

Quest for a science policy

Over a three-month period this summer the pastel walls of hearing room 2325 in the House Rayburn Office Building echoed with the pronouncements of the nation's premier scientific leaders, who came to lament the passing of science as one of the country's major preoccupations and to propose new ways to insure an orderly flow of support to scientific research.

The occasion was a series of hearings on a national science policy (SN: 7/25, p. 57), conducted by the scientific community's politically weak but very sympathetic best friend in Congress, the Subcommittee on Science, Research and Development. The hearings represented also a sort of scientific swan song of the subcommittee's outgoing chairman, Rep. Emilio Q. Daddario (D), who Tuesday lost his bid for election as governor of his home state of Connecticut.

The report based on those hearings, issued this week, contains few surprises. The need to establish a formal national policy for the support of science is reaffirmed. A special administration task force to draft one by the end of 1971, for Congress to consider in 1972, is requested. (The report this spring of a Presidential commission on science policy (SN: 5/16, p. 478) is termed a beginning, not a concluding, effort.)

The White House Office of Science and Technology, the subcommittee urges, should be bolstered to become the focal point for the coordination of Federal support of research and technology.

And, as many scientists have been saying, the responsibility for basic research should center in the National Science Foundation. NSF now funds only 15 percent of the federally supported basic research in the United States, and the subcommittee wants that proportion to increase to approximately one-third.

This would go a long way toward alleviating one of the major problems of research support, the year-to-year fluctuations in research funding by the mission-oriented agencies, whose budgets are large but highly susceptible to shifting exigencies. The need to have basic research proceed in a deliberate rather than flighty fashion is a legitimate central tenet of the proposed national science policy—although scientists tend not to emphasize that many other national needs, like housing and health care for the poor, would likewise benefit from regularized support.

The trend toward a strengthened NSF is well under way and has fairly

Federal R&D Outlays		
Fiscal years	Research and Development Expenditures (millions \$)	Expenditures as percent of Federal Budget
1940	\$ 74	0.8
1945	1,591	1.7
1950	1,083	2.5
1955	3,308	4.8
1960	7,744	8.4
1961	9,284	9.5
1962	10,381	9.7
1963	11,999	10.8
1964	14,707	12.4
1965	14,889	12.6
1966	16,018	11.9
1967	16,842	10.6
1968	17,030	9.5
1969*	16,553	9.0
1970*	16,922	8.7

* estimates

NSF

broad support, but another recommendation of the subcommittee, eventual establishment of a National Institutes of Research and Advanced Studies (NIRAS), faces the formidable obstacles any extensive proposed governmental reorganization confronts. NIRAS, a concept the subcommittee began promoting earlier this year, would absorb NSF and the basic research and graduate education activities of other agencies. It would account for 60 percent of all federally supported basic research. But the creation of any such institution is years off at best.

Administration science policy leaders are hardly unaware of the need for improved procedures for deciding what is supported. The new director of OST, Dr. Edward E. David Jr., and the director of NSF, Dr. William D. McElroy, are trying to evolve new procedures for weighing the priorities of various subfields of science against each other. "There is a strenuous effort to try to do this allocation process better—to try to exercise leadership and develop new mechanisms," says an OST aide. But staff members in both OST and NSF caution not to expect too much from these fledgling efforts. □

INTERNATIONAL SPACE

Meshing at the hardware stage

Progress on the international scene is often difficult to define, detect or measure. But recently, spacemen of the Soviet Union and the United States appear to be accomplishing what diplomats find frustrating—talking and reaching some agreement.

A space accord signed last week—the first significant cooperative agreement since 1965—defines the tempo and scope of technical exchanges between the space agencies of both countries, directed toward the development of mutually compatible rendezvous and docking systems for spacecraft (SN: 10/17, p. 315). Such systems would allow a spacecraft of the Soviet

Union to rescue stranded American astronauts in orbit, and vice versa.

Dr. Robert R. Gilruth, Director of the National Aeronautics and Space Administration's Manned Spacecraft Center in Houston, and Boris N. Petrov, Chairman of the Soviet Council for International Cooperation in Exploration and Use of Space, signed the working agreement after two days of preliminary talks in Moscow. (The pact will be signed on the governmental level later.)

The two-day Moscow conference identified 12 technical areas to resolve if spacecraft of the two nations are to dock. These include the dynamics of docking (energy and shock absorption), radio devices for the rate of closure, optical devices and alignment optics, cabin atmosphere compatibility and airlock use. Three technical groups composed of from three to five members from each nation will work on compatible hardware, operational problems and coordination of the exchange. Arrangements are to continue through the fall, leading up to another meeting in March or April, probably at the Manned Spacecraft Center.

It is not inconceivable that a multiple docking adapter could be designed to link the current Soviet Soyuz series and the Apollo series to be used in the 1972 Skylab workshop (SN: 10/10, p. 303). But both space agencies are studying the development of new hardware. The Soviets are thinking of large earth-orbiting space stations and NASA is pushing the reusable shuttle and space stations. Therefore, any compatible systems would most likely be used in the next generation of spacecraft.

The current Soviet Soyuz series, designed for earth-orbital research, differs in size and complexity from the larger moon-landing Apollo hardware. The Soviets also currently use a slightly different rendezvous method, which is described as a "catch-up" maneuver in the same orbit, but slightly out of plane. The American astronauts, on the other hand, try to get in plane as soon as possible and catch up by moving from a lower and faster orbit to the awaiting spacecraft in a higher and slower orbit. It is believed that although the Soviet method requires more propulsion, it is just as accurate and extremely flexible.

Soviet docking procedures differ as well. Instead of moving through an internal tunnel from one craft to another after docking, the cosmonauts space walk outside the craft to make a transfer. However, Soviet officials revealed blueprints of more advanced systems that include an internal tunnel much like the Apollo system.

The Moscow talks coincided with a 10-day visit by Soyuz 9 Cosmonauts