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XI. SCIENCE AND TECHNOLOGY

A. INTRODUCTION

1. Background, 1945-63: Creation of SCI

Prior to President Johnson's Administration, science was understood less well and was less emphasized as a substantive element in the formulation and conduct of foreign affairs. Three earlier reports, however, were especially relevant to the ensuing integration of science with foreign policy:

(1) Dr. Vannevar Bush's Report written at the instance of President Franklin Roosevelt.[1/] Bush recommended certain initial steps in support of international scientific cooperative programs, including establishment of a science attache program.

(2) John R. Steelman's Report[2/] under President Truman, which further recommended a "scientific foreign service."

1/ Vannevar Bush, Science, The Endless Frontier, July 1945.

2/ John R. Steelman, Science and Public Policy, August 1947.

(3) Lloyd V. Berkner's Report,[3/] which called on the State Department to "take science and technology into consideration in the formulation of foreign policy and the administration at all levels" and recommended creation of a science staff in the Department, as well as at selected embassies.

As a result of the Berkner Report the Department established in 1950-51 the Office of the Science Adviser, under the direction of Dr. Joseph B. Koepfli of the California Institute of Technology, and also a science staff at several embassies. Staff reductions shortly thereafter, however, depleted the science program almost to zero. Only a separate Atomic Energy Office remained very active until, with the Soviet launching of "Sputnik" in July 1957, attention again focussed on the need for a more coordinated administration of science in foriegn affairs. As one of a series of related actions throughout the government designed to strengthen US scientific and technical capabilities, it was decided to reactivate the Department's science program.

3/ Lloyd V. Berkner, Science and Foreign Relations, April 1950.

Accordingly, Dr. Wallace Brode, then Associate Director of the National Bureau of Standards, was appointed Science Adviser in January 1958. (He was succeeded by Professor Walter G. Whitman, 1960-62.) An initial operating task of his office was recruitment and placement of qualified scientific attaches. This was difficult, as it depended on persuading capable scientists to leave assignments usually relating to the specific practice of science and research in order to perform a function not at that time very clearly understood by the Embassy to be served or by the Department as a whole. In an unfamiliar working atmosphere they had to make the job fit the situation existing at the post. Their generally successful performance has been a credit to the recruiters and to themselves. And by 1963 the scientific attache program was largely re-established.

Meanwhile the concept of a Science Office was becoming accepted at the Department, largely because scientific events such as the International Geophysical Year in 1957-8 necessitated governmental and private arrangements and understanding on a complex scale.

The role of Science Adviser in the Department gave way to that of Director of International Scientific Affairs (SCI) with the appointment in September 1962 of Dr. Ragnar Rollefson, Professor of Physics on leave from the University of Wisconsin. His mission was to mesh scientific and technological components into the Department's foreign policy-making machinery and to act as adviser both to the Department and to other Government agencies on the one hand, and as a bridge to the US scientific community in matters concerning science and technology in foreign affairs on the other. Concurrently with its establishment, SCI received by transfer the duties of the Special Assistant to the Secretary for Atomic Energy and Outer Space relating to the civilian aspects of those matters. SCI was at the same time given the status, but not the formal designation of a Bureau.

Dr. Rollefson had as his Deputy Dr. Edwin Kretzmann, a Foreign Service Officer, who became largely responsible for introducing the science course at the Foreign Service Institute and for the Secretary's "science luncheons". The Department's more formal science education was begun.

The Department's acceptance, despite its traditional orientation, of science and technology was made easier by outside events. Sputnik's launching in 1957 not only revolutionized US Government attitudes; it also entailed, with the development of US space programs, the need to arrange for space tracking stations abroad and eventually to bring the utilitarian and beneficial aspects of satellite technology into harmony with other nations' aspirations. Again, the exigencies of atomic science in its peaceful and military developments alike made inevitable a close association between scientists and the Department. The United Nations Conference on the Application of Science and Technology to Development (UNCAST), in February-March 1962, ushered in an era in which less developed countries increasingly recognized the relation of science, technology and research to economic progress. One result was a desire on the part of such countries for science links with the US. At the same time it was becoming obvious that the Department would have to work out informed ways of dealing with such problems as technological gaps, the brain drain, technologically-forced changes in international

transportation and communications arrangements, the military implications of the peaceful atom, and opportunities for exchanges with the USSR and Eastern Europe.

2. Trends During the Johnson Administration - A Summary

Dr. Rollefson's term as Director was limited to two years because he was on leave from the University of Wisconsin and had in September 1964 to resume his activities there as Professor of Physics. His resignation precipitated a search for another practicing scientist who like him might combine science, administration, and government.

Prior to President Johnson's assumption of office and also during the following ten months SCI was making general progress. It had not yet in that period, however, succeeded to its own satisfaction in relating its activities smoothly to the more traditional business and practices of the Department. Nor were its role and its potential yet thoroughly comprehended within the other bureaus. A similar vagueness and uncertainty plagued the Scientific Attaches abroad.

The Secretary appreciated the situation and determined to recruit as Director of International Scientific Affairs a leading public figure who, in addition to being an able

scientist, would have a professional understanding of the nature and substance of international relations, be an aggressive and sophisticated administrator, and possess a personality that would wear well in a bureaucratic milieu. There was then undertaken, with the assistance of the Science Adviser to the President and the leaders of the governmental and academic scientific communities, a nationwide canvass which resulted in the detailed evaluation of over 20 prospective candidates.

This effort, which covered several years, was unsuccessful for a number of reasons. Perhaps most important, the men who were approached were already engaged and committed to activities of national importance and significance. Furthermore, the function within the Department of State had not yet established itself as one of leading importance. Though the position had been made equivalent to that of an Assistant Secretary (April 1965), it was not in fact a statutory Assistant Secretary position appointed by the President with the advice and consent of the Senate.

During this interval the office was administered by Herman Pollack, a career civil servant, long associated with

the Department, who joined SCI in September 1964 as Deputy Director and became Acting Director in January 1965. In July 1967, Mr. Pollack was appointed Director and Dr. J. Wallace Joyce, a geophysicist and engineer, long associated with the organization, was appointed Deputy Director.

Especially during the President's full term, SCI succeeded in clarifying and providing a wide base of understanding of the relationship of scientific and technological developments and events to foreign affairs. As a consequence of this and the quickening pace of the scientific and technological revolution now under way, the pace of activity in SCI increased several-fold.

The President's interest in employing science as a bridge to other nations was a particular stimulus to SCI and to others in the Department with a concern for science. The White House, among other science initiatives, originated the Water for Peace Program and the concern for an international approach to problems of the human environment. The President and German Chancellor Ludwig Erhard conceived the idea of US-German cooperation on technological problems affecting natural resources. It was President Johnson's interest in

coordination with Philippines President Marcos that gave their joint communique in September 1966 a scientific character and content. Elements of the scientific programs involving the US with Iran and Australia and US support for the Korean Institute for Science and Technology stem from Presidential initiatives. Various international visitors to the White House during this Administration have been engaged, on both the policy and protocol levels of exchange, in matters involving science.

Our government's clarification of the interactions of science with foreign affairs has gone hand in hand with clear gains by SCI in a number of areas. These have resulted especially since 1963 from the conscious pursuit by SCI of opportunities common to science and foreign affairs. They include:

(1) Orientation of the scientific activities of such regional organizations as NATO, CENTO, OAS and others to courses of action more compatible with need, practical considerations, and the interest of participating governments. This has incidentally

led to higher level attention by the U.S. and other governments.

(2) Development - in accordance with President Johnson's initiative - of the Water for Peace Conference in May 1966, from which emerged the Department's Water For Peace Office and a continuing mechanism in tandem with the Department of the Interior to handle U.S. Government responsibilities abroad in the desalting field.

(3) Leadership within the U.S. Government in answering the foreign relations problems growing out of progress in the marine sciences and underwater technologies.

(4) Formulation, in considerable measure, of policy for space programs as they impinge on foreign affairs.

(5) Serving as the focal point within the Department for dealing with the peaceful uses of the intractable atom, involving such delicate problems as those induced by the Plowshare Program, Gasbuggy, and widening implications of economic nuclear programs

throughout the world.

(6) The concept of using executive agents to administer substantive scientific programs within bilateral science agreements. These have stimulated participation by researchers actively concerned by engaging the interest of the most pertinent agency.

(7) Stimulation of working collaboration between academic U.S. researchers and foreign scientists in problems peculiar to the local environment. Iran is a case in point.

Further SCI initiatives that were still being studied at the end of the Johnson Administration in terms of foreign policy had to do with man's relations to his environment and weather modification. Both of these subjects show how advances in science and technology have made the business of foreign policy more complex.

Out of this complexity, which places the resulting problems increasingly beyond the competence of other bureaus and offices of the Department, SCI most recently had been striving to promote better relations with other countries even as it must anticipate and seek to avoid the frictions

inherent in science-induced change. Along with this effort has gone SCI's work to provide appropriate interagency leadership in foreign scientific affairs. This in many of its aspects has rested with the Federal Council on Science and Technology, of which the Department of State has only been a full-fledged member since mid-1967. Participation through full membership results from the fact that significant science questions generally have acquired worldwide as well as domestic implications and that SCI has become competent to speak to them for the Department on more than an ad hoc basis.

