voting. That plan, however, ran afoul of council opposition, particularly from the smaller sections; they feared an unfair domination by colleagues in more populous disciplines.

As a result, the AAAS will remain divided along sectional lines both for scientific and voting purposes. The bylaws now designate each section an electorate; each electorate will have one council seat for each 3000 of its members, with a minimum of one seat for sections with fewer than 3000 members.

The most immediate effect of the new electoral system will be to trim the council to about 100 members after the coming general election in the fall. Thus the AAAS's form of governance will have shifted toward the representative end of the spectrum; whether new faces and new directions in policy emerge is another question, and one that will have to await the elected council's first meeting, at San Francisco in February 1974.

—ROBERT GILLETTE

Truman Era: Formative Years for Federal Science

The obituaries of former President Harry S Truman quite reasonably emphasized the fateful decisions he made which resulted in the use of the atomic bomb, the Truman Doctrine and the Marshall Plan, NATO, the development of the hydrogen bomb, and the commitment of American forces in Korea. These decisions were based on a view of the world which influenced the major lines of American foreign policy for two decades and is only beginning to be modified as Cold War diplomacy bends toward détente. Much the same sort of thing can be said of postwar relations between science and government. It was during Truman's presidency that wartime cooperation between scientists and the military was institutionalized. Of the new civilian science agencies, the most symbolic though not the first was the National Science Foundation. Now there are signs that these established relations too are being reappraised and revised.

The watershed issue in postwar science policy was probably the debate over the control and development of atomic energy immediately after the war. Even before the atomic bombs were dropped on Japan in August 1945, scientists in government service were expressing concern about nuclear policy after the war. Nils Bohr, James Franck, and Leo Szilard were leaders among those who argued that only effective international control of atomic energy could avert a dangerous arms race between the United States and the Soviet Union.

Barely 2 months after the war ended, Congress plunged into debate on the issue of a domestic policy for atomic energy. A bill had been hurriedly framed and was introduced by Senator Edwin Johnson and Representative Andrew May. The key issue almost immediately became the choice between military or civilian control. The May-Johnson bill was an Administration measure, but by the end of the year Truman had reexamined his position and from then on unwaveringly backed a bill introduced by a close friend from his Senate days, Brian McMahon, which placed authority in a civilian-dominated Atomic Energy Commission. Scientists from wartime laboratories had rapidly organized the Federation of American Scientists and lobbied effectively in the cause of civilian control. Their efforts contributed significantly to the passage of the McMahon Act, but that success had a price that could not have been accurately counted at the time. During the debate, Representative J. Parnell Thomas of the House Un-American Activities Committee had charged "subversive" tendencies among scientists in government labs. For scientists, this questioning of their loyalty was to trouble the universities as well as the government, to reach a crescendo during the McCarthy era, and to culminate in the lifting of J. Robert Oppenheimer's security clearance after hearings before the personnel security board of the Atomic Energy Commission at the beginning of the Eisenhower Administration.

Within a year after the end of the war, efforts to establish effective international control of atomic energy had foundered. Increasing tensions between the United States and the Soviet Union had made impossible the creation of a sort of international atomic energy commission as had been proposed. Although Truman himself was aware that the science relevant to the making of fission weapons could not be kept an American monopoly, he consistently resisted sharing research, technology, or materials related to nuclear weapons with foreign powers, even allies.

Truman's attitude toward science was the rather uncritically approving one prevailing at the time, and he supported the idea of a National Science Foundation advanced by Vannevar Bush in the famous blueprint for postwar science, *The Endless Frontier*, published in 1945. Under the circumstances it seems surprising that legislation creating the NSF was not finally enacted until 1950.

Controversy Surfaces

Controversy surfaced when the first bill embodying the Bush formula was introduced in 1945 by Senator Warren Magnuson (D–Wash.). Bush favored a strong National Science Board (NSB) formed primarily of nongovernment scientists who would exercise strong control over the director and the work of the foundation. Another view with which James B. Conant, Harold Urey, and Edward U. Condon were identified held that the head of the foundation, responsible to the President, should exercise primary control with the NSB acting in the conventional advisory capacity. Other questions raised at the time—on ownership of patents resulting from government-supported research and on geographical distribution of research funds, for example—became chronic issues.

