

## GEOPHYSICS

# Earth Probe Continues

**As part of the International Geophysical Cooperation-1959, scientists around the world are continuing their extensive probing of the earth, its atmosphere and oceans.**

By ANN EWING

A WORLD-WIDE cooperation of scientists, started during the International Geophysical Year, is continuing now as part of the International Geophysical Cooperation—1959. It will be maintained for many years to come in at least three important fields: the Antarctic, oceans and space.

The results of such international cooperation cannot be foretold but they are bound eventually to affect every man, woman and child.

One suggested outcome is a large jump in the food fish available to peoples of the East following an intensive study of the Indian Ocean during 1962-1963. This survey will be made by more than 20 ships representing at least that number of countries.

A preliminary exploration of the Indian Ocean will be made during 1960 to determine what should be explored during the full-scale survey. The 1960 study will also be used to train oceanographers from countries bordering the Indian Ocean.

That ocean was selected for a variety of reasons, one being that it is the simplest in which to study the effects of winds on currents. The energy transferred from the wind to the ocean can be measured more easily there than anywhere else on earth, scientists have concluded.

## Special Ocean Study

This international operation will be under the direction of SCOR, the Special Committee on Oceanic Research set up by the International Council of Scientific Unions. ICSU is the highest world-wide science body. Its Special Committee for Inter-Union Cooperation in Geophysics, or SCG, is the guiding group for all International Geophysical Cooperation-1959 activities not covered by special organizations like SCOR.

Present and future studies in Antarctica are being handled by SCAR, the Special Committee for Antarctic Research. A 12-nation conference to work out the peaceful and scientific development of the still largely unexplored white continent will be held next October in Washington.

Besides the U. S., the 11 other nations are Russia, Argentina, Australia, Belgium, Chile, France, Japan, New Zealand, Norway, Great Britain and the Union of South Africa. These are the same 12 nations that conducted research in Antarctica during the IGY and are continuing to do so during IGC-1959.

The third special group set up to deal with geophysical research is COSPAR, the international committee on space research.

It plans the scientific studies made with rockets, satellites, and space, lunar and planetary probes.

The ten nations of COSPAR include the two that have launched satellites, United States and Russia, and the rocket-launching countries of Canada, Australia, France, Japan and the United Kingdom. Three nations interested in tracking satellites will serve in rotation on COSPAR. Currently these are South Africa, India and Peru.

Also serving on COSPAR are representatives of nine international scientific unions, including astronomy, physics, geophysics, mechanics, chemistry, physiology, biology, radio and biochemistry.

COSPAR has until Dec. 31 to coordinate space research and recommend future steps. It is cooperating with the United Nations on problems of regulation and control of space affecting scientific activities. How-

ever, it has no authority to make political decisions.

One action being taken by COSPAR is the establishment of a code of conditions for landing objects on the moon or planets to keep damage at a minimum from the scientific point of view.

The international research programs for the oceans, Antarctica and space are long-range ones. The International Geophysical Cooperation-1959 activities will end on Dec. 31.

This extension of the International Geophysical Year that ended last Dec. 31 is being carried on by most countries cooperating in the IGY at close to the same level of participation. When data gathered during the IGY and IGC-1959 are combined with information learned during preparatory studies, scientists in most disciplines will have three continuing years of reports for their studies.

## More Than Space to Study

Although the launching of earth and solar satellites captured man's imagination



**WEATHER BALLOON RELEASED**—Three Weather Bureau scientists prepare a weather balloon for launching skyward, one of the many thousands of such routine observations being made during the International Geophysical Cooperation—1959.

and newspaper headlines, the other programs in geophysics are equally important. They are divided into such fields as meteorology, geomagnetism, aurora and airglow, ionospheric physics, solar activity, cosmic rays, longitudes and latitudes, glaciology, seismology and gravity.