B. Adjustments to the Growth of Science in Foreign Affairs

The further developments in SCI during the Johnson Administration can for convenience be described according to the activities of the three component SCI offices: General Scientific Affairs (SCI/SA), Space and Environmental Affairs (SCI/SE), and Atomic Energy Affairs (SCI/AE). This division of responsibility has remained essentially the same since September 1962, although the arrangement resulted from a Departmental report and order issued the previous spring. A major change was the shifting of responsibility for the environmental sciences from the jurisdiction of SA to SE in October 1967 when developments in marine sciences became a

more considerable overall SCI concern. All three Offices have had to expand the range of their activities - though not their size - significantly in order to keep pace with the growth of science in world affairs. By way of example, AE came to devote part of its attention to the technology of desalting whether or not it may be related to nuclear energy; similarly SA took over the growing field of science information as one of its concerns and also had to attend to the proliferating problems of technology as distinct from science.[4/] Almost all aspects of science in foreign affairs have grown in significance, requiring correspondingly more attention.

1. General Scientific Affairs

a. The Scientific Attache

The U.S. Scientific Attaches[5/] functioning in 1968 in some sixteen foreign capitals were,with the exceptions of

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4/ As a result of Mr. Pollack's initiative "Technology" became a part of SCI's title in April 1965. The change anticipated that controversies respectively in Europe concerning the "technology gap" and in the Less Developed Countries concerning their need for better technology and to speed local industry and trade.

5/ Although SA provides administrative support for the Scientific Attaches, it should be understood that all three SCI offices project their business to them. Their responsibility is broad. In some cases other US agencies' science offices report through them to the Ambassador.

Dr. Walter Ramberg in Rome and Dr. Edgar Piret in Paris, second or third generation appointments beyond the original recruitment by Dr. Brode and his Deputy Dr. L. H. Farinholt at the end of the 1950's. Their number had not greatly increased since that time. In the cases of our London, Paris, Bonn, Stockholm and Tokyo Embassies there has also consistently been an Assistant Attache. During the latter 1960's Tehran succeeded Karachi and Cairo was closed when diplomatic relations were broken with the UAR. Also Scientific Attaches were established in our Embassies in Warsaw and Belgrade. In Latin America, Mexico City and Bogota were added to Rio de Janeiro and Buenos Aires as posts with Scientific Attaches. In the Far East, Australia - probably only temporarily - is without an Attache.

It is understandable that with the first appointments - no matter how good the recruits - a varying and sometimes lengthy adjustment had to occur before the new Scientific Attache and his work were fully integrated into the mainstream of Embassy activity. The appointees, almost all of whom were unfamiliar with foreign affairs and the problems of life abroad, had in each case not only to prove their worth to the Embassy, to a possibly skeptical Ambassador, and to a staff unfamiliar with science, but also had to prove it in an environment

remote from their particular professional experience. The Science Attache position relates either to the Ambassador directly, to the Political Affairs Office, or to the Economic Affairs Office, according to the Embassy.

Early attempts were made to suit the scientist to the post. For example, Meterologist Sverre Petterssen was selected for Stockholm and Scandanavia, which had important mutual weather interests. U.S. Polar Explorer Paul Siple was assigned to Canberra, chemist Ludwig Audrieth to Bonn.

In more recent years gerater stress has been placed on administrative experience and policy capacity than on scientific standing. During the Johnson Administration, owing to their greater appreciation of foreign affairs, the Attaches matured professionally; their knowledge and services became better understood and utilized. They were much more than a bridge to the local science community, which was the earlier concept of their function.

An important development was the designation of a Foreign Service Officer as Science Officer at all Embassies lacking a Science Attache. A number of these men have proven quite effective and have played major roles in their Embassies. Also significant in the development of the program was the

elevation in 1967 of Dr. Piret to the position of a Counselor of Embassy - a recognition of the importance of the scientific function in Paris.

b. Science Education within the Department

As science became an increasing dimension of foreign policy, it seemed important that the Foreign Service and policy makers within the Department become better acquainted with those developments in science most pertinent to the international community. In the past, Foreign Service Officers had understandably trained in languages, history and politics to the neglect of science. Only a very few had had an earlier education in the latter discipline.

Accordingly, in 1965 SCI inaugurated a program which included a continuation of the series of information science advisory sessions known as the Secretary's Science Luncheons and the installation of Secretary's Science Briefings which are directed toward the applied end of the science spectrum and are held during working hours. The purpose of the luncheons and the briefings was to bring distinguished scientists and principal officers of the Department together. Thus Department policy officers have from time to time been apprised of significant developments on the frontiers of science, conversely,

distinguished scientists are exposed to major issues and pressures affecting world affairs.

Science briefings have been provided on subjects such as desalting, remote resource sensing by satellite, the future of civil power and nuclear energy, and the geologists view of the earth as a source of minerals. The most recent luncheons have involved presentations on high energy physics (Murray Gell-Man), world food supply (Ivan Bennett), and biology (Philip Handler).

Related to these activities have been visits of large groups of officers to NASA headquarters and smaller groups to field installations for briefings on the space programs. Dr. Glenn Seaborg, Chairman of the Atomic Energy Commission briefed a large audience on nuclear safeguards. More recently, policy officers of the Department of State are being briefed on the mechanics of computers by arrangement with International Business Machines International.

Another major element of this program is the Science Exchange Program, under which approximately 10 Foreign Service Officers have been assigned for 1 to 2 years to technical agencies such as the Atomic Energy Commission, National Aeronautics and Space Administration, National Science Foundation, and the science segment of the Department of

Commerce. A slightly smaller number of officers from these agencies are assigned to the Department of State for comparable terms. This lubrication of understanding and acquisition of insights concerning each others related affairs is already paying dividends.

The implementation of yet another element of this program has been delayed until December 9, 1968 when Dr. Rene Dubos, a distinguished scientist at the Rockefeller University will inaugurate the Department of State Science Lecture Series to a large and distinguished audience of Departmental policy officers, diplomatic officials, members of Congress, government and academic scientists, etc. These lectures will provide a platform for major statements on the interaction of science and foreign policy.

Yet another important element in this program is the continuing series of seminars for higher level Foreign Service Officers conducted by the Foreign Service Institute which SCI inaugurated in January 1965. During three subsequent years the seminars were held twice annually, with some 25 FSO's in attendance at each session.

c. Consultants

On September 6, 1968 The Department announced the formal appointment of scientists Dr. Gordon J. F. McDonald

and Dr. Thomas F. Malone as advisers. They are the first of a group, working chiefly with SCI respectively in the fields of broad international science policy and of weather modification. Their appointment was intended to fulfill an increasingly clearer need for perceptive scientists to focus on science as an inducement to change and in the context of the restrictions inherent in our relations with other countries. It is difficult wisely to encompass the problems of science in foreign affairs without a systematic relationship with scientists.

Under informal arrangements, SCI has been consulting on specific and general problems with a large number of non-governmental scientists such as I. I. Rabi, James Killian, Lawrence R. Hafstad, William Nierenberg, Fred Seitz, Eugene Skolnikoff, Herbert York, and Keith Glennan.

d. New Operational Areas

The nature of science is to develop new horizons, and once its scope becomes international, its results proliferate. SCI's complement has lagged behind the pace of new developments. Drastic adjustments in priorities and liberal use of short term personnel availability between regular assignments have permitted useful effort on such new and important operational areas as the technological gap, oceanography, closer cooperation

in information exchange, practical uses of satellites and general forecasting and scientific planning for the future. On a number of other important areas such as computers, export of technology to Eastern Europe, application of science and technology to development, and bilateral science relations, the lack of manpower has resulted in less than adequate attention being paid to the problems and opportunities involved.

C. Science as a Force in International Relations

1. Cooperative Programs and Agreements

a. Multilateral

Within its bounds, SCI has shaped the course of scientific cooperation among nations. Promoting such cooperation has been a major function of General Scientific Affairs (SCI/SA). However, SCI has played only a supporting role in the broadly multilateral scientific cooperation stemming from the U.N. agencies (including UNESCO) and the Antarctic Treaty. The Department's main responsibilities for U.N. science remained with the Bureau of International Organization Affairs (IO), and for UNESCO science with the Bureau of Educational and Cultural Affairs (CU); in these spheres, SCI has continued as a junior partner. This pattern

had been set prior to SCI's capacity to attend usefully to the U.N. and, until very lately, politics rather than substantive scientific questions have remained dominant in the U.N. The complexities of filtering science through the U.N.'s political web pose a major challenge, not just for SCI but for the U.N. itself. SCI has had increasing interest in the U.N. Advisory Committee on S&T Applications to the Less Developed Countries, as the Committee has begun to focus on major issues and problems in applying pertinent technology. SCI has also been attentive to the substantive science interests of U.N. regional agencies, such as ECAFE, ECLA and ECA. And SCI interest will increase should UNIDO develop promising programs.

The Antarctic Treaty remains a preserve of the Navy and NSF. On the other hand, SCI has been studying initiatives which through science might develop the mutual interests of Arctic region nations including the USSR in their shared polar environment.

b. Regional

Scientific cooperation on a regional basis has been much more the direct concern of SCI than has such cooperation in multilateral agencies.

For many reasons, potentials for regional cooperation have not been fully realized. During the past few years SCI has pressed more effective science programs within existing regional organizations.

(1) Organization for Economic Cooperation and Development

OECD's deficiencies have been typical. In an attempt to elicit broad support from its diverse membership, the OECD program was fragmented into uncoordinated activities. The modest support available for scientific purposes was largely dissipated in superficial studies.

In 1963 and 1964, SCI proposed a reorientation of the science program into activities of prime significance to governments and which could best be carried out by consultation between governments. The US Federal Council for Science and Technology (FCST) approved this proposal, which was then adopted by the OECD. This concept emphasizes use of OECD as a forum for discussion of science policy and development of strong science policies in member countries. A high-level Committee on Science Policy was thus created to establish guiding principles for OECD and for member countries in such basic areas as scientific and technical information, basic research, relationship of science to technological development, etc. The sister

committee on Research Cooperation also was persuaded to deal with problems of prime concern to national governments (such as environmental pollution and urban and social problems), rather than with the more parochial problems that had previously engaged its attention. In short, over the past 5 years, SCI has helped strengthen the OECD program at policy and working levels.

