

These 2-year appointments constitute the first of a series for the science program, which is under the direction of Wallace R. Brode, science adviser to the Secretary of State. Still to be appointed are science officers for the U.S.S.R., India, and South America, and deputy science officers for all the posts except the one in Paris, to which Cox is being assigned. Leaders in science who have had experience as educators, research scientists, and administrators have been especially selected for these posts because of their international scientific reputation, their knowledge of the status of science and acquaintance with scientists in the country of assignment, and their facility with the language.

A science officer's primary role will be to serve as an adviser to the ambassador and his staff in the evaluation of the interaction of science with foreign policy, the assessment of current scientific progress abroad, and the enhancement of the liaison between U.S. and foreign scientists and engineers. There are 24 countries that have scientific attaches in their embassies in Washington, attesting to the need and usefulness for representation of science in international affairs.

Jet Propulsion Laboratory Transferred to NASA

An executive order was issued by President Eisenhower on 3 December that transfers from the Army to the National Aeronautics and Space Administration the facilities of the California Institute of Technology's Jet Propulsion Laboratory. In addition, NASA and the Department of Defense have agreed that, at NASA's request, the Defense Department will make available a portion of the research and development capacity of the Army Ballistic Missile Agency at Huntsville, Ala. Under the Army-NASA agreement, which accompanied the executive order, Wernher von Braun and his 2900-man space research group will devote part of their activities to peaceful projects for the space agency. This will include eight satellite launchings next year.

The Jet Propulsion Laboratory will continue to be operated by the California Institute of Technology, as contractor for NASA. Under the agreement, which accompanied the executive order, Army projects now underway at JPL will continue under Army supervision until they are "phased out," largely during 1959. These constitute more than half of the research program at JPL and include work on the Sergeant missile and on several smaller, classified projects.

The Jet Propulsion Laboratory was established prior to American participation in World War II. Pioneering work

was performed there on solid propellants for rockets; in addition, JPL scientists are recognized as leaders in electronics, communications, and guidance systems for space technology. The JPL facilities are valued at approximately \$55 million; more than 2300 scientists, engineers, and supporting personnel are employed at this research center.

Discussions between NASA and the Department of Defense over the transfer of facilities began nearly 2 months ago. T. Keith Glennan, NASA administrator, pointed out that NASA, in order to discharge fully its responsibilities as set forth in Public Law 85-568, must develop at the earliest possible moment a capability for the effective handling of the functions connected with the design, development, and use of satellite systems, including propulsion units, guidance and control, scientific payload packages, and the acquisition and analysis of data of interest to both the scientific community and the Department of Defense.

Glennan said that NASA had assigned the highest order of importance to the avoidance of significant interference with the discharge of missions in support of the defense effort assigned to the separate installations by the several services. He estimated that if NASA were to develop its own facilities to perform nonmilitary space projects, an investment of more than \$60 million would be required, and it would be necessary to recruit a scientific and supporting staff of between 2000 and 3000 people. Building and staffing such a complex of space technology facilities would require 3 to 4 years.

Deputy Secretary of Defense Donald A. Quarles, in the course of the discussions, informed Glennan that the Department of Defense agreed that the Army facilities at JPL could be transferred to NASA at once, but that it could not agree to the proposed partial transfer of ABMA to NASA. The reason for the latter decision was that the Army is now engaged in the development of missiles and that the unique capabilities of the ABMA team (Wernher von Braun's group) are essential to vital and high-priority Department of Defense programs for the development of advanced military systems. However, he suggested a portion of the capacity of ABMA could be made available for work on NASA space projects.

Glennan agreed to the Defense Department proposal, saying that for the present it provides a workable solution to NASA needs. Moreover, the NASA administrator observed that every effort will be made to utilize the skills of ABMA to the maximum extent feasible. The Department of Defense and NASA are agreed that within the next year a

joint report will be made to the President and the Space Council about the experience under the cooperative arrangements that have been announced.

Project Discoverer

The Department of Defense announced on 3 December the beginning of a new satellite program called Project Discoverer. It will consist of the launching of a series of 1300-pound satellites, on an average of one a month, to develop: (i) a manned satellite; (ii) an early-warning satellite for the detection of enemy missiles; and (iii) a means for safely returning satellites to the earth for the recovery of occupants, films, instruments, or other "payloads" too valuable to lose. The project will be directed by the Advanced Research Projects Agency.

The first satellite will be launched late this year or early next year from the new Pacific Missile Range on the coast of Southern California. The launching pads are located at the Vandenberg Air Force Base, about 120 miles northwest of Los Angeles.

The satellites in the Discoverer series will be capable of carrying payloads of several hundred pounds and will be launched into polar orbits by directing them in a southerly direction. Orbits that will carry satellites over the North and South Poles are necessary for certain projects. A satellite in a polar orbit will travel over the entire surface of the globe. Actually, its path will remain fixed in space as the earth rotates inside it.

Cape Canaveral in Florida will continue to be used for satellite and space-probe launchings to the east and southeast. Launchings from the Pacific Missile Range will be only toward the south.

World Population and Agricultural Productivity

The world should support a population of 6 billion in the next century. This is the calculation of G. V. Jacks, one of Europe's leading soil experts and director of the Commonwealth Bureau of Soils at Rothamsted Experimental Station, Britain's chief center for agricultural research, in an article included in the most recent annual report of the Smithsonian Institution. However, Jacks emphasizes that his conclusion depends on a proper organization of the burgeoning society. Fertility of the soil must be maintained everywhere, a far more important factor than bringing new land into cultivation.

