organization. "It puts a fence around the military program, and it makes possible an open and safeguarded civilian program. In addition, anything that takes Qadeer Khan out of the picture makes me happy."

The announcement came as United Nations Secretary-General Kofi Annan was visiting Islamabad to try to ease Indo-Pakistani tensions. Although the government labeled it as a promotion, Khan has said that he will not accept the appointment. "Khan was surprised at the news and is very unhappy," says Pervez Hoodbhoy, a professor of high-energy physics at Quaid-i-Azam University in Islamabad. Khan told Pakistani journalists that he will instead pursue "social welfare," often a code for seeking public office.

Khan has headed the Khan Research Laboratories (KRL) in Kahuta since returning from the Netherlands in the mid-1970s, where he was trained in metallurgy and worked for an international nuclear power consortium. He is credited with setting up Pakistan's uranium enrichment facilities, which enabled it to build the nuclear bombs that Pakistan exploded in May 1998. Albright says that Khan was given extraordinary freedom to carry out his work, which some have alleged skirted or ignored international law, and that the new structure, by putting the lab under the NDC, is likely to provide more institutional oversight. "[Khan] has not been accountable to anyone in the government with the technical expertise to know what was going on," says Albright.

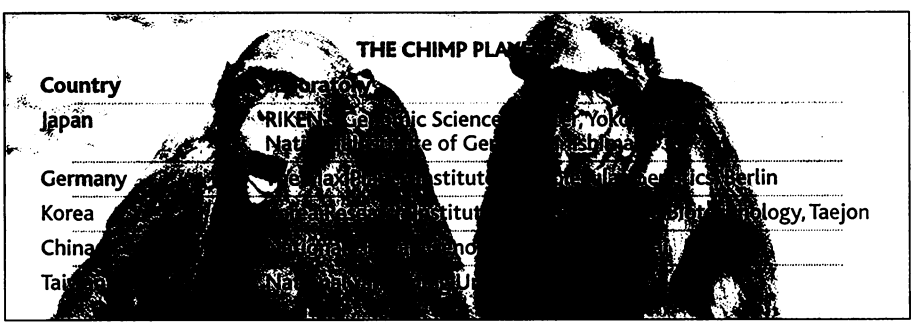
Khan will be succeeded at KRL by Javed Mirza, an experimental nuclear physicist who is now deputy chair of the lab. Pervez Butt, a nuclear engineer, takes over for Ahmad as head of the slimmed-down PAEC. "Both men are experienced and competent professionals from inside the establishments that they are now going to lead," says Abdul Nayyar, a physicist at Quaid-i-Azam University.

–PALLAVA BAGLA

GENOMICS

Chimp Sequencing Crawls Forward

TOKYO—An international team of researchers is cobbling together an effort to sequence the chimpanzee genome. So far, however, the big global genome players aren't joining the party. Scientists from Japan, Germany, China, Korea, and Taiwan used a meeting here last week to promote the project, while interested U.S. researchers were dubious that their government would provide a significant portion of the estimated $100 million needed to complete it.



Yoshiyuki Sakaki, director of the Human Genome Research Group at RIKEN's Genomic Sciences Center in Yokohama, said that sequencing the chimp genome should help to answer basic questions about evolution. Only a chimp-human comparison "will show what makes humans human," he says. Ajit Varki, a biochemist at the University of California, San Diego, believes that the knowledge could also prove invaluable in treating a number of human diseases, including AIDS and Alzheimer's, that are very difficult to model in animals. Varki, who is studying the evolutionary implications of a gene that chimps possess but humans don't (see p. 2340), co-authored a public letter last summer urging the U.S. government to climb aboard (*Science*, 25 August 2000, p. 1295). But no government funding has been forthcoming from the United States, the United Kingdom, or France.

Rumors were rife at the meeting that Celera Genomics of Rockville, Maryland, one of two teams that sequenced the human genome, might turn its large bank of sequencing machines over to the chimp genome. But Celera's president, J. Craig Venter, told *Science* last week that his company has no plans to do so. "[The chimp sequence] is too close to [humans] to be really useful at this stage," Venter says.

That lack of interest has left a niche for groups with smaller sequencing operations. Rather than join U.S. efforts to sequence the mouse, Sakaki says, "we wanted to do something where we could play a bigger role." That sentiment was echoed by representatives of other smaller sequencing centers. Park Hong-Seog, a molecular biologist at the Korea Research Institute of Bioscience and Biotechnology in Taejon, says his colleagues feel they largely missed out on the human genome sequencing effort. "Participating in the ape genome sequencing effort would be an attractive way for us to contribute," he says.

Japan is taking the lead. Next month RIKEN's Genomic Sciences Center will get $2 million to construct a map; scientists hope for additional funding in fiscal 2002 to begin sequencing. The Max Planck Institute for Molecular Genetics in Berlin has also gotten approval for a chimp sequencing project; Hans Lehrach, a molecular biologist at the institute, says they, too, are negotiating funding levels. Other centers are just starting to line up support.

Sakaki expects to divide up the work following a formal cooperative agreement "within a few months." For example, RIKEN and the German group collaborated on sequencing human chromosome 21 in part to extend work on diseases, including Down syndrome, associated with this chromosome. The two groups hope to repeat that collaboration on the equivalent portion of the chimp genome, which is chromosome 23.

–DENNIS NORMILE

CREDITS: (TOP TO BOTTOM) K. M. CHOUDARY/AP; KENNAN WARD/CORBIS (CHIMP PHOTO)