

gram be balanced with a certain degree of industrialization. Industrial research must, therefore, be properly attended to. Unfortunately, the tendency in too many countries, including those in our part of Asia, such as Thailand, Pakistan, India, Formosa, and even our Philippines, has been to launch a disproportionately ambitious program of industrialization and shove agriculture into the back seat. A swing to this extreme may well spell disaster, as was unfortunately the sad experience in Argentina, in Peron's time, when the economy of the country was nearly ruined through overindustrialization.

Before we can industrialize to any

considerable extent, agriculture, which is the basis of our economy, must first be strengthened. Vigorous, sustained, and adequately supported research is necessary to solve the many important problems that still remain to be studied to make our farms give more bountiful yield. For a good many crops, superior seeds that could produce fourfold or more still await development. Better farm management has to be worked out to make operation more economical and more efficient; needs for fertilizer have to be more precisely determined; numerous pests, diseases, and weeds that exact a heavy toll on the harvest cry for more effective control.

As it is now, the average Philippine farmer, it is estimated, can raise only enough for himself and three other persons. Compare him, for instance, with the American farmer, who, after feeding himself, has enough left over for 20 other persons. As we raise the efficiency of our agricultural worker, more manpower could then be released to industries without harmfully affecting the farm, and the average per capita income would have sufficiently improved to take care of the market for the industrial products. These goals can hardly be attained if we slacken, rather than accelerate, the pace and intensity of agricultural research.

## News of Science

### IGY Oceanography

The deep currents in the South Atlantic Ocean, the ocean bottom, and the influence of a large river system on ocean bottom deposits will be investigated during the next 8 months by the research vessel *Atlantis*, which left the Woods Hole Oceanographic Institution last month on a cruise in the South Atlantic and Indian Oceans for the International Geophysical Year. Under the leadership of oceanographer Arthur R. Miller, the seven-man scientific party will make observations in the Brazil Current to fill in data obtained last year.

From a distance of about 1000 miles offshore from Buenos Aires, the *Atlantis* then will sail in the direction of the Rio de la Plata, obtaining long and short cores of ocean-bottom sediments for chemical analyses to determine the influence of a large estuary on ocean-bottom deposits. Bottom photographs will also be made. Upon arrival in Buenos Aires, Richard G. Leahy will leave the ship and transfer to an Argentine vessel to obtain sediment samples in the Rio de la Plata. He will travel upstream until sea water is no longer encountered.

The major task in the South Atlantic will be the making of observations of temperature, salinity, and dissolved oxy-

gen from the surface down to the ocean bottom along latitude 32° S. Such observations will be made by stopping the ship every 80 miles, each "station" taking from four to five hours. In between stations the sea temperature will be measured hourly to a depth of 900 feet while the ship is underway with the aid of a bathythermograph.

The section between Buenos Aires and Cape Town will be the southernmost one to be finished in the British-U.S. IGY Atlantic Ocean program. Eight of the eleven east-west crossings have been made during the past year by the small (125-foot) research vessel *Crawford* of the Woods Hole Oceanographic Institution and the *R. R. S. Discovery II* of the (British) National Institute of Oceanography. By the end of 1958 the Atlantic Ocean water masses from Nova Scotia to Argentina on the west, and from Ireland to the Cape of Good Hope on the east, will have been examined. For the first time in history it will then be possible to provide a complete description of the three-dimensional distribution of the physical and chemical properties of the whole Atlantic Ocean. In the past satisfactory data existed only in rather limited areas; with the exception of the South Atlantic, where the German vessel *Meteor* made a survey in 1926-27.

During this IGY it has become possible for the first time to note whether any changes have taken place in the ocean during a 30-year period. Preliminary examination of the data acquired last year by the *Crawford* has shown but little change in temperatures and salinities but a significant loss in dissolved oxygen in deep water. A similar loss in oxygen has been found in the North Atlantic, compared with observations made nearly 30 years ago by the *Atlantis*. It is believed that neither in arctic nor in antarctic water has it been cold enough in recent years to form water of sufficient density to replace the very cold water now present in the deep ocean. In other words, the deep ocean water is getting "older" and is not being replaced by oxygen-rich waters from the surface.

*Plankton tows and other observations.* Biological observations will be made by Langley Wood and Robert Risebrough. These will include the making of plankton tows and chemical determinations of nutrients in the sea. Such observations will be especially important in the Indian Ocean, which rarely has been visited by oceanographic vessels.

*Lamont-Woods Hole Indian Ocean Expedition.* After arrival in Cape Town, South Africa, in the latter part of April, most of the members of the scientific party will fly back to Woods Hole and be replaced by a group of geophysicists under John W. Graham. The latter group will take the ship through the Indian Ocean and Red Sea, working together with the research vessel *Vema* of the Lamont Geological Observatory of Columbia University. The two ships will make echo-sounding profiles of the ocean bottom and, with the aid of explosives, determine the thickness of the sediment on the ocean bottom and the character of the bedrock below the ocean floor.

Seismic observations made in the Atlantic and Pacific Oceans in recent years have shown significant differences in the rock strata and in the thickness of the earth's crust between continents and ocean. Bottom photographs will also be made with the aid of a newly developed deep-sea camera that was successfully used in 1957 to obtain hundreds of exposures during each of several lowerings.

The two ships will cruise together over the location of a major crack in the earth's crust discovered by Lamont scientists. The expedition also expects to study uncharted submarine mountains. Heavy steel dredges can be lowered to obtain rock samples from the sides of such mountains.

