United States some 5,000 man-hours of flight experience in earth orbit, develop U.S. capabilities for rendezvous and joining of spacecraft in orbit, and prove out man's ability to perform valuable missions during long stays in space.

*Made man's first close-up observations of another planet during the highly successful Mariner II flyby of Venus.

*Obtained the first close-up pictures of the moon, taken and relayed to earth by Ranger VII.

*Initiated an ambitious long-range program for scientific investigations in space utilizing large, versatile spacecraft called Orbiting Observatories for geophysical, solar and stellar studies.

*Operated the world's first weather satellites (Tiros).

*Set up, under the Communications Satellite Act of 1962, the Communications Satellite Corporation, which is well on the way to establishing a global satellite communications system to provide reliable, low-cost telephone, telegraph, and television services to all parts of the world.

In short, the United States has matched rapid progress in manned space flight with a balanced program for scientific investigations in space, practical uses of space, and advanced research and technological pioneering to assure that the new challenges of space in the next decade can also be met, and U.S. leadership maintained.

Atomic energy. The number of civilian nuclear power plants has increased from 3 to 14 since January 1961; and now the advent of economic nuclear power provides utilities a wider choice of competitive power sources in many sections of the country.

The world's largest nuclear power reactor, the Atomic Energy Commission's Production Reactor near Richland, Washington, achieved a controlled, self-sustained nuclear reaction on December 31, 1963.

The first deep-sea anchored, automatic weather station powered by nuclear energy has gone into unattended operation in the Gulf of Mexico, and the first lighthouse powered by nuclear energy flashes now in Chesapeake Bay.

Nuclear energy was extended to space for the first time in 1961. Compact nuclear generators supplied part of the power for instruments in two satellites, and in 1963 provided all of the power needs of two other satellites.

Vigorous support has been given to basic research in atomic energy. The world's highest energy accelerator, the AGS, has come into productive operation.

Oceanography. For the first time in history the United States is building a fleet expressly designed for oceanographic research. Since 1961, 29 ships have been completed or are currently under construction. Shoreside facilities and training programs have been established as part of a major government-wide effort, begun in 1961, to capture the enormous potential rewards of research in this area which until now have been almost as remote and inaccessible as space itself.

—D. S. GREENBERG

Science Advice: New Division for Science Policy Research Set Up in LRS to Aid Congress

The most conspicuous result, to date, of the growing demand for more and better science advice for Congress is the establishment of a new Science Policy Research Division in the Legislative Reference Service (LRS) of the Library of Congress.

The LRS is the research arm of Congress, created to answer specific requests from congressional committees and individual members on matters related to legislation and public issues. Science and Technology is the area in which the LRS business has grown most rapidly in recent years, without, until now, a corresponding expansion in staff to handle this increase.

To head the new division, Librarian of Congress Quincy L. Mumford has appointed Edward Wenk, Jr., a member of the LRS staff for 2 years before he moved from the Library in 1961 to the Executive branch to serve as assistant to the President's science adviser. When the Office of Science and Technology was established in the Executive Office of the President in 1962, Wenk became a member of the staff and technical assistant to the director of OST.

According to the Library of Congress announcement of his appointment, Wenk "will serve in the Legislative Reference Service as a Congressional consultant in scientific and technical developments that affect public policy, and he will also serve the Library as a whole, in his capacity as special adviser to the Librarian and as coordinator of science information services furnished to Congress."

The bestowal of a second hat to principal scientists in government agencies is becoming a common practice, apparently because the adviser-to-the-chief role serves to give science more emphasis in the agency and to give the scientist higher status.

When Wenk went to work for the LRS in the late 1950's he was the first "senior specialist" in science and technology to fill a post which had been created in the aftermath of the Sputnik alarm. (Senior specialists are a group of researchers holding higher pay grades and occupying separate status in LRS. The group, representing about a score of varied specialties—agriculture, conservation, education, international trade, taxation, and so forth—was set up to provide Congress with consultants of a competence comparable to that of the experts in the Executive agencies.)

Wenk holds a master's degree in applied mechanics from Harvard, and bachelor's and doctoral degrees in engineering from Johns Hopkins. Between 1942 and 1956 he served as researcher and administrator at the Navy's David Taylor Model Basin in Washington. In naval engineering his particular field has been stress analysis, and he has contributed substantially to the development of deep-diving submarines. At OST he held a pivotal job as secretary of the Federal Council for Science and Technology. He served as staff director for the so-called Gilliland panel, which made recommendations for Federal policy on graduate education in science and technology (*Science*, 21 Dec. 1962), and has worked on various long-range planning projects at OST. Wenk has also been OST's man on oceanography.

With Wenk as chief of the new division it is not surprising that some observers on Capitol Hill expect the new LRS division to become a "Congressional OST." Such a development would please those who feel that the Executive has had a monopoly on information and expertise in science and technology.

No New Departures

This expansion of the Legislative Reference Service in science and technology builds on existing foundations rather than creating new entities, as had been suggested in some other proposals for ways to improve science advice for Congress. And Congress is more comfortable with minor adjustments than with major alterations in its machinery.

