News of Science

Federal Budget Sets Research and Development Funds at $5.5 Billion with Emphasis on Space Activities

The budget of the United States Government for the fiscal year ending 30 June 1960 has been submitted to Congress by the President. It is balanced, precariously in the opinion of many commentators, at $77 billion. If Congress responds to it as President Eisenhower would like, income will exceed expenditure by the insignificant sum of $70 million. The projected surplus is based on the acceptance by Congress of a number of proposals for increasing revenue, among them a second increase in postal rates. Criticism of the budget by members of the Democratically controlled House and Senate has been caustic.

Funds allotted to the Government's scientific programs are the highest in the country's history. The projected figure for research and development for the coming year, $5.5 billion, exceeds the 1940 expenditures by $5.4 billion, the 1950 expenditures by $4.4 billion. Although the research programs undertaken or continued with these funds will cover virtually the whole range of scientific and technological activity, the emphasis will be on space activities as conducted by the military agencies, particularly the Advanced Research Projects Agency, and the new National Aeronautics and Space Administration.

Scientific Agencies

The Department of Defense, in this and recent previous budgets, has received the greatest share of the research and development budget. This is a reflection of the fact that "major national security" accounts for $45.8 billion, or 59 percent of the total budget.

The Defense Department, for its research, development, test, and evaluation programs, is authorized a total of $3.38 billion, of which $415 million goes to the Advanced Research Projects Agency. The figure for these programs in 1958 was $2.18 billion. The estimated figure for the Defense Department for the current fiscal year, which will end 30 June, is $3.17 billion. No figures are available for the original requests of the Defense Department, but the assumption can be made that the allocations fall much below the requests. Observers note, for example, that the Army received only half of its request for weapons modernization.

The federal budget, a document of 1105 pages, contains a special analysis section which brings together various governmental programs—aid to state and local governments, statistical programs, and others. One such section analyzes federal research and development programs. In this section no distinction is made between the National Advisory Committee for Aeronautics and the National Aeronautics and Space Administration which absorbed it. Thus, the $280 million that NASA is authorized for research and development for 1960, its first full fiscal year, may be compared with the figures allotted in the past to NACA. In 1958 the actual figure for expenditures was $89.2 million; in 1959, the fiscal year during which NASA superseded NACA, the figure is an estimated $153 million. One incidental point can be made here. The budget for fiscal 1958 estimated the expenditures of the National Advisory Committee for Aeronautics at $86.5 million. The actual expenditure for that year as given in the current copy of the budget was the figure above, namely $89.2 million. The disparity between the estimated and actual figures can be expected to be the case in regard to many elements in the Administration's budget for 1960. The balance, as the commentators suggest, is precarious indeed.

The research and development program of the Atomic Energy Commission is carried on in contractor-operated laboratories, in universities, in private research institutions, and by industrial contractors. The commission's expenditures for this program for fiscal 1960 have been set at $651 million. The fiscal 1959 estimate is $617 million. A total of $516 million was actually expended in 1958. Elements of the research and development program of the commission are production and weapons, reactor development, physical research, biology and medicine, and isotope development. Until Congress reviews the budget, the original request of the commission for these aspects of its work will not be known. As in the case of the Department of Defense, it can be assumed to have been higher, perhaps by one quarter or more. The standard attitude of a governmental agency is that the figure in the budget is its official request until later hearings before Congress bring out its actual request.

The major research expenditures of the Department of Health, Education, and Welfare are under programs of the Public Health Service working through the National Institutes of Health. The seven institutes have been authorized a total of $216.8 million by the Budget Bureau for the coming fiscal year. The total Public Health Service budget for research and development stands at $236.5 million. The institutes received $154.4 million in 1958 and have an estimated budget of $206.2 million for the fiscal year now in progress. For the past 7 years Congress has appropriated more funds for the NIH than the Administration has recommended. Should this trend continue, especially in the magnitude of the increases—39 percent for fiscal 1959—there is reason to believe that the actual budget for research and development for NIH may be on the order of 300 million.

Congressional Review

The Administration has given its definition of the proper role of the country's scientific community for the coming fiscal year. Its budget is the shaping tool. There is a widely held opinion that Congress, led by Senator Johnson, who had a major role in the establishment of the National Aeronautics and Space Administration, will vote very considerable increases in funds to many of the government agencies, particularly those concerned with national defense. The Congress will thus offer another definition of the scientific community's role. When it comes time to review the budget, many of the questions that will be asked will reflect the kind of thinking that had a full expression in a report of the President's own Scientific Advisory Committee. This report, *Strengthening American Science,* which called for a federal council for science and technology, examines in depth the needs of the nation's scientific effort. It points out the critical role that basic research has in any scientific program and maintains that basic research in the United States is insufficiently supported. Two quotations from the report illustrate the committee's approach on this point. " 'Research and development' is an elastic term that covers a broad spectrum of activities. . . ." "Of the government's total research and development budget, it is estimated that about 6 percent is earmarked for basic research." In his letter covering this report the President said that "the task of

further strengthening United States science is so broad that government, industry, universities, foundations, and individuals all have essential roles to play." Congress will ask, when it reviews the new budget, whether the government has fully accepted its "essential role."

