

SCIENTIFIC MANPOWER COMMISSION

A new examination of the present and future utilization of scientists and engineers has been published by the Scientific Manpower Commission.

The Human Resources of Science and Engineering—Today and Tomorrow is a collection of 15 illustrated papers presented at a symposium at the annual meeting of the American Association for the Advancement of Science on Jan. 27, 1975. Manpower specialists examined the present utilization of manpower in each of several science and engineering fields. Past projections of supply and demand were compared with what really happened. The nature and quality of career guidance in science and engineering included a special look at guidance for girls and minority youth.

Looking toward the future, field by field enrollment information shows some of the enrollment trends that will change the relative supply of new graduates in science and engineering over the next few years.

Four speakers from academe, the professional societies, industry and Congress assessed the implications for action in these sectors to encourage policies and practices leading toward future balances in the supply of and demand for scientists and engineers.

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vide greater precision than with any previous laser-tracked satellite, according to program manager Dick S. Diller. (Early next year NASA plans to launch LAGEOS, a GEOS designed to wring the most out of laser tracking, equipped with 426 reflectors and promising measurements to within as little as 3 centimeters.) It is even being tracked from orbit by another satellite, ATS-6. With so many methods in use at the same time, it is not surprising that one of the goals of the program is to see what can be gained by using the different systems to check one another out.

The ocean studies will be particularly valuable to the researchers now making plans for SEASAT, a probe scheduled for 1978, which will provide sea-state information to a wide range of users, much as LANDSAT does with crop and other earth resources data. The SEASAT office is already hearing from a wide range of potential "clients," both gov-

ernment and civil.

Geodetics, however, are still very much a part of GEOS-3. Major improvements are hoped for in charting earth's gravitational field, as well as investigating such solid-earth dynamic phenomena as polar motion, fault motion, earth rotation, earth tides and continental drift theory.

There is even a sort of tail-wagging-the-dog aspect to the mission, in that once the satellite's motions have been well determined by all that tracking, NASA analysts will start using it to refine their existing knowledge of the locations of their own tracking stations on the ground. Such role reversal, in fact, goes back as far as 1959, when tracking of early U.S. satellites, not necessarily geodetic ones, was used to provide positioning information in setting up the tracking network for the manned space flights of Project Mercury. □

Careers in science: Flexibility needed

Improving the methods of gathering data on manpower projections and developing better understanding of how students react to those projections are key suggestions made by an ad hoc subcommittee on manpower of the National Science Board. In a seminar slated specifically to analyze how manpower projections are made, and how accurate they are, the subcommittee agreed with Lewis C. Solmon, of the Higher Education Research Institute, who testified, "If the data collected by the different professional societies could be coordinated, and if societies and social scientists with longitudinal data sets could begin collecting comparable data, we might be able to understand why people's careers develop the way they do."

Manpower miscalculations, upon which many college students base career plans, may be responsible for four-year fluctuations in the job market. To help compensate, the subcommittee suggests that colleges help place students in training programs outside of school rather than in university labs and that they make it easier for students to transfer from one department to another (physics to mathematics, for example) should career plans fall through midway into a student's academic training.

Since employers are obligated to hire numbers of women and blacks, the non-minority graduate student may have to select broader career choices. Substitutability has already become an important consideration in college programs, since persons trained as specialists in research may be forced to seek nonspecific jobs. More emphasis should be placed on vocational interests—

what the student actually wants to do—than on achieving academic degrees, the report says. The subcommittee's report, "Scientific and Technical Manpower Projections," was issued by the National Science Board last week.

Manpower predictions estimate at most a need for 160,000 new scientists and engineers between now and 1985, depending on pollution abatement requirements. This falls far short of the 200,000 new Ph.D.'s in science and engineering expected to come onto the job market by then. Employment prospects, coupled with anticipated salaries, may steer science majors into brighter fields—health professions, city planning, dentistry, medicine and law. Students generally are primarily interested in the lifetime income of their prospective fields, the subcommittee reports, but rarely do they accurately perceive careers beyond the first five years.

One of the fallacies in predicting job markets is overlooking the number of foreign students trained as engineers and scientists, and the students who leave the college pool to accept internal training jobs within large firms, such as Exxon. Figures on the transferability of such specialists, layoff and hiring rates and attrition predictions could lead to more accurate forecasts of the future.

Channeling the unemployed Ph.D. into sales, manufacturing production and control should begin while the student is still in school. "The real issue for scientific manpower lies in the strength and quality of the universities," the committee says. As important is strengthening university faculties, implanting young professors, and keeping qualified Ph.D.'s in education. □