

Reagan issues order on science secrecy: Will it be obeyed?

After five years of what sometimes seemed like a guerrilla war fought by the Defense Department against research scientists, it took no less than President Reagan to conclude a peace treaty. Drafted and revised by dozens of officials in the Pentagon and White House, the treaty appeared in the form of National Security Decision Directive 189, signed by the President on 21 September. (See Editorial, page 176.) It was a week later that the policy section of NSDD 189 was announced in a simple news release by his principal press spokesman, Larry Speakes. Like all treaties, this one accommodates conflicting expectations in Washington and in the nation's academic and industrial research communities. For the most part the new policy is a straightforward reaffirmation of Defense Department guidelines for scientific communications, first proclaimed a year and a half ago in a surprisingly unorthodox way—under questioning at a routine hearing of the House Science and Technology Committee (PHYSICS TODAY, July 1984, page 57).

"It is the policy of this Administration," reads the policy section of NSDD 189, "that, to the maximum extent possible, the products of fundamental research remain unrestricted. It is also the policy of this Administration that, where the national security requires control, the mechanism for control of information generated during Federally funded fundamental research in science, technology and engineering at colleges, universities and laboratories is classification. Each Federal government agency is responsible for: a) determining whether classification is appropriate prior to the award of a research grant, contract or cooperative agreement and, if so, controlling the research results through standard classification procedures; b) periodically reviewing all research grants, contracts or cooperative agreements for potential classification. No restrictions may be placed upon the conduct or reporting of Federally funded fundamental research that has not received national security classification, except as provided in applicable US statutes."

The policy statement originally proposed by DOD in 1984 had fewer provisos. The phrases "to the maximum extent possible," "where the na-

tional security requires control" and "except as provided in applicable US statutes" do not appear in the Pentagon's version. Their emergence in the President's order is no mere word game or rhetorical device. "You have to admire the authors of the policy," says a staffer on the House Science and Technology Committee. "The idea that the hawks at the Defense Department and National Security Council would leave any loopholes or ambiguities for militarily useful research to flow freely to the Soviet bloc is so preposterous that it would be amusing if it weren't so serious."

Indeed, in NSDD 189's covering memorandum to Vice-President Bush and heads of departments and agencies, Robert C. McFarlane, the President's national security adviser, pointedly re-

minds them, just in case they may have missed it, that the new policy "preserves the ability of the agencies to control unclassified information using legislated authority expressly for that purpose in applicable US statutes." There are four key laws involved: the Atomic Energy Act for restricting information about nuclear weapons, the Invention Security Act that allows for security classification of patent applications deemed of military importance, the Arms Export Control Act (with its associated International Traffic in Arms Regulations) and the Export Administration Act, which was extended for another four years last 12 July, when Reagan signed a slightly revised law (PL 99-64) eliminating many of the limitations on exports of high-tech items to friendly nations but



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Soviet 'hit list' of leading US defense firms

In its 1985 report titled *Soviet Acquisition of Militarily Significant Western Technology: An Update*, the Pentagon has listed the defense contractors whose research is most prized by Soviet-bloc agents. The number following the firm's name indicates the ranking according to the frequency of Soviet identification of prized technology. The second number indicates the rank by dollar value of DOD contracts.

General Electric	1	4	Sperry	17	20
Boeing	2	5	Goodyear Aerospace	17	45
Lockheed	3	6	Gulf Oil	18	90
Rockwell International	4	3	IBM	19	15
McDonnell Douglas	5	2	Northrop	19	26
Westinghouse	6	14	Signal Co (Garrett)	19	50
Martin Marietta	7	12	Morton Thiokol	19	59
General Dynamics	8	1	Litton	20	13
Allied (Bendix)	9	27	Grumman	21	11
DuPont	10	80	Ford (Ford Aerospace)	22	22
Pratt & Whitney	11	7	Raytheon	23	10
Honeywell	12	21	Singer	23	32
MIT	13	71	Royal Dutch Shell	23	51
General Motors	14	23	LTV	24	16
Hughes Aircraft	15	9	Hercules	24	55
General Tire (Aerojet)	15	35	Aerospace Corp	24	68
AVCO	16	29	Burroughs	24	72

strengthening the authority of the Commerce and Defense Departments to review licenses for shipments of critical goods and transfers of technical data of potentially military value to unfriendly countries, essentially those associated with the Soviet Union in the Warsaw Pact.