(2) North Atlantic Treaty Organization

NATO's Science Committee has had similar problems in developing a sharply defined program. From the start in 1957, it has been concerned with training scientists from member nations and with development of basic science. Several years ago its original energy dissipated, the program began to languish and its top position went unfilled. SCI took the initiative to revitalize, first US, then other governmental interest in the NATO Science Program. SCI outlined requirements for a more productive programbased on key and common interests of member nations: these suggestions were strongly endorsed by the NATO Science Committee and then the North Atlantic Council. In the spring of 1968 the top position was filled again by Gunnar Randers, a very capable and energetic Norwegian.

(3) Organization of American States

Within OAS, the 1967 meeting of Western Hemisphere

Presidents at Punta del Este led to a broad program of cooperation in science aimed at full development of manpower and natural resources in Latin America. SCI, working closely with President Johnson's Office of Science and Technology, and drawing on the technical competence of other Federal agencies, has helped devise a program within OAS which will carry into practice the principles espoused by the Presidents for cooperation in science, technology, health, education, and resource development. The OAS Science Secretariat has been strengthened and high-level support for the development of programs has been obtained from the private and governmental communities in the United States.

(4) Central Treaty Organization

In 1963, CENTO had a Scientific Council which was concerned mainly with the administration of an institute for nuclear science research located in Tehran. The United States had just become a member of the Council but, since it had no responsibility for the Tehran Institute, its participation was negligible. SCI has provided the representation on the Council, and its successor, the Council for Scientific Education and Research. The Institute was originally designed to train workers in the application of radioisotopes in various fields of research, but by 1965 or 1966, it had outlived its

usefulness. SCI took the lead in urging disestablishment of this institute and reallocation of member countries' resources to activities of more direct benefit. As a result, a multilateral fund was established in 1967 to which all five CENTO countries contribute. This fund is used for a wide range of activities selected by the Council for Scientific Education and Research and monitored by a newly appointed CENTO Scientific Secretary and by a five-nation Scientific Coordinating Board. It insures flexibility and responsiveness to countries' needs, sparking opportunities for collaboration.

c. Bilateral

Although SCI has strongly supported regional cooperative projects, it has persistently sought additional ways to expand bilateral collaboration with other countries. Although bilateral programs lack the theoretical appeal of global or regional programs, they have inherent advantages. In the first place, they can be fashioned to meet countries' specific needs and unique capabilities. Regional programs can rarely be developed with similar precision. Furthermore, bilateral programs appeal to most countries for they spotlight each country's contributions.

SCI has used such agreements to promote our foreign policy goals as well as for mutual scientific benefits. To

establish a proper base for future activities, SCI has preferred to experiment with various forms of agreements rather than to establish a stereotyped format. Also, it has resisted pressures to develop a large number of cooperative programs until it could evaluate the effectiveness of these various forms. Present scientific agreements are with Japan, Germany, Italy, and Iran. As of September 1968, discussions are fairly advanced for bilateral programs with Australia, Taiwan, Libya, and Brazil. The success of existing programs is attested by the expressed desires of a number of other countries to participate in similar agreements.

(1) US-Japan Agreement

The US-Japan Committee on Scientific Cooperation is discussed here at greater length than later agreements, because it was the first substantive one and is still probably the most significant.

This early venture in international science grew out of discussions in 1961 between President John F. Kennedy and Prime Minister Hayato Ikeda, in which they recognized the importance of broadening cooperation in educational, cultural, and scientific fields. The Program, developed under auspices of a Joint Committee, is one of shared support for projects of mutual interest. It was frankly experimental in approach.

The Joint Committee, a "consultative body," explores ways to facilitate peaceful scientific cooperation between Japan and the United States. The Committee reports and makes recommendations to the two Governments. These recommendations do not commit either Government; support of any recommended action depends in each case on normal governmental procedures. The terms of reference were intentionally broad, and the Committee was free to define its operation scope, focus, and methods of procedure.

The American members of the Committee, designated by the Secretary of State, are eminent in the scientific community. The Japanese members, designated by the Japanese Government, include leading scientists, the President of the Japan Science Council, and officials of the Ministry of Education, the Ministry of Foreign Affairs, and the Science and Technology Agency.[6/]

Areas of cooperation especially include:

- Promotion of the exchange of scholars
- Encouragement of scientific information and materials exchanges

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6/ Dr. Kankuro Kaneshige, professor emeritus of Tokyo University, and Dr. Harry C. Kelly, Dean of the Faculty, North Carolina State University, have served as co-Chairman since the Committee's establishment.

- Encouragement and pursuit of joint research projects in specified scientific areas.

The fields selected by the Committee at the first meeting included earth and atmospheric sciences of the Pacific, the biological sciences, and cancer research (later expanded to include other fields of medical science). Science education and hurricane and typhoon research were added in 1962, and in 1965 the Committee recommended research on pesticides as an eighth field for joint research.

At the request of the Secretary of State, NSF -- in cooperation with SCI -- serves as principal coordinating, administering, and funding agency for US participation in the US-Japan program.

To help promote joint activities under these broad topics, implementing agencies of both countries appointed advisory panels of scientists.

Published work from the program did not begin to appear until 1963, and most papers resulting from the program date from 1964. In 1966 the Committee meeting in Washington reviewed its progress and adopted a report written by SCI on its activities and projects to that point -- the "Five Year Report". In his message to the Committee at that meeting, President Johnson noted that:

> ...after a half-decade of close working relationships, it is clear that the United States and Japan have established, through their Committee on Scientific Cooperation, a new path for cooperation among nations. This has been a truly joint program -- in geography, in funds, and in scientific dedication.

There is no doubt that the program has been a success. It has been conducted in a scientific atmosphere, free of political bias, by the scientists themselves.

(2) US-Japan Cooperative Medical Science Program

The success of the US-Japan science program had, by 1965, attracted notice. The medical research panel in particular appeared to offer opportunities for meaningful cooperation beyond those inherent in research programs only. Rather than simply expand the medical panel, President Johnson and Prime Minister Sato established a new vehicle in January 1965--the US-Japan Cooperative Medical Science Program. Their joint communique announced the program in these words:

> The President and the Prime Minister, mindful of the many areas of human health which are of great concern to all the peoples of Asia, agreed to undertake a greatly expanded program of cooperation in medical science with respect to such diseases as malaria, cholera, schistosomiasis, tuberculosis, and stomach cancer, in addition to cooperative efforts on problems of air pollution and pesticides.

The program includes research and public health activities concerning these diseases. Leprosy, virus diseases, filariasis, and malnutrition have been added to the program.

President Johnson asked the Secretary of State to provide for the new program and SCI was further designated as the focal point for the United States.

Four annual meetings of the Cooperative Medical Science Committee have been held. At the last meeting (Tokyo, August 8-9, 1968) the Committee noted such advances as:

-- a service-oriented cultural bank for the production of living tuberculin
-- findings in support of home treatment of leprosy patients
-- strong evidence that malnutrition is injurious to learning and behavior
-- development of higher protein and high yield rice strains.

Research has led to an improved treatment of infantile cholera, and research on an orally administered cholera vaccine is in progress.

(3) Other Bilaterals

In the area of technology as opposed to more basic

sciences SCI and the Department of Interior accepted the initiatives generated by President Johnson and Chancellor Erhard in December 1965 to develop US-German expert exchanges in such fields as natural resources, pollution control, and urban development. Mr. Pollack was one of the officials accompanying Interior Secretary Udall to Germany in February 1966 when specific exchange activities were selected. The Department of the Interior administers the programs for the United States. Solid waste disposal, coal research, noise abatement, and housing have since been added to the original areas of exchange. Since each party pays its own expenses, the agreement is proving a flexible device for comparing procedures and advances in fields in which both countries have much to offer and to learn. In this case SCI's role is formal, with Interior's problems often being resolved with the Germans through the Scientific Attache in Bonn.

On June 19, 1967, the United States and Italy concluded an Agreement for a Cooperative Program in Science. The initiative stemmed from the Italians, who were anxious to widen Italian scientists' exposure to US research and researchers. SCI carried on all the negotiations. The concept rests on the interest of specific institutions and individual scientists in collaboration. SCI insisted that

the agreement be signed only after specific projects were in sight. Examples are: 1) M.I.T.-University of Palermo research in molecular developmental biology, 2) Washington (St. Louis) University collaboration in zoology with the Center of Neurobiology at the Instituto Speriore di Sanita in Rome, and 3) molecular biology research and teaching exchange between Naples and the University of California. NSF on the US side is the Executive Agent.

2. SCI Relations with Other US Agencies

SCI's work relating to the broadening activities of other US Departments and agencies in science abroad during the years 1963-68 has developed significantly. In some degree SCI's ability to speak for the Department of State in scientific affairs has been greater than its voice within the Department, where by their more traditional presence other foreign affairs' problems often have taken precedence.

