to meet the needs of that agency's Project Mercury, a civilian program in which a man will be sent into orbit at a 100-mile altitude for 24 hours or less. The Advisory Committee for Man in Space serves the needs of the Defense Department's Advanced Research Project Agency and the Research and Engineering unit, military agencies with many bio-astronautical problems peculiar to their missions. The Psychological and Biological Research Committee of the Academy of Sciences' Space Science Board serves the function of providing a long, broad view of bio-astronautical problems and contributing to the thinking, the "philosophy," that gives the basic orientation to future research and development in bio-astronautics.

A second factor that works to avoid duplication, or more exactly, quadruplication, is what would be called the "interlocking directorate." As it applies to these four committees, the term means that an individual serves on more than one committee. For example, Don D. Flickinger of the Air Force is a member of both the NASA committee and the new Armed Forces-NRC group; Otto H. Schmitt, chairman of the latter committee, is also a member of the Defense Department's Man in Space group and of the Psychological and Biological Research Committee. There are numerous cases of such multiple membership. The effect of this arrangement, which reflects both planning and the fact that there are only so many qualified men in bio-astronautics, is obvious: on the one hand, repetition of effort will be avoided; on the other, "cross fertilization" will work in the favor of each committee.

Major Subjects of Study

As the result of two meetings of the committee's executive council, panels are now in the process of organization. These groups will address themselves to major problem areas of immediate concern as outlined by the council. These areas are: information in space biology fields, general biological problems of extra terrestrial life, closed ecological systems, bioinstrumentation for space experimentation, accelerational stress of ballistic rocket system, space orientation, space psychology (sensory deprivation, selection, isolation), space radiation biology, bio-engineering of protective systems, and specifications of unanswered problems in bio-astronomics.

Membership of Executive Council

Policy decisions and the programming of activities within the committee are the responsibility of the executive council. The following scientists—representing different fields of endeavor in universities, private research organizations, and the armed forces—have been appointed to the council by Detlev W. Bronk, president of the Academy-Research Council: chairman, Otto H. Schmitt, department of physics, University of Minnesota; vice chairman, Melvin Calvin, department of chemistry, University of California, Berkeley; Howard J. Curtis, department of biology, Brookhaven National Laboratory; Paul M. Fitts, department of psychology, University of Michigan; Don D. Flickinger, Directorate of Life Sciences, Air Research and Development Command; John D. French, department of anatomy, University of California Medical Center, Los Angeles; Charles F. Gell, Office of Naval Research; James D. Hardy, U.S. Naval Air Development Center, Johnsville, Pa.; and Robert H. Holmes, Research and Development Command, Office of the Surgeon General, Department of the Army.

The ex-officio members of the council are R. Keith Cannan, Academy-NRC chairman of the division of medical sciences; Sam F. Seeley, professional associate of the NRC staff, who is acting executive secretary of the committee; and K. Cutler, Air Research and Development Command, who is the contracting officer representing the military services.

Scientific Information

The International Conference on Scientific Information, which was held in Washingon, D.C., 16–21 November 1958, under the sponsorship of the National Academy of Sciences–National Research Council, the National Science Foundation, and the American Documentation Institute, was the culmination of nearly 3 years of planning [*Science* **128**, 464 (29 Aug. 1958); **128**, 1126 (7 Nov. 1958)].

Background

Some 10 years before, a similar conference had been convened by the Royal Society in London, and in a certain sense this was a 10-year follow-up. There was an important difference, however. In 1948 it was still feasible to discuss in a single conference the entire problem of scientific information: primary publication, dissemination, abstracting and indexing, and financial and administrative problems relating thereto.

But the magnitude of this whole field of activity has swelled so rapidly with the steadily increasing volume of research that it no longer seemed practical to cover so broad a range of topics in 1958. A few years ago the National Academy of Sciences–National Research Council convened a relatively small conference on one aspect of the problem, primary publication; the recent international conference was concentrated on another aspect, storage and retrieval of information.

In another sense the International Conference on Scientific Information was more specialized than its predecessors, for a serious effort was made to concentrate primarily on the technical problems involved in storing and retrieving information without becoming involved with administrative and financial questions, except in a single session.

Organization

The opening session, on Sunday evening, 16 November, featured a formal but delightful address by Sir Lindor Brown, secretary of the Royal Society of London. Remarks of welcome on behalf of the sponsors of the conference were made by Detlev W. Bronk, president of the Academy–Research Council, Alan T. Waterman, director of the National Science Foundation, and Milton O. Lee, who represented the American Documentation Institute throughout the period of organization of the conference.

The discussions were organized in an unusual way, for the reading of papers contributed to the conference was expressly prohibited. Instead, the papers were distributed to all participants well in advance of the conference. The sessions were discussions led by panels. More than 70 scientists and information specialists, who usually were not authors of papers, took part as members of the panels. The authors also engaged in the discussions. There were approximately 150 active participants in all. In addition, nearly 1000 nonparticipating observers attended the sessions, and almost as many were prevented from attending by the limitation of space.

Less intense but perhaps equally rewarding activities during the conference were tours to some of the important information processing agencies in the Washington area and visits to an exhibition adjacent to the conference hall, where a number of significant systems and components were displayed by their manufacturers or proponents.

Sessions

It would be a bold individual indeed who would pretend to present a fair summary of the content of such a conference, but I will give some of my own impressions of it. Others may draw their own conclusions when the conference proceedings are published and available from the Academy–Research Council sometime in the coming months.

