

PHYSICS IN GOVERNMENT

Congress boosts undergraduate education

More funds for the small college, teaching fellowships, and improvement of undergraduate instruction will soon be forthcoming from the federal government. President Johnson recently signed into law the Higher Education Act of 1965 (P.L. 89-329), authorizing some \$2.5 billion over the next three years "to strengthen the educational resources of our colleges and universities".

Title III of the act provides funds (\$5 million this year, unspecified amounts for four succeeding years) to strengthen academic programs and administration of developing colleges ("seriously handicapped . . . by lack of financial resources and a shortage of qualified professional personnel"). The US Commissioner of Education would pay part of the cost of planning and carrying out cooperative arrangements between developing colleges and other schools and organizations. These arrangements might include exchange of faculty, faculty improvement programs using internships and research participation, introduction of new curricula and teaching materials, and joint use of facilities such as labs and libraries.

National teaching fellowships to enable qualified graduate students and junior faculty members to teach at developing institutions are also authorized under Title III. Each fellowship would extend for up to two years, with stipends of up to \$6500 per academic year plus \$400 for each dependent.

Another section of P.L. 89-329 provides for undergraduate teaching facilities. \$35 million in fiscal 1966, \$50 million in 1967, and \$60 million in 1968 are allotted to help colleges buy laboratory and other equipment. An additional \$2.5 million this fiscal year and \$10 million for each of the next two years are for closed-circuit-television equipment. In amending the 1963 Higher Education Facilities Act, the new law doubles authorization of construction grants from \$230 million to \$460 million for undergraduate facilities

and from \$60 million to \$120 million for graduate facilities.

College libraries will also be aided by the new legislation. \$50 million a year for three years has been authorized for the purchase of books and library materials; \$15 million a year for training library personnel. Other parts of P.L. 89-329 concern community service programs, reduced-interest loans, work-study payments, and a National Teacher Corps.

The US Office of Education has sent letters to all colleges and universities inviting them to attend regional meetings at which various provisions of the higher-education bill will be explained. USOE will also answer questions and gather views on regulations that the office will later issue to put the bill into operation.

While the 1965 Higher Education Act was being readied for implementation, USOE released data on two other programs of prime interest to higher education.

The Higher Education Facilities Act of 1963, which aimed at a broader diffusion of federal support for graduate education, has already made grants totalling \$74.2 million in its first 17 months of operation. Analysis of the 114 grants shows institutions in all parts of the country as recipients with schools of larger resources, such as Yale and Columbia, receiving only about 40 percent of the money. The program, similar in purpose to the science development project of the National Science Foundation, supports mainly PhD-granting schools that seek either to improve a graduate program of already high quality or strengthen one that shows promise of excellence. Where NSF can pay up to 50 percent of project cost, however, USOE, according to statute, can pay no more than 33 1/3 percent, and this fact has limited the program's growth. It now remains to be seen whether the state legislatures will cooperate in support of the program by coming to the aid of institutions not having financial

wherewithal to raise the matching two-thirds funds. John W. Ashton, former vice president and dean of the graduate school at Indiana University, is currently directing the program for the Office of Education.

The National Defense Student Loan Program, enacted under the 1958 National Defense Education Act, is one of the most widely diffused of all federal education programs. With over 75% of US institutions of higher learning participating, only the college housing and veterans assistance programs can compare with its broad academic distribution. USOE figures indicate that some 750 000 students at 1630 colleges and universities have borrowed approximately \$619 million during the loan program's first seven years. This year, the loan-forgiveness feature, whereby 50 percent of the loan is waived if the borrower later teaches at a public school, has been extended to student borrowers who become teachers in colleges and private schools. Other NDEA programs have administered 11 500 graduate fellowships (5883 this year) at a cost of about \$130 million, and over \$29 million has been obligated for research in the use of TV, motion pictures, teaching machines, and other communications devices in education.

200-BeV news

By Dec. 3 the Atomic Energy Commission had visited all 85 proposed sites for the planned 200-BeV proton accelerator and had passed the evaluations on to the National Academy of Sciences. Eight AEC inspection teams took part in the visits, each group headed by an AEC assistant general manager, who was aided by an engineer and scientist from the Commission's Division of Research and a physicist from one of the national laboratories. The NAS Site Evaluation Committee will shortly announce five or six locations they believe have the best qualifications, and the AEC commissioners will themselves visit the sites as part of their efforts in making the

final decision. One AEC spokesman said the site choice will be made some time this spring. "We hope it will stand heads and shoulders above all the rest," he added wistfully. "I believe the physics community should be congratulated," he continued. "This is the largest basic science project that has ever been contemplated, and physicists have been very generous and cooperative in giving us their best thoughts and suggestions."

Science development grants

The National Science Foundation has awarded science development grants totalling \$11.6 million to Louisiana State University, Polytechnic Institute of Brooklyn, and University of Southern California at Los Angeles.

LSU will receive \$3.79 million to add new faculty and bolster salaries in its physics, mathematics, chemistry, and geology departments. Under a five-year plan, the school will also add research assistants and technicians and offer more attractive appointments for graduate students. The university, which had been working with the Louisiana Washington delegation for about a year and a half to win the NSF award, said that financial backing for higher academic pay scales by the governor and state legislature had strongly influenced the NSF decision.

Strengthening of faculty is also the primary focus of a \$3.3 million grant to Polytechnic Institute of Brooklyn. Main areas of investment will be the electronics-engineering and chemistry departments, with secondary support going to the library, educational experiments, and research equipment. Polytechnic plans to set up named and visiting professorships, special fellowships, and expand its sabbatical program. Part of the grant will be used in a faculty development program enabling teachers to write new textbooks and plan new courses.

NSF awarded \$4.47 million to University of Southern California to help build a 106 000-sq-ft laboratory building for research and graduate training in the solid state. Under the grant, a new department of materials science will start graduate and research programs, and research in the physics and other departments will be broadened,

with addition of new equipment and faculty. A science-engineering library will occupy one fourth of the laboratory structure, and another area will accommodate an undergraduate instructional program in physics.

The Foundation's Science Development Program to increase the number of first-rate science schools is restricted to "already good institutions that can advance rapidly to a higher level of quality." Recently, the program has come under attack from the Reuss subcommittee of the House Committee on Government Operations. A subcommittee report stated, "it is clear that the rich will continue to get richer despite the development program. The subcommittee believes that, given the necessarily limited funds available to the program, the net ought to be cast more widely, and emphasis should be placed on improving developing institutions rather than lagging departments within already important research institutions. The subcommittee hopes that . . . the first four grants have not defined the NSF's intentions; that the agency will not limit, or indeed use a preponderance of its program money to improve science at large universities with well established research programs; and that it will move into the four-year college group, not at some point, but soon." That the foundation paid no particular heed to the Reuss subcommittee suggestion is evident from the nine subsequent development award recipients, all of which are among the top 100 academic spenders of the research dollar (Arizona, Virginia, Florida, Colorado, Rice, and Rochester Universities, besides the three named above). Charles Burmeister, chairman of the physics department at Trinity University, was expressing the sentiments of the Committee on Physics Faculty in Colleges, when he told the subcommittee, "It is often stated that the science development program will make possible in the future a wider distribution of Government research funds. This program, however, is primarily directed toward those institutions which have an opportunity to become competitive with our very best graduate institutions. The non-PhD-granting institutions are generally not considered for these grants." Burmeister then went on

to propose a separate NSF program of research support to colleges.

To what extent NSF will broaden the character of its science development and institutional programs or how much other federal agencies will extend their programs to the small colleges remains to be seen. Donald F. Hornig, Special Assistant to the President for Science and Technology, recently told a symposium on universities and federal science policies, "The small colleges have difficulties recruiting faculties in the sciences; they have difficulties in providing the kind of facilities and the awareness of current change in science which is important if they are to continue to play the strong role they have in the past. There are some indications that their role is declining. I am sure that increased federal attention will be placed in this area through programs in various agencies, but I cannot now predict their form."

Laser patent challenge

R. Gordon Gould is challenging the laser patent issued to Charles H. Townes and Arthur Schawlow. In a trial before the US Court of Customs and Patent Appeals that began Dec. 8, Gould claimed that he was the first to conceive of the Fabry-Perot arrangement of plane-parallel mirrors to produce laser action.

Stories in the Nov. 27 issue of *Business Week* and Dec. 9 issue of *The New York Times* contain details of the court battle. Gould claims to have conceived his laser idea in November 1957 while he was a Columbia graduate student. Townes and Schawlow filed their patent application the following July but have notebooks containing their laser ideas dated as early as September 1957. At the time Schawlow was working for Bell Telephone Laboratories and Townes was a consultant to Bell.

Gould went to work for TRG, Inc., in March 1958, and later assigned his patent claim to them. So, actually TRG is suing Bell Labs. The Board of Patent Interferences has upheld the Townes and Schawlow patent over Gould's challenge. A decision from the US Court of Customs and Patent Appeals is expected in approximately a month or two, according to Gould.