During 1963-68 SCI has held the chairmanship of the International Committee of the Federal Council on Science and Technology, but only within the last year have SCI and the Department held a seat rather than observer status on the Parent Council of the FCST. Mr. Pollack's close and friendly relations with other pertinent agency heads and

officials have played an important part.

a. National Institutes of Health

SCI has been linked comfortably in the 1960's with NIH by having a former NIH officer on its staff. He has monitored NIH's extensive foreign research network and other HEW foreign projects. He is also secretary for the US-Japan Medical Committee.

b. National Science Foundation

The NSF has also worked smoothly with SCI. Several SCI officers were formerly employed with NSF, including Dr. J. W. Joyce, who is SCI's Deputy Director, and Dr. E. G. Kovach, who has been in charge of General Scientific Affairs. As of 1968 an NSF officer from the Foundation's Office of International Affairs was working in SCI in exchange status. Another former NSF man is Scientific Attache in Paris to our OECD Mission and another is Scientific Attache in Warsaw. Such relationships go far to improve interagency understanding. The closeness of NSF-SCI relations has made easier NSF's role as Executive Agent for the US-Japan Science Committee, for Indian scientific exchange, and for the agreement with Italy. SCI has worked successfully in 1968 to support legislation in Congress which permits NSF to support scientific activity without reference to domestic mission. This has

clearly extended its mandate beyond domestic concerns. Present financial problems may temporarily impede that mandate, but it gives promise for the future commensurate with the increasing import of foreign science.

c. National Academy of Sciences

SCI's relations with NAS, especially with its Foreign Secretary Harrison Brown and his staff, has been considerable prior to and during the Johnson Administration. Mutuality of interest includes foreign travel of scientists to and from the United States, programs such as the International Biological Program and the International Hydrological Decade, which have been gathering momentum since 1965, various international scientific meetings which may affect according to events the climate of relations with other nations (most notably the Soviet Union), Science Workshops, the success of ICSU and science information programs, etc. Dr. Brown and Mr. Pollack consult together frequently. Representatives of each periodically attend the other's meeting, so that there is a detailed mutual awareness of the activity of each office. SCI continues in behalf of the Department to contribute $25,000 annually to the Office of the Foreign Secretary, thus assisting NAS' administration of Academy-to-Academy scientific exchange with the USSR and other Eastern European nations.

Relations have remained habitually satisfactory.

d. Other Departments

SCI's special and growing interest in scientific agreements has brought it into close working contact with the Departments of Interior, Housing, and Transportation. Interior administers the very satisfactory working agreements with Japan and Germany which largely involve natural resources and related research. Through Interior's Geological Survey it also will have working ties with Libya and other nations in which water and problems of geology are concerned. The concept in September 1968 is to arrange an "umbrella" agreement to be signed on the US side by the Department of State, within which technical subagreements would be signed by the administering agency.

Almost all Federal Departments now have science offices; SCI is their main collaborator when exchanges or cooperation with other nations are involved.

3. Science and US Assistance Policy

During President Johnson's term, SCI increasingly concerned itself with the awakening of the developing countries to the fact that science (including technology) and research are keys to economic progress. That the United States is the greatest power in science makes it a magnet for those developing

country interests which would improve their lot through science. It has seemed a fruitful area in which to strengthen US associations abroad and to extend economic benefit at the same time. The operating issues, however, are complex. In order to achieve by late 1968 some promising, though not yet proven, links with developing countries in this area, SCI has had to persevere against difficulties.

A first focus on the problem was achieved at the UN's 1963 Geneva Conference on the Application of Science and Technology to Development. AID was a major sponsor and supporter. Dr. Rollefson was an active participant.

Lack of experience plus the amorphous character of developing country aspirations in science limited SCI attention initially to equating science in those countries with occasional political problems attendant upon it; thus, SCI consistently supported AID and the Department of Agriculture in maintaining tsetse fly research in Rhodesia despite that state's break in relations with the US. 7/

7/ Without SCI insistence the Department would very likely have withdrawn what may prove to be a vital research activity toward elimination of the tsetse fly throughout Central Africa. Another instance of tempering politics in favor of science has been SCI's impeding a proposed nullifying of scientific links with South Africa.

Although SCI has maintained good relations with AID's Science Advisor from 1963 through 1968, that Agency with notable exceptions has required prodding 8/ in promoting its own research into the economic process or in supporting the research activity of the developing country. SCI has played a role with other offices in supporting commitments to research and science that AID has in fact made.

SCI, for example, participated usefully in 1966 in implementing recommendations of the Korry Report for streamlining and regionalizing assistance activity in Africa. It was perhaps instrumental in getting on the tracks again an AID project for an agricultural research conference in Africa, a project administered by the National Academy of Sciences and finally taking place in Abidjan in April 1968. The Conference brought together experts in tropical agricultural and stimulated wider and more meaningful cooperation among African researchers in agriculture.

8/ The Korean Institute of Science and Technology, although substantially funded by AID, was initiated as a project by Presidential Science Advisor Hornig. AID's Science Book Program received lukewarm support. The Agency's Research Advisory Committee gained support for a scattering of research projects relating to special environmental problems and to the aid process itself, but it did not inject AID with the philosophy that research is an important concomitant to the economic development process.

a. The Workshop Concept

In later 1965, AID inaugurated support for a series of contracts with NAS, whereby NAS has promoted "science workshops" in the Philippines, Nigeria, Brazil, Taiwan, Peru, and Colombia. SCI has attended serveral of the workshops and monitored some of the activity but without playing an affirmative role. In the case of the Philippines especially, it was disturbed that recommendations in the "workshop" would lead to local expectations that AID or American science could not make good; concern on that front may have been exaggerated, and workshop relations as of late 1968 are proving themselves salutary overall, if not always very significant in their effect.[9/] (The workshop approach to organizing science and integrating it better with developing country government activity has also been used by UNESCO. The fact that private scientists are primarily involved in such operations has made advisable SCI's adoption of observer rather than active status.)

b. "AID Graduate" Relations

SCI's part in promoting US scientific links with the less developed world has increased markedly during the last two years of President Johnson's term as AID budgets and

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9/ NAS since 1965 has submitted a series of reports on individual workshops to AID.

activity have decreased. Until 1967, little if any thought was being given to problems of countries such as Taiwan, Iran, and Libya, from which AID has withdrawn. Although technically speaking those nations were now able to pay their way, skilled and top-level manpower was still lacking. In science and research as in other categories, positions once manned by Americans remained vacant or were filled by less expensive technicians from other countries; links which might possibly be maintained with the American science community were dissolving rather than being strengthened. Long established associations inevitably suffered.

SCI first deferred to AID in science exchange, because the funds supposedly required could only be supplied by the latter. CU, on its part, could determine the proportion of scientists within Fulbright exchange programs by its control over the funds. It has traditionally favored social scientists. An illustration of funding difficulties resulted from President Johnson's joint communique of September 1966 with President Marcos of the Philippines, projecting cooperation in typhoon warning activity, training in space technology, and science and workshops. SCI finding itself responsible for raising funds, scholarships, and personnel had to solicit the direct

assistance of others. Even for so limited a program, raising funds proved complex.

Perhaps because of diminishing USG funds for scientific exchange generally, SCI has taken the lead in devising S&T links with "AID Graduate" countries. As of late 1968, success in developing those links is not clear. However, during 1967 SCI's General Scientific Affairs responded to Taiwanese requests for S&T links which would assure continuing growth of Taiwan's economy through improved science education and local research activity which would in turn stem the emigration of their scientists.

Development of the US-Taiwan scientific relationship was assured with the appointment of Dr. Bruce Billings as Special Assistant to the Ambassador on Science and Technology on June 7, 1968. SCI had previously conferred at length with Chinese leaders and administrators in the science field who were located both in Taiwan and the United States. Previously NAS led in promoting scientific relations. Now the objective was with a knowledgeable US scientist on the spot to assist Chinese scientific enterprise and education through links with American firms in Taiwan or the United States to strengthen its technological base.

Although simultaneous with efforts to strengthen

Taiwan's S&T through closer association with the US technical community, SCI was preparing a scientific cooperation agreement with Iran. It was formally achieved at the end of May 1968 by an exchange of letters between the American Ambassador and the Iranian Prime Minister. The aim of the program was to intensify cooperation between the scientists of the two countries, so that there would be further exchange of ideas, information, skills, techniques, and the pursuit of joint research. SCI arranged for the Smithsonian Institution to be the Executive Agency on the US side. The agreement developed from several considerations: 1) the withdrawal of AID after an important presence in Iran over many years, 2) indication that despite AID's involvement in Iranian education and science, research quality and performance would deteriorate without continuing close association with outside scientists, 3) a diligent canvass by Dr. Herman Chinn, former Scientific Attache in Tehran and in 1968 an officer in SCI, which identified interesting medical and other scientific problems peculiar to Iran, and 4) Chinn's work to interest US scientists and to discover sources of funds; in 1968 USG funds for such a purpose were scarcely to be found.

The agreement with Iran had as a partial model the agreement with Italy (discussed elsewhere) and was stimulated

by Iran's "AID Graduate" status. Also, Iran like Taiwan has long suffered from serious emigration of its scientists and of the students it sends abroad. Cooperation which would make local conditions for scientists and researchers more attractive appeared very desirable.

Similarly, during the summer of 1968 SCI participated in arranging a scientific "umbrella" agreement with Libya which initially would include subagreements providing for US "cooperation" in hydrologic surveying and related water projects 10/ and an AEC subagreement to assist in seminars and pre-nuclear physics training. The further intention was to leave open the possibility of cooperation by appropriate Federal agencies in other technical fields such as roads, health, general scientific education, agriculture, etc. The attractiveness of such ties for the United States rested on the point that the then Libyan Prime Minister Bakkush planned to pay for US technicians, professors, and scientists -- some of them USG employees as from the US Geological Survey -- who would participate in the projected surveys. This was necessary both because FY 1969 funding did not permit expansion of USG obligations and because AID withdrew earlier when new oil

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10/ The new Water for Peace Office in the Department will administer a specific program.

revenues enabled Libya to pay its own way. New US-funded assistance would be a contradiction in terms. Although Libya with its new revenues replaced expensive US technicians with other foreigners, many of them Eastern Europeans, still it appeared wise to respond to new Libyan requests for US personnel when they believed the efficiency of a US technician might outweigh his extra cost.

