or not, just as the Republicans had begun to assail the administration for limiting the Air Force's space role, the administration announced that Air Force astronauts will be given a chance to ride along with their civilian counterparts in the two-man Gemini capsule.

The aerospace trade press, which frequently thinks like the Air Force but does not have to contend with McNamara's blue pencil, has raised the question of whether the Gemini role is nothing more than hush money. Whatever the answer may be, the fact is that any assault on the administration's views of the military potential in space is now considerably undermined because a few Air Force men are scheduled to go into orbit.—D. S. GREENBERG

Population: National Academy Group Nearing Completion of Study

A 9-member group appointed by the National Academy of Sciences as a Committee to Consider Population Problems is nearing the completion of its studies and expects to report to the Academy sometime this month.

The committee, which was appointed without announcement last fall, is headed by William D. McElroy, chairman of the Department of Biology and director of the McCollum-Pratt Institute, Johns Hopkins University. The committee has surveyed the state of knowledge on population problems and the existing means for disseminating this knowledge. Its report will include recommendations for research and other activities affecting population problems. The study was undertaken at the initiative of the Academy.

Postscript to Portland's Penguins

The machinations employed by the Portland (Oregon) Zoological Gardens to obtain a flock of penguins from Antarctica were described in this space last 26 October. The penguins, it can now be reported, were delivered to Portland on 1 December. At last count, according to zoo director Jack Marks, 16 of 42 had died, apparently of respiratory ailments. The National Science Foundation, which sanctioned the penguin lift against its own judgment and under pressure, has no comment.—D.S.G.

Education: President's Program Provides More Room at Top

Hearings began Monday before the House Education and Labor Committee on an administration bill which combines more than a score of proposals for education legislation. Congress over the past 2 years has failed to give final approval to any of several aid-to-education measures which the administration has given high priorities, and the decision this year to resort to an omnibus bill has not been received as a tactical masterstroke by either foes or friends of federal aid on Capitol Hill.

Tied together in the bulky National Improvement of Education Act of 1963 are major programs to benefit higher education, elementary and secondary schools, and vocational education, along with help, on a smaller scale, for such allied causes as adult education and community libraries.

The administration's all-purpose bill mingles proposals which would probably command majorities if they could be steered successfully to the floor with others afflicted by the controversies over federal control, race, or religion which have made federal aid to education the most hagridden of national issues.

Many of the proposals in the 24 principal sections of the bill have led previous lives as separate legislation, but the bill cannot be fairly described as a mixture of old wines in a big new bottle. New programs have been added, old ones have been modified, and the package has been carefully assembled to meet both the wants and the objections of the special-interest groups which have demonstrated their power to block education legislation.

The strategy of the big bill appears to have two main objectives: (i) to provide something for nearly everybody so that most will acquiesce in the total program; (ii) to confront Congress, and particularly the House and Senate education committees, with the whole range of education problems, together with proposals to attack these problems.

Hearings on the omnibus bill opened this week before the full House Education and Labor Committee—a rather unusual course of action, since a combination bill would ordinarily be broken up and parceled out to appropriate subcommittees for hearings.

The new Commissioner of Education, Francis Keppel (*Science*, 7 December), is reported to have sought full committee hearings because he felt they afforded a forum which would enable Secretary of Health, Education and Welfare Celebrezze, himself, and other administration advocates to tell the whole story to the group which would have to report out education legislation. Customarily, a full committee is inclined to accept legislation more or less in the form in which it is approved by one of its subcommittees. Often, only four or five subcommittee members have attended hearings with any faithfulness.

It is expected that when the more prestigious witnesses have had their say, the bill will be cut up into its component parts and these will be turned over to the responsible subcommittees for action.

Objections to the omnibus approach have been voiced by Republicans on the Education and Labor Committee, who charge that the President has made it more difficult to pass any education legislation this year by failing to set priorities. The Republicans offered some priorities of their own by proposing action in three areas: a program of grants and loans for construction of academic facilities for colleges and universities; extension and expansion of the National Defense Education Act, which includes a variety of programs for both higher education and elementary and secondary schools; and continuation of assistance to federally "impacted" areas where relatively large numbers of children of federal employees attend schools. Both NDEA and impacted-areas legislation will expire this year, but legislation in these

two categories is, in general, acceptable to Congress in its present form.

College aid bills were enacted last year in both the Senate and House, but attempts to reconcile differences in the two versions failed last year because of the controversy over providing federal aid—particularly in the form of grants —to private institutions.

If the President has not allotted priorities among the education programs he has put forward, he has put very strong stress in his messages to Congress, and in his budget, on efforts to develop the nation's resources in professional manpower, particularly in the scientific and technical fields.

Graduate education in general, and graduate study in engineering, mathematics, and physical sciences (EMP) in particular, are designated for a much larger injection of federal funds. This big boost to graduate education would be provided not through enactment of new laws but through expansion of existing programs. This, in Congress, is the path of less resistance.

The proposals for support of EMP graduate programs reflect a decision within the administration to implement recommendations of a report on a study of graduate training in engineering, mathematics, and physical sciences that was made under the auspices of the President's Science Advisory Committee (*Science*, 21 December). The study panel examined the present and projected supply of specialized manpower in light of the demands of the military and space programs, medical research, and the long-range requirements of the economy. The panel report emphasized the need for sharply increased financial support for graduate students, and for funds to help universities expand and improve graduate training.

In his special message on education the President put the argument for creating more room at the top in these terms:

"A serious barrier to increased graduate study is the lack of adequate financial aid for graduate students. Only 1500 fellowships are permitted annually under the National Defense Education Act program, upon which we are dependent for urgently needed increases in the number of college teachers and the number of graduate students pursuing other courses essential to the Nation's advancement and security.

"The National Science Foundation has broad authority for fellowships and training grants, but its program, too, has been restricted by limited appropriations. The President's Science Advisory Committee has predicted that the dramatically increasing demand for engineers, mathematicians, and physical scientists, will require that the output of Ph.D.'s in these fields alone be increased 2½ times, to a total of 7500 annually by 1970, and that the number of masters' degrees awarded annually be substantially increased. In all fields the need exceeds the supply of doctoral recipients. The shortage is particularly acute in college teaching, where at present rates the nation will lack 90,000 doctoral degree holders by 1970. It is clearly contrary to the national interest to have the number of graduate students limited by the financial ability of those able and interested in pursuing advanced degrees. Fellowship programs can ease much of the financial burden and, most importantly, encourage and stimulate a fuller realization and utilization of our human resources."

The effect of the administration's EMP program would be most apparent in the increase in fiscal 1964 in the number of federal graduate fellowships and the accompanying "cost of education" grants to universities. The fellowship program marked for greatest expansion would be that of the National Defense Education Act, in which the number of NDEA fellows would rise from the present 1500 a year to 10,000, plus 2000 summer-session awards for fiscal 1964. NDEA fellowships are open to students in the humanities and social sciences as well as to those in science, mathematics, and engineering, but it is expected that more than 40 percent of the NDEA grants would go to students in the latter group.

Hurdled in First Year

According to the presidential EMP panel, financial need prevents many able holders of bachelor's degrees in EMP fields from pursuing graduate studies. The fact that first-year graduate students in these fields have much greater difficulty obtaining fellowships and assistantships than graduate students in later years was also cited in the report as a source of difficulty. To meet this problem, and to achieve a maximum increase in EMP enrollment immediately, heavy emphasis is being put on fellowships for first-year students.

For example, of approximately 2900 EMP fellowships to be awarded under the proposed new NDEA allocation for fellowships, some 2400 awards will go to first-year students and 500 to students in other than the first year.

To estimate the full potential of the President's proposals for the EMP fields, however, it is necessary to look beyond the education bill to plans of the agencies which already are a force to reckon with in graduate education—the National Science Foundation, the National Aeronautics and Space Administration, and the Atomic Energy Commission.

No less spectacular than the rise in NDEA support of fellowships would be the proposed expansion of NSF programs. The number of NSF fellowships would go up from the current annual number of 4565 to 6475 for fiscal '64. The number of graduate students getting NSF predoctoral fellowships would be boosted from about 2800 annually to 4200 (about half in EMP), the other 2000 grants being awarded under a variety of programs ranging from summer graduate teaching assistantships to full-year senior postdoctoral fellowships.

Perhaps most significant of all for EMP, funds to finance 5000 new training grants, chiefly for students in EMP graduate fields, have been requested for NSF. These grants would go to selected graduate departments to provide stipends for students and educational costs for the institution. The value of each grant would be about $5500, about half going to the student and half to the institution. In money and terms the training grants closely approximate regular fellowships given by NSF and other agencies. NSF fellowships, by law, however, can be awarded only through national competition, whereas the training grant permits NSF greater flexibility in strengthening particular graduate faculties. Some of the training grant money would be added to NSF project grants to permit employment of first-year graduate students as research assistants.

NASA, well in advance of promulgation of the EMP committee report, had announced plans of its own for major support of graduate study in "space related" disciplines—a term which for the most part means the EMP fields. This year NASA is supporting about 100 graduate students in ten universities, and next year it expects to have about 900 fellows in 88 universities, 700 of them first-year students. The NASA grand design calls for intake to level off at 1350 a year in the 1964–65 academic year in order eventually to produce 1000 space Ph.D.'s a year.

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The Atomic Energy Commission expects to maintain its graduate fellowship program in EMP students in its field at about 350 in all years of graduate study.

Not to be overlooked in surveying support for graduate students are research assistantships financed through research project grants made to universities by federal agencies. Figures on scientific and technical manpower in general are astonishingly defective, and nowhere is the picture less clear than in respect to research assistantships. But it is estimated that if the President's EMP proposals are put into effect, the number of students holding research assistantships in the EMP fields would climb from about 9000 this year to 11,000 in 1964.

A congressional staff study on federal activities in education, made at the behest of the Education and Labor Committee, is nearing publication, and another by the National Academy of Sciences is in the works, but the current figures, even of number of graduate students getting federal assistance, have to be taken as approximations.

Allowing generously for error, government sources estimate that without the proposed new EMP program, total full-time graduate enrollment in EMP fields in 1964 would be 44,000, with 18,000 of these receiving federal support, 17,000 others getting other types of support, and some 9000 on their own. The presidential panel recommended, as a "reasonable" goal for 1964, an increase of 10,000 in the number of graduate students getting federal support. Present proposals for increasing the number of fellowships, training grants, and research assistantships would provide very nearly that number. Asked by the panel, but not requested by the administration, were funds to take over support of 5000 students already enrolled, many of them part-time students or those eligible for federal assistance for whom no funds have been available.

Estimated cost of the EMP program for 1964 would be upward of $130 million for student support and allowances to institutions and some $80 to $90 million a year in matching funds for universities to use in construction of EMP facilities.

Objections have been raised to the recommendations of the President's Science Advisory Committee (PSAC) on the grounds that expansion of graduate enrollment in the EMP fields would be achieved only at the cost of diluting quality (*Science*, 1 February 1962), and the debate is likely to be carried on in Congress when the EMP proposals are taken up.

The basic administration argument for the program is that the federal government is a major consumer of man-power in the EMP fields and has an obligation to see that its own needs for defense and space programs are met and that other sectors of the society are not denied the professionals they require. The argument continues that unless a major federal effort is undertaken now, shortages in EMP fields can only go from bad to worse.

There is a feeling in Congress this year that many, at least, of the President's education proposals will succumb to the economy knives or the fires of the church-state issue. Politically, however, the EMP proposals have two main advantages over most other parts of the bill. Federal aid to graduate education has been little beset with controversy. The appeal to national security and prestige, Congress finds persuasive.
—JOHN WALSH

Announcements

The National Science Foundation is seeking a physician to serve as ship's doctor aboard its **Antarctic research** vessel *Eltanin*. The doctor will have the opportunity to perform his own research, although this will not be required. His tour of duty will be 9 months to 1 year, with an option for renewal if desired. The cruises last about 2 months, with 10-day stops at South American ports.

The *Eltanin* will carry a crew of about 45 men, plus 38 scientists in various biological and physical disciplines. (Robert Hinchcliffe, Office of Antarctic Programs, NSF, Washington 25)

Courses

Applications are being accepted for a 1-year advanced course in the theory and techniques of **steroid biochemistry,** offered by the University of Minnesota. The program is sponsored by the National Cancer Institute, and is open to