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

of national politics traveled by another Southerner, Lyndon B. Johnson of Texas.)

In its typical form, found in the Appalachia Act, the Long amendment provides that "no part of any appropriated funds may be expended pursuant to authorization given by this act involving any scientific or technological research or development activity unless such expenditure is conditioned upon provisions effective to insure that all information, copyrights, uses, processes, patents, and other developments resulting from that activity will be made freely available to the general public. . . ." As it stands now, the amendment applies to research for which the government pays any portion of the cost, even a minor percentage.

(The Long amendment does include the qualification that nothing in the amendment shall deprive the owner of any related "background" patent.)

At present, overall federal patent policy is formally governed by a memorandum to the heads of executive departments put out by the White House a month or so before President Kennedy's assassination.

The Kennedy memo enunciates a "flexible" policy. Government ownership as a single standard is rejected, but areas are indicated where the government should acquire full rights to protect the public interest. Health is a principal one of these areas, and the implications of public ownership of the results of federally sponsored medical research has stirred sore apprehension in the pharmaceutical industry (*Science*, 8 Jan. 1965). At the same time, the memo notes that "the policy recognizes that the public interest might be served by according exclusive commercial rights to the contractor in situations where there is greater likelihood that the invention would be worked and put into civilian use than would be the case if the invention were made more freely available." Current practice varies considerably from agency to agency. The Defense Department, the biggest federal patron of R & D, also appears to be most generous in allowing its contractors to keep commercial rights to research findings. (It should be noted that the memo provides that in all research contracts the government shall acquire "at least irrevocable nonexclusive royalty-free license throughout the world for government purposes.")

The Atomic Energy Commission stands at the other end of the spectrum.

Senator Russell B. Long

Because of security problems and because of a desire to encourage growth of a nuclear industry, the Congress wrote into AEC legislation what amounts to a requirement for government ownership of the results of AEC-supported research. While there have been exceptions to the "non-exclusivity" rule, the AEC by and large has followed it. The act creating NASA carried a similar patent clause, but in the wake of the Presidential memo, NASA modified its policy in the direction of more flexibility.

Senator Long's position, as one Senate staff member put it, is basically that "he feels it is an outrage to give away public property." Long denies his opposition's argument that, if exclusive commercial rights are not given, some important inventions will not be developed and marketed. The Long amendment permits private persons or firms to get patents on further development of government-owned inventions or processes. Advocates of the Long viewpoint are fond of citing precedents from the research history of the Agriculture Department, which has followed a policy of putting into the public domain discoveries made under its grants and contracts. The basic DDT patent, the fermentation process which permitted large-scale manufacture of penicillin, the aerosol bomb, and the basic processes for wash-and-wear and cotton-stretch fabrics are all cited as examples of gifts to American technology from the Agriculture Department and its open patent policy.

Long takes his text from Article 4 of the Constitution, which states that "Congress shall have the Power to dispose and make all needful Rules and Regulations respecting the Territory or other Property belonging to the United States . . .," and argues that allowing agency administrators to decide on the disposition of patents violates the Constitution. In floor debate he has been particularly critical of delays by defense contractors in disclosing information to the government.

A chief opponent of the patent amendment has been Representative Emilio Q. Daddario (D–Conn.), who represents the industrial district of Hartford. Daddario is a member of the House Committee on Science and Astronautics and chairman of its subcommittee on science, research, and development. He served as chairman of a special subcommittee on patents and inventions that conducted a study on the space-research patent problems which contributed to the action taken to make NASA patent policy more flexible.

Daddario, in general, supports the flexible approach expressed in the Kennedy memo and an "Interpretative Statement" issued by the patent advisory panel last December to provide more definite guidelines for administrators.

Hornig States Case

The case against a rigid government-take-all policy is summed up in this excerpt from a letter written to the House Public Works Committee, when it was considering the Water Pollution Bill, by Donald F. Hornig, director of the Office of Science and Technology and the President's science adviser.

"There seems to be widespread agreement that the government should pursue a patent policy that results in maximum benefits to the nation as a whole, not merely in the accommodation of parochial interests. However, the differing objectives and circumstances under which Federal research and development is conducted rules out the possibility that a blanket 'title' or 'license' policy could take them properly into account. For example, the nature of the research and specific inventions and the commercial background and know-how of the contractor must be considered. There are circumstances where the government would like to take advantage of the fact that the prospective contractor has made a substantial private investment in the field of interest. The granting of some commercial rights may be necessary to attract private investment in developing and commercializing the invention. Or,

there may be opportunities through a licensing program to exploit the inventions abroad that could be of economic benefit to the United States."

Of what happens when flexibility is denied, Daddario gave this picture in testimony before the same committee.