The new division will face some possible disadvantages as well as advantages in being a part of the well-established LRS. The prime purpose of the LRS is to serve Congress, and that means having 535 bosses. Many of the requests which go to LRS are trivial when measured on the scale of value to national legislation, but they may not seem trivial to the senators and congressmen who are, periodically, candidates as well as legislators.

On the one hand, the LRS staff makes background studies and produces reports which often contribute decisively to legislation. On the other hand, LRS must cope with a barrage of congressional requests for information to relay to constituents. A major category in-

cludes the requests from high school and college students who, in effect, want their congressman or senator to do their research for them on some paper or class project. Some legislators rely heavily on LRS for ghostwriting assistance, and the often perfunctory quality of the LRS response to requests for speeches, statements, and articles probably contributes to the banality of much congressional prose. Recently, a special group has been set up within the LRS to handle more routine requests and this group should serve as something of a buffer for LRS as a whole.

It is difficult to generalize about the performance of LRS, but it seems that among legislators and their staffs there is a feeling that LRS usually does well on the bigger, more important jobs. It has, however, a spotty reputation in performing the workaday tasks that Congress showers on it. A frequent complaint is that LRS is slow. Because many congressional offices operate most of the time on a system of deadlines barely made, an in-by-nine, out-by-noon service on requests is expected, which the LRS cannot provide. In fiscal 1963 LRS recorded 105,000 separate inquiries. About 20,000 of these were oral inquiries answered on the spot or after a short trip to the stacks. About 65,000 were answered by sending material, bibliographies, and reports prepared by the service; more than 7000 got answers in the form of letters, special reports, or memorandums, and more than 8000 were answered by telephone after some research.

LRS can call on other departments of the Library for help. Chief support comes from the Reference Department, which has a science and technology division and the National Referral Center for science and technology. The National Referral Center, supported by National Science Foundation funds, is a clearinghouse organized to compile a comprehensive inventory of information resources in all fields for science and technology and to make that information available in various ways to professionals. It is clear, however, that the main task of making the resources of the library available to Congress in science and in other fields will continue to be centered in the LRS.

The LRS, under its director, Hugh L. Elsbree, now employs about 200 people and operates on a budget of about $2 million a year. Its staff, according to the law, is employed "without regard to the civil service laws and without reference to political affiliations, solely on the grounds of fitness to perform the duties of their office."

Despite its nonpartisan charter and the academic clutter in the small study rooms on the top floor of the Library of Congress Annex, which many of the researchers occupy, the LRS is not a scholarly sanctuary. Senior specialists, for example, may be queried for factual information on a law or public issue. But they may also be asked to write a brief memorandum supporting one side of a question, and they are expected, like lawyers (which some of them are), to be able to argue either side of a case and argue it well.

In theory, perhaps, LRS staff members do consulting work rather than staff work. In practice, the distinction often erodes, especially with those who work well with committee chairmen and staffs and have a flair for writing studies and reports. Many LRS staff members in the past have been lent or leased to Congress—there is an arrangement under which a Library of Congress staff member is reimbursed by Congress if he spends a certain length of time on a specific project.

Recruiting for the Division

Under this reimbursement policy it is very possible that the new science policy research division could increase its effective manpower beyond its presently authorized level. In response to a committee request, for example, an authority in some technical field might be persuaded to come to Washington for a year to help with a specific project. He would be attached to the new division but would be paid, indirectly, by the committee on whose project he was working.

The authorization of four new positions, incidentally, represented a halving of the original Library of Congress request to Congress, and there are indications that the Appropriations committees might look kindly on an increase in the number of positions if they are favorably impressed by the early operation of the division.

What kind of people are needed for the new division is a question that cannot be answered simply by finding applicants with sound scientific and technical backgrounds. A study by the staff of the subcommittee on science research and development of the House Science and Astronautics Committee (*Science*, 28 August) includes this inside view of the personnel requirements of the LRS in serving congressional needs for advice in science and technology.

Edward Wenk, Jr.

The experience of the Legislative Reference Service indicates that people trained in a variety of disciplines have been effective in helping to meet congressional needs. Over the past few years, several hundred requests for information and advice in matters involving science and technology have been handled by a dozen or more members, or former members, of the Legislative Reference Service staff. Close relationships have been built up over the years with congressional committees and their members dealing with defense, space, atomic energy, public works, and other fields where science and technology have been involved as elements of public policy. The experience thus gained indicates that science and technology are not basically different from the other complex fields in which Congress operates, and that the problem of Congress is basically that of relating science and technology to public policy. To assist in this, Congress needs staff generalists, rather than laboratory scientists, to assist it in playing the independent role in policy guidance assigned it under the Constitution. Admittedly, a basic education in one of the areas of science or engineering is a good background for such generalists, but training in political science, economics, law, or other social studies has also formed an adequate background for many staff members who have become proficient in working with Congress on scientific matters.

This is taken from a study paper by Theodore M. Schad, LRS senior specialist in engineering and public works,

and Elizabeth M. Boswell, research assistant, written at the request of the subcommittee for its staff study on "Scientific-Technical Advice for Congress: Needs and Sources." Shad is widely known on Capitol Hill and "downtown" in the agencies as a seasoned and knowledgeable consultant and staff man in his area. His list of qualifications for recruits would probably accord closely with one that might be drawn up by legislators and their staffs, who tend to be generalists themselves and to feel most at ease with other generalists.

