Congress will be in the middle of the rough-and-tumble."

Though Hanson worked for an authorization committee in the House, he admits that the appropriations committee takes precedence in shaping annual budgets ". . . and it sets the priorities and that's it." Even so, he observes, "the appropriations committee doesn't operate in a vacuum. Sometimes they'd like to, and sometimes we on the authorizing committees accuse them of ignoring us. But there's certainly interaction—in part through the staffs of various committees, in part through strong members. Nevertheless, the authorization process is not irrelevant, because we attend to a lot of matters that get picked up by other committees and other members. The give-and-take of our hearings and the information gathered at our hearings get into the negotiations for the final budget."

The House science committee's main emphasis, says Hanson, is on space because of the interest of constituents, the size of NASA's budget and "the long-range impact on the country of sending humans into space, colonizing the moon and exploring our solar system." Other leading issues are industrial competitiveness, science and mathematics education, advanced technologies and global climate change—"in that order," says Hanson.

Can members of Congress be expected to deal with such vexing problems? "Nobody takes the Graduate Record Examination to become a member," states Hanson. "Still, in general, members are really quite bright. There are exceptions, of course, but by and large they are quick studies. They know they better understand something about what they're talking about or they will look foolish in a hurry. . . . I think the professional staff on the committees have the technical competence to keep members informed—in foreign affairs, domestic matters, defense activities, scientific developments and so forth. On the science committee there are roughly 15 PhDs and a somewhat fewer number of MSc's. Most of the members rely on staff to tell them what's sensible and what's not sensible. However, it impressed me to see how much technical material members actually assimilated. Someone once tried to organize seminars on science for members and their staffs—and nobody attended."

Would Congress be better if scientists were elected, which is what happens in the Soviet Congress of People's Deputies? "Scientists like Andrei Sakharov amd Roald Sagdeev and Vitalii Goldanski, who have served in the Soviet parliament, are among the finest minds of the 20th century. These are not ordinary scientists. We are not likely to get their counterparts in our House or Senate--the likes of Leon Lederman or Willie Fowler or John Bardeen. I'd like to see them in our Congress. They're smart fellows with lots of charm and charisma—and Nobel Prizes to boot."

Just as politics isn't a top priority of scientists, science is not a top item on the agenda of Congressmen, says Hanson. "It's about everybody's fifth or sixth priority or maybe even lower than that. The first priority is getting reelected, and the second is dealing with the problems of their constituents so that the member can be reelected. Then, what member could be against veterans' benefits or low-income housing or child care and food stamps? Despite these concerns, science and technology have no enemies. The science budgets in the past decade are proof of that, even in these times of fiscal constraints and competing claims. I think science has done extremely well under the circumstances."

Now retired, Hanson has been welcomed back to the University of Florida. He was awarded the titles of executive vice president emeritus of the university and professor of physics. As such, he gives colloqiums on the relationship of physics and politics, and he serves on several university advisory committees. "The net effect of my honorary position here," he says, "is to provide me with an office in the physics department and to allow me free parking."

Hanson was succeeded by Robert C. Ketcham, a lawyer who had been an aide to members of Congress from 1967–1972, staff attorney to the National Resources Defense Committee in 1972–1973 and special council to subcommittees of the House science committee and to the full committee since 1974.

—IRWIN GOODWIN

WASHINGTON INS & OUTS

DREAMS OF FIELDS TAKE HIM TO MCC; JUDD LEAVES SDI; OSTP AND NSF ARRIVALS

The abrupt removal of **Craig I. Fields** as director of the Defense Research Projects Agency last April set off a political firestorm that still burns on Capitol Hill. Members of Congress and executives in the electronics industry expressed outrage in letters and speeches when they learned that Fields, after months of quarreling between him and senior Bush Administration officials, had been told he would be fired if he didn't resign from DARPA or accept reassignment. The episode that apparently led to the Pentagon's action was Fields's decision to invest $4 million of DARPA's $1.1 billion annual budget in Gazelle Microcircuits, a tiny California start-up company that makes gallium arsenide chips, in exchange for a share of the profits and royalties. But the furor over Fields goes to the heart of the question whether the US should have an industrial policy.

As DARPA's deputy director for research since 1986 and as its director since 1989 (PHYSICS TODAY, June 1989, page 43), Fields propelled the little agency into such high-risk technologies as artificial intelligence, parallel-processing computers, lightweight satellites and high-definition television—presumably intending to transform it into an American MITI, similar to Japan's Ministry of International Trade and Industry.

The idea of a civilian DARPA that would pick industrial "winners and losers" was an issue in the second term of the Reagan Administration, but it has been rejected in the Bush era by an influential circle that includes John H. Sununu, the White House chief of staff, Richard Darman, the budget director, and Michael Boskin, the chairman of the Council of Economic Advisers. While DARPA supports programs that help industry in general, such as its $100 million annual contribution to Sematech, which is working on ways to improve the manufacture of advanced semiconductors (see page 78), the White House has opposed on ideological

grounds any government attempt to back esoteric new technologies that it believes should be left to the nation's marketplace.

Some in Congress think differently. A day after the Pentagon acted against Fields, 11 members from both parties, including Representatives Mel Levine of California, Dick Gephardt of Missouri, Don Ritter of Pennsylvania and Edward Markey of Massachusetts, along with Senators Al Gore Jr of Tennessee and John Heinz of Pennsylvania, demanded his reinstatement in a letter to Deputy Defense Secretary Donald Atwood Jr, a former General Motors executive. They called the decision to remove Fields "at best shortsighted, at worst a major breach of our future economic security." The letter writers claimed that Fields's "innovative" use of Federal research funds to support "cutting-edge technologies" had made him "a symbol of the kind of industry–government cooperation that will be crucial to revitalizing the US industrial base."

Other Congressmen took to the floors of their respective chambers or to the television talk shows to hail Fields as a "true patriot" and a "lonely hero" in the battle to stop the erosion of the nation's advanced technology industry against the competition from Japan and Western Europe.

Indeed, Fields was already a favorite of many on Capitol Hill after he sent a letter last year to officials at the Commerce Department recommending a Japan-style industrial policy. "We need a national religious conversion," he wrote, because "the American way" is no longer good enough. At the same time, he took a swipe at "highly placed individuals who think nothing is wrong"—presumably a jab at senior White House executives who sometimes lecture businessmen on the virtues of 18th- and 19th-century Americans as "risk-takers" who endowed the country with a competitive market economy.

Fields, a former Harvard professor of mathematics who joined DARPA in 1974, didn't fret for long over his transfer to a desk job in Pentagon R&D management. In July the Microelectronics and Computer Technology Corporation in Austin, Texas, announced that Fields had become the consortium's new president. In fact, MCC's chairman and CEO, Grant Dove, a former Texas Instruments executive, said in an interview that he is grooming Fields to become CEO of the organization as early as next year.

Conceived in 1981, when US antitrust laws forbid R&D collaborations among competing companies, MCC originally had 21 member firms—though companies like IBM, Texas Instruments and Cray Research refused to sign on for fear of running afoul of the Justice Department. Over the years, MCC lost some companies and gained others. Now, with antitrust regulations substantially relaxed, MCC has 25 full members, each contributing $25 000 per year and another 20 companies kicking in lesser sums. It now also accepts government funds—though only about 11% of its total income comes from agencies like DARPA, the Air Force, NASA and the National Security Agency. One of the duties assigned to Fields is to expand MCC's research programs and generate more support from government agencies, though, obviously, dealing with DARPA would raise problems of ethical conflict.

The electronics industry is watching MCC's new outreach by Fields with great interest. So are many on Capitol Hill. Senator Heinz says he joined the protest against Fields's demotion because he did not want President Bush to go down in history as the man who presided over America's economic decline. He believes Fields was on the right course for the country's own good.

E. U. Curtiss ("Buff") Bohlen was sworn in on 27 June as Assistant Secretary of State for Oceans and International Environmental and Scientific Affairs, the top scientific post at the department. He succeeds **Frederick M. Bernthal**, who became deputy director of the National Science Foundation on 1 March. When Erich Bloch's six-year term as NSF director ended last August, Bernthal became the foundation's acting director—a title he will relinquish with the arrival of the new director.

Bohlen, a graduate of Harvard, served in the US Foreign Service in East Africa and the Middle East from 1955–1969 and as deputy assistant secretary of the Interior for fish, wildlife and parks from 1969–1977. Since then Bohlen has been associated with various environmental and wildlife groups, most recently as senior vice president of the World Wildlife Fund in Washington. He is the son of the late Charles E. ("Chip") Bohlen, who was a central figure in the US Embassy in Moscow during the early years of the Cold War.

Bernthal received his PhD in nuclear chemistry from the University of California at Berkeley in 1969. He worked as a postdoc in Allan Bromley's lab at Yale for a year before joining Michigan State University where he taught physical chemistry from 1970–1977. He then spent a year as a NATO senior scientist and worked at the Niels Bohr Institute in Copenhagen. On his return to the US in 1978, Bernthal became an American Physical Society Congressional Fellow, working in the Senate office of Howard Baker, the Tennessee Republican. In 1980 he was appointed chief legislative assistant to Baker, then Senate majority leader. As Baker neared retirement, he got President Reagan to appoint Bernthal as a member of the Nuclear Regulatory Commission, on which he served from 1983–1988. In the aftermath of the Chernobyl disaster in 1986, Bernthal led a 12-member interagency group to the Soviet Union to negotiate the first US–USSR nuclear safety protocol. Bernthal joined the State Department in 1988 and led delegations for the Montreal Protocol on Depletion of Stratospheric Ozone and for the United Nations Intergovernmental Panel on Global Climate Change.

O'Dean P. Judd, chief scientist of the Strategic Defense Initiative (PHYSICS TODAY, December 1987, page 59), left the "Star Wars" program in mid-May to return to Los Alamos National Laboratory. At the lab he is chief scientist for defense research and applications, the job he held before going to the Pentagon in October 1987 to succeed Gerold Yonas, SDI's first chief scientist, who is now back at Sandia Laboratories in Albuquerque. Judd remains enthusiastic about the space shield concept, revealed by President Reagan almost as an afterthought to a foreign policy talk on national television in March 1983. Since then, Congress has appropriated some $13 billion to the program. But without Reagan to hype his space-based anti-missile brainstorm, the program is encountering a perilous passage on Capitol Hill.

On 17 October, Senate and House negotiators agreed to slash nearly $2 billion from President Bush's $4.7 billion spending request for SDI in the fiscal 1991 Defense budget. If this sum holds in the Defense appropriations act, it would be the smallest amount in five years and result in restructuring and restricting the program to coincide with the startling transformation in East–West relationships. Senate critics chaffed at the "blank checks" SDI received in the past. The surprising thing is that the both houses are seeking to micromanage SDI for the first time. The bill revises plans for early deployment of "Brilliant Pebbles," a pro-

posed plethora of independently orbiting heat-seeking rockets designed to destroy any adversary's missiles on course to US targets. It allows research but no development work on nuclear weapons for SDI—the vaunted "third generation" of nuclear arms that some weapons designers had hoped to produce. Instead, Congress directs research to proceed on ground-based defenses that would intercept a small number of missiles launched by accident by a terrorist group or a Third World country. Though he is good humored about the changing fortunes of Defense R&D programs, Judd admits to being peeved by the attitude of "Congress-knows-best" about SDI.

In July, President Bush packed off all but one of the 15 members of the Foreign Intelligence Advisory Board appointed by his predecessor. In their place Bush installed five intelligence experts and scientists. The one holdover from the Reagan years is former Senator **John Tower**, a Texas Republican who had been Bush's first choice to head the Defense Department. The Senate scuttled Tower's nomination after widespread stories of drinking and womanizing. Since the board reports to the President only, and does not require Senate confirmation, Bush could name Tower to the the newly constituted panel without Congressional opposition. The others:

▷ **Lew Allen Jr**, vice president of Caltech and director of NASA's Jet Propulsion Lab, who headed the National Security Agency from 1973-78 and was Air Force chief of staff from 1979–1982;

▷ **John M. Deutch**, former undersecretary of the Department of Energy in the Carter Administration and until recently provost at MIT, who is now professor of physical chemistry at MIT

▷ **William G. Hyland**, currently editor of *Foreign Affairs* and onetime deputy director of the National Security Council under President Ford;

▷ **Bobby Rae Inman**, deputy director of the CIA in the Reagan Administration and former head of the National Security Agency, who was the first president of Microelectronics and Computer Corporation, and

▷ **William J. Perry**, chairman and chief executive officer of Technology Strategies and Alliances in Menlo Park, California, and codirector of Stanford's Center for International Security and Arms Control, who had been deputy director of research and engineering at the Defense Department in the Carter Administration.

On 24 July, Energy Secretary James D. Watkins announced the appointment of **Everet H. Beckner**, vice president for defense programs at Sandia National Laboratories in Albuquerque since 1986, as special scientific adviser on the department's weapons activities. Beckner, who earned a PhD in physics from Rice University in 1961, joined Sandia that year and worked in plasma physics, non-equilibrium radiation processes and radiation effects. He is on temporary assignment to DOE from Sandia, where he was responsible for the design and development of nuclear-weapons systems, as well as for their safeguard and security.

Kenneth P. Yale, former special assistant to President Bush and executive secretary to the White House Domestic Policy Council became chief of staff in the Office of Science and Technology Policy. on 1 September. He was selected for the post by OSTP's director, D. Allan Bromley, who also is the President's science adviser. Yale has an unusual background, He got a DDS from the University of Maryland in 1981 and practiced dentistry with the Public Health Service for three years before becoming an instructor at the Georgetown University Dental School for another year. Forsaking dentistry, he studied law at Georgetown and worked part-time as a Washington lobbyist for the American Dental Association. He received his law degree in 1988 and the following year joined the staff of the Senate Republican Whip Alan K. Simpson of Wyoming as legislative counsel. When Bush became President, Yale moved from Capitol Hill to the other end of Pennsylvania Avenue, where the White House is located. At OSTP, Yale replaced **William G. Wells Jr**, who returned to his former teaching position in business administration at George Washington University. Even so, Wells will carry on as a consultant to Bromley's office.

Also at OSTP, three physicists have stepped into new positions as fellows:

▷ **David L. Huber**, on leave as director of the Synchrotron Radiation Center at the University of Wisconsin, is on a nine-month fellowship sponsored by the National Association of State Universities and Land Grant Colleges. He is examining programs in the physical sciences and engineering and in industrial technology. A solid-state physicist, Huber received his PhD from Harvard in 1964 and has been professor of physics at Wisconsin since 1969. He will return to the synchrotron center next May.

▷ **Janice A. Howell**, a supervisory patent examiner in the Commerce Department's Patent and Trademark Office, is reviewing science and mathematics education programs and international scientific matters at OSTP. Howell joined the patent office in 1977 after receiving an MS in physics from James Madison University. At the patent office she supervised 14 scientists and engineers who examine applications for scientific, medical and industrial devices using x rays and gamma rays, infrared and ultraviolet spectrometry, electron beams and nuclear radiation.

▷ **Thomas J. Russell**, a program analyst at the National Institute of Standards and Technology, joined OSTP in September on a one-year Commerce Department fellowship. He earned a PhD in solid-state physics from Tulane in 1972 and worked as a postdoc in the Princeton University materials lab. Russell went to the National Bureau of Standards in 1976 to work in semiconductor electronics. At OSTP he is working on the National Critical Technologies Report, which is to be delivered to the President early in 1991.

Julie H. Lutz, professor of astronomy at Washington State University, became director of the Division of Astronomical Sciences at the National Science Foundation on 1 October. She took the job for one year while the division director, **Laura P. Bautz**, is on sabbatical at the University of California at Berkeley, where she is working on designs of a particle detector that could be installed at the Superconducting Super Collider and investigating developments in optical and radio interferometry.

After he was unceremoniously deposed from his position as head of NSF's science and engineering education directorate last June, **Bassam Z. Shakhashiri** (see PHYSICS TODAY, July, page 54) decided to take a leave of absence from the agency. In September he returned as professor of chemistry to the University of Wisconsin, from whence he came to NSF in 1983. His class in introductory chemistry attracted more than 300 students. Though his nemesis, Erich Bloch, has left the NSF director's office, Shakhashiri prefers to wait until the designated new director, Walter E. Massey, is confirmed by the Senate, possibly in late January or early February, before he appeals the rough treatment he claims he received for his efforts to raise the appropriations levels for education.

—IRWIN GOODWIN ■