This is the longest cruise the *Atlantis* has undertaken in her 28-year career. The vessel has made 240 cruises, the longest having been a 6-month investigation of the Mediterranean Sea in 1947-48.

### Population Growth of United States and Canada

Both the United States and Canada scored record population gains in 1957. In the United States the increase exceeded 3 million for the second year in a row, raising the total population, including the Armed Forces overseas, to 172,830,000 at the end of the year. In the 7¾ years since the 1950 census, 21.7 million people have been added to the population, an increase of 1.7 percent annually. Canada has been experiencing a much higher rate of growth, the population having increased by 2.9 percent a year since the June 1951 census. At the close of 1957, Canada's population reached 16.9 million, an increase of about 556,000 during the year and of almost 2.9 million since June 1951.

### Study Abroad

More than 75,000 international scholarships and fellowships for study in 83 countries and dependencies are listed in the 1957-58 edition of *Study Abroad*, a handbook published by the United Nations Educational, Scientific and Cultural Organization. The handbook includes such information as eligibility requirements, application procedures, amount of awards, and length of courses. It also lists 250 information centers in 50 countries which advise foreign students on living conditions, tuition fees, and enrollment procedures.

According to a 1955-56 UNESCO survey, reported in *Study Abroad*, of a total of 140,744 persons studying outside their countries during that period, 36,494 came to the United States, more than to

any other country. France, with 16,877 foreign students, was second, followed by the U.S.S.R. with 12,300.

*Study Abroad* (\$2.50) is sold by: UNESCO Publications Center, 801 Third Ave., New York 22, N.Y.; U.N. Bookshop; and Columbia University Press, 2960 Broadway, New York 27, N.Y.

### Grants, Fellowships, and Awards

**Biology.** Applications are invited for a new \$5000 scholarship in biology that has been established by the General Biological Supply House, Chicago, Ill. The award is open to an American citizen who is studying for the doctorate degree in botany, zoology, or biology. Applications should be submitted *before 24 March*. For information, write to the chairman of the award committee, Dr. Frank A. Brown, Jr., Department of Biological Sciences, Northwestern University, Evanston, Ill.

**Chemistry.** The Association of Official Agricultural Chemists has announced that nominations are now being accepted for the second annual Harvey W. Wiley Award for achievement in analytical methods. This \$500 award goes to the scientist who has made an outstanding contribution to the development of methods of analysis for foods, drugs, cosmetics, feeds, fertilizers, and pesticides, or for use in general analytical chemistry. Nominations must be submitted *by 1 April*. Nominees need not be members of the association. Further information may be obtained from the secretary of the association, William Horwitz, Box 540, Benjamin Franklin Station, Washington 4, D.C.

**Mental health.** The Adolf Meyer awards committee of the Association for Improvement of Mental Health, Inc., is inviting nominations for the 1958 awards, which will be announced in May during Mental Health Week. These awards are given annually to individuals and/or organizations who have made meritorious contributions to the professional care and treatment of the mentally ill, both in and outside of hospitals. Nominations for this award should be sent *before 1 April* to Dr. Milton M. Berger, Chairman, Advisory Committee, A.I.M.H., 50 E. 72nd St., New York 21, N.Y.

**Ornithology.** The Frank M. Chapman Fund of the American Museum of Natural History was established to provide financial assistance to those conducting research in ornithology. The awards are usually made to younger scientists, in particular to graduate students, but there are no hard and fast restrictions. Applicants should bear in mind that the field stations operated by the American Mu-

seum are frequently available for ornithological as well as other types of scientific work. The Archbold Biological Station at Lake Placid, Fla., the Southwestern Biological Station in the Chiricahua Mountains in southeastern Arizona, and the Lerner Marine Station at Bimini, Bahamas, as well as the collections and laboratories of the museum itself, should be mentioned in this connection. Applications should be received *before 31 March*. Each applicant should state clearly the nature of the proposed research and provide an estimate of the financial requirements of the project. Letters of recommendation should be included. All correspondence should be directed to the Chairman, Chapman Memorial Fund Committee, Department of Birds, American Museum of Natural History, Central Park West at 79th St., New York 24, N.Y.

### Human Resources in Science

"America's Human Resources to Meet the Scientific Challenge" was the theme of a national conference at Yale University 3-4 February sponsored jointly by the President's Committee on Scientists and Engineers and the William Benton Foundation. The conference brought together 100 representatives of American science, education, industry, labor, government, religious and minority groups, and the nation's public communications media. The conferees considered the competitive position of the United States in world science and technology.

Principal speakers were Allen W. Dulles, director of the Central Intelligence Agency, who described "The Soviet Challenge"; James R. Killian, Jr., special assistant to the President for science and technology, who discussed steps needed "Toward a New Level of Excellence"; and Alan T. Waterman, director of the National Science Foundation and Lee A. DuBridge, president of California Institute of Technology.

### Insecticide Threat

The National Audubon Society has urgently recommended that the Department of Agriculture stop all insect control programs in which highly toxic chemicals are broadcast unless incontrovertible evidence becomes available that no serious damage to human and wildlife resources will result. The society has requested the Secretary of Agriculture to stop the proposed control program for the imported fire ant on some 20 million acres in nine southern states. The program is already underway. At the same time, the society warned the general public that all use of highly toxic modern insecticides, fungi-