As of early September, the initial agreements had been provisionally subscribed to by both sides and were scheduled to be signed later in the month during Prime Minister Bakkush's visit to Washington. Unfortunately, circumstances at home induced him to resign. It is not clear whether the new Prime Minister will find the agreements acceptable.

A science agreement with Brazil was in the making during late spring of 1968 also, but as of September it had not been signed. Despite texts ready for signature, the Brazilians had not met SCI's criterion that at least one specific project be identified by Brazilian scientists in parallel with the signing. SCI has been consistently sought to have new agreements based on practical actions and interests rather than be "empty" of content. In the case of Brazil, scientific ties at present are being successfully advanced by the NAS workshop

program in cooperation with that country's Research Council.

c. Technology Transfer

During 1967 and 1968 SCI in accord with its secondary mandate to identify and pursue technology as an aspect of foreign relations contributed to Dr. Hornig's Committee activities and report concerning the "technology gap". The process itself was salutary in getting responsible Europeans to avoid slogans and to recognize that their problems vis-a-vis the United States were in some degree illusory and, where real, more the result of deficient management, educational and government policy than scientific ability.

The emerging theme of technology transfer, on the other hand, was proving more pertinent to relations with developing countries, who in UNCTAD, the UN's Advisory Committee on Science and Technology, and through the new UN agency, UNIDO, were requesting technological help to assist local industrialization. One officer participated at length in a 1968 seminar on the subject at Columbia University. Closer SCI ties are being forged with the Department of Commerce as the subject proves to embrace activities such as patents, standards, tariffs, and commercial relations. The general problem is more than a passing one and will concern the

Department in years to come; the difficulty will be to evolve a progressive policy sensitive to all. SCI is helping by stressing the substantive and technical elements not easily familiar to the Foreign Service.

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4. Special Situations

a. Brain Drain, Technology Gap

Since early 1965 SCI has acted for the Department in responding to Western European and British complaints that massive USG-supported research, recruitment through high salaries of foreign S&T personnel, and US firms' neglect of research in their foreign operations have created a dangerous technical imbalance. The Department and Mr. Pollack in particular have backstopped the President's and Dr. Hornig's initiative aimed at countering the accompanying sense of frustration which might prove a divisive issue with sympathetic actions and goodwill. Thus in November 1966 the President instructed Dr. Hornig (NSAM 357) to direct an intergovernmental committee in the matter. SCI was a member and important contributor to preliminary and later studies; the latter were used for a US report and in OECD North Atlantic Council discussions and assisted the general conclusion that the Gap resulted, to the degree there was one, from European management deficiencies and lack of

propensity to innovate; in a word it was a problem for the Europeans to solve. 11/

SCI has urged parallel initiatives as with British Minister of Technology Wedgwood Benn for an English School of Management and with the Von Karman Institute in Belgium, where we have argued for the logic of strengthened European support.

The related Brain Drain issue has concerned SCI. Generally speaking we have encouraged in committee manpower studies for the developing countries and less polemical involvement than that generated by the Bureau of Educational and Cultural Affairs. Constructive encouragement of scientific travel rather than restrictions appears to SCI the more practical answer.

b. STINFO and Science Information Activity

The problem of handling and using scientific and technical information (STINFO) has been rapidly growing in importance. Since science is inevitably international, STINFO must also be.

11/ Relevant documents include NSAM 357, an Interim Report to the President, Final Report to the President, and OECD Report on the Gap.

Since 1964 SCI has become involved with international STINFO activities on a continuing basis, especially in relation to OECD. In 1963 an ad hoc Information Policy Group was established under the OECD Committee for Scientific Research, which then became a permanent activity under the Committee for Research Cooperation in 1966. SCI shared responsibility for the establishment of STINFO as a significant portion of the agenda for the Third Meeting of Science Ministers in January 1968.

The OECD meeting of Science Ministers resulted in STINFO being given significantly greater attention as a factor in technological transfer in the US and in other more advanced countries. Other international organizations have taken up activity in STINFO, relating it to technical assistance needs of developing countries. SCI has thus assumed responsibility for foreign policy contributions in the very difficult tasks of developing mechanisms and agreements for international cooperation in the exchange of STINFO.

c. US Research Involvement Abroad

SCI has consistently monitored and encouraged other US agencies' sponsorship of research in other countries where mutual benefits are derived. In Europe and the UK, where there

has been resentment against the pull of US domestic research, it has in addition to its inherent value demonstrated US goodwill toward foreign science. Ironically, cutbacks during Mr. Johnson's years necessitated by tight budgets elicited more vocal appreciation than before of the programs from both the scientists directly assisted and their governments. SCI has used care to avoid where possible abrupt termination of support. Except for matters touching on policy and political issues, SCI has seldom intervened in the relation between the funding agency and the foreign researcher.

In particular, SCI has sought to stimulate as in Yugoslavia, Taiwan, India, and Israel the use of counterpart funds for research and scientific exchange; in those countries indigenous science has thereby been much strengthened. In Israel "excess currency" financed activities have been a major contribution to the nation's science; the fact of its running out during 1968 has posed a large question for Israel's war economy, a problem which involves judgments concerning the manner and extent of cutbacks.

Again, US/DOD-supported research has become in 1968 subject to attack by foreign opponents of US-Viet Nam policy, especially in Scandinavia and Japan. SCI and the relevant

Scientific Attaches have worked to maintain scientific links within reasonable restraints that are not one-sidedly imposed by the other nations.

d. Eclipses and Other Scientific Expeditions

SCI/SA has since its inception been a focal point for assisting international scientific expeditions, where they may require diplomatic resolution of their activity. A partial list of Western Hemisphere expeditions should illustrate the scope:

1. International Scientific Galapagos Island Project
2. NY Zoological Gardens-National Geographic Expedition to Peru
3. Office Naval Research Geomagnetic Studies in Canadian Northwest Territories
4. Stanford-Kyoto University Ionospheric Studies
5. US Army-Costa Rican Snake Venom Research Project
6. University of Wisconsin Seismic Studies in Canada
7. Dartmouth College Arctic Geological Project
8. Lamont Geological Studies in Chile
9. University of Kansas Expedition to the Amazon
10. Lamont Geological Studies in the Amazon Region
11. Carnegie Institution-University of Cuyo Argentine Seismic Studies
12. US Geological and US Coast and Geodetic Survey Mission to Chile
13. University of California Botanical Expedition to Bolivia and Ecuador
14. San Joaquin Delta College Latin American Expedition
15. University of Alaska-University of Guyana Solar Eclipse Study

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16. Lamont Geological Seismic Expedition to Canada

The kinds of assistance rendered in these cases generally involved:

(1) obtaining authority for the expedition to enter the country;
(2) arranging for custom-free entry and exit of necessary scientific equipment, including laboratories mounted in motor vehicles;
(3) obtaining authority for the export of samples from the country;
(4) arranging for the entry of plant and animal samples into the United States with appropriate agencies of the US Department of Agriculture.

Of greater complexity because of the nature of the expedition, its duration, or the size of the effort, was the assistance given to three undertakings: (1) The Line Island Meteorological Experiment;[12/] (2) The Latin American Solar Eclipse;[13/] and (3) The R/V "Alpha Helix".[14/]

12/ A catalogue of Meteorological Data obtained during The Line Island Experiment February-April 1967 NCAR - TN-35.

13/ Department of State CA-1704, August 30, 1966.

14/ R/V "Alpha Helix" Amazon Expedition February to October, 1967. A cooperative scientific program organized by universities and institutions of Brazil and the United States. Major sponsors: The US National Science Foundation and Scripps Institution of Oceanography, University of California, San Diego. (Not published. Not for publications).

e. Scientists and Unrestricted Travel

Almost from its inception SCI has had to deal with the problem of the sometimes incompatability of visa regulations and freedom of travel to international scientific meetings. The point was underlined in a resolution on free travel passed by the International Council of Scientific Unions (ICSU) in Washington in 1958. Many international scientists had been barred from meetings in the US during the 1950's and only four of 13 unions had held major meetings here during that decade. SCI's efforts alone and with the European Bureau (SES and SOV) and with the Department's Visa Office have been instrumental in relaxing unnecessarily restrictive limitations on travel of scientists from communist countries in general and on the right and ability of scientists from Eastern Europe unrecognized regimes in particular to apply for entry to meetings in the US. Thus Chinese Communist scientists were by 1967 given an opportunity to attend several meetings, though none used it. Temporary Travel Documents were granted East Germans first in 1963-64, enabling them to attend meetings in NATO countries.

By May 1966, SCI in concert with the Visa Office supported successfully the new group waiver procedures. These

provide for the Secretary of State to recommend to the Attorney General the granting of a group waiver to conferees otherwise ineligible. This is highly facilitative and several large scientific meetings recently held in the US have used such waivers.

In requests for waivers for entry into the US of foreign scientists the Visa Office has worked closely with SCI. The result has been entry for all bona fide foreign scientists excepting a few cases where other considerations than science have been overriding. The new approach has strengthened the Department's ability to protest Soviet barriers to certain non-Communist scientists traveling to UN meetings in the Soviet Union. In general, SCI's advocacy within the Department of freer scientific travel improved our standing the world science community, facilitated intercourse with East European and Russian scientists, and increased the likelihood of meetings in the United States when for balance of payments as well as intellectual reasons they are most desired.

f. Diminishing Travel Funds: Meetings Abroad

In 1967 and 1968, SCI has worked with FCST's International Committee and especially with the National Academy of Sciences to alleviate US Government cuts in travel funds which enable

US scientists to attend meetings abroad. It has been sensitive to the need owing to its task in behalf of the Department of supporting with advice (when such is requested) American delegations to Scientific Unions and other science meetings abroad. A pattern of briefings has developed and has proved useful in alerting US delegates to insertions of politics by Soviets and certain other countries into scientific meetings. Conversely, SCI has discouraged tendencies to urge our scientists to back fruitless political causes within the Unions, for example, opposition to membership by national regimes unrecognized by us. An objective, non-political stance by American scientists has not only been generally their desire compatible with existing ICSU resolutions, and unpreventable by the Department, but also it has strengthened greatly US efforts when necessary to hinder Communist and other anti-US nations from employing science as a political tool against our interests. We have more logically been able to protest USSR maneuvers to bar UN members from attending UN-sponsored meetings in Russia.