In 1947, after efforts to achieve consensus appeared to succeed, Congress

passed a bill which followed the major lines of the Bush proposal. Truman, however, vetoed it, expressing dissatisfaction on several points. His major objection is stated in the following excerpt from the veto message.

> . . . this bill contains provisions which represent such a marked departure from sound principles for the administration of public affairs that I cannot give it my approval. It would, in effect, vest the determination of vital national policies, the expenditure of large public funds, and the administration of important governmental functions in a group of individuals who would be essentially private citizens. The proposed National Science Foundation would be divorced from control by the people to an extent that implies a distinct lack of faith in democratic processes.

By the time a National Science Foundation with an "in-line" administrative structure was created in 1950, the basic pattern of government-sponsored research in universities had been set by other agencies. The Navy, at the end of the war, led the way in finding a formula to maintain contact with civilian scientists through its Office of Naval Research. The Atomic Energy Commission soon had its own major extramural research program and medical research was increased under the auspices of the Public Health Service.

A framework for postwar federal science was already erected when Truman addressed the centennial meeting of the AAAS in September 1948 and set out the following priorities for science, which were in fact to be followed:

> Two years ago, I appointed a Scientific Research Board. Its report, entitled *Science and public policy*, was submitted last fall to the 80th Congress. That report stressed the importance of science to our national welfare, and it contained a number of important recommendations. The most important were these:
>
> First, we should double our total public and private allocations of funds to the sciences. We are now devoting, through Federal and private expenditure, little more than $1,000,000,000 for research and development per year. With a national income of more than $200,000,000,000 annually, the Board felt that we should devote at least $2,000,000,000 to scientific research and development each year.
>
> Second, greater emphasis should be placed on basic research and on medical research.
>
> Third, a National Science Foundation should be established.
>
> Fourth, more aid should be granted to the universities, both for student scholarships and for research facilities.
>
> Fifth, the work of the research agencies of the Federal Government should be better financed and coordinated.

For advice on issues involving science Truman appears to have depended on contacts with leading scientists who had been involved in the wartime mobilization. Particularly in his early years in the White House he appears to have relied on men like Conant, Bush, and Oppenheimer. Later he met with members of the Atomic Energy Commission and the AEC's General Advisory Committee. Truman seems to have valued the opinions of Alan T. Waterman, who headed the Office of Naval Research, and the President is reported to have said he would nominate anyone the National Science Board suggested to be the first director of NSF as long as it was Waterman.

It was not until 1950 that the groundwork was laid for the formal science advisory structure that later developed in the White House. Efforts

Area Studies under the Axe

The federal program that has provided funds for the support of foreign language and area studies programs in major universities for the past 15 years is reportedly a disaster area in the forthcoming budget. According to word that is being regarded as fiscal gospel in Washington, the sum on the foreign languages and world affairs line of the higher education budget will be cut from $15.3 million in the current fiscal year to zero next year.

Rumors are rampant that the education budget will show heavy reductions almost across the board. Congress, of course, must act on the President's recommendations and doubtless will oppose many specific cuts. The language and area studies program, however, is said to be one the Administration is determined to cut.

The program originated in the National Defense Education Act passed in 1958. Title VI of that act was intended to encourage the teaching of languages "critical" to national defense, and the program provided the first substantial federal funds for the study of Russian, Chinese, and other, more exotic languages, as well as for comprehensive studies of areas of Africa, Asia, the Middle East, and Latin America.

Over the years, funds have flowed primarily into two programs. One supported language and areas studies "centers," the other funded graduate fellowships in relevant disciplines. Currently, some $7 million is going into 106 centers at 63 universities and about the same amount into financing the fellowship program. Most of the funds go to major research universities in the Northeast, Midwest, and West Coast.