In addition, there are five types of designated world days or series of days on which special observing programs are conducted. These occur when unusual magnetic, ionospheric or auroral activity is predicted, and at times of a solar eclipse or unusual meteor showers.

### Remote Research

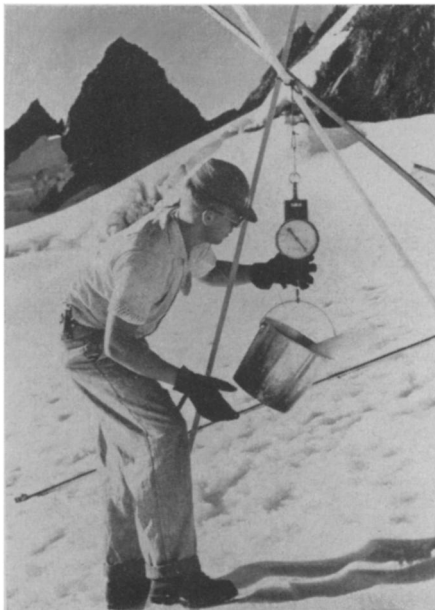
No matter how remote the site where IGC-1959 scientists are working, from Antarctic outposts to Pacific Islands, an elaborate and far-reaching communications network has been set up so special experiments at planned times can be conducted simultaneously on a planet-wide basis.

These times occur not only on scheduled world days but at times of special alerts. The warnings are broadcast by the World Warning Agency, the National Bureau of Standards' radio forecasting center at Fort Belvoir. They are based mainly on worldwide observations of the sun's surface and on soundings of the ionosphere, the electrically charged portion of the earth's upper atmosphere that reflects radio waves.

Because of IGC-1959, scientists will have a record of solar behavior not only during the highest peak in the sun's activity ever known but into the declining phases of the sunspot cycle.

All information collected during both

*(Continued on p. 13)*



**SNOW DENSITY**—Roger Ross determines the density of snow at the IGY Blue Glacier Project, Olympic National Park, Washington. Behind the scale is a part of the coring auger used to bring up samples of snow from beneath the surface.

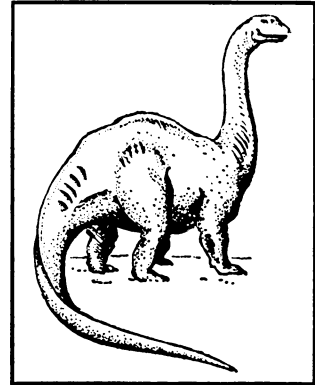
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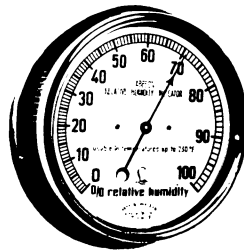
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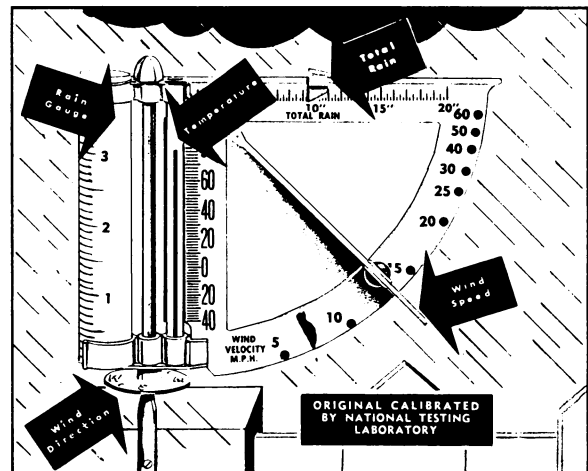
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Fourth Conference on the Biology of Normal and Atypical Pigment Cell Growth—Myron Gordon, Ed.—*Academic*, 647 p., illus., \$13.50.

PLAIN TALK FROM A CAMPUS—John A. Perkins—*Univ. of Delaware Press (Univ. Pubs.)*, 195 p., \$4. The president of the University of Delaware gives his views on how to cope with ever-increasing enrollments, "shoestring" financing and the confusion over educational aims.