SCI has similarly been able to discourage suggestions for deliberately abolishing scientific links with South Africa, a move which would for the first time

contradict the employment of scientific relations in peacetime as a force for understanding.

g. Miscellaneous Exchange Matters

SCI has had a close working association with the Bureau of Educational and Cultural Affairs within the Department, particularly when Dr. Charles Frankel was its Assistant Secretary. We have worked mutually (1) to develop trips by scientists in scientific exchange to other countries within CU's exchange programs, (2) to devise with the help of other participating agencies Guidelines intended to insure a reasonable uniformity of performance and purpose in the many different scientific exchange programs of the Federal Government, and (3) to see that there is a fair proportion of physical and life scientists in governmental (and Fulbright) exchanges. The last point has been the subject of inconclusive debate; CU has tended to adopt the general philosophy that their role is to emphasize social scientists in their own programs. They assume that the natural scientists are favored elsewhere.

SCI has negotiated with and assisted programs of prominent visiting scientists and scientist-administrators

to the US. A prominent example was the visits in late spring 1966 and January 1967 of Dr. S. Husain Zaheer, long the head of India's Council for Science and Industrial Research. In the first instance, SCI successfully persuaded NSF to accept administration on the US side of a Zaheer-proposed program for using counterpart and other funds to bring important Indian scientists and engineers to the US to study essentially industrial questions pertinent to their interests. The program though smaller than originally intended has been successful. In the second instance we help to influence the choice of the Committee on Science and Astronautics in the House of Representatives to include Zaheer in their annual panel on science and technology. SCI helped select a number of prominent foreign scientists as participants at that meeting.

D. Outer Space Matters

1. International Cooperative Programs

These programs are of two basic sorts: those which exist mainly to acquire support abroad for the US space program (e.g., tracking stations) and those which involve cooperative projects of mutual training and research (e.g., cooperative satellite and sounding rocket projects). The two categories are not mutually exclusive. The former

offers significant opportunities for cooperation, and the latter has accrued important benefits to the US program from foreign scientific and engineering contributions. In both categories, the task of the past 5 years has been to build on established policies and programs, as evolving space capabilities required additional foreign support and afforded further cooperative opportunities.

In early 1966, at the request of the Vice President as Chairman of the National Aeronautics and Space Council, the Department undertook an interagency examination of US goals and programs for international cooperation in space activities. It was conducted by an interagency working group, chaired by SCI, on behalf of an Ad Hoc Committee of Space Council members headed by the Deputy Under Secretary for Political Affairs. The Working Group reviewed all prior and future possibilities for cooperation, and prepared the draft report for Deputy Under Secretary Johnson. During its examination the Working Group identified several circumstances and policy issues which were affecting the use of space technology adversely or impeding cooperation. Acting through its member agencies, it took steps to solve these problems;

a. An easing of US policy restrictions on exchange of space technology relating to development of communication satellites was needed. The Special Assistant to the President for Telecommunications Management was asked to review NSAM 338 ("Policy Concerning US Assistance in the Development of Foreign Communications Satellite Capabilities") to enable broader cooperation in developing launch vehicles and spacecraft without compromising the integrity of the global communication satellite system being developed by the International Consortium for Telecommunications via Satellite (INTELSAT). This NSAM was revised and reissued by the President in July 1967.

b. A greater US response to the needs of the European Launcher Development Organization (ELDO) was necessary. The Working Group prepared a policy statement which was promulgated by the President in July 1966 as NSAM 354 ("US Cooperation with European Launcher Development Organization"). It was designed to enable, and delimit, cooperation in European launch vehicle development so as to encourage multilateral efforts as distinct from separate national efforts without providing critical assistance to development of military strategic delivery systems.

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c. In the interest of determining the proliferation of military strategic delivery systems elsewhere, it seemed necessary to find a way to limit export from Japan of solid-fueled, missile-related launch vehicle technology. The Department approached the Japanese Government, offering US launch services and US cooperation in other space projects as an alternative in the further development of a Japanese space program.

d. A thorough and continuing review of procedures for security classification and export control over space-related technology was needed. Such a review was initiated among the agencies concerned.

e. It appeared desirable to examine further the need for additional international institutions to support future space cooperation. A study group was established for this purpose.

In other respects the Working Group found policies and agency programs (essentially within NASA) adequate to the opportunities and needs for international cooperation. In view of NASA budget reductions over the past 2 years this is no longer the case, particularly in space science and applications programs.

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a. Support Abroad for the US Space Program

Over the past 5 years, SCI has participated in arrangements to meet the needs of NASA's worldwide tracking networks. They now involve stations in 13 foreign countries and possessions. A special problem was seen with NASA requirements in southern Africa if facilities in the Republic of South Africa had to be abandoned. Through establishment of contingency facilities in the Malagasy Republic, Spain, and on Ascension Island, the most critical tracking needs for NASA's Apollo and inter-planetary programs have been met.

b. Multilateral (worldwide)

(1) Communications -- The most notable program using space technology has been in international commercial communications. In August 1964, the US and 10 other countries signed the "Agreement Establishing Interim Arrangements for A Global Commercial Communications Satellite System." Sixty-four nations have now signed the agreement, establishing the International Telecommunications Satellite Consortium (INTELSAT) on a global basis pursuant to the will of the Congress as expressed in the Communications Satellite Act of 1962.

(2) Meteorology -- Less dramatic, but equally successful has been the use of satellite to collect weather

data. After an experimental period of several years the Environmental Science Services Administration (ESSA), in cooperation with NASA, established an operational satellite meteorological system in February 1966. This system affords direct, local read-out of data from an Automatic Picture Transmission sub-system (APT). Data is made available on a worldwide basis and is widely used.

(3) Geodesy -- SCI and G/PM are now negotiating for sites abroad for a worldwide ground station network to support the National Geodetic Satellite Program (NGSP). The Program, operated by NASA with participation by Defense, Coast and Geodetic Survey, and the Smithsonian Astrophysical Observatory, will involve stations at about 38 geometrically interconnected points on the earth's surface. It will produce unclassified data for development of a single, worldwide, three-dimensional coordinate system and a more precise model of the earth's gravitational field. This data, some of it gathered by foreign scientists, will be available to the world scientific community.

In addition, the Department is negotiating for supplemental sites for the Defense Department's geodetic satellite program (GEOSAT), whose purpose is to acquire additional classified

data for military purposes. SCI and G/PM have been heavily involved in coordinating requirements for these programs and in developing arrangements for foreign participation. Despite the interest of foreign scientists, negotiations for the basic NGSP network have been difficult because of presumed military implications.

c. Regional

(1) The European Space Research Organization (ESRO)

Since ESRO was established in March 1964, NASA and the Department have developed a close working relationship with that Organization, including a number of cooperative satellite and sounding rocket projects. We have been anxious to encourage ESRO as one of the multilateral institutions contributing toward the regional integration of Europe. In response to a request from ESRO, the Department arranged for the Organization to establish a tracking station near Fairbanks, Alaska. The station, now operative, is the only foreign base on American soil.

(2) The European Launcher Development Organization (ELDO)

ELDO was established in 1962 to develop a European launch vehicle for non-military space programs. From its inception, it has been plagued with financial, management,

and engineering problems. Today there is a serious question whether it will be able to complete its initial project, or having done so, move on to a more useful second-generation launch vehicle. The US preferring that European launch vehicle development be on a multilateral, rather than national, basis, and wishing to be able to assist ELDO where desired by the Europeans has been inhibited by two policy considerations; (1) not to provide assistance which would be indirectly and critically useful to development of a strategic weapons delivery capability in Europe, and (2) not to provide assistance without reasonable assurance that the resultant launch capability would not be used in competition with the INTELSAT system. This problem has been measurably eased by the policy decisions embodied in NSAM-354 of July 1966 and the revision of NSAM-338 in July 1967. Nonetheless, the course of European multilateral space activities, and the measure of US cooperation with those activities, remains quite uncertain at this time.

d. Bilateral

NASA now has on-going cooperative arrangements with agencies and scientists in more than 70 countries. During the past 5 years, for political and programmatic purposes,

SCI and other offices have placed special emphasis on developing cooperation in this field with Germany, Japan, and the USSR. This effort has been quite successful with West Germany, but, in the absence of a clear view of their own space program objectives, not so with the Japanese. With two minor exceptions, our attempts to bring the Soviets to further development of cooperative projects already agreed on, or to engage them in identification of further opportunities for cooperation, have been totally unsuccessful. These exceptions are, first, an agreement reached in October 1965 to jointly prepare and publish a review of work accomplished in space biology and space medicine and, second, in September 1966 to begin to exchange satellite meteorological data over a direct communications link between Washington and Moscow.

2. Agreements and Arrangements through International Organizations

The US has continued to participate in the UN Committee on the Peaceful Uses of Outer Space where emphasis over the past 5 years has been mainly on developing legal principles and international agreements for the conduct of space activities. These efforts produced the Treaty on Principles Governing the Activities of States in the Exploration and

Use of Outer Space, including the Moon and other Celestial Bodies, which came into force in October 1967, and a draft Agreement on the Rescue of Astronauts, the Return of Astronauts, and the Return of Objects Launched into Outer Space, which was endorsed by the General Assembly in 1967, was signed by the US in April 1968, and now awaits ratification.