Everyone agreed with the truism that requirements of users should determine the design of new systems, but there was little agreement about what these requirements, in fact, are, how they vary from subject to subject, from country to country, and with the nature of research (pure or applied). Nor was there agree-

ment on how best to determine answers to these questions. It was apparent from the discussions that verbal communication (at conferences and symposia, at table, or in the hall) is relied upon much more than is commonly supposed. Abstracts are relied upon less, and critical, comprehensive review articles of broad segments of the literature are desired very much. This does not necessarily indicate that more conferences or more financial support for existing systems will solve the problems; instead, it may emphasize the need for improved or even fundamentally new systems.

Centralization versus decentralization of services was considered in very interesting discussions in which the protagonist of centralization was A. I. Mikhailov, director of the All-Union Institute of Scientific and Technical Information of the Soviet Academy of Sciences. Mikhailov's institute has performed remarkable feats of service; nevertheless, there were many who regarded such a mammoth, government-operated organization as an impractical means for solving the problem in the United States.

A middle position was described by a Polish participant, A. Majewski, who is director of the Central Institute of Scientific and Technical Documentation in Warsaw. The scanning and abstracting of the world's literature in Poland is divided among some 80 specialized research centers there and is carried on by working scientists and engineers. A central headquarters, under Majewski's direction, controls the machinery for assembling, duplicating, and distributing information from the specialized centers and carries out a number of services, such as preparation of card indexes for distribution, that could be done locally only with much repetition and inefficiency.

These discussions will no doubt be of great interest to those considering the several proposals for a national scientific and technical information service in the United States, one such proposal having been made by the Council for Documentation Research to the Academy–Research Council.

Trends

Two quite different trends in the thinking at the conference were apparent in discussions of how to deal with the steadily increasing flow of information. What might be called the classical approach demands self-restraint at all levels, for in this view less should be published in the first place and more should be eliminated from the retrieval systems; editors should reject more papers, and abstract services should become more critical and should process only what is worth while.

The other approach would regard the classical position as one to be approved in principle, but hopeless in practice. Instead, we must develop mechanized systems with such capacity, speed, and selectivity that they can absorb all that is produced and serve up to their users only what they want. The designers of large-scale, high-speed computers were more sanguine about the future of this trend than the librarians and the using scientists, although the evidence of progress that they presented was encouraging.

Certainly the need for cooperation among using scientists and librarians on the one hand and mathematicians, engineers, linguists, and logicians on the other was made more evident. As C. W. Cleverdon, a participant from England, put it:

"These people who are trying to find out what we, the librarians, are doing, and trying to find out how we should do it, are working toward the aim of eliminating any necessity for us to do it at all. . . . Yet, as librarians, we should not abrogate our right and duty to tell all who come into documentation from outside what are our problems, and try to direct their efforts toward the solution."

Perhaps the conference laid the basis for closer cooperation of this kind. Certainly Sir Lindor Brown made us feel that in this respect the conference had been worth while when he interjected very nearly the last remark in the conference record. He said:

"We started this week speaking about *your* conference. We finished by speaking about *our* conference. What better praise could there be?"

CHARLES I. CAMPBELL
Rockefeller Institute,
New York, N.Y.

Cloud Cover Satellite

A small satellite, designed to produce pictures of the earth's cloud cover, has been put into orbit at an altitude ranging from 929 to 2086 miles. This is the first of the space vehicles designed for meteorological purposes. The satellite, weighing 20½ pounds and having a diameter of 20 inches, was launched from Cape Canaveral 17 February as a part of Project Vanguard, a program originally set up for the International Geophysical Year, which ended last December.

The sphere carried two transmitters, a receiver, a recorder, and batteries in addition to the two photocells which alternately scan the earth's cloud cover during daylight hours. Solar cells operate a switch which halts the recording tape when the satellite is in the shadow of the earth.

Clouds and sea and land masses have different qualities of reflection which can be translated into electrical impulses. As the satellite's photocells sweep the sunlit side of the earth, the intensity of sunlight reflected from the cloud areas (80 percent) will differ from that reflected from the land (15 to 20 percent) and sea (5 percent) areas. These reflections, converted to electrical signals, are stored in the tape recorder within the satellite for telemetering to ground stations in compressed form when the satellite is "interrogated"—that is, the transmitter is activated by a ground signal.

The Vanguard program, originally a Navy activity, was transferred last fall to the National Aeronautics and Space Administration. T. Keith Glennan, administrator of NASA, announced the successful shot and relayed President Eisenhower's personal congratulations to the scientists responsible for it.

National Manuscript Catalog

The Council on Library Resources, Inc., Washington, D.C., has made a grant of $200,000 to the Library of Congress to initiate work on a National Union Catalog of Manuscript Collections. It is hoped that this catalog will eventually record all collections of manuscripts in libraries and archives in the United States. The immediate goal is to bring together uniform descriptions of some 24,000 known collections in approximately 75 cooperating repositories, in addition to some 3000 collections in the Library of Congress itself, and to print and sell separate catalog cards for each of these collections so that any library that wishes to do so may maintain a similar record.

A need for a central national inventory of manuscript collections has long been felt by people involved in studies which depend upon such sources. These studies include not only civil, military, and social history but also literary history and criticism, history of the arts, biography and genealogy, paleography, business and economic history, history of science, and legal history and inquiries.

Grants, Fellowships, and Awards

Literature of science. The Phi Beta Kappa Senate has established an annual prize of $1000 for an outstanding contribution to the literature of science. The first award will be made next December to the author of the best book on science or the interpretation of science published between 1 July 1958 and 30 June 1959.

The purpose of the award is to stress the need for literate and scholarly interpretations of the physical and biological sciences and mathematics, and to symbolize the importance of science as a part of humanistic studies. Such books as *Deserts on the March,* by Paul B. Sears; *The Immense Journey,* by Loren