These programs have been in similar jeopardy for at least the past 2 years. The American Association of Universities, whose membership comprehends the major research universities, is understood to be protesting the prospective gutting of the program to the White House. Two years ago, an AAU delegation came away with what they regarded as a firm commitment from the President that the existing program would be continued at least until a National Foundation for Education was established.

In at least one case in the past, the intercession of former Nixon adviser Daniel Patrick Moynihan has been credited with reprieving the program. The program's university constituency has been regarded as ineffectual in lobbying, probably because the interests of its members are divided over so many languages and areas that it is hard to perceive a common interest. Partisans of the program, however, point out that, of all the categorical programs in higher education, the languages and areas program is perhaps the most important to the national interest at this juncture.

Direct federal support of the centers averages only about 10 to 12 percent of their operating budgets, but fellowships add substantial funds. The demise of the federal program would also mean loss of the primary source of funds for faculty research abroad.—J.W.

NEWS & NOTES

• **SABIN RETIRES**: Albert B. Sabin, president of the Weizmann Institute of Science in Rehovot, Israel, for the past 3 years, retired from that post on 1 January because of ill health. Best known for his discovery of the oral polio vaccine, Sabin will become a Fogarty Scholar at the National Institutes of Health this year. Israel Dostrovsky, vice president of the institute, will serve as acting director and chief executive officer.

• **ENERGY BOARD AT INTERIOR**: The Interior Department, in the expectation that it will one day be part of a new Department of Natural Resources (DNR), has set up an Energy Board whose function eventually will be to coordinate energy policies in all branches of the federal government. Executive director of the board is Kenneth L. Lay, formerly an economist in the Federal Power Commission, who has been appointed Deputy Under Secretary of the Interior for Energy. The board is chaired by Secretary of the Interior Rogers C. B. Morton and consists of four or five assistant secretaries, who will meet periodically to coordinate the energy concerns of the Interior. The board will eventually be fleshed out with advisers, staff, and a separate budget and will work with other government agencies. Ultimately, it will be the focal point for energy development and research policies within the DNR. It would "interface" with the natural resources group of the Office of Science and Technology, a group whose main function is to advise executive decision-makers on how science and technology can be brought to bear on the development of energy resources.

• **CALL FOR REPEAL OF ABORTION LAWS**: The American Public Health Association (APHA) has urged the repeal of restrictive state abortion laws. In the new "Recommended Program Guide for Abortion Services," APHA stresses that even currently revised laws requiring state residency or prior approval by hospital committees or doctors pose serious barriers to access to abortion services. The abortion guide was prepared by APHA's Task Force on Family Planning Methods, Council on Population, and was approved by the executive board in November.

to set scientific priorities through the work of interagency groups fell flat. Then in 1950, Truman's budget director William T. Golden undertook a one-man study of federal science. He recommended creation of the post of science adviser to the President and of a science advisory committee reporting to the President. This led to the formation of a Science Advisory Committee in the Office of Defense Mobilization (SAC-ODM). Chairman of the committee was Oliver Buckley of Bell Labs, but Buckley declined to serve as science adviser. Lee A. DuBridge, a member of the committee and later its chairman, who was President Nixon's first science adviser, recalls that the SAC dealt primarily with planning for the recruitment of scientific talent in the event of a national emergency, and only toward the end of Truman's years in office did the committee begin to take initiative in offering advice on current problems.

Mechanisms for planning and control of military research during the Truman period were primitive. The unification of the armed services occurred in the late 1940's, but competition in the areas of research, development, and procurement of new and increasingly costly weapons systems persisted among the services.

In other areas, such as the development and conservation of natural resources, some groundbreaking legislation was enacted. The first federal legislation against water pollution, for example, was passed during Truman's Administration. But environmental problems had a low political priority in those days. In the field of social legislation Truman was sharply rebuffed on proposals for federal aid to education, housing, and national health insurance.