The Committee is heavily engaged in drafting a liability convention to deal with damages arising from space accidents, and organized the first International Conference on the Peaceful Uses of Outer Space, held in Vienna in August 1968.

3. International Meetings and Exhibitions

In addition to participating in the UN-sponsored space conference in Vienna, the US has taken part in space-related international meetings, symposia, and exhibitions over the past 5 years, including tours by American astronauts to most areas of the world. The latter have been particularly successful; the former generally less productive than might have been hoped, mainly because of budgetary limitations.

4. Manned Space Flight

This area of the US space program, though of prime

importance from the viewpoint of the US image abroad, has offered fewer opportunities than other areas for cooperative projects and meaningful economic and social applications abroad. SCI's involvement has been: (1) to arrange negotiations for tracking station sites and aircraft overflight arrangements abroad to meet NASA's manned flight and deep space tracking requirements, and (2) to make contingency arrangements abroad to enable prompt recovery of astronauts in the event of an emergency landing. The latter has been a substantial task for SCI and the Department, involving arrangements in some 80 foreign countries, policy decisions on conduct of search and rescue operations in a great many circumstances (including communist territory and territorial waters), and "quick reaction" standby and control procedures with the Department.

5. Policy Matters and Special Programs

In the past 5 years, SCI/SE has been concerned with several major problems in space activity involving these policy questions:

a. To what extent can the US cooperate with foreign countries in launch vehicle technology while avoiding proliferation of missile-related technology critical in

developing strategic weapons delivery capabilities?

b. To what extent can the US cooperate with other countries in launch vehicle and satellite technology without helping them to develop capabilities to operate communications satellites in competition with, or in derogation of the economic integrity of, the INTELSAT global commercial communication satellite system?

c. From the viewpoint of foreign policy goals what sort of space programs should the US undertake after the initial commitment to a lunar landing has been met (post-Apollo)?

d. In the light of the foregoing questions, what measure and type of cooperation with space programs of advanced countries (Western Europe and Japan) should be encouraged?

e. What engineering and program safeguards will best serve our interests abroad as the use of nuclear power in spacecraft and launch vehicles expands?

In addition, with the early prospect of a capability to survey earth resources from satellites, the Department already faces difficult questions on international arrangements

needed to realize full benefit of this application of space technology; at the same time we must deal with sovereignty and proprietary interests abroad as well as with US national security problems.

Actions taken over the past 5 years affecting cooperative space programs per se as they relate to the first two questions (non-proliferation and INTELSAT) are described under "International Cooperation Programs" above. The second question is a major element in the Administration's planning for renegotiation of the INTELSAT Agreement in 1969.

On the third question (post-Apollo planning), SCI, along with the Policy Planning Staff and the Office of Politico-Military AFfairs, prepared a staff study which was circulated to the members of the Space Council in May 1967. The views contained in this study were also incorporated in a memorandum of March 2, 1967, from the Secretary to the Vice President conveying comments on The Space Program in the Post-Apollo Period, a report published by the President's Science Advisory Committee the preceeding February.

On the fourth question (character of cooperation with advanced countries), the Department and NASA are engaged in a continuing, informal dialogue with European Space Conference

and with the Japanese Government. Resolution of this question depends on the continuing willingness of the Europeans and Japanese to deal with it on a mutual basis and on decisions yet to be made by all parties, including the US, as to the extent and character of our future space programs.

The fifth question is the object of continuing review by the National Aeronautics and Space Council in accordance with NSAM 50, as revised in April 1965. SCI, acting on behalf of the Department, is directly engaged in each step of this process.

The prospects and problems of earth resource surveying by satellite are as yet neither proven nor entirely clear; nor have administrative means of dealing effectively with these developments within the Executive Branch been established. A concerted effort in this area will be needed within the next year or two--an urgent task for SCI and other bureaus and offices within the Department over the coming months.

E. Environmental Science Activities

During President Johnson's Administration, the Department's involvement in international arrangements and policy issues affecting, or affected by, developments in

enviornmental science and technology has focused mainly on water resources and atmospheric and marine activities. SCI's efforts have thus been concentrated in these fields--a reflection of greatly expanded capabilities in desalting, water conservation, meteorology, and oceanography during this decade and of the burgeoning interest, opportunities, and implications for our international relations arising from these capabilities.

This is not to suggest that US participation in international activities in other fields of environmental science (e.g., geodesy, geography, geology, vulcanology, hydrology, and environmental pollution) has lessened. On the contrary, as in all areas of science and technology, they have expanded. However, the greatest opportunities and most pressing problems, from the viewpoint of policy issues and cooperative projects, have arisen in these three fields.

1. Atmospheric Sciences

The rapid strides made in recent years in the weather sciences, fostered by the new technology of meteorological satellites and computers, have brought much closer to reality the possibility of understanding weather on a global scale and developing an effective global weather observation system.

US policies have promoted a heightened awareness in the world political community that weather does not respect national boundaries, and that an attack on problems it creates is of common benefit. Those policies have served to stimulate international cooperative efforts and research programs, in which US scientists are playing a leading role. In carrying forward those policies on a multilateral basis, such as in the UN, and on a bilateral basis--SCI has represented the Department on all pertinent interagency committees and has closely coordinated with and supported the technical agencies, particularly the Environmental Science Services Administration, the National Science Foundation, and NASA. In this field the nature of US international involvement, and of the Department's developing role over the past 5 years, may be illustrated best by a brief description of two international cooperative projects for which SCI has served as the focal point for decisions and arrangements made by the Department.

a. Project BOMEX

On behalf of the Environmental Science Services Administration, the coordinating technical agency, a bilateral agreement was concluded with the Government of Barbados in

July 1968 to carry out Project BOMEX (Barbados Oceanographic and Meteorological Experiment) next year. BOMEX, designed as an intensive study of air-sea characteristics and interrelationships in a tropical oceanic area to the east of Barbados, will involve deployment of a number of research vessels and flights by research aircraft. The study, part of the Global Atmospheric Research Program (GARP), will constitute an important contribution to the WMO World Weather Watch Program and the oceanic data acquisition program of the Intergovernmental Oceanographic Commission. The arrangements with the Government of Barbados permit participation by other governments or institutions in other countries.

Project BOMEX is likely to be the forerunner of even larger-scale ocean-atmosphere experiments. The experience gained in its conduct will therefore provide valuable background--in political-diplomatic as well as scientific terms--for future projects.

b. Constant-Level Meteorological Balloons

Within the framework of the World Weather Watch program and the Global Atmospheric Research Program (GARP), the United States had initiated two major research projects using experimental, constant-level balloons for worldwide collection of weather data.

The first involves arrangements with New Zealand for the joint conduct of preliminary tests of a constant-level balloon system for observations in the Southern Hemisphere. During the first phase, from March 1966 to January 1968, a total of 122 balloon flights were made. Phases II and III will extend through June 1970.

The second project involves US plans for a preliminary series of 22 test-balloon flights at high altitudes from Ascension Island over a 2 year period beginning in 1968. Principal goals of the flights are to determine the durability of the balloons and to investigate the flow of winds in equatorial regions.

In these cases SCI arranged negotiations, closely coordinating with NSF and ESSA, on behalf of the National Center for Atmospheric Research at Boulder, Colorado, which actually conducts the flights. Both projects required careful attention to sensitivities in the event of overflight of other countries and to the potential hazard to air navigation. These projects are likely to be only the first of a series of experimental undertakings requiring US balloon activity extending far beyond our borders. The Department has sought, therefore, to establish a firm groundwork that will promote

international cooperation and facilitate acceptance abroad of future projects of this nature.

2. Marine Science and Engineering

In the years prior to the Administration of President Johnson, the Department had been involved increasingly in marine matters, e.g., in fisheries agreements and regulations, in the negotiation of the Geneva Conventions comprising the Law of the Sea, and in support of oceanographic research projects, particularly those developed and sponsored by the Intergovernmental Oceanographic Commission (IOC) of UNESCO. Starting in 1966, however, Department involvement has grown markedly, and within the Department it has mostly affected SCI and IO. Over the past few years, a growing technical and scientific capability to explore the oceans and to exploit marine resources has emerged. It has been accompanied by a resultant public debate on international political issues affecting jurisdiction over the seabeds, availability and use of the resources of the ocean floor, and military uses of the ocean. This debate has been focused largely in the UN and its specialized agencies.

a. International Cooperative Programs

US participation in international oceanographic programs of Government agencies and private institutions has continued

apace with our growing scientific and technological capability. The Department's role has been to encourage these programs, to assist in their definition and development by such international bodies as the IOC, and to make the necessary arrangements for foreign participation and conduct of research in foreign territorial waters or over continental shelves of other countries. Of particular note was the round-the-world voyage of the USS Oceanographer. Interagency coordination of plans and arrangements for US participation in these programs continues as a function of the Interagency Panel on International Programs and International Cooperative Organizations (PIPICO) which is chaired by the Department.