"For one thing, the government may have to deal with reluctant contractors who tend to compartmentalize their government research and isolate it from their most promising commercial ideas. We know, for example, that in many instances private contractors will separate their research teams working on government projects from their other researchers working strictly on commercial ones. This happens mainly because the contractors feel the need for legal protection of their most profitable investments. Hence they do not want to mix their private research talent with personnel working on government projects. It goes without saying that when this happens there is little cross-fertilization of ideas and the government may find itself shortchanged."

Question of Method

On the tactical level, Daddario has criticized the practice of tacking important amendments to bills during floor debate. Referring to the Long amendment, in testimony before the House Public Works Committee, Daddario said, "It is a provision which was never considered in committee, which the Senate never saw until it was time to pass the bill, and which received virtually no debate considering the complexities of the subject."

Long responded to this line of criticism, in the Senate debate on the Water Pollution Bill, in January when he described his experience in stirring committee action on his proposal. "I went before a subcommittee. I do not know whether it was the proper subcommittee, but I went before some subcommittee of the Committee on the Judiciary 3 years ago—in 1961. I went to great efforts to explain my proposal, but nothing happened. That being the case, I felt the committee would not support the bill. I decided that if the committee would not report the bill I would offer an amendment on the floor of the Senate. That is what I have been doing for the past 3 years. If any Senator does not know by now how to get a committee to consider a research proposal, he ought to offer an amendment on the floor of the Senate."

In both the House and Senate there has been noticeable reluctance to deal comprehensively with patents on government-sponsored research. There have been studies and hearings and reports on the subject, but Congress usually takes a subject seriously when a specific piece of legislation is being proposed, and no comprehensive measure has been, so far. On copyright there has been virtually no discussion at all.

Now the pot seems to be near the boil. Creeping federalization of patents is under examination, and an investigation of the subject, as well as other aspects of the administration of the patent office and a full review of patent law, is being undertaken by the Senate Judiciary Committee under a resolution passed in February.

Behind this move is the realization by Congress that an entirely new set of relationships affecting inventors, manufacturers, and the government has been created by massive postwar government support of research, and that the patent system needs a thorough reappraisal.

Senator Long, who gained added leverage by his election to the post of majority whip, is by no means playing a lone hand. Senator Clinton P. Anderson (D–N.M.), for example, has similar views and has been an effective advocate of these views over the years as the policies of the AEC, NASA, and the Interior Department reveal.

A key man in the patent policy study will be Senator John L. McClellan (D–Ark.), chairman of the Senate Judiciary Committee. McClellan is reputed to favor a flexible approach to patent policy.

Most significant, perhaps, is the news that Senator McClellan intends to introduce—reportedly this week—a bill embodying the flexible approach of the Kennedy memorandum. If such a bill were enacted it would wipe patent amendments from legislation to which they have been attached. Consideration of the bill should induce a fuller examination than has, up to now, been essayed in Congress on the complicated and controversial question of policy on government-financed research.

If there is one thing on which disagreement is unlikely it is the sentiment expressed by McClellan in the debate on the resolution on 8 February, when he replied to a questioner who asked why action had not been taken earlier. "Many bills," he said, "come up on which no action is taken. They sometimes present perplexing problems and questions. If there is anything more complex and perplexing than the patent laws of the United States, I do not know what it is."—JOHN WALSH

Elliott Postscript: Reuss To Head New House Subcommittee Recommended by Research Study

A number of developments related to the now-defunct Elliott Committee have taken place during the past few weeks. The committee, properly known as the House Select Committee on Government Research, automatically expired with the 88th Congress at the end of last year. Its chairman, Representative Carl Elliott (D–Ala.), lost the primary election and is back in Alabama practicing law.

One of Elliott's principal recommendations, the establishment of a Government Operations subcommittee on Technical Operations, has been put into effect. The committee, to be chaired by Representative Henry Reuss (D–Wis.), will have as its chief staff member Harry Selden, who served on Elliott's staff. The subcommittee's scope of operation is now being worked out.

The Elliott Committee's final publication* has now been issued. Titled "Staff Resume of the Activities of the Select Committee on Government Research," it summarizes the recommendations contained in the ten studies issued by the committee during its 15-month study. The résumé also describes the organization of the committee's studies and contains reproductions of the questionnaires used in its inquiry into government support of research.

A critical epitaph to the Elliott Committee was placed in the 16 March *Congressional Record* by Representative George P. Miller (D–Calif.), who is chairman of the House Committee on Science and Astronautics. Miller also took exception to a review of the Elliott Committee that appeared in *Science*, 8 January.

Miller made his remarks to explain his reservations concerning a number of findings that the Elliott Committee published just prior to its expiration. Because of a tight deadline, the explanations were not included in the final reports.

Miller objected to the Elliott report on "Impact of Federal Research and

* Copies are available for 30 cents from the U.S. Government Printing Office.