The eulogies of Truman have emphasized his forthrightness in accepting responsibility for his actions. It was partly this that gave his presidency a personal quality, which diminished subsequently as the work of the Executive grew in scale and complexity and the President grew steadily more insulated. Truman operated with a relatively small staff; West Virginia Congressman Ken Hechler (D), who served as a White House aide toward the end of the Truman years, recalls that Truman himself regularly presided over morning staff meetings. Everyone had a clear idea of what everyone else was doing, says Hechler, and there was no apparent friction over prerogatives.

Truman's reading of history and service in the Senate had given him a clear idea of the powers of the presidency and the nature of the Constitution. He believed in delegating responsibility to his Cabinet officers, but often directed White House staff members to see that Administration policies were being carried out. When he believed that a constitutional issue was involved as in the case of the dismissal of General MacArthur, he could act without regard to probable political costs.

Presidential reputations ride a roller coaster, and rating Truman is more than usually difficult. In recent years a school of revisionist historians have blamed Truman and his advisers for actions which exacerbated, perhaps even created, the Cold War. Use of the atomic bomb is seen to have been directed less at defeating Japan than at warning the Soviet Union. And the system of economic and military aid and regional alliances constructed in the Truman years to meet perceived threats, first from the Soviet Union and later from Communist China, is viewed as having narrowed postwar diplomacy into a dangerous armed rivalry between superpowers.

The decision to use the atomic bomb probably was fraught with more profound moral and political consequences than any other decision made by an American president. Truman made that decision within 3 months after taking office; he had been told nothing about the bomb project while he was Vice President. As far as the public record shows, Truman never had doubts about his decision. His reasoning is described in this excerpt from his memoirs:

> It was their [his advisers] recommendation that the bomb be used against the enemy as soon as it could be done. They recommended further that it should be used without specific warning and against a target that would clearly show its devastating strength. I had realized, of course, that an atomic bomb explosion would inflict damage and casualties beyond imagination. On the other hand, the scientific advisers of the committee reported, "We can propose no technical demonstration likely to bring an end to the war; we see no acceptable alternative to direct military use." It was their conclusion that no technical demonstration they might propose, such as over a deserted island, would be likely to bring the war to an end. It had to be used against an enemy target.
>
> The final decision of where and when to use the atomic bomb was up to me. Let there be no mistake about it. I regarded the bomb as a military weapon and never had any doubt that it should be used. The top military advisers to the President recommended its use, and when

I talked to Churchill he unhesitantly told me that he favored the use of the atomic bomb if it might aid to end the war.

In deciding to use this bomb I wanted to make sure that it would be used as a weapon of war in the manner prescribed by the laws of war. That meant that I wanted it dropped on a military target. I had told Stimson that the bomb should be dropped as nearly as possible upon a war production center of prime military importance.

It should be remembered that the atomic scientists who in the last months of the war were perhaps best able to grasp the tragic implications of the decision to use the bomb were divided on it too. Given the pressures of that time and also Truman's personality and experience—he was after all an ex-AEF battery commander who had seen a lot of blood shed in a final offensive in France—his decision to use the bomb was probably inevitable. Whether he was right or wrong became an abstraction once the irretrievable moment at Hiroshima was past. It was equally inevitable that the decision would cast a shadow on his reputation.

As for the postwar record, the revisionists now say that Truman was the architect of an imperialistic system aimed at economic domination which led the United States ultimately to the ordeal of the Vietnam war. Truman's partisans claim that the use of American military and economic power made it possible to survive a period of Soviet expansionism and the turmoil of decolonization without a nuclear war and to reach a point when changed power relations have bettered the prospect for stability in international relations. Truman himself could probably appreciate the irony of how his critics changed with the times. When he was in office, the country was bitterly divided by the issues raised by Senator Joseph McCarthy and Truman's Administration was under ceaseless political attack for being "soft on Communism." In retrospect, the revisionists appear to be blaming him for being too hard on Communism.

Truman's death 20 years after he left office came at a time when the premises of diplomacy established during his presidency seem to be altering significantly. At the same time, relations between government and science are also changing. As President, Truman accepted the principle that world leadership in science was a guarantee of national security and helped to make it part of the conventional wisdom of the time. This principle opened the way to a period of great achievement—particularly in basic research—and of a considerable measure of affluence and self-determination for the scientific community.

In recent years the growth rate of science has been curbed and emphasis increased on applied science through cuts and shifts in funds. It now appears that President Nixon's forthcoming budget will prescribe a major realignment of scientific efforts, mainly through more cutbacks, and there are indications that this will be accompanied by a redesign of the decision-making machinery for science. So it seems that with less hyperbole than usual it can be said that Truman's death, by coincidence, marks the end of the era which he did so much to shape.—JOHN WALSH

APPOINTMENTS

Clair E. Cox, II, professor of medicine, Wake Forest University, to chairman, urology department, College of Medicine, University of Tennessee. . . . **Luke N. Zaccaro**, professor of mathematics, Worcester Polytechnic Institute, to chairman, mathematics department, Youngstown State University. . . . **Robert W. Mulligan**, provost, Xavier University, to president of the university. . . . **Steven Muller**, president, Johns Hopkins University, also to president, Johns Hopkins Hospital. . . . **Clarence M. Tarzwell**, director, National Marine Water Quality Laboratory, to science adviser, Environmental Protection Agency. . . . At Auburn University: **Chester C. Carroll**, chairman, electrical engineering department, to vice president for research and **Taylor D. Littleton**, dean of undergraduate studies, to vice president for academic affairs. . . . **Raleigh A. Suarez**, dean, School of Humanities, McNeese State University, to vice president of academic affairs at the university. . . . **Carleton B. Chapman**, dean, Medical School, and vice president of Dartmouth College, to vice president, Commonwealth Fund. . . . **Lawrence Harvill**, provost, University of Redlands, to vice president for academic affairs at the university. . . . **Valmore R. Goines**, dean of academic services, Eastern Michigan University, to vice president for academic affairs, Virginia State College. . . . **Donald W. Robinson**, dean of education, Youngstown State University, to dean of education, Oklahoma State University. . . . **Frederick G. Adams**, presidential assistant for allied health research, University of Connecticut, to dean, School of Allied Health Professions at the university. . . . **Fred Esser**, professor of education, Northwest Missouri State University, to dean of education at the university. . . . **Theodore W. Rall**, professor of pharmacology, Case Western Reserve School of Medicine, to director, pharmacology department at the medical school. . . . **John F. Schafer**, head, plant pathology department, Kansas State University, to chairman, plant pathology department, Washington State University. . . . **Hong S. Min**, professor of biology, Georgia Institute of Technology, to head, zoology department, Clemson University. . . . **James S. Meditch**, associate professor, School of Engineering, University of California, Irvine, to chairman, systems engineering and operations research group at the school. . . . **J. L. Wilhm**, professor of zoology, Oklahoma State University, Stillwater, to head, zoology department at the university. . . . **C. Philip Larson, Jr.**, professor of anesthesia, University of California, San Francisco, to chairman, anesthesia department, Stanford University School of Medicine. . . . **Theodore Axenrod**, professor of chemistry, City College, City University of New York, to chairman, chemistry department at the college. . . . **Peter E. Thompson**, professor of zoology, University of Georgia, to head, zoology department at the university. . . . **Robert C. Stephenson**, director, Ohio State Research Foundation, to director, Center for Marine Resources, Texas A&M University. . . . **Lewis H. Kuller**, professor of epidemiology, Johns Hopkins University, to chairman, epidemiology and microbiology department, University of Pittsburgh. . . . **James Crum**, professor of chemistry, California State College, San Bernardino, to dean, School of Natural Sciences at the college. . . . **Charles B. Fancher**, dean of faculty, Tennessee State University, to vice president for academic affairs at the university. . . . **Jack L. Titus**, associate professor of pathology, Mayo Graduate School, to chairman, pathology department, Baylor College of Medicine. . . . **Thomas Detre**, professor of psychiatry, Yale University, to chairman, psychiatry department, University of Pittsburgh. . . . **Frederick H. Carpenter**, professor of biochemistry, University of California, Berkeley, to dean of biological sciences at the university.