



RUSSIA'S CLOSED NUCLEAR CITIES and their former names and post office box numbers.

taken to the streets to demand back pay that the government hasn't provided for months. Russian newspapers have reported that guards at nuclear laboratories have left their posts to find food and have admitted strangers in exchange for a pack of cigarettes or a bottle of vodka.

In November, after visiting some of Russia's nuclear centers, Senator Lugar called on DOE to request more funds in fiscal 2000 to expand NCI. "We cannot allow our great success in dismantling weapons and securing materials to be negated by the possible flight of weapons scientists to rogue regimes

and terrorist organizations," Lugar said upon his return to Washington.

The US will lay out more than \$450 million this year, mostly in Nunn-Lugar money to disarm Russia's nuclear weapons system. The Washington-based Federation of American Scientists has held several workshops since 1995 to help Russia's three "plutonium cities" (Chelyabinsk-65, Tomsk-7 and Krasnoyarsk-26) to find economic alternatives for separating weapons-usable plutonium into reactor fuel. The European Union, for its part, spent \$104 million last year on nuclear safety in the former Soviet Union, including two new

centers to train 1000 monitors to keep tabs on Russia's nuclear material.

Meanwhile, tons of highly enriched uranium and plutonium at Russia's nuclear weapons laboratories, research centers and scientific institutes are now considered more vulnerable to theft and diversion because of the country's economic and political disintegration. The situation was worsened by the devaluation of Russia's ruble on 17 August, which effectively diminished the already meager salaries of scientists, technicians and security guards at nuclear sites and further drained domestic funds available for protecting nuclear materials.

"The Russian economy is the world's greatest proliferation threat today," says William C. Potter, director of the Center for Nonproliferation Studies at the Monterey Institute of International Studies in California. Making NCI work will require sustained investment by both the US and Russia, says Matthew Bunn of Harvard's Belfer Center for Science and International Affairs. "Nothing else the United States can do to prevent nuclear proliferation will be enough if the essential ingredient of nuclear bombs—the experience needed to make them—become available on the world's nuclear black market," he says.

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Richter's Impending Retirement as SLAC's Director Deepens Concerns about Changing the Guard at DOE Labs

The national laboratories operated by the Atomic Energy Commission and later the Department of Energy (DOE) have been lucky to be run by a resourceful bunch of physicists. From Robert Oppenheimer at Los Alamos and Herb York at Lawrence Livermore to Wolfgang Panofsky at the Stanford Linear Accelerator Center (SLAC) and Robert Wilson at Fermilab, a generation of physicists who had participated in the Manhattan Project pointed the direction and set the standard for the new labs. In the past three years, their successors have been exiting to make way for a new generation of lab directors, who, many hope, will have the vision and vigor needed at a time when political support of DOE and its facilities are far from assured.

The changing of the guard is symbolized by the announcement on 23 November that Burton Richter intends to retire next August as director of SLAC. "Burt's a class act, and he will be hard to follow," says Martha Krebs,

who heads DOE's Office of Science.

Now 67, Richter, SLAC's director for the past 14 years, will leave a vacancy that requires a charismatic successor. Richter is unyielding on his departure. "This is the right time to step aside and give a younger generation the chance to do some new things," says Richter. "Periodically, a research lab needs fresh minds."

After receiving his PhD from MIT, Richter came to Stanford University as a postdoctoral student in 1956 to work at the 1 GeV linac. He shared the 1976 Nobel Prize for Physics with Samuel C. C. Ting of MIT for their independent and simultaneous discovery of a massive particle with a lifetime 10 000 times longer than might be expected. Richter's discovery had been made with a new kind of collider, the Stanford positron-electron accelerating ring, or SPEAR, which his group had built. He called the particle " ψ " because it was the only Greek letter that hadn't already been assigned to an elementary

particle. Ting named it "J." They agreed to the label of J/ψ , for the first particle to contain a charm quark. A decade after the discovery, Panofsky retired as SLAC's director and Richter took over.

Stories that Richter is being forced out or is angry at DOE for not including his concept of the Next Linear Collider in its budget for fiscal 2000 are dismissed by Krebs as "just plain wrong." For his part, Richter denies that his decision resulted from any disagreements with DOE officials. He says he had been thinking about retirement for a few years, and late this summer he informed Gerhard Casper, Stanford's president, of his intention to step down. They agreed that no announcement would be made until DOE renewed Stanford's contract to operate SLAC, and when that took place last month, Richter issued his statement.

To be sure, Richter is not known for silently suffering rebuffs by DOE officials. When jobs or facilities are at

stake, Richter has sometimes headed straight to Capitol Hill. "I can always depend on Burt to speak the truth," says Krebs. "When he's not charming, he's usually winning."

Richter's announcement came just weeks after Energy Secretary Bill Richardson praised him at the dedication of SLAC's Asymmetric B Factory. (See the story on page 22.) Completed on time and on budget, at a cost of \$177 million, the B Factory will begin experiments next April or May.