Improving High-School Education

During January the national concern about high-school education manifested itself in a number of significant ways. Of first importance was the release of James B. Conant's report, *The American High School Today*. With the support of a Carnegie Foundation grant administered by the Educational Testing Service, Conant made a close study of 55 high schools in 18 states that led to 21 specific recommendations. Conant says of his work, which is to continue for at least another year:

"I can sum up my conclusions in a few sentences. The number of small high schools must be drastically reduced through district reorganization. Aside from this important change, I believe no radical alteration in the basic pattern of American education is necessary in order to improve our public high schools. . . . I think one general criticism would be in order: the academically talented student, as a rule, is not being sufficiently challenged, does not work hard enough, and his or her program of academic subjects is not of sufficient range. . . . A correction of this situation in many instances will depend upon an altered attitude of the community quite as much as upon action by a school board or the school administrators."

Columbia Honors Program

New York City has recently demonstrated the effectiveness of the community interest to which Conant refers. This fall a science honors program was established at Columbia University's School of Engineering with the aid of $29,000 from the Hebrew Technical Institute of New York and $25,000 from the Fund for the Advancement of Education of the Ford Foundation. The first half of the program has just been completed, and an initial report indicates that it is a complete success. The professors responsible for the 158 students, 25 of whom are girls, describe the students' ability with unqualified enthusiasm.

Every Saturday morning the group hears lectures on such subjects as physical and chemical metallurgy, theory of vibrations and wave motions, symbolic logic, nuclear physics, protein chemistry, and population genetics. Laboratory work includes advanced projects in enzyme chemistry, chromatography, effects of radiation on soils, and animal behavior. Every week 50 students have lunch at the men's faculty club, where five students are seated with each faculty member.

John R. Dunning, dean of the engineering school, says that the program is intended "to make the best science available to the best minds and to set an example that all colleges and school systems can follow."

Nationwide Survey of Students

Another important event in public high-school education to be reported last month was the U.S. Office of Education's national student survey, a survey that would attempt to assess the quality and quantity of these "best minds." The project would include a program of tests that would cover aptitude, achievement, personality, interest, and biographical data. These tests, given to a 5-percent sampling of the nation's high-school students (500,000), would provide a representative picture of the entire high-school population. The Office of Education's Research Advisory Committee has already approved the planning phase of the project, for which $335,000 has been provided. However, final action on the plans will not be taken until the committee meets in mid-February. If the study is approved—and it would cost more than $1 million—work will begin on 1 March. In May, a 2-day series of 25 tests would be given to 1000 to 1500 pupils as a pilot study; the national testing would be done next January and February.

The survey has been planned cooperatively with the National Institute of Mental Health, the Office of Naval Research, and the National Science Foundation. The project would be conducted by the American Institute for Research, a nonprofit affiliate of the University of Pittsburgh, with John T. Flanagan, professor of psychology at Pittsburgh, as principal investigator, and John T. Dailey, research associate, as program director.

Stanford Conference

Still another effort to improve high-school education in the United States occurred 24–27 January, when 15 scholars, educators, and lay authorities gathered at Stanford University's Center for Advanced Study in the Behavioral Sciences for exploratory talks on how to strengthen the national public-school curriculum. The group—which included Conant and Graham DuShane, editor of *Science*—was under the cochairmanship of Ralph Tyler, director of the study center, and Paul R. Hanna, professor of child education at Stanford. The conference was supported by the Ford Foundation's Fund for the Advancement of Education. Three questions were considered.

1) How can we achieve a solution to the curriculum problem as viewed by the public and its legislators, by the scholars and scientists, and by the professional educators?

2) How can public-school curriculums adequately represent the national interest and at the same time the special needs of the local and state community?

3) What steps can be taken and what procedures should be followed toward development of a more adequate public-school curriculum?

Hutchins' Comments

In contrast to Conant, Robert M. Hutchins, president of the Fund for the Republic, had some sharp words for American education when he received the Hillman Foundation Award for meritorious public services on 22 January. He said that every citizen must be educated to the limit of his capacity if this nation is to survive as a democracy in the nuclear age, that to preserve the democratic faith men must be sufficiently informed to take part in making decisions in a free society: "I don't mean trained, amused, exercised, accommodated or adjusted; I mean that his intellectual power must be developed."

He then went on to say that history would have trouble assessing American education in the 20th century.

"It will see a people, who say they are dedicated to education and who are the richest in the world, indifferent to education and unwilling to pay for it. It will see an educational system that delivers less education per dollar than almost any other saying that all it needs is more money. . . . History will smile sardonically at the spectacle of this great country's getting interested, slightly and temporarily, in education only because of the technical achievements of Russia, and then being able to act as a nation only by assimilating education to the 'cold war' and calling an educational bill a defense act."

Humphrey Explains Detection of Nuclear Weapon Testing

In a speech given 20 January to his colleagues, Senator Hubert H. Humphrey, Democrat from Minnesota, gave the sources of the new scientific data on nuclear test detection and related these data to the talks now in progress at Geneva. These negotiations stem in part from an agreement reached last summer by Soviet and Western scientists that a detection system was feasible. A White House announcement early last month cast some doubt on the bases for that agreement.

The senator, chairman of the Foreign Relations Subcommittee on Disarmament, served as congressional adviser to