Elastic Moduli of Diamond

An ultrasonic technique for accurately measuring the elastic moduli of small specimens of a wide variety of materials, including diamond, has been developed by H. J. McSkimin and W. L. Bond of Bell Telephone Laboratories. With suitable auxiliary equipment, the method can be applied to specimens under widely varying conditions of temperature and pressure.

Precise information on the elastic constants of materials is of importance in many fundamental studies of the solid state. Diamond is of particular interest because there are very few recorded measurements of its elastic moduli.

The new technique consists essentially of transmitting short trains of high-frequency mechanical waves into the specimen and determining their velocity of propagation. From these data and the known density of the specimen, the elastic moduli can be calculated. In the work with diamond, both longitudinal and shear waves were used, giving data for determining the gem's three elastic moduli.

Two diamonds were used in these studies. Before cutting, each was a natural dodecahedron of a pale yellow color and quite transparent. Both were type I diamonds, as evidenced by a strong optical absorption at a wavelength of 8 microns, and each was a single crystal, as determined by x-ray reflection patterns.

Expressed in units of 10^{12} dynes per square centimeter, the elastic moduli were 10.76 ± 0.6 percent for C_{11}; 1.25 ± 5.4 percent for C_{12}; and 5.76 ± 0.3 percent for C_{44}. While the value for C_{11} agrees reasonably well with previous measurements, the value for C_{12} is much smaller than other workers have reported, and that for C_{44} is larger.

Chemical Water Conservation

As much as 65 percent of the water lost from the nation's reservoirs and lakes through evaporation might be saved by applying a coating of the chemical compound hexadecanol (cetyl alcohol) to the water's surface. This process eliminated more than two-thirds of evaporation losses in laboratory experiments conducted by the Department of the Interior's Bureau of Reclamation. In order to determine whether or not the conservation method is effective on large water areas, tests will be carried out at Rattlesnake Reservoir, near Loveland, Colo., which has a surface area of 97 acres. Tests conducted with cetyl alcohol on reservoirs in Australia reduced evaporation by 20 to 70 percent [*Science* **124**, 1071 (1956)].

In the tests to be conducted in Colorado, the soap-flakelike particles of hexadecanol will be slowly dispersed on the water surface, forming a film that shields the water from the air and sun. Even if the coating is only 20 percent effective, W. A. Dexheimer, commissioner of the Reclamation Bureau, says the water savings would be "tremendous." Each year the nation's reservoirs lose as much as 8 feet of water, yet our consumption of water has grown so much that it is now more than four times what it was in 1900. And by 1975 it is estimated that we will be using twice as much as we do today.

Fellowships for Bacteriologists

The Society of American Bacteriologists has announced that funds provided by the Difco Laboratories are available as president's fellowships to members of the society 35 years of age or under for visits to laboratories to study procedures and techniques and to obtain other specialized training concerned with their research programs. The funds may be used to meet transportation and maintenance expenses for short periods of study. The fellowship grant is not a fixed sum, but is determined by the merit of the proposal and availability of funds. More detailed information can be obtained from R. L. Starkey, Agricultural Experiment Station, New Brunswick, N.J.

U.N. Technical Assistance

In 1956 the United Nations and seven specialized agencies carried out the largest technical assistance program since operations were begun in 1950, with records set in the level of the contributions from 77 countries and in the number of experts provided. A review in the annual report of the Technical Assistance Board shows that aid was provided in 103 countries and territories, and that a total of $25.3 million was spent on direct field operations—about $4 million more than in 1955. The assistance included services of 2346 experts and the provision of 2128 fellowships, including study grants.

The annual report this year contains for the first time a chapter on evaluation of the technical assistance program. In addition, the report contains a survey of operations in 1956, statements by the participating organizations, and information on administration and finance. The expanded program is carried out by the United Nations Technical Assistance Administration, the International Labor Organization, the Food and Agriculture Organization, the United Nations Educational, Scientific and Cultural Organization, the World Health Organization, the International Civil Aviation Organization, the International Telecommunication Union, and the World Meteorological Organization.

Pergamon and Soviet Publication

The Pergamon Institute is a nonprofit foundation that has been formed to make available to English-speaking scientists, technologists, and physicians the results of research in the Soviet Union and the Soviet orbit. The organization has recently become incorporated in Washington, D.C., and is expected to complete incorporation in London soon. More than 100 scientists of various nationalities have accepted membership on the honorary advisory council of the institute, and the following are on the board of governors: Sir Robert Robinson (president), Capt. I. R. Maxwell (director), Sir Edward Appleton, Detlev W. Bronk, and S. A. Goudsmit.

At present the institute is publishing ten journals in complete translation. Of these, the U.S. Department of Health, Education, and Welfare gives financial support to the following: *Problems of Virology, Problems of Hematology and Blood Transfusion, Biophysics, Problems of Oncology,* and the *Sechenov Physiological Journal of the U.S.S.R.* The other journals are *Atomnaya Energiya (Atomic Energy); Journal of Microbiology, Epidemiology and Immunobiology; Elektrichestvo (Electricity),* and *Physics of Metal and Metallography.* The institute also plans to translate a number of books and monographs.

Any scientist or scientific institution may apply to the institute for a free monthly list in English of the articles and books currently published in a specific field of interest. Full translations of any listing may be obtained on a cost-sharing basis—that is, the costs will be assessed equally among all who order the translation during a period of 6 months, but in any event the maximum charge per recipient will not exceed $4 per thousand Russian words.

Immigration and Population

Immigration added 3.2 million persons to the population of the United States —or about one-ninth of the total population increase—between 1946 and the end of 1956, according to statisticians of the Metropolitan Life Insurance Company. Following the historic pattern of immigration into this country, the majority of the newcomers were of European origin. However, their proportion of the total was considerably below that of earlier decades. In fact, during