Over the past 18 months SCI has concentrated on developing a broad, long-term international program of oceanographic research to be undertaken in the 1970s as a Decade of Ocean exploration. Its concept was proposed publicly by the President in his State of the Union Message to Congress in January 1968. It looks to a program of cooperation under the general aegis of the UN, involving projects developed by the specialized agencies as well as through bilateral and multilateral national arrangements where they are most appropriate. We have sought international support for a Decade program in which all states able to do so would make

a special effort to acquire knowledge of the oceans; their resources and subsoil; would coordinate their research efforts; would share their studies; and would help other nations develop capabilities in marine science and technology. To this end, SCI has arranged discussions of the proposal with more than four dozen countries, and has made presentations at meetings such as the UN Ad Hoc Committee on the Seabeds, the Committee on Fisheries of the World Food and Agriculture Organizations, the Bureau of Consultative Council of the Intergovernmental Oceanographic Commission, and the Economic and Social Council of the UN. SCI has also arranged consultation with the non-government oceanographic, scientific, and engineering community within the US, including the National Academies of Science and Engineering, so that they in turn, through their own associations, would elicit the interest and support of the international scientific community. We have thus far presented this concept without preconceived ideas as to precise organizational structure or size or scope, since, to be truly meaningful politically and scientifically, the program must evoke support and initiative from many governments and international bodies from the outset. The response has been encouraging.

b. The Marine Council

Perhaps the thrust of growing national interest in marine matters is reflected most clearly in the creation of the National Council on Marine Resources and Engineering Development, and in the steps it has taken within the Executive Branch to assess, define, coordinate, and project US interests and capabilities in this field. The Secretary of State is a member of the Council; staff support for his participation is provided by SCI.

The "Marine Resources and Engineering Development Act of 1966" (Public Law 89-454) which created the Marine Council declared it to be the policy of the United States "to develop, encourage and maintain a coordinated, comprehensive and long-term international program in marine sciences for the benefit of mankind to assist in protection of health and property, enhancement of commerce, transportation and national security, rehabilitation of our commercial fisheries and increased utilization of these and other resources." It provided that US marine science activities should be conducted so as to contribute, inter alia, to "cooperation by the United States with other nations and groups of nations and international organizations in marine science activities when such cooperation is in the national interest." The Council is charged to "coordinate a program of international cooperation in work

done pursuant to this Act."

To these ends, and at the request of the Vice President, the Secretary of State established in early 1967 an Ad Hoc Interagency Committee on International Policy in the Marine Sciences to examine and develop recommendations on major international policy issues in this field. The Committee was chaired by the Deputy Under Secretary for Political Affairs; the Director of SCI served as Alternate Chairman. It was composed of senior policy officials of all agencies having responsibility in this field. During 1967, the Ad Hoc Committee developed preliminary government-wide studies of basic aspects of our marine science relationships with other countries. In January 1968, it was converted to a permanent Committee on International Policy in Marine Environment (CIPME) which, along with the several interagency committees established by the Marine Council itself, is intended to maintain an overview of the entire marine environment, all aspects, of which are interrelated. It is not, however, directly responsible for fisheries, shipping, and maritime communications matters. These would continue to be dealt with through existing separate Departmental and interagency arrangements. SCI has been heavily occupied with the work of this Committee.

In addition to considering issues affecting the use

of the seabeds (see below), the Committee has examined: opportunities for regional and worldwide cooperative programs in oceanographic research (leading to the Decade concept and to specific proposals for programs involving Latin America and Western Europe); the present structure and adequacy of international organizations in the field (leading to the US proposal for a special committee of the UN General Assembly); the eventual creation of an overall international oceanographic organization; and legal problems affecting the freedom of scientific research in the oceans (leading to a proposal for consideration by the IOC).

c. Policy Issues Concerning the Seabeds

When the USS Oceanographer was launched in July 1966, President Johnson stated the basic US response to international concern over the growing capability to exploit the resources of the ocean floor:

> Truly great accomplishments in oceanography will require the cooperation of all the maritime nations of the world. And so today I send out our voices from this platform calling for such cooperation, requesting it and urging it.
>
> ...under no circumstances, we believe, must we ever allow the prospects of rich harvest and mineral wealth to create a new form of colonial competition among the maritime nations. We must be careful to avoid a race to grab and to hold the lands under the high seas. We must insure that the deep seas and the ocean bottoms are, and remain the legacy of all human beings.

In November 1966, Ambassador Roosevelt, serving as US Representative in Committee II of the UN General Assembly, called for a study by the Secretary-General of existing knowledge of marine resources and their exploration and use, and of proposals to insure the most effective international arrangements for an expanded program of international cooperation in developing marine resources and in strengthening marine education and training programs (UN Resolution 2172 - XXI). These studies became available in late spring 1968.

During its 22nd Session in the fall of 1967, the General Assembly, on the basis of a proposal by Ambassador Pardo of Malta, debated "the question of the reservation exclusively for peaceful purposes of the seabed and the ocean floor, and the subsoil thereof underlying the high seas beyond the limits of present national jurisdiction, and the uses of their resources in the interests of mankind." At the conclusion of the debate, the Assembly created an Ad Hoc Committee to further study these issues (UN Resolution 2340 - XXII). In prospect of the debate and during the work of the Ad Hoc Committee throughout 1968, SCI has been heavily engaged in the development, through CIPME and in systematic consultation with the mining and petroleum industries and scientific institutions, of a US policy and negotiation position on

the following issues:

(1) The question of the seaward boundary of national jurisdiction or exclusive sovereign rights on the continental shelf;

(2) International arrangements involving control or ownership of the mineral resources of the deep ocean floor beyond national jurisdiction.

(3) The question of distribution of revenues derived from exploitation of the resources of the ocean bottoms.

(4) The development of general principles which might be adopted by the UN General Assembly to guide states in their exploration and use of the seabeds.

F. Peaceful Uses of Atomic Energy

The Department of State's responsibilities for atomic energy matters within their essentially peaceful context were assigned to SCI in 1962. SCI/AE has since been involved in international agreements for the control of nuclear material and equipment supplied to other nations for peaceful nuclear programs.[15/] This office also backstops the representation of

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15/ The "Atoms for Peace Program" in 1953 presented to the UN General Assembly was intended to differentiate sharply between military and peaceful programs. The administrative separation has been successfully maintained over 15 years. Early US work concerning atomic affairs is beyond the scope of this history and therefore not discussed.

of US technical interests in the programs of the International Atomic Energy Agency. It coordinated the development of US Water for Peace Programs until 1967 when that became an activity of an independent office within the Department. SCI/AE has also been involved in desalting matters, an increasingly important technology for the world at large which relates at times to atomic energy production. Where peaceful atomic energy programs impinge on the military and disarmament matters, as they inevitably do, SCI/AE works closely with G/PM and ACDA.

1. International Non-proliferation "Safeguards" Program

The US at an early stage decided to encourage the International Atomic Energy Agency (IAEA) to organize a worldwide safeguards program. Under this system all nations could place faith in an objective, capable international secretariat administering non-proliferation safeguards in an unbiased way with the least burden on the inspected country and at the lowest cost.

As a lever toward achieving this goal, SCI urged, in cooperation with the Bureau of International Organization Affairs and the Atomic Energy Commission (AEC), a policy

of transferring to IAEA responsibility for administering non-proliferation safeguards controls over materials and equipment involved in our bilateral arrangements with other countries in the peaceful nuclear area. This decision was approved by the Secretary of State on January 18, 1963. Under the policy, safeguarding responsibility for 18 bilateral agreements for peaceful nuclear cooperation has been assumed, pursuant to trilateral agreements, by IAEA.

This US policy alone, however, cannot put a complete cover on potential diversion of material in international traffic from peaceful to military uses. The US accordingly sought to achieve gentlemen's agreements with other major exporting countries to the effect that each would follow the same practice.

The countries concerned met originally about once each year as an informal "Western Suppliers Group" to discuss common policies in this direction. The chief negotiator has usually been the US Representative to IAEA, advised by officials from SCI and AEC. The group kept expanding--at its most recent meeting in February 1967, 13 countries were involved: United States, United Kingdom, Canada, France,

South Africa, Australia, Belgium, Netherlands, West Germany, Italy, Japan, Norway, and Sweden, plus Switzerland (as an "observer"). Invitation had been extended informally to Argentina and Spain, but they decided not to participate.

As the group grew (which seemed unavoidable with increased recognition of the problems posed by additional uncontrolled sources of supply), the informality of early meetings was necessarily reduced. The discussions were constantly hampered by French refusal to enter into constructive discussion of the issues; they reiterated their intent to decide on a case-by-case basis whether or not to require importers of French reactors oruranium to accept safeguards as a necessary accompaniment of the transaction. At the other extreme, Canadian representatives used the meetings for categorical expressions of their policy that no sales of Canadian reactors or uranium could be made except for peaceful purposes, with the reinforcing assurance of safeguards to make certain that no material could be diverted from peaceful to military uses.

The utility of the Nuclear Suppliers Group became somewhat overtaken by expansion in potential suppliers in

international nuclear trade. The need for such a group will undoubtedly be affected by the degree of success achieved by the Non-Proliferation Treaty. The Treaty requirement (Article III) of international safeguard controls on nuclear exports will, if broadly enough applied, accomplish much the same goal the US had been trying to achieve through the Suppliers Group. Failure of significant nuclear exporting countries to adhere to the Treaty could represent a serious shortcoming, however.

The US policy requiring international safeguards on nuclear exports obviously presupposed a dependable international staff to perform this important function. To accomplish this required vigorous US support of the IAEA in its effort to develop a satisfactory safeguards program.

Much work was done in the early days by US experts in leading IAEA's international staff to a proper appreciation of the technological requirements for an adequate safeguards program. A series of international working groups headed by the Norwegian scientist, Dr. Gunnar Randers, and in which SCI and AEC representatives participated, followed in many respects the models previously found effective by the US in

its own safeguards programs. US influence has been applied consistently and--insofar as possible--inconspicuously in helping the Agency advise and perfect a safeguards system for nuclear applications.

Initially this was done for small-size research reactors in 1961. Further efforts carried the program in successive stages to inclusion of large power reactors (1964), chemical reprocessing plants (1966), and conversion plants and fuel fabrication facilities (1968). These steps covered virtually the entire nuclear fuel cycle except for the security-sensitive technology of uranium enrichment.

Evolution of the Non-Proliferation Treaty through months and years of patient negