for supervising instruction in science and mathematics, for improving science and mathematical curricula, and for related work; (v) grants or contracts with institutes of higher education to support short-term and regular-session institutes for advanced training of teachers or prospective teachers of foreign languages, and funds for supporting stipends to these teachers; and (vi) the authorization of funds up to $50,000 a year for 4 years to assist any state to improve the adequacy and reliability of its educational statistics. The individual state would be required to match this fund.

The Hill-Elliot bill, while similar in purpose—bettering the quality and quantity of the country's educated young people, particularly in the fields of mathematics and science—offers different means for accomplishing this end. Its major provisions are: (i) 240,000 scholarships over a 6-year period, awarded according to merit rather than need by the individual states; (ii) permanent authorization for $15 million a year to be matched by the states in the third and succeeding years for the purpose of improving counseling and guidance work; (iii) grants for the awarding, on a national basis, of 1000 fellowships the first year and 1500 additional ones in each of the next 5 years; and (iv) allocation among the states of $10 million a year, on a matching basis, for paying or supplementing the salaries of science, mathematics, and modern foreign language consultants.

The Hill-Elliot bill also has the following provisions, which are not found in the Administration bill: (i) scholarships for the year 1958–59 for students now in college; (ii) a student loan fund of $40 million a year; (iii) stipends for teachers engaging in summer and extension work, particularly in the sciences and mathematics; and (iv) provisions for honorary citations for superior high-school work, for a science information service within the National Science Foundation, for aid for vocational training, and, in a marked departure from the Administration pattern of means, a provision for funds for research in the matter of the development and use of television, radio, motion pictures, and related media as they may have value in education.

Comparison

Out of the welter of debate in the House Education and Labor Committee has come a bill which fully incorporates some of the provisions of the earlier bills, rejects others, and modifies to a greater or lesser degree those remaining.

The number of scholarships granted by the compromise bill runs between 76,000 and 88,000 over a period of 4 years. This is about twice the number asked for by the Administration bill and about one-third the number called for in the original Hill-Elliot bill. The scholarships would be administered by the individual states, as is required by Federal law, and financial support would be on the basis of $500 an academic year for all successful applicants, with another grant, up to $500 a year, to be available to students with a demonstrable need for further aid. This arrangement represents a compromise of the need or merit problem as it arose in the earlier bills.

Compromise can also be seen in the provisions for counseling and guidance. A 4-year grant, rather than a permanent grant, as in the Hill-Elliot bill, would be given to the states, to be matched by them, for the purpose of establishing and maintaining programs of testing, guidance, and counseling. An additional fund would be granted to arrange, through contracts with institutions of higher learning, for the establishment and operation of summer- or regular-session institutes that would offer courses in counseling and guidance of students at secondary school level. Stipends would be paid to eligible persons who attend such institutes.

In the matter of graduate study, the provisions of the Hill-Elliot bill have been adopted with minor changes, notably reduction in the period of availability of the grants.

The new bill modifies those provisions of the Hill-Elliot bill that grant aid to states for the purpose, among others, of improving those parts of the physical plant that are used for instruction in the sciences, mathematics, and modern foreign languages. Instead of the 6-year period of enactment, a 4-year period is used, but the funds authorized are increased from $40 million a year to $60 million. The result in both cases is a total expenditure of $240 million.

In addition to support for language study mentioned above, the new bill incorporates the major relevant provision of the Administration bill: supported supplemental study for teachers of language.

In its other provisions the bill now before the House retains elements of the Hill-Elliot bill which were not found in any equivalent form in the Administration bill. Most notably, these are the sections calling for the establishment of a student loan fund of $40 million for the current year, jumping to $60 million in the succeeding 3 years (the original called for a steady $40 million a year for 6 years), and the section calling for research and experimentation in more effective utilization of television, radio, motion pictures, and related media for educational purposes. Under this provision, an $8 million fund would enable the Commissioner of Education, through grants or contracts, to (i) make studies and surveys to determine the need for increased or improved utilization of television, radio, motion pictures, and related media of communication by state or educational agencies and institutions of higher education in providing education; (ii) conduct research, demonstrations, and experiments in the use of such media for such purposes; (iii) conduct research, demonstrations, and experiments in the development and use of new media of communication; (iv) evaluate and publish reports concerning the effectiveness of such media for such purposes; and (v) prepare and publish abstracts and catalogs of audiovisual material available, to the extent such abstracts or catalogs are not otherwise readily available. The U.S. Commissioner of Education would provide, upon request, advice, counsel, and technical assistance to state and local educational agencies and institutions of higher education undertaking to utilize such media of communication in providing education.

Civilian Space Agency

A governmental agency to coordinate nonmilitary problems of space exploration is expected to come into existence in the near future. The agency, which will be under civilian control, will be called the National Aeronautics and Space Administration and will have jurisdiction over all aeronautical and space activities except for those which President Eisenhower determines to be primarily associated with national defense.

The bill calling for the establishment of the agency (HR 12575) has been passed by both the House and the Senate and has been signed by the President. Among its provisions, the bill:

1) Declared it to be U.S. policy that activities in space should be devoted to peaceful purposes.

2) Established the National Aeronautics and Space Council composed of the President, the secretaries of State and Defense, the administrator of the National Aeronautics and Space Administration, the chairman of the Atomic Energy Commission, and four other appointees—three nongovernment.

3) Directed the President, with advice of the Council, to develop a comprehensive program of aeronautical and space activities, allocate responsibility for major projects, provide for effective cooperation, and resolve differences among departments and agencies.

4) Directed the NASA to coordinate and conduct aeronautical and space ac-

tivities, arrange for participation by the scientific community, disseminate information, and make semiannual reports on its activities.

5) Authorized the administrator to acquire and develop research facilities, aeronautical and space vehicles, and related property and accommodations; hire 260 specially qualified scientific and engineering personnel at pay grades higher than provided in the Classification Act of 1949 and to pay others entering Federal service for the first time at rates two grades higher than usual starting salaries; make monetary awards for significantly valuable scientific or technical contributions.

6) Declared that any relevant invention made in the performance of contracted work under the NASA would be the exclusive property of the U.S. Government and authorized the administrator to apply for or waive patent rights.

Physics Course

The Educational Testing Service, Princeton, N.J., reports that a new physics course will undergo its first large-scale evaluation in 300 of the nation's schools next fall. Frederick L. Ferris, Jr., associate director of test development at ETS, is in charge of the evaluation aspects of the study, which may involve testing as many as 10,000 high school students several times during the academic year.

The new program was developed by the Physical Science Study Committee, a group of scientists, teachers, and education specialists who have been working for 2 years under the leadership of Jerrold R. Zacharias at Massachusetts Institute of Technology. The committee staff, supported by grants from several large foundations, has developed a new text; a laboratory manual, including many ingenious experiments; and a variety of visual aids. More than 50 new motion pictures for this project are now in production.

Summer institutes are being sponsored by the National Science Foundation at five colleges for the 300 teachers who will use the new materials next fall. Teachers at these institutes will take special tests. These tests will provide a basis for study of the relationship between the achievement of teachers and the subsequent achievement of their pupils.

Associated Midwest Universities

Twenty-six leading educational and research institutions have formed an inter-university corporation to be known as Associated Midwest Universities, a successor to the organization formerly known as Participating Institutions of Argonne National Laboratory. James H. Jensen, provost, Iowa State College, is the first president of the new organization, which has headquarters at the Argonne National Laboratory's main site near Lemont, Ill.

The articles of incorporation list three main purposes for organizing the new corporation:

1) To promote, encourage, and conduct research and education in all branches of science, including but not limited to nuclear science in relation to all other fields of science.

2) To establish means for facilitating the use of the Argonne National Laboratory and other laboratories by duly qualified personnel and students from the several cooperating institutions and other research and educational institutions.

3) To establish, maintain, and operate laboratories and other facilities as necessary for research and education.

This is the third such university association to be organized within the framework of the Atomic Energy Commission. The first two are Associated Universities, Inc., which is the AEC's contractor for operations of the Brookhaven National Laboratory, Upton, N.Y., and the Oak Ridge Institute of Nuclear Studies, which directs educational and other activities associated with the Oak Ridge (Tenn.) National Laboratory for the AEC. The administrative framework of Associated Midwest Universities is expected to be somewhat similar to that of ORINS.

Toward Controlled Fusion Reactions

Recent Congressional hearings have brought out new information on the progress of United States attempts to harness the hydrogen bomb reaction for industrial power.

Two main conditions must be attained before it is possible to utilize the power released in a fusion reaction. First, heavy hydrogen must be brought to a temperature of at least 100 million degrees centigrade. Second, the atomic nuclei in this hot gas must be held together for an appreciable time. Scientists working at the University of California Radiation Laboratory, an Atomic Energy Commission facility, have concerned themselves with the first of these two conditions and are "well along the road" to the temperature objective, according to testimony released by a House Appropriations subcommittee.

Temperatures of 10 million degrees, 90 million degrees short of the required temperature level for a controlled hydrogen fusion reaction, have been generated by the University of California scientists. While the achievement of the objective temperature itself will not lead to the immediate availability of the power of fusion reactions, it is a prime objective and its attainment will be a major advance toward the solution of problems surrounding the controlled release of fusion reaction power.

TV Program on the Senses

Gateways to the Mind, a discussion of human senses, will be the next Bell System Science Series TV program. It will be seen on the NBC network on the evening of 23 October. This 1-hour color film, one of a continuing series, presents the story of man's knowledge about his senses and their function as the channels through which all awareness of the external world is passed to the brain.

Producer-director Owen Crump uses a movie sound stage as the setting for this story of the senses, with Frank C. Baxter explaining the story to a production crew about to start on a picture. The scientific material that will be presented during the course of the program includes animated sequences, documentary films, and sequences of experiments dealing with optical illusion.

George Wald of Harvard University served as principal adviser for the production, with Frederick Crescitelli, professor of zoology at the University of California, Los Angeles, acting as consultant. The scientific material in the program was prepared under the general supervision of a 10-member advisory board. Starting with Aristotle's discussion of the five senses, the program shows how scientific research in the past has increased the list of recognized senses to include balance, pressure, pain, tension, and so forth, and how current research at Princeton, McGill, and other institutions is expanding man's knowledge of sight and of the brain's role in sensory perception.

After the initial telecast, the Bell Telephone Companies will make the program available to schools and other interested groups in 16-mm color films.

Summer Research in Geology

A group of 50 students of geology composed of faculty members, graduate students, and undergraduates has departed from Princeton University to take up summer research projects in Canada, the Caribbean, Western Europe, and other areas.

One project, on which the chairman of the department of geology has spent the past 12 summers, involves the study of the formation and development of mountains and the relationships of