

In Guatemala, three Unesco experts are advising the government in technical education and assisting in the development of technical schools under a joint agreement entered into by Unesco and the International Labor Organization.

In Peru, Unesco's technical assistance program fits into the country's ten-year plan of educational development, under which seventeen percent of the national budget is to be devoted to education at every level from developing literacy to training professors. Among the specialists Unesco is sending to Peru is R. Zuckerman from France, who will contribute to the nation's education program by helping to train physics teachers.

## Weather Physics

### G-E to Conduct Study for ONR

A one-year study of long-distance weather migrations and cloud physics will be made by scientists of the General Electric Research Laboratory under a contract with the Office of Naval Research. Irving Langmuir, Nobel prize winner and G-E consultant, will conduct research on weather movements over long distances, extending and intensifying studies he has made on the transcontinental travel of weather systems. The laboratory study of cloud physics will be carried out by Vincent J. Schaefer, who has worked with Dr. Langmuir on cloud-seeding techniques, and by Raymond E. Falconer, G-E meteorologist. At the outset, the study will be concerned with spontaneous formations of ice crystals and the role that atmospheric dust plays in developing snow crystals. The new project has no connection with Project Cirrus, joint weather research program of the Army Signal Corps and the Office of Naval Research, which is being conducted in consultation with the G-E Research Laboratory.

Speaking at a meeting of the Institute of Mathematical Sciences at East Lansing, Michigan, on September 4th, Dr. Langmuir stated that investigation of recent rainfall patterns recorded throughout much of the country has produced new evidence of close correlation between periodic cloud seeding and periodic weather changes. First reports of the periodic nature of the weather patterns last spring seemed to refute earlier findings of high correlation with silver iodide seeding in New Mexico, he said, but a thorough study of commercial seeding operations in the West during the spring showed that seedings had been conducted at regular intervals. Commercial seedings during the middle of the week in western states, he pointed out, correlated extremely well with rainfall patterns occurring later in the week in eastern states.

## The Giant Skyhook

### Cosmic-Ray Balloon Fails in Test

A huge plastic high altitude balloon, the "Giant Skyhook", intended to carry a load of 250 pounds to an altitude of nearly twenty-three miles, was inflated early in September by personnel from the Office of Naval Re-

search and the engineering research and development department of General Mills, Inc., but suffered damage in the process and its load of scientific instruments had to be cut away before it was launched. The balloon, even in its perforated state, managed to reach an estimated altitude of 35,000 feet before it was automatically dropped to earth two hours later some fifty miles from the launching site in Minnesota.

ONR's plastic balloon project has been in progress since 1946 and hundreds of flights have been made from a variety of locations within the United States and from naval vessels in the Atlantic, Pacific, and Caribbean. Flight objectives have been primarily to obtain meteorological and cosmic-ray information from measuring and recording instruments carried aloft by the balloons. The particular significance of the plastic balloons used in ONR-sponsored research programs is that it has been possible to send them to high altitudes where they automatically level off and float for hours, thus enormously increasing the likelihood of observing certain of the rarer cosmic-ray events which take place in the upper regions of the earth's atmosphere. Numerous flights have been made to altitudes of about 100,000 feet, above approximately 99 percent of the atmosphere. The Giant Skyhook had been designed to rise above an additional 0.6 percent of the atmosphere at 120,000 feet, a region of considerable interest in cosmic-ray research.

The Giant Skyhook, made of 0.001-inch plastic film which, if spread flat, would cover an area of more than two acres, presents a more difficult launching and flight problem than has been encountered with the smaller balloons. According to the Navy, however, the scientific advantages of such high altitude flights and the knowledge engineers will gain in designing better balloons are sufficient to justify the project.

## National Science Foundation

### Graduate Fellowship Program Announced

The second graduate fellowship program of the National Science Foundation, providing awards for study during the 1953-54 academic year in the physical, mathematical, engineering, biological, and medical sciences, will get under way early this month. Most awards will be made to graduate students seeking master's or doctor's degrees in science, although a limited number will be made to postdoctoral graduates. Emphasis is placed upon awards for graduating college seniors who hope to continue their studies. Candidates will be judged on their scientific aptitude and achievement as reflected in academic records and recommendations from individuals who are familiar with their work. Predoctoral applicants will take a special examination designed to measure scientific promise and level of advancement, and all applications will be screened by panels of outstanding scientists chosen by the National Academy of Sciences.

