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The Scientist in the Federal Service

The federal government has become the nation's leading employer of scientists and engineers.

John W. Macy, Jr.

In August of 1964 the Civil Service Commission issued new salary schedules for scientists and engineers in the federal service, setting pay rates for many professional engineering, scientific, and medical positions even above the newly enacted rates of the general salary schedule. The Commission took this action under the authority of the Federal Salary Reform Act of 1962, on the basis of a decision that the higher salaries were necessary to meet nongovernmental pay standards in occupations in which there is a shortage of manpower.

This singling out of science for special attention is not new in the federal government. Salary reform of the past 2 years caps a decade of legislative and administrative actions that have been taken to keep the government's personnel system responsive to the requirements of science and technology. Within the last 10 years employment conditions for the scientist in the federal service have been radically improved.

Ten years ago there were 56,700 federal employees in the physical and biological sciences and 60,500 in engineering, altogether making up 9 percent of the federal white-collar work force. Now there are more than 71,000 in science and 188,000 in engineering, constituting 11½ percent of the white-collar work force. Moreover, from 1951 to 1962 federal employment of white-collar workers increased by 28 percent, while employment of blue-collar workers decreased by 19 percent.

The impact of science and technology has changed the whole makeup of the federal civil service, and is still changing it, day after day. Today there are more professional physical scientists than general clerks, and more engineers than typists.

Scientific research and development are carried out in 25 federal departments and agencies, principally in the

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laboratories of the Departments of the Army, Navy, and Air Force, the National Aeronautics and Space Administration, the Atomic Energy Commission, the Department of Agriculture, the National Institutes of Health, the National Bureau of Standards, the Department of the Interior, the Federal Aviation Agency, and the Veterans Administration. In addition to the work of government scientists, a great deal of government research and development work is done not in the government's own laboratories but by universities, private companies, and nonprofit organizations under contract. But where this is the case, federal scientists have the responsibility for leadership, for directing and reviewing, and must also do enough research on their own to maintain their expertise. The quality of the federal scientific effort is crucial to our nation's success. To meet this goal the federal personnel program for scientific manpower must be maintained at the highest possible level of effectiveness.

Government Incentive Awards

A review of significant changes in that program might well begin with an outstanding legislative step taken 10 years ago, the Government Employees Incentive Awards Act of 1954. Under the authority and the stimulus of that law a great many means for encouraging and rewarding excellence on the part of employees have been developed, particularly for recognizing scientific achievement. Cash awards of up to $25,000 and honorary awards ranging from an official commendation up to the President's Award for Distinguished Federal Civilian Service have been made to scientists and engineers. Of the 16 largest cash awards made under the Act—$5000 to $25,000—13 were given for scientific and technical achievements.

Three cash awards of $25,000 have been made: to William B. McLean of the Navy for development of the Sidewinder Guided Missile Weapon System; to a team of five scientists at the Army's Harry Diamond Laboratories for microminiaturization of electronic parts; and to a team of three scientists at the Army's Picatinny Arsenal for work in nuclear weapons development.

Of the 35 recipients of the President's Award, 15 have been career scientists. They are Sterling B. Hendricks, William B. McLean, Doyle L. Northrup, Hazel K. Stiebeling, Wernher von Braun, Hugh L. Dryden, Winfred Overholser, Robert M. Page, Wilbur S. Hinman, Jr., Robert R. Gilruth, Donald E. Gregg, Waldo K. Lyon, Frances O. Kelsey, Fred L. Whipple, and Herbert Friedman.

Federal agencies engaged in scientific work have established a number of special medals or awards for achievement in research, for technical papers, and for inventions. The Incentive Awards Act has stimulated considerable ingenuity in establishing programs of these types.

Employee Training

A second highly significant legislative step was passage of the Government Employees Training Act of 1958. The enactment of this law—long sought by the Civil Service Commission—was a landmark in the government's pursuit of excellence. Its many flexible provisions are especially suited to keep the scientific and technical staff of federal agencies abreast of rapidly changing developments.

The Training Act authorizes employee training at full pay within the federal agency or at colleges, universities, professional institutes, industrial laboratories, or research foundations; full or partial payment of tuition and related costs; payment of travel expenses and registration fees for attendance at professional meetings; and cooperation among agencies in opening up training courses across agency lines.

A number of agencies are using this authority to send staff members to universities for full-time training for periods of as much as 1 year. In addition, several laboratories have worked out arrangements with nearby universities under which senior faculty members give graduate courses at the laboratory.

Passage of the Training Act has encouraged the Civil Service Commission to set up interdepartmental training programs. These now include a wide-range of management training courses, many of them specially designed for science administrators and for scientists moving into administrative positions in which they need training that was not a part of their academic background. Some representative course titles are as follows: Introduction to Science and Engineering in Government; Management Institute for Supervisory Scientists and Engineers; Management of Scientific and Engineering Organizations; and Institute for Executives in Scientific Programs: Science and Government Policy.

