## 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 $10.76 \pm 0.6$ percent for $C_{11}$; $1.25 \pm 5.4$ percent for $C_{12}$; and $5.76 \pm 0.3$ 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

1953–56, not quite two-fifths came from continental Europe, and less than one-tenth came from the British Isles; by contrast, the proportion of immigrants from Europe and the British Isles was at least nine-tenths prior to World War I.

Female immigrants have outnumbered the males in each of the postwar years, reflecting the special entry provisions for wives of citizens and of resident aliens. About two-thirds of the newcomers were between 18 and 49 years old, and nearly a fourth of the total were under 18 years of age.

## Publication Series in Microbiology

The Institute of Microbiology at Rutgers University is initiating the publication of a series of book-length manuscripts on subjects that relate to microbiology. The series has a twofold aim: (i) to offer an outlet for specialized contributions in microbiology that are of relatively limited interest to commercial publishers and to existing scientific journals; (ii) to make available biographical and historical studies in microbiology.

This program is operating with the financial assistance of the Foundation for Microbiology. Although volumes for the series are being assembled by invitation, comments are welcome with reference to desirable subjects, or in regard to authors qualified to fill existing needs. Prospective contributors are invited to describe their interests. Comments or suggestions may be sent to Vernon Bryson, Institute of Microbiology, Rutgers University, New Brunswick, N.J.

## Radio Noise Recording

The National Bureau of Standards has set up 16 radio-noise recording stations throughout the world as part of the International Geophysical Year program. These stations will record radio signals generated by the more than 50,000 thunderstorms occurring daily on earth. The noise recording program is being conducted by W. Q. Crichlow, R. T. Disney, and F. F. Fulton, Jr., of the NBS Boulder (Colo.) Laboratories.

During the past year the atmospheric radio-noise recorder developed at NBS has been accepted internationally as appropriate for use in a world-wide measurement program. The receivers provide continuous recordings of the average power of the noise received on a standard antenna at 8 discrete frequencies in the range from 15 kilocycles to 20 megacycles per second. In addition, some have been modified to record also the average noise voltage and the average of the logarithm of the noise voltage. It has been shown that these three statistical characteristics of the noise provide a reasonably comprehensive picture of the physical nature of its amplitude distribution.

Some man-made radio noise will also be recorded and studied; however, most of the recording sites will be as far as possible from sources of interference. For example, one station is installed at Marie Byrd Base in Antarctica, which is far removed from the radio noise of civilization and from the belt of high thunderstorm activity circling the equator. Information will be gathered at this base about the radio waves that travel long distances through the atmosphere.

The antarctic site is also an ideal place to study radio noise originating in the sun and the stars. Moreover, the station is inside the auroral zone—the belt around the pole where the southern lights appear during magnetic storms—and thus will provide information on the effect this zone has on radio waves passing through it.

Stations planned for operation by the Boulder Laboratories or other U.S. agencies will include, Marie Byrd Base, Antarctica; Maui, Hawaii; Thule, Greenland; and Balboa, Canal Zone, in addition to the stations within the continental United States. Stations which will be operated by other governments but equipped by NBS will be located at Accra, Ghana; Cook, Australia; Johannesburg, Union of South Africa; Rabat, Morocco; San Jose dos Campas, Brazil; Singapore, Malaya; Stockholm, Sweden; and Tokyo, Japan. India will cooperate in the network by furnishing and operating two stations.

All data from the various stations will be forwarded to the Boulder Laboratories for analysis. The results of this study will not only provide information about radio propagation and meteorology but will also establish an engineering basis for assigning frequencies to stations. For the commercial and military radio users who must know which frequencies are best for use at a given time and place, forecasts will be made of the amount of unwanted noise that will interfere with their communications. With other information provided by the bureau, broadcasters will be able to tell the minimum transmitter power than can be used to get their information to the receiver in spite of competition from noise of natural origin.

## Proposed Legislation

Of the many bills introduced in Congress, some have a special relevance to science and education. A list of such bills introduced recently follows.

HR 7798. Protect the public health by amending the Federal Food, Drug, and Cosmetic Act to provide for safety of chemical additives in food. Delaney (D N.Y.) House Interstate and Foreign Commerce.

HR 7841. Authorize a 5-year program of grants for construction of medical, dental and Public Health educational and research facilities. Fogarty (D R.I.) House Interstate and Foreign Commerce.

S Res 142. Print additional copies of the "Report on the Development of Scientific, Engineering, and other Professional Manpower." Humphrey (D Minn.) Senate Government Operations.

S 2189. Promote the increase and diffusion of knowledge of the Antarctic. Wiley (R Wis.) *et al.*

## July Scientific Monthly

Articles appearing in the July issue of *The Scientific Monthly* are: "History of tension," A. Huxley; "Guiding migrant salmon," P. E. Fields; "On the rejection of the Martian canal hypothesis," W. A. Webb; "Mathematics, abstract entities, and modern semantics," A. Pap. Thirteen books are reviewed.

## Scientists in the News

JOSEPH W. GOLDZIEHER, chief of the endocrine laboratory in the department of physiology and biochemistry at the Southwest Foundation for Research and Education, San Antonio, Tex., has been named chairman of the foundation's newly established department of endocrinology.

GERALD A. THOMAS, business manager of the Florida Section of the American Chemical Society for 10 years, will become chairman of the division of natural science at San Francisco State College next fall. Located on a new campus of 92 acres in the southwestern San Francisco area, this college has 9000 students. More than 40 professors and instructors make up the division of natural science, which also includes mathematics.

FREDERICK F. WANGAARD, professor of lumbering at Yale University, began a year's leave of absence on 15 June. For 6 months he will serve as forestry adviser for the Philippines Forest Products Laboratory, under the auspices of the Food and Agriculture Organization of the United Nations. Following his service in the Philippines, he will go to Oslo, Norway, on a Fulbright grant. There he will conduct research in woodworking and technology at the University of Oslo and at the Norwegian Institute of Technology.