

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-