THE PLANT KINGDOM: A Laboratory Manual—Paul C. Lemon and Norman H. Russell—*Mosby*, 176 p., illus., paper, \$3.25. Considers the plant kingdom from an evolutionary viewpoint, for use with advanced courses.

RADIOACTIVE WASTE DISPOSAL INTO ATLANTIC AND GULF COASTAL WATERS—Working Group of the Committee on Oceanography, NAS-NRC, Dayton E. Carritt, Chmn.—*Nat. Acad. of Sciences-Nat. Res. Council*, 37 p., illus., paper, \$1.

RESEARCH TECHNIQUES IN HUMAN ENGINEERING—Alphonse Chapanis—*Johns Hopkins Press*, 316 p., illus., \$6. Practical handbook of operational methods of human engineering, of interest to those engaged in industrial engineering, operations research, systems engineering, experimental psychology and scientific management.

ROCKET SCIENCE FOR AMATEURS—L. E. Lewis, Jr.—*Sooner Science Pubs.*, preliminary ed., 50 p., illus., \$2. Written by the director of the Oklahoma City Rocket Research Club, to meet the needs of teachers and amateur rocketeers, stressing safety and scientific principles.

SOME TROPICAL SOUTH PACIFIC ISLAND FOODS: Description, History, Use, Composition and Nutritive Value—Mary Murai, Florence Pen and Carey D. Miller—*Univ. of Hawaii Press*, 159 p., illus., paper, \$2. Joint project supported by the Pacific Science Board, the U. S. Department of Agriculture and the Foods and Nutrition Department of the Hawaii Agricultural Experiment Station.

STRESS EFFECTS OF ABRASIVE TUMBLING—H. R. Letner—*Mellon Institute*, 19 p., illus., paper, free upon request direct to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa.

TECHNOMETRICS: A Journal of Statistics for the Physical, Chemical and Engineering Sciences, Vol. I, No. 1—J. Stuart Hunter, Ed.—*Am. Soc. for Quality Control and Am. Statistical Assn.*, 100 p., paper, \$2, quarterly, annual subscription \$8.

A TREATISE OF THE ANALYTICAL DYNAMICS OF PARTICLES AND RIGID BODIES with an Introduction to the Problem of Three Bodies—E. T. Whittaker—*Cambridge Univ. Press*, 4th ed., 456 p., \$4.95. Reprint of 1947 edition.

THE URBAN FRONTIER: The Rise of Western Cities, 1790-1830—Richard C. Wade—*Harvard Univ. Press*, 360 p., \$6. Traces the growth of Pittsburgh, Cincinnati, Louisville, Lexington and St. Louis during their first decades.

THE WHITE DESERT—Noel Barber—*Crowell*, 205 p., illus., \$4.50. An English newspaperman tells the dramatic story of the scientific expedition which trekked 2220 miles across Antarctica, led by Dr. Vivian Fuchs, thus accomplishing the first successful crossing of this subcontinent.

WHY SHOULD YOU STUDY PHYSICS IN HIGH SCHOOL?—Franklin Miller, Jr.—*Am. Inst. of Physics*, 16 p., illus., paper, single copies free upon request direct to publisher, 335 E. 45th St., New York 17, N. Y. Written to encourage boys and girls in the eighth and ninth grades to plan to study physics.

YOU WILL GO TO THE MOON—Mae and Ira Freeman—*Beginner Bks. (Random House)*, 62 p., illus., by Robert Patterson, \$1.95. A book for six-year-olds, conveying concepts of space travel in the simplest terms.

Science News Letter, July 4, 1959

## CONSERVATION

# Urge Pesticide Study

MILLIONS of dollars to study the effects of the hundreds of millions of dollars worth of pesticides being used throughout the nation, this is what the conservationists have been urging.