NSF graduate fellows may attend any accredited non-profit institutions of higher learning in the United

States or similar institutions abroad. Stipends will vary with the academic status of the individual. First-year fellows (students entering graduate school for the first time or those who have had less than one year of graduate study) will receive \$1400; fellows who need one final academic year of training for the doctor's degree will receive \$1800; fellows between these groups will receive stipends of \$1600. The basic stipend for postdoctoral fellows will be \$3400 per year. Tuition and laboratory fees and limited travel allowances will be provided, as will dependency allowances for those fellows who are married.

Application forms for both predoctoral and postdoctoral graduate fellowships may be obtained by writing to the National Science Foundation, 2144 California Street, N.W., Washington 25, D. C. Completed applications must be returned to the Fellowship Office, National Research Council, by January 5, 1953. The special examination for predoctoral candidates will be given at various places throughout the United States on January 31.

## New Research Journal

### Mechanics and Physics of Solids

Publication this month of the first number of an international quarterly, the *Journal of the Mechanics and Physics of Solids*, has been announced. Edited by W. M. Baldwin, Jr., professor of metallurgical engineering at the Case Institute of Technology in Cleveland, and by Rodney Hill, of the department of theoretical mechanics at the University of Bristol in England, the journal will contain original research papers, both experimental and theoretical. The following subjects have been mentioned as giving an indication of the journal's scope: creep, fatigue, elastic and plastic properties of engineering metals, stress analyses of structures and continua, significance of material tests, rationale of technological forming processes.

The editors will be assisted by an advisory board comprising four British representatives and two each from the United States, Switzerland, and Western Germany. They are: J. F. Baker (Cambridge, England), E. Brandenberger (Zürich), G. Busch (Zürich), A. H. Cottrell (Birmingham), F. A. Kochendörfer (Düsseldorf), N. F. Mott (Bristol), A. Nadai (Pittsburgh), G. Sachs (Syracuse, N. Y.), E. Siebel (Stuttgart), and H. W. Swift (Sheffield). The journal is published by the Pergamon Press Ltd., London, which is represented in this country by Lange, Maxwell, & Springer, Inc., 122 East 55th Street, New York 22, N. Y.

## Infrared Spectra

### Punch Card Compilation of Data

The Committee on Infrared Absorption Spectra, formed last year under the sponsorship of the National Research Council (see *Physics Today*, November 1951, p. 26), was assigned the task of developing methods for collecting and distributing spectral absorption data on

organic and inorganic compounds. Working in close collaboration with the National Bureau of Standards, much of the Committee's efforts were directed towards designing a punch card system and preparing a bibliography in order to provide workers in the field with a means for obtaining quick access to published results from the large and rapidly expanding infrared spectra literature.

According to a recent announcement from the Bureau, the task of compiling a punch card catalog is now well under way, and cards covering forty-five separate compounds and containing spectra and other useful data, as well as bibliographic references, are now being made available on a subscription basis to industrial and research laboratories. The catalog, which is being compiled under the direction of E. C. Creitz and the NBS staff, provides a series of spectral curves with which the spectra of unknown compounds can be compared and makes data needed for theoretical computation readily accessible without the use of expensive sorting equipment. Machine-size key-sort cards, punched and notched so that they may be sorted by means of a knitting needle or an inexpensive sorting machine, are to be supplied to users at cost. In addition, the Bureau proposes to print the spectra and bibliographic data on  $8\frac{1}{2} \times 11$ -inch paper. IBM cards will also be made available. The Bureau plans eventually to supplement the regular series of spectra with a special series to be obtained at high resolution on specially purified compounds. Each card for this series will contain all the physical and chemical data obtainable on the particular compound, including melting and boiling points, refractive indices, visible and ultraviolet spectra, and x-ray diffraction data.

Detailed instructions for ordering the infrared cards can be obtained from E. Carroll Creitz, National Bureau of Standards, Washington 25, D. C.

## Miscellany

The National Geographic Society has announced the organization of a scientific expedition to study high altitude cosmic-ray effects over twenty-three degrees of latitude in the mountains of India. Martin A. Pomerantz, research physicist at the Franklin Institute's Bartol Research Foundation, will head the party. Dr. Pomerantz is expected to arrive in Bombay this month after having spent several weeks consulting with colleagues in London, Paris, and Amsterdam. He will be joined in Aligarh by a group of Indian scientists, including P. S. Gill, director of the department of physics at Muslim University, who will participate in the study.

Unesco has issued a list of scientific and technical journals published in South East Asia, together with a supplement dealing with Chinese journals, according to the U. S. National Commission for Unesco. It is further reported that a comprehensive listing of scientists and scientific institutions in South East Asia is now in progress.