to Washington for support of their research.

However, given the continuing federal budgetary squeeze and the promise of another lean year for academic research, some well-placed observers believe that the current session of Congress is not a propitious time to seek enactment of a costly new aid-to-education bill. Just the fact that the Miller bill singles out academic science for support may strike many members of Congress the wrong way. "It sounds like an extraordinary plea for special benefits for a field already favored by legislation enacted in the past," comments Representative John Brademas (D–Ind.), a member of the House subcommittee on higher education.

Of course, the program proposed in the Miller bill can be viewed as a foot in the door—as the precursor of general institutional support benefiting all fields. There is, in fact, reason to think that the bill is so regarded by the association leaders who drafted it. But the strategy of invoking the name of science to establish precedent-setting programs of federal support for higher education may have lost much of its efficacy.

While congressmen may once have felt that to vote benefits for academic science was the moral equivalent of saluting the flag, there is now evidence, as in the massive cuts in the NSF budget last year, of a change of attitude. In this connection one must note that, although the American Council of Education's Commission on Federal Relations supports the Miller bill, it is now developing a proposal for a program of general institutional grants. The commission is doing so apparently in the belief that the chances of such a program's receiving congressional approval are as good as, or better than, those of a program benefiting academic science alone.

According to John F. Morse, director of the commission, the program his group is considering would be administered by the U.S. Office of Education (USOE) rather than by NSF and the legislation creating it would be handled by the House Education and Labor Committee. Thus, even now one can foresee the possibility of a major jurisdictional rivalry developing between the Education and Labor Committee and Miller's Science and Astronautics Committee. Although Edith Green (D–Ore.), chairman of the House subcommittee on education, is now withholding comment on the Miller bill, she has spoken favorably of the concept of general federal aid to higher education and she presumably would like to take up such measures in her subcommittee.

The Department of Health, Education, and Welfare, of which USOE is a part, has reported unfavorably on the Miller bill, partly on the grounds that it slights the smaller, weaker institutions and, though it provides additional support for the sciences, it does not support the humanities. Yet, even if its formula and coverage were made more equitable in HEW's eyes, the bill would receive a low priority from the department's present program planning staff.

Alice M. Rivlin, assistant secretary of HEW for planning and evaluation, has been chairman of an interagency policy committee assigned to make a "strategy study" of federal support for higher education. As this is written, the committee's report still had not been made public, but there is reason to believe that, in general, it will be similar in viewpoint to the report of the Carnegie Commission on Higher Education (chaired by Clark Kerr, former president of the University of California).

In its recommendations (*Science*, 20 Dec. 1968), the Carnegie Commission stressed equality of educational opportunity and direct aid to students. It proposed a program of cost-of-education supplements to institutions, but these would be based on the number of students who had received federal grants. Under the Miller bill, on the other hand, two-thirds of the money would be distributed according to formulas based on the volume of research grants received and the number of advanced degrees awarded; the remaining third would be allocated to the various states on the basis of the number of undergraduates enrolled in their institutions and divided up among institutions within each state on the basis of such factors as the number of baccalaureate degrees awarded in science and the number of student semester hours in science taught. Some educators, such as Charles J. Hitch, president of the University of California, who feel that the program set out in the Miller bill would be useful, nevertheless give the Carnegie proposals a higher priority.

Also, the Nixon administration, now on the point of taking office, may not want Congress to push ahead with the Miller bill or any other proposal until it has had time to generate some ideas of its own. In sum, rather than as a proposal to be viewed as ready for enactment, the Miller bill probably can best be regarded as the opening bid in the discussion of the need of higher education for further federal support.—LUTHER J. CARTER

French Science: Austerity Drive Ends Rapid Budget Growth

Paris. The franc crisis has taken the acceleration out of French support for science and technology, but outside of canceling or postponing a few big projects, the government, despite a broad austerity program, does not seem to be squeezing these fields too hard.

As was the case with their American counterparts, French scientists and technologists are finding it painful to live with the prospect of little or no financial growth after several years of sensational increases. But since the days of true penury were not so long ago, the current situation, difficult as it may be, is not regarded as calamitous. The French Government is now providing about $1.7 billion a year for research and development; this amount, plus another $800 million spent by industry, brings French R & D expenditures to approximately 2.4 percent of the gross national product, compared with 1.5 percent as recently as 1962. Science and technology have long stood in the center of De Gaulle's plans for national greatness, and there they remain, however much the government must revise its plans because of the wobbliness of the franc.

In France, as elsewhere, the complexities of research bookkeeping make it difficult to arrive at precise measurements, but the growth in recent years has been phenomenal, with major components of the science budget rising by as much as 35 percent between 1966 and 1967, and 24 percent between 1967 and 1968—as measured in actual purchasing power. In the new year, however, the increase, as now estimated, will be slightly below 4 percent for most areas, but with costs still going up, including a 12-percent salary increase that was approved following last spring's upheavals, the total fund for the actual conduct of research is remaining constant, and, in reality, may turn out to be somewhat less than before.

Faced with this situation, but still regarding science and technology as a key part of France's aspirations to world importance, the government still holds to its design of at least some involvement in every significant field of research. Thus, harsh treatment has been accorded one aspect of high-energy physics through the cancellation of plans for a national accelerator in the 25- to 40-Gev range. And another high-energy physics project that was in the very early stages of discussion, a Franco-German accelerator in the 40-Gev range, has also been dropped. But France is staying with its commitment to support construction of the 300-Gev accelerator planned by the European Organization for Nuclear Research (CERN). This pattern is consistent with past French actions regarding "Big Science": do it alone if possible, but, if not, go international.

Some $12 million has been cut from the amount France originally planned to spend this year on the Anglo-French Concorde supersonic transport project, but the arcane finances of this venture are such that the saving is not expected to affect the plane's completion date or anything else. And, as part of an $80-million reduction in military expenditures, the government has canceled the nuclear weapons tests that it had planned to hold this year in the Pacific. France's nuclear aspirations, however, remain intact, and other work in this field is apparently going ahead.

In space-related activities, the budget—some $93 million—has not been directly touched, but some juggling will be necessary. This is because the French last year apparently based their space plans on the assumption that the European Launcher Development Organization (ELDO) would collapse as a consequence of Britains' attempt to get out of its commitment to support the organization (*Science*, 6 December 1968). Surprisingly, and possibly even to France's veiled disappointment, ELDO survives, and so does France's commitment to put up about $36 million for it this year. The government has indicated that it will give the national space agency half this sum by slicing a like amount from funds originally scheduled for atomic energy activities. The balance will be made up by delaying several satellite-development and satellite-launch projects. Among these are a weather satellite which was to have been launched for the French by NASA in 1970, and a scientific satellite that was to have been developed for launching by the Soviets in 1972. As things now stand, each of these will be delayed about a year. Delays of at least 6 months have been planned for two other projects, one a weather satellite and the other a satellite for measuring atomic hydrogen around the earth.

Though the government has committed itself to a period of austerity to avoid devaluing the franc, it is generally agreed that the French economy is relatively healthy and productive, and that, barring some unexpected turbulence, the need to limit expenditures will not be of long duration. Against this background, one of the guiding principles for France's managers of science and technology is the view that, when the choice is between making cuts in staff or cuts in construction or operating expenses, preference should be given to keeping people on the payroll. Nevertheless, there are some areas where large-scale expansion of facilities is taking place; perhaps the most notable of these is oceanography, which has undergone an extensive reorganization over the past 2 years.

Another field that has been protected from the austerity is the Plan Calcul, France's design to achieve independence in computer technology. Capital funds will be raised to nearly $31 million, an increase of 7 percent over the previous year. But the basic scientific disciplines, which have flourished, but not nearly so much as the spectacular fields that contribute to national prestige, will almost all be hard hit by the cutbacks on capital expenditure. In virtually all of these—mathematics, physics, chemistry, and so forth—the reductions from 1968 levels range from 10 to 50 percent. For example, the 1968 authorization for chemistry was $10.4 million; under the new budget, the provisional figure is $5.4 million.

Among American scientists familiar with the French scientific scene, a commonplace assessment is that, with few exceptions, the French have nothing to teach us, and that there is nothing in the offing to suggest that this situation will change. The policy of maintaining at least a presence in all fields has sizably boosted the total French research effort, but at the same time it has made it difficult to concentrate substantial resources in any particular field. One consequence is that the image of French science and technology is probably a good deal better than the reality. With nuclear weapons, a budding space program, and now a major move into oceanography, the French have more or less demonstrated a capacity for independence and have gathered a good deal of prestige—whatever that means and whatever it is worth. But, at the same time, there is a growing realization that independence and prestige are probably not the most useful guides for employing science and technology in behalf of down-to-earth human needs. Biomedical research, being relatively unglamorous, is, with few exceptions, in a sorry state in France. And, despite the large sums that have been put into Big Science and technology, there have been few beneficial spin-off effects on French industry. Whether anything will be done about this situation is not at all certain, but Robert Galley, the new Minister of Science, has declared that, in making policy for science and technology, greater emphasis is to be placed on research that will improve France's industrial position. But even if the best intentions are translated into policy, the fact is that scientific and technical institutions are notoriously unwieldy, and no way, short of wartime necessity, has been found to force them into a swift change of course.

After all, for a decade now, United States science administrators and government officials have agreed that something should be done to bring the national laboratories closer to national needs, and they also agree that very little progress has been made. There is no reason to assume that France, beset by financial and political problems, social upheaval, and remarkably durable institutional rigidities, is likely to find the formula for quick success in redirecting its research activities.

—D. S. GREENBERG