Now the Department of the Interior has endorsed legislation to increase the amount of money that its U. S. Fish and Wildlife Service can spend on pesticide research. On the basis of what is already known of the harmful effects of current practices in the use of pesticides on wildlife, Ross L. Leffer, assistant secretary of the Interior, said the money is needed for a greatly increased research program.

Pointing to the large-scale use of insecticides in the U. S. Department of Agriculture's fight to control the imported fire ant and the gypsy moth, conservationists have been demanding more research into the effects of these toxic substances on wildlife. They have cited proof of the harmful effects in the elimination of fish from lakes and streams, reduced fertility in game birds and in fewer songbirds. Spraying with "recommended" doses of insecticide for mosquito and Dutch elm disease control have also taken a toll among wildlife.

Governmental officials responsible for the control programs have said that when used as suggested, the insecticides are not dangerous to wildlife. In evidence they point to the large areas treated, with no reported deaths.

Legislation up before Congress—H.R. 5813 and S. 1575—is aimed at increasing pesticide research funds. The funds authorized for research would be raised from \$280,000 to \$2,565,000 a year. This does not mean that the Fish and Wildlife researchers will get their money, however. The Appropriations Committee still would have to pass on the amount.

The four major objectives of the proposed pesticide research are: 1. to determine the toxicities of some 200 basic pesticidal chemicals now marketed plus those being developed; 2. to analyze plant and animal tissue to detect pesticide residues, develop diagnostic procedures and to measure toxic conditions in wildlife habitats; 3. to carry out field studies of long-range and immediate effects of pest control on wildlife populations; 4. to make results of this research available to all those interested.

Science News Letter, July 4, 1959

## CHEMISTRY

# New Chemical Weapons

THE UNITED STATES is totally unprepared to wage modern chemical warfare. Soviet troops in East Germany and Poland are equipped to unleash a crippling chemical attack at a moment's notice.

This unbalance of specialized military power was revealed by Lt. Gen. Arthur G. Trudeau, Army chief of Research and Development, in testimony before the House Science and Astronautics Subcommittee on Research and Development.

Gen. Trudeau said 15% of the Russian arsenal in the two Iron Curtain nations consists of chemical weapons.

He told SCIENCE SERVICE: "The figure is based on U. S. intelligence reports, but I do not know exactly what kinds of weapons they are."

By contrast, he pointed out, the U. S. has no stockpiles of chemicals except for those made during World War II. Our only modern chemical weapons (such as the psychochemicals described to the subcommittee) are in various stages of research and development.

In his testimony, Gen. Trudeau regarded a repugnant attitude of Americans toward chemical warfare as a hindrance to our defense capabilities.

"They are more horrified by the thought of chemical warfare than they are about the ability of a nuclear bomb to burn a million people. Yet, they see the gas chamber as the most humane way of executing criminals. And what is the gas but a lethal chemical!"

He emphasized to the subcommittee that

the Army's most urgent problem in chemical and other weapon development is "lead time." This is the amount of time required from concept of a new weapon to research, development, production, and finally to distribution among troops. The lead time in the U. S., he said, is eight to ten years while in Russia it is four to five years.

The frightening difference is mainly due to the bureaucracy inherent in our Governmental and military systems, Gen. Trudeau charged.

Science News Letter, July 4, 1959

## Earth Probe Continues

(Continued from p. 10)

IGY and IGC-1959 is being sent to world data centers. In the U. S., the center actually consists of 12 archives located at institutions known for their work.

Also in the U. S., a special committee of scientists trained to use their brains and pencils in attacking problems has been set up to study and analyze the geophysical data collected under the international programs. Because the world itself is the laboratory for geophysicists, these scientists are specialists in various fields from cosmic to seismology.

One unexpected result of the world-wide cooperation has been a surge of interest among young persons in the many problems of geophysics. This has occurred not only in the U. S., but in Russia and virtually every country in the world.

Science News Letter, July 4, 1959