Richter's impending retirement increases speculation about the recent spate of departures by lab directors. One of the first lab directors to leave in recent years was Alan Schriesheim, who retired after 12 years as director of Argonne National Laboratory on 1 July 1996, which happened to be the 50th anniversary of the lab's founding. Schriesheim, an organic chemist who had been an executive at Exxon Research and Engineering for more than 30 years before his appointment at Argonne, had become exasperated with the irksome micromanagement from DOE headquarters and field offices and the budget cuts handed down by Congress. He was replaced by another industrial scientist, Dean Eastman, an electrical engineer who had climbed the corporate ladder at IBM to become vice president of systems technology and science research (see PHYSICS TODAY, August 1996, page 58). But Eastman left after only 14 months to become a professor at the University of Chicago, which manages Argonne, and he was succeeded by Frank Fradin, a solid-state physicist whose entire career has been in research within the lab.

Early in 1997, Nick Samios stepped down after 15 years as director of Brookhaven National Laboratory. Samios joined Brookhaven in 1959, soon after getting his PhD in nuclear physics from Columbia University. His resignation occurred amidst the public controversy that flared up when trace amounts of tritium were detected in groundwater at the site (see PHYSICS TODAY, May 1997, page 45). The source of the radioactive tritium was quickly identified as the spent fuel storage tank of Brookhaven's High Flux Beam Reactor, which had been shut down in 1996 for refueling and has remained shut since. DOE's Secretary at the time, Federico Peña, responded quickly to the outcries of environmental activists and political opportunists and sacked the lab's managerial organization, Associated Universities Inc, which had overseen the lab for 50 years. Peña appointed John Marburger, a physicist and a respected president emeritus of the State University of New York at Stony Brook, to run the

place. With the sensitivity to public and political issues gained as a university president, Marburger has won the confidence of the local and state communities, reassuring the public that Brookhaven can be relied upon to be an environmentally sound, humanely safe and reliable neighbor while it engages in important science and technology.

Within months after Samios left, Siegfried Hecker, a nuclear metallurgist, resigned from the directorship of Los Alamos, also under fire from community leaders, who had sniped at him



RICHTER: 'A class act, hard to follow.'

over staff layoffs, radioactive wastewater runoffs and a rash of serious accidents that left one man dead and another in a coma. After 12 years as director, Hecker, now 56, returned to plutonium research in the lab's stockpile stewardship program. He was succeeded by a lab insider, John Browne, a nuclear physicist (see PHYSICS TODAY, December 1997, page 55). Hecker was 42 when he accepted the director's job at Los Alamos, intending to hold the post only a few years. "I spent the first five years learning the job," says Hecker. "The challenges of a nuclear weapons lab are much different from those of labs like Argonne or SLAC. During my time as director, budgets [for nuclear weapons] fell with the end of the cold war and the lab came under intense scrutiny [for environmental waste]. The job of director is not unlike that of a university president. The demands are almost identical: interfaces with the staff or faculty, the trustees, the public, the legislature, the press. It's little wonder that the tenure of university presidents is now, on average, just five years."

Last spring, Fermilab's director for the past decade, John Peoples Jr, announced that he would be retiring next July. Unlike many of his counterparts

at the other national labs, Peoples had a good idea of the job, having served as deputy director to Leon Lederman in 1987-89. Labs such as Fermilab or SLAC don't have an abundance of skilled managers, observes Tom Kirk, associate laboratory director for high energy and nuclear physics at Brookhaven. Kirk understands the stoichiometry of DOE's national labs, having spent time at Argonne, Fermilab, the ill-fated Superconducting Super Collider and now Brookhaven. "There are few young physicists waiting in the wings to step on stage," he says.

"It's not a very appealing job," Peoples contends. "A few years ago, the directors of several national labs decided we were hitting the wall at the same time. We were reaching the geriatric limits and DOE was becoming increasingly dysfunctional. Congress was talking about destroying or dispersing DOE. More than ever, the department was becoming a house of many mansions. Directors were there to be pushed around by different offices, each with different expectations and each reporting to different high-level officials."

"DOE is not well integrated," admits former Deputy Energy Secretary Charles B. Curtis. "The one thing that holds it mostly together is the national laboratory system." But its methods to manage the labs effectively have often resulted in more red tape, he contends.

It's not surprising, then, says Peoples, that search committees are having trouble finding replacements for retiring directors. Universities Research Associates, the Washington organization of 87 universities that oversees Fermilab, has interviewed more than a dozen possible successors to Peoples.

Now Stanford's Casper also has appointed a search committee to fill SLAC's top spot. Richter's successor, says Sidney Drell, who recently retired as SLAC's deputy director, will start from a strong position. "Under Burt's direction, SLAC has excelled at research fields," he notes, "especially with the linear collider Burt pioneered. He also has built a vision for the future with the newly dedicated B Factory and ongoing efforts, in collaboration with other American institutions and Japanese physicists, for new frontiers with electron-positron colliders on the ground and the large aperture gamma-ray telescope in space."

Says Krebs: "It's clear to us all that the individuals who follow Burt and John Peoples will need to be the leaders that the times demand."

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