Recruiting of people with respectable scientific or technical backgrounds who are also sensitive to the requirements of Congress and interested in public-policy aspects of technical questions is obviously not easy. And this is proved by the difficulties of both the Library of Congress and congressional committees in recent years in recruiting technically trained staff members.

Some things have been happening, however, which may ease the problem. The recent federal pay raise is no bagatelle. The new LRS division in science and technology, for instance, has been authorized one position at the equivalent of the annual pay of the top civil service General Schedule (GS) salary of $24,500; two GS 17's at pay ranging in five increments from $21,445 to $24,445; a GS 15 at $16,460 to $21,590; a GS 11 in the $8000 to $11,000 range; and a GS 9 in the $7500 to $9500 range.

Interest in questions of science and public policy is obviously increasing in the universities and in the scientific community. At the same time, both in Congress and the Library, work in the science and policy area is being given more emphasis, and this may well serve as a recruiting incentive.

The Library of Congress reportedly has been having better luck recently in attracting applicants for science and technology jobs than it has had for several years. Both the Library and the congressional committees, incidentally, report that it is somewhat easier to find engineers than hard scientists.

Ultimately, of course, the effectiveness of the new division and its style of operation will depend on the people it employs, the direction it gets from Wenk, and the relationship it develops with Congress, particularly with the chairmen of the science committees and their staffs.

Last week the new division and Wenk were welcomed in speeches on the floor of the House and Senate by two legislators who will probably figure prominently in the division's future—Senator Clinton P. Anderson (D–N.M.), chairman of the Senate Aeronautical and Space Sciences Committee, and Congressman George P. Miller (D–Calif.), chairman of the House Science and Astronautics Committee.

This endorsement by Anderson and Miller serves to reinforce a growing impression that Congress will follow an evolutionary course in improving its apparatus for science advice, in effect ordering more of the same by continuing to strengthen the staffs of science committees, making greater use of panels of outside consultants, and requiring new service from the old LRS.—JOHN WALSH

Electron Microscopes: Duty on Foreign Models Restored by House; Action in Senate Is Uncertain

After receiving no attention for over 18 months, a bill to restore the tariff on imported electron microscopes was unexpectedly passed by the House of Representatives on 17 August.

It was another step in the on-again, off-again tariff history of these costly research instruments (*Science*, 8 Mar. 1963). Before 1961, electron microscopes were formally subject to duty. Commercial institutions purchasing foreign models always paid the tariff, but friendly congressmen frequently interceded on behalf of universities or research institutions in their districts, introducing special bills to win exemptions for particular purchases. As a result of this arrangement, both the Treasury Department and the Ways and Means Committee—the tariff-writing committee of the House—were annually confronted with a large number of bills requesting tariff exemption, each requiring separate action. In 1961, acting under the belief that the foreign imports were not competitive with domestically produced models—and on a desire to rid itself of a tiresome nuisance—the Ways and Means Committee voted that all electron microscopes imported by nonprofit institutions should be duty-free.

Subsequently, the Radio Corporation of America, the only domestic manufacturer of the class of microscopes most commonly used in research, began a campaign to have the tariff reinstated. RCA claimed that removal of the tariff had placed it in an unfavorable competitive position with foreign manufacturers, and that its sales were declining. The company also claimed that since its instruments were the equivalent of those produced abroad, the principal effect of the tariff removal had been to enable American institutions to purchase substantially identical instruments at lower foreign prices.

NIH representatives and other scientists had earlier gone on record opposing RCA's claim that the instruments were identical. No one suggested that the RCA product was inferior, but the general feeling in the scientific community appeared to be that each microscope had its own distinctive features, and that certain functions were better performed by foreign microscopes than by RCA's. Several scientists felt that since researchers would continue to seek out the foreign equipment best suited to their own needs, the tariff would simply penalize their institutions without benefiting RCA. Those opposed to the tariff also argued that the competition between foreign and domestic manufacturers of electron microscopes acted as a stimulus for both, and that this interplay would be curtailed by a protectionist tariff.

Table 1. Prices of domestic and imported electron microscopes.

Instrument	Price with duty	Price without duty	Actual dollar reduction passed along to non profit organization	Actual price reduction (in %) passed along to nonprofit organization
RCA EMU-3G (domestic)	$36,725	$36,725		
Siemens & Halske (Germany)	38,632	31,720	$6,912	17.9
Hitachi HU-11 (Japan)	36,500	31,000	5,500	15.1
Phillips EM-200 (Holland)	45,100*	41,000	4,100	9.1 †
J. O. E. L. JEM-6A (Japan)	33,247	28,402	4,845	14.6
AEI EM-6 (England)	43,000*	37,500*	5,500	12.7

* Estimated. † Phillips claims that it imports its microscopes in a partially disassembled state, therefore its instruments were subject to only 10 percent customs prior to removal of the tariff. (Source, *Congressional Record*, 13 August 1964).