There is a curious relationship be-

tween distribution of population and agricultural productivity, Jacks points out. By and large, land fertility increases with the size of towns, not with the number of persons engaged in farming. At first, crop land does little more than supply food for the actual cultivators. Little or nothing is left to put back into the land out of which something is taken by each successive crop. Exhaustion comes soon and the people must find new land.

Then a surplus population flocks together to establish towns supported by industries. They require some of the farm products, and this need tends to make agriculture more stationary in the neighborhoods of towns. Actual money flows back to the farmers. They are able to buy fertilizers or apply more effective measures to prevent soil depletion and raise bigger crops. The process is continuous as long as the industrial centers continue to pour more and more back into the land. Jacks continues:

"Will the world of a hundred years hence be able to feed the 6000 million people who will then be in it? The answer is yes, provided most of them live in towns and produce enough wealth to pay for the food they need. If they offer enough money for their food, the food will be produced."

Coeducation in Turkey

Robert College and the American College for Girls in Istanbul, Turkey, have merged, paving the way for a Western-style coeducational college, effective next September. Two of the oldest American schools in the Near East, the colleges have a combined enrollment of 1800. Robert College this year has 1150 men students, while 650 women attend the College for Girls. Alfred Ogden of New York City was elected chairman of the new board. Duncan S. Ballantine will continue as president.

Although courses were designed primarily for young Turks, students from 50 nations have studied at the two colleges. Robert, founded in 1863, claims to be the first American college established overseas. It is chartered under the Board of Regents of New York State. The American College for Girls was given a charter under Massachusetts law in 1891. The campuses lie less than 3 miles apart on heights overlooking the Bosphorus.

Homicide in the United States

In contrast to the marked increase in other major crimes, the incidence of homicide in the United States has decreased in the period since World War

II, according to statisticians of the Metropolitan Life Insurance Company. The homicide rate fell about one-fifth between 1946-47 and 1955-56, from 6.1 to 4.8 per 100,000 of population.

The relative decline was greater for white than for nonwhite persons, and for each race was considerably greater for males than for females. Among white males, the decrease amounted to one-fourth; among nonwhite males it was one-fifth.

Among white people, the homicide rates vary but little in the range of ages from early adult life through middle age, and decrease only moderately at the older ages. Among nonwhites, and particularly for males, the toll from homicide rises to a definite peak in the late 20's and early 30's, and then falls rapidly with advance in age.

Despite the marked increase in juvenile delinquency in recent years, the homicide rate at ages 15-19 decreased. Moreover, the rate at these ages is much lower than that for most adult age groups.

Germ-Free Laboratory

A new and simplified germ-free laboratory, believed to be virus-proof as well, has been successfully tested at the University of Michigan Medical Center. A goal of biological scientists since the turn of the century, the apparatus is an outgrowth of two other systems developed in the United States and Sweden.

Guinea pigs born in the sterile laboratory last September have survived. The achievement recalled stormy debates that raged early this century on the proposition that all animal life depends, for its very existence, on certain "beneficial bacteria" prevalent in normal life. The apparatus is a sealed metal and glass box about the size of a deep-freeze cabinet. It was designed by Richard Horton, a former postgraduate student at Michigan who is now with the National Institutes of Health.

Nothing rots inside the miniature laboratory. Excess food and animal feces have remained for weeks without decomposing and without odor. Guinea pigs were delivered by Caesarean section directly into the cabinet, employing an intricate surgical procedure that used a plastic membrane to prevent possible contamination by the mother's body. By means of sealed-in rubber gauntlets, investigators can work in the sterile area.

A pressure compartment attached to one end of the unit permits steam sterilization of food and equipment. All air entering the cabinet is first heated to temperatures above 750°F and then cooled. These precautions kill all living

organisms, and have prevented contamination for more than 4 months. It is believed, though not tested, that the apparatus will prove as invulnerable to environmental viruses as it is to germs.

News Briefs

The AAAS has received a \$250,000 grant from the Carnegie Corporation of New York to continue until 1961 its nationwide program to improve the teaching of science and mathematics in the secondary schools. The Science Teaching Improvement Program is headed by John R. Mayor, director of education for the AAAS. For details of the program's first years—it was launched in 1955 with Carnegie support—see the article on page 1262 of the 21 November issue of *Science*.

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Dedication exercises were held on 5 December for the U.S. Department of Agriculture's new National Seed Laboratory, just completed at Colorado State University at Fort Collins. The laboratory will provide storage for seeds of thousands of different plants—representing the world's most valuable food, feed, pasture, fiber, and tree crops—for use as breeding stock. The Crops Research Division of USDA's Agricultural Research Service will administer the new facility. Operations will be supervised by Edwin James, director of the laboratory and Louis N. Bass, seed physiologist.

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The Woods Hole Oceanographic Institution reports that its new 214-foot research vessel *Chain*, the fourth ship in the institution's ocean-going fleet, left on 6 December for a 16-day cruise between Nova Scotia and Bermuda. The *Chain*, equipped with four large laboratories, has accommodations for a crew of 33 and 28 scientists. She has a cruising range of 10,500 miles. On 2 January she will begin a 3½-month trip for the International Geophysical Year in the southern South Atlantic, and on 1 May she will depart for a 3-month cruise to study the bottom of the Mediterranean.

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Two vocational guidance booklets on careers in chemical engineering and chemistry have recently been published by the Chemical Institute of Canada. The booklets discuss job opportunities, salaries, and the two professions in general. For free copies, write to the institute at 18 Rideau Street, Ottawa 2, Ontario.

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The Medical Research Center at Brookhaven National Laboratory was dedicated on 16 December, following a 2-day conclave of deans of medical colleges. The dedicatory address was de-