to ask their separate governments, when ratifying the convention, to signify that they therewith grant general permission to any scientific research vessel to conduct investigations of the bottom and subsoil of the continental shelf, provided that the program is specifically approved by ICSU and that the results of the investigations will be published openly for the benefit of science. It was recommended that the coastal state concerned should be notified far enough in advance to enable it, if it so wishes, to designate a representative to take part in the work. In this way, it is hoped that governments will be substantially assisted in identifying bona fide scientific research projects and that diplomatic delays which might jeopardize many types of oceanographic investigations may be avoided.

Publications. Starting in 1959 a new quarterly international journal to be known as the *ICSU Review* will be published, to cover all significant activities of ICSU and its member unions; it will also assure the regular appearance of a current bibliography of ICSU publications.

And, because of the special demand stimulated in large measure by the IGY activities, there is to be established a new ICSU Publications Office. Among the several functions of this office will be (i) publication of the *ICSU Review*, (ii) production of a self-consistent series of volumes of high standard in the fields of activity of ICSU and its dependent organisms, (iii) provision of editorial and publication assistance to scientific groups associated with ICSU, and (iv) financing, promotion, and distribution of ICSU publications.

UNESCO relations. In recognition of the close and mutually advantageous relationship between ICSU and UNESCO, the assembly expressed its deep appreciation for the latter's significant support of the work of ICSU and its associated scientific unions and noted with pleasure that ICSU programs have, in turn, materially furthered the objectives of UNESCO. The hope was expressed that UNESCO would undertake a major expansion of its Marine Sciences Program and that it would aid the countries bordering the Indian Ocean to take an active part in the international investigation of that ocean planned by SCOR.

It was also urged that scientific members be included in each national delegation to general conferences of UNESCO in order to insure full consideration of the program of the Natural Sciences Department, which in recent years has received a smaller and smaller percentage of the total UNESCO budget.

Financial matters. As controller of its own financial affairs, the assembly passed a resolution strongly endorsing the establishment of a capital fund and instructing the treasurer to invite each council member to take early and vigorous action to secure appropriate donations. Such a fund, preferably aggregating $1 million, is needed to permit ICSU to meet its steadily growing responsibilities and to move swiftly when significant developments in international science demand immediate and positive action.

At the same time, thanks and appreciation were expressed for contributions totaling some $28,000 to the ICSU Special Fund made by the Sir Darabji Tata Trust of India, the Academy of Sciences of the U.S.S.R., and the National Academy of Sciences and National Science Foundation of the United States.

Figure 2, prepared by the academy's Office of International Relations, shows the "national" and "international" income of ICSU and its member unions in 1957. It also shows how these funds, approximately $550,000, were used by ICSU for specific projects, including the IGY, and by the unions for support of their activities. Secretariat and administrative services provided by ICSU amounted to a little over $40,000.

The assembly approved an annual operating budget of $58,000 for the next triennium. The allocation of ICSU funds to special projects and to the 13 member unions was reserved for action by the executive board, which meets annually.

Admission of new national members. The assembly admitted the National Council of Scientific and Technical Research of Argentina and the Bulgarian Academy of Sciences as new national members of ICSU.

Election of new bureau. The following officers and members of the bureau were elected to serve until the next triennial assembly: Sir Rudolph Peters (Great Britain), president; Lloyd V. Berkner (United States), retiring president; Reverend Pere Lejay (France), vice president; W. A. Engelhardt (U.S.S.R.), vice president; Colonel E. Herbays (Belgium), treasurer; Nicolai Herlofson (Sweden), secretary-general; and Arthur Stoll (Switzerland) and Seiji Kaya (Japan), members.

The new bureau lost a valuable member with the passing of Reverend Pere Lejay on 11 October during the return voyage to his homeland.

A special vote of appreciation for valued service to ICSU was extended to retiring members of the bureau: Bertil Lindblad (Sweden), Sir K. S. Krishnan (India), and Sir Harold Spencer Jones (Great Britain).

Summary

The preceding account of the Washington assembly of ICSU is for the most part factual. It is essentially a record of actions taken by the assembly. As such, it summarizes the work of the delegates and reveals the plans, hopes, and aspirations of the international scientific community. The importance of freedom of scientific research from artificial restrictions of any kind, political or otherwise, has been reaffirmed. The important types of research arising out of the highly successful International Geophysical Year will be carried forward on an international basis under ICSU auspices by groups newly constituted for the purpose. The necessity for continued international scientific cooperation, with a maximum of support from such kindred units as UNESCO, has been made clear, as has been the need for adequate funds for the work. New facilities for publication and dissemination of material will provide another step forward in what every scientist trusts is steady progress toward uncompromised, uncompromising, and recognized universality for science and scientific knowledge.

The accomplishments of the IGY have yet to be evaluated, and many another task remains to be completed. But plans already are being made for new and daring explorations into the unknown, always pushing forward the frontiers of knowledge. This is the spirit of ICSU and of all those who together constitute the ICSU family of scientific unions. As ICSU grows, so will our knowledge of nature and our ability to cope with the problems which currently beset the peoples of the world.

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Overseas Science Officers

The Department of State has announced the re-establishment of its overseas Science Officer Program with the appointment of seven distinguished scientists to serve in the U.S. embassies in London, Paris, Rome, Bonn, Stockholm, and Tokyo. The men selected are as follows: Thomas H. Osgood, physicist and dean of the School of Advanced Graduate Studies at Michigan State University, for London; Edgar L. Piret, professor of chemical engineering at the University of Minnesota, for Paris; Edward H. Cox, retired head of the department of chemistry at Swarthmore College, as deputy science officer for Paris; Walter Ramberg, chief of the Mechanics Division at the National Bureau of Standards, for Rome; Ludwig F. Audrieth, professor of chemistry at the University of Illinois, for Bonn; Julian E. Mack, professor of physics at the University of Wisconsin, for Stockholm; and Willis R. Boss, professor of zoology at Syracuse University, for Tokyo.

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-