Tough order. Classification is the centerpiece of any system for controlling access to information that, if disclosed to unauthorized sources, could be expected to damage the nation's security. By issuing Executive Order 12356 on 2 April 1982, Reagan revalidated the system established in previous orders issued by every president since Truman. Reagan's order is more stringent than the rest, observes John Shattuck, a Harvard vice-president, in his 1984 report, *Federal Restrictions on the Free Flow of Academic Information and Ideas*. Executive Order 12356, writes Shattuck, "gives unprecedented authority to government officials to intrude upon academic research by imposing classification restrictions on areas of research after projects have been undertaken. . . . The . . . order appears to allow classification to be imposed at any stage of a research project and to be maintained for as long as government officials deem prudent."

By contrast with Reagan's policy, President Carter's Executive Order 12065 of 28 June 1978 called for classification of information only if "its unauthorized disclosure reasonably could be expected to cause at least identifiable damage to the national security." It provided for automatic declassification routinely after six years. What's more, the Carter order required that "if there is a reasonable doubt which designation is appropriate, or whether the information should be classified at all, the less restrictive

designation should be used, or the information should not be classified."

Reagan's executive order struck at the main features of Carter's order. As Shattuck put it in his report: "No longer must classifiers weigh the public's need to know against the need for classification." Under Reagan, some 7000 classifiers with rubber stamps possess more discretion—and the opportunity to make arbitrary decisions, according to Shattuck. "Finally, the presumption in favor of openness is reversed. Now, if there is a reasonable doubt about the need to classify, it will be safeguarded as if it were classified and if there is doubt about the appropriate level of classification, it will be given a higher classification." Notwithstanding fears that this may happen, there is no evidence that it has, says a White House official.

Tensions increase. Still, tensions between scientists and the government have increased, provoked by some unseemly confrontations between influential forces in the academic and scientific communities and the government. One of the earliest battles occurred in February 1980, when the Commerce Department forced the American Vacuum Society to disinvite nationals from the Soviet bloc from a conference on magnetic-bubble memories. Later that month, the State Department denied visas to Soviet bloc researchers who sought to attend the Conference on Lasers and Electro-Optical Systems, sponsored by the Optical Society of America and the Institute of Electrical and Electronic Engineers (PHYSICS TODAY, April 1980, page 81). In retrospect, these were mere skirmishes. A historic clash came in August 1982, when Defense Department agents swooped into the annual meeting of the Society of Photo-Optical Engineers the

night before its start and forced the withdrawal of more than 150 of the 626 papers scheduled for presentation.

Many scientists and technologists were enraged. Amid the sound and fury, the National Academy of Sciences issued *Scientific Communication and National Security* (PHYSICS TODAY, November 1982, page 69). A report by a top-level panel of academics, scientists and industrialists headed by Dale R. Corson, president emeritus of Cornell University, it spoke of "security by accomplishment" in the nation's science laboratories as preferable to "security by secrecy."

The Corson panel—financed in part by the Defense Department in the hope of disarming the guns of academe—found, after listening to briefings by the government's intelligence agencies, that indeed there was "a substantial and serious transfer" of US technology to the Soviet bloc, with a "significant portion" damaging to the nation's security. In recent years, Soviet intelligence efforts directed at US universities and other research centers have increased, with accounts of spying activities by visiting scholars on US-USSR exchange programs, the report said. But, the panel concluded, "very little" leakage of militarily significant information came from open scientific research performed at universities. The panel suggested that between basic research, which should remain unfettered and unrestrained by government, and research and technology with potential military uses, which might be classified under government grants and contracts, there are a few technological "gray areas." In these, the government might reasonably impose some controls, using contract restrictions in preference to export regulations or security classifications.

OSTP response. To help resolve problems raised by the SPIE incident and the specter of crackdowns on science and engineering meetings, the Corson panel called for establishing within the government an appropriate group to develop policies and procedures for reporting on research data. In response, the White House Office of Science and Technology Policy and National Security Council organized an interagency task force to propose a policy. Even before the Corson report, the Pentagon set up the DOD-University Forum as a debating society on matters of academic research, with Donald Kennedy, president of Stanford University, and Richard D. DeLauer, undersecretary of Defense for research and engineering, as its cochairmen. It was DeLauer and Forum members who formulated the Defense Department guidelines on basic and applied research in May 1984, after Kennedy, along with Marvin Goldberger, presi-

dent of Caltech, and Paul E. Gray, president of MIT, warned that "it would be impossible for our universities—and for the majority of American universities—to accept a contract that... would require government approval of publication."

Pentagon debate. DeLauer found unworkable the Corson panel's notion of "gray areas" for "sensitive but unclassified" research. Instead, he opted for a clear-cut decision: Research should be labeled classified or unclassified at the time a government agency issues a funding agreement. DeLauer, who left the Pentagon last November, admits arguing "for the better part of a year" with Richard N. Perle, assistant secretary of Defense for international security policy, about the precise wording of any Presidential directive on research secrecy, as well as Section 379.3 of the new Export Administration Act. Perle's ideological influence at the Pentagon and White House on such matters goes well beyond his job title and his background (as an aide to the late Democratic Senator Henry Jackson) before joining Reagan's Republican Administration.

"Our debate sharpened our ideas and resulted in separating the sense from the nonsense," recalls DeLauer. "Am I pleased with the President's policy? I'm jubilant. It's my last hurrah at the Pentagon," he says. "I don't think I could have done it without support from Jay Keyworth and a lot of university heads and industrial executives."

It was George A. Keyworth II, the President's science adviser, and his deputy, John McTague, who kept the pressure on the interagency task force to make sure the government did not erect higher barriers to protect security. Somewhat surprisingly, neither public opinion nor Congressional support ever entered the cold war over restricting unclassified research—not even when the Defense or Commerce Departments acted on at least 12 occasions to pull papers from meetings and to block attendance of foreign scientists from the Communist bloc.

The episodes were abhorrent to many. What's more, as they contemplated the prospects that the Pentagon might impose arbitrary new controls on normally open meetings, as it has in recent months (PHYSICS TODAY, June, page 55), under authority provided by Congress under the 1984 Defense Appropriations Act, more scientists and engineers raised objections. The furor led the presidents of 12 leading scientific and engineering societies, including The American Physical Society, the Institute of Electrical and Electronics Engineers and the Optical Society of America, to fire off a letter on 17 September to Defense Secretary Caspar W. Weinberger objecting to the

Soviet 'spy' scientists on US campuses

During the past decade or so, according to the Defense Department's 1985 report, the Soviet Union's Military-Industrial Commission (*Voenno-Promyshlennaya Kommissiya*) pinpointed about 40% of the US universities listed below as "targets of opportunity" for scientists on exchange programs and special studies, under cover of the Soviet Academy of Sciences and State Committee for Science and Technology, to collect information principally for military aerospace.

Alabama	Indiana	Penn
Arizona	Iowa State	Penn State
Caltech	Johns Hopkins	Pittsburgh
Carnegie-Mellon	Kansas	Polytechnic (New York)
Chicago	Kentucky	Princeton
Cincinnati	Lehigh	Purdue
Clemson	Loyola (New Orleans)	Rensselaer
Colorado	MIT	Stanford
Colorado State	Maine	Tennessee
Columbia	Maryland	Texas
Cornell	Miami (Florida)	UC Berkeley
Dayton	Michigan	UC San Diego
Denver	Minnesota	UCLA
Florida	NYU	USC
George Washington	Nebraska	Utah
Harvard	North Carolina	Vanderbilt
Hawaii	Northwestern	West Virginia
Illinois (Chicago)	Ohio	Wisconsin
Illinois (Urbana)	Ohio State	Wyoming
Illinois Tech	Oregon	Yale

actions. It said that if the Pentagon wants certain subjects restricted from open discussion, it should take these out of public meetings or arrange classified sessions on its own. The letter argued that "controls have resulted in disruption of technical conferences... and have forced the introduction of a new category of technical session, one that is unclassified but with limited access... Responsibility for implementing controls for such information must lie with the government and not with our organizations. Therefore, our organizations will not be responsible for, nor will they sponsor, closed or restricted technical sessions at meetings or conferences conducted under their auspices."

A news account of the letter appeared in *The Washington Post* under the headline "Scientists defy Pentagon on research restrictions." If the Pentagon was annoyed, it didn't show it, insisting that it was formulating a response to the protest. Meanwhile, at the DOD-University Forum meeting on 7 October, DeLauer's successor, Donald Hicks, sought to soothe the academics. "I plan to pay as much attention to your concerns and give as much support to open communication of fundamental research as Dick DeLauer did," said Hicks. "We have to be pragmatic... Support of university research is of great value to the Defense Department. I'm right in line with your thinking. It best serves the DOD and the country by keeping ahead, not by secrecy."

Pentagon report. To some, however, Hicks's remarks seem curiously out of place in view of the news conference called by Weinberger and Perle on 17

September to publicize the updated version of *Soviet Acquisition of Military Significant Western Technology*, a report first issued in 1982 by the CIA. Over the years, the report claims, the Soviets have become addicted to US science and technology, so they must buy, borrow or steal the work of universities and industries to keep their military and economic systems functioning. The report lists dozens of research universities and industrial laboratories the Kremlin targets for ideas, patents and hardware (see boxes).

The purpose of issuing the report with a publicity barrage, said Perle in a question-and-answer exchange, is "to sensitize the scientific and technical community to the fact that there is a very large and well-organized Soviet apparatus that has targeted scientists and engineers and universities and the like for military purposes. And with an awareness on their part, without intervention by the government, we think they may be more circumspect in the kind of material that they publish and the circumstances in which it's made available in general." Should there be more classification? "The price you pay for more classification is to narrow the circle of individuals who have access to information that may be a stimulus to research and development on our part," said Perle. "Striking a balance is difficult... Were we to significantly restrict unclassified material, we would impair our own scientific and technical efforts."

That the Pentagon report and President's directive came out within days of each other is viewed suspiciously in some circles. "It characterizes the

underlying tension," says Robert M. Rosenzweig, president of the Association of American Universities. "Those elements in the government

who believe they can enhance security by keeping things from the Russians are still there and still very effective. But the new directive will provide

those of us who believe in openness an important argument on our side. It helps us clear the cloudy atmosphere."

—IRWIN GOODWIN

Wisconsin seeks to prolong life of Aladdin light source

Aladdin is dead. Its quietus came formally on 30 September, the end of fiscal 1985, when it was entered on the National Science Foundation's necrologue. Aladdin had been a long time dying, as NSF Director Erich Bloch observed to a small group assembled at the agency on 23 September in Room 523 to discuss the once and future synchrotron light sources for materials research. Bloch explained that NSF has given up any idea of reviving Aladdin, the chronically weak light source at the University of Wisconsin's Synchrotron Radiation Center near Stoughton, after four review panels decided in the past six months that the machine could never live up to its original specifications for an electron current of more than 100 milliamp and a beam energy of at least 750 MeV, without installing an expensive high-energy injector (PHYSICS TODAY, August, page 45).

Even so, said Bloch, NSF made a grave decision not to bury Aladdin if still another panel of specialists, after reviewing the university's proposal to operate the machine at a lower current, found it to be stable, reliable and useful. NSF would raise the ring from the dead, Bloch said. In the event, it would not be Aladdin, though.

Prairie mourning. At Wisconsin, Aladdin is lamented in name only. For most of August and all of September, the machine was shut down while scientists and engineers were making corrections that review panels and accelerator experts had identified as necessary to increase the current and control the beam. That meant, among other things, remounting the storage-ring magnets and other components to the bedrock substrata and making extensive measurements of both floor and beam movements, inserting additional clearing electrodes to prevent the phenomenon known as ion trapping in the electron beam, and installing monochromators on the beam lines.

All has gone very well so far, according to David L. Huber, the center's new director. The machine has accelerated currents of 40 milliamp to an energy of 800 MeV—values considered unthinkable just last January, when it operated at only 2.5 milliamp with energy of 0.75 GeV. Huber credits the ideas and efforts of Ednor Rowe, the Wisconsin physicist who designed the machine, and teams of accelerator experts from Argonne, Lawrence Berkeley and

SLAC for restoring life to Aladdin. Huber believes further corrective measures should result in raising currents to 50 milliamp and even higher at 800 MeV. "That's not a promise," he says, "but it is a reasonable expectation." While Aladdin's idiosyncrasies are dealt with, the staff is transferring monochromators from the center's smaller 0.24-GeV storage ring named Tantalus to the larger ring.

It was always the intention to gain experience from building and running Tantalus to design and construct Aladdin. The idea was tantalizing and, in the true meaning of the machine's name, ultimately disappointing. In Greek mythology, Tantalus, the son of Zeus and Pluto, divulged the secrets of the gods to mortals and, in consequence, suffered an agonizing end.

Wisconsin's Tantalus will be dismantled slowly and shut down completely in March 1987, if Huber's scenario is right. By then, Tantalus's eight beam lines will be operating at the larger ring, which then will have 17 lines, running 24 hours a day, 7 days a week, and serving industry and university researchers, as do the National Synchrotron Light Source at Brookhaven and the Stanford Synchrotron Research Laboratory.

Before sending the proposal for the Synchrotron Radiation Center to NSF in mid-October, Huber made sure the name Aladdin did not appear anywhere in the document. "We simply refer to it as the larger ring or the 1-GeV machine," says Huber. Though NSF cut off all funds for Aladdin last June, the agency continues to support Tantalus at \$1.5 million per year. "We are confident the 1-GeV machine will have twice the number of Tantalus's beam lines, as well as greater brilliance and significant spectral range," adds Huber. It should continue operating for at least another five years and possibly longer, Huber says.

While the technical troubles of the 1-GeV ring seem to be solved, it still faces difficult problems, including the uncertainty of financial support and the prospect of being superseded by larger machines. Wisconsin's proposal calls for \$3.4 million to operate Tantalus and modify the large ring in fiscal 1986, which began on 1 October. NSF, for its part, remains cautious and uncommitted to the larger ring until it receives the results of the proposal review by a peer group.

Birth pangs. Equally troublesome is the agenda for new light sources that was delivered at Bloch's meeting in September by Dean Eastman of the IBM Thomas J. Watson Research Center, cochairman (with Frederick Seitz, former president of Rockefeller University) of last year's study of major facilities for materials research (PHYSICS TODAY, September 1984, page 57). Eastman argued the case for Federal support for the top two priorities in his report: a 6-GeV synchrotron-radiation facility producing hard x rays to study the properties of complex materials and a 1.5-GeV machine for both soft x rays and vacuum ultraviolet. Lawrence Berkeley has been fighting for more than two years to get such a 1.5-GeV machine funded at its Center for Advanced Materials.

At the NSF meeting, Eastman told Alvin W. Trivelpiece, director of the Department of Energy's Office of Energy Research, John McTague, deputy director of the White House Office of Science and Technology Policy, and Bloch that possibly some \$50 million per year would be required for five years to build both light sources. Given the dismal outlook for the nation's budget deficits during that period and the persistent expressions of financial restraints in Congress, it's unlikely the machines will be started soon.

—IRWIN GOODWIN

Washington Ins and Outs: Merrell to NSF astronomy post

With President Reagan's nomination of William J. Merrell Jr as assistant director of the National Science Foundation for astronomical, atmospheric, earth and ocean sciences on 13 September, all the top jobs at the agency have now been filled. When he took command in August 1985, NSF Director Erich Bloch promised the National Science Board he would fill four major vacancies by the first anniversary of his Senate confirmation. Merrell was professor of oceanography at Texas A&M University, associate dean of the university's College of Geosciences and principal investigator of the Ocean Drilling Program since 1983. A physicist with a PhD from Texas A&M, Merrell served as a program executive at NSF's Office for the International Decade of Ocean Exploration from 1974 to 1977. □