Merit Promotion

An important administrative step was taken in 1958: the establishment by the Civil Service Commission of the government-wide merit promotion program. The essence of this program is the selection of the best-qualified employee—not just the fellow at the next desk—when a position is to be filled by promotion. Under general standards issued by the Commission, each agency develops a promotion plan to suit its own situation and to insure that a wide area will be searched for the best-qualified candidate. Seniority is not a factor. Some federal agencies convene panels of senior colleagues to consider the candidates; thus, professionals are rated for promotion by experts in the area concerned.

Salary Reform

The next great landmark in the development of the modern federal personnel system was the Federal Salary Reform Act of 1962, which enunciated a revolutionary principle: "Federal salary rates shall be comparable with private enterprise salary rates for the same levels of work."

This comparability is achieved through annual surveys by the Bureau of Labor Statistics and recommendations by the President to the Congress for any action he considers justified.

The 1962 Salary Act included several special features that help the federal service attract and retain high-quality personnel and stimulate excellent performance. One of these was the special salary-rate authority mentioned in the opening paragraph of this article. Pay differentials between grades were increased for the middle and higher grades, and pay steps within the grade were also increased. (The classified salary structure consists of 15 regular grades and three "super-

grades." There are several levels or steps within each grade, except for grade 18, the highest.) In addition to the regular periodic within-grade step increase, an additional step increase can be granted for high-quality performance; also, the regular within-grade increase can be withheld if work is not of an acceptable level of competence.

Professional positions in the physical and natural sciences, medicine, and research engineering were removed from the restrictions limiting the number of positions in grades 16, 17, and 18 (the "supergrades"). Federal agencies may now recommend to the Civil Service Commission, for its approval, inclusion of as many such positions in those grades as duties and responsibilities warrant. This change goes far toward eliminating a potent barrier to the proper matching of pay and responsibility at the highest levels.

In 1964 a second Government Salary Reform Act was passed, which accomplished two things of enormous importance.

1) It enacted the first comprehensive adjustment of compensation for federal executives since 1956 and the first full and realistic realignment of federal pay rates, from top to bottom, for all branches of government. Not only will the pay adjustments for the top appointive posts permit able people to serve the public without great personal sacrifice but the more realistic rates for these positions will relieve the compression on the career salary scale and permit the upper grade rates to rise in proportion to the lower grades.

2) It reaffirmed legislative commitment to the principle of comparability by providing, in accordance with the President's request, for a further increase in career salaries following a rise in pay levels of private industry.

We know that to most professional personnel the question of pay is not of top importance, but the contrast between our federal salary system of today and that of just 3 years ago is so great that it merits special attention. Let me give a few examples. In 1961 the standard professional entrance-level salary (in grade 5) was $4345; now it is $5000; the special rate for shortage-category scientists, engineers, and technologists at that grade is $5990. In 1961 the regular salary for grade 15 was $13,730; now it is $16,460, and for Manned Space Flight Systems engineers in the Washington, D.C., area it is $18,170. In 1961 the highest salary in the general schedule, grade 18, was $18,500; now it is $24,500. If a reasonable degree of comparability is maintained, there will be no occasion for such drastic changes in the future.

Recruitment for Quality

While these legislative and administrative actions were being taken, constant improvement was being made in federal recruiting practices, with emphasis on the recruitment of college students of high quality. For example, we now offer initial appointment to graduates with superior academic standing at grades higher than those they would otherwise qualify for. Also, in shortage occupations, officials of federal agencies can make immediate offers to well-qualified candidates on the assumption that their names will be high enough on the appropriate register of eligibles when the grading of the civil service examination they have taken is completed. A number of other measures have been taken to speed up the competitive examining and appointing system so as to get the best people on the job in the shortest possible time. Advancement, I may add, is very rapid up to the middle grades; it slows down, of course, as the pyramid narrows toward the top.

Classification of Positions

Position classification in the federal civil service—the process by which the grade and salary level of a job are determined—is a flexible procedure in scientific fields. Traditionally, "the position, not the person, is classified," but in determining the grade level of research positions the qualifications, professional stature, and scientific contributions of the scientist are primary considerations. Also, the job can be tailored to fit the qualifications of an outstanding scientist.

There is a wide-spread impression that a scientist in government must become an administrator in order to reach the top. The truth is, however, that classification standards provide a dual career ladder, so that the creative researcher can advance in grade without taking on any supervisory duties. In fact, the Commission's *Guide for Appraisal of Scientific Positions Proposed for GS-16, 17, and 18* specifically provides that nonsupervisory positions can be evaluated as high as grade 18—the very top. By adjusting the classification system in these and other ways, the Commission endeavors to keep it responsive to changing technology and the latest findings of social science research.

A Creative Environment

The Civil Service Commission communicates regularly with various scientific and engineering groups and committees that are concerned with improvement of the quality of government science—for example, groups set up under the Federal Council for Science and Technology and the National Academy of Sciences—and action has been taken on a great many of their recommendations. As the government's central personnel agency, the Commission is specifically interested in projects to improve personnel management in agencies concerned with scientific research and development. To this end we participate actively in identifying problem areas through periodic personnel-management reviews in the agencies and through conferences with science administrators, laboratory directors, and agency managers, giving assistance or advice wherever needed. Our aim is to free the scientist from petty annoyances and to stimulate creativity.

Within the framework of government-wide personnel laws and policies, agency and laboratory directors can maintain a creative environment by providing privileges and recognition for their scientific personnel. This is done in ways such as the following: by (i) encouraging staff members to attend meetings of professional societies and to publish in professional journals; (ii) giving them credit lines on official publications of the laboratory; (iii) giving them freedom to teach and serve as consultants on the outside, and to write books; (iv) maintaining a liberal patent policy; (v) providing reasonable flexibility of working hours; (vi) establishing meaningful professional titles; and (vii) encouraging co-workers of different grades to

consider themselves colleagues, not boss and subordinate.

In the federal service there are some restrictions regarding conflict of interest and disclosure of classified material, but otherwise laboratory directors are given considerable discretion in using the measures listed above to build the type of environment they seek.

Additional Needs

There are still some weaknesses in the federal personnel system which we are working to correct. For example, we badly need reforms in two aspects of policy related to travel: (i) we need authority to pay travel expenses of candidates who come to the laboratory for visits and interviews, and (ii) we need to provide more adequate reimbursement when employees are required to move in the interest of the government.

In both these respects industry is far more generous than we are. We have proposed legislation to provide the authority that is required.

Summary

The plus factors of the federal personnel system for scientists may be summarized briefly as follows.

1) We have a modern, progressive personnel system which compares very favorably in most respects with that of a good private laboratory.

2) Although our pay scale may still be a little below that of private employment, great progress has been made in the past 3 years, and we are now catching up rather than falling further behind.

3) We do about as well as private employment with respect to benefits such as group life insurance, health insurance, and retirement, although some companies pay a larger share of the costs.

4) We have a generous and flexible leave system.

5) We are especially strong on promotion programs, incentive awards, and career development opportunities on the basis of merit and demonstrated competence.

But it is not primarily because of these fundamentals of a good personnel system that the federal government as an employer strongly attracts many people in scientific research and development. More important are some special factors: challenging scientific missions; an impartial and scientific environment; freedom from involvement in scientific trivia; good equipment and respected colleagues; and, finally, an opportunity to render service to the entire nation. These are the elements that basically characterize scientific programs in the federal service, and they are always present.

News and Comment

Patents and Copyrights: Congress Moves toward Comprehensive Policy on Federally Financed Research

After a period of congressional skirmishing, a decisive engagement seems to be approaching on disposition of rights to the results of research financed by the federal government.

Amendments which in effect put patents and copyrights arising from this sort of research in the public domain have been attached to several bills in the past and present sessions, but in recent weeks a showdown has been shaping on this piecemeal approach.

The Saline Water Act, Helium Act, and Coal Research Act in the last session and the Appalachia Act this year carried public ownership riders. On two occasions in 1964, with disarmament agency and mass transit bills, such amendments were attached in the Senate but rejected by the House and did not become part of the legislation.

Water pollution legislation was voted out of the House Public Works Committee 2 weeks ago, reportedly after spirited discussion led the committee to strike a federal-rights-to-research amendment added in the Senate. And in the Senate the health subcommittee has been ordered by its parent Labor and Public Welfare Committee to reconsider a medical facilities bill to which a similar amendment has been attached. The facilities bill is viewed as particularly significant, since the amendment to the bill applies to the whole Public Health Service Act and presumably would affect research done where any federal funds are involved.

The proviso which gives the government title to the results of federally financed R & D is being called the "Long Amendment" after Senator Russell B. Long (D–La.), chairman of the Senate monopoly subcommittee and newly elected majority whip, who has been increasingly active in the cause of the patent amendment. This year he extended it to cover copyrights as well, to the consternation of book publishers in both the commercial and university press sectors.

(Long is a second-generation senator. His father was Louisiana governor and senator Huey P. Long. Russell Long was elected to the Senate at the age of 30—the constitutional minimum—in 1948. He has combined a standard, if unrabid, Southern segregationist record on civil rights and a stance as an oil-and-natural-gas-state senator with a strain of antimonopoly populism like his father's.

(For most of his time in the Senate Long attracted little notice nationally, but with the death of Senator Robert Kerr 2 years ago and the departure of Vice President Hubert Humphrey from the Senate floor this changed. Long is now heir presumptive to the chairmanship of the influential Senate finance committee, and with his election to the Whip's post he won a formal place in the Democratic leadership structure. There is speculation that Long aspires to the job of Majority Leader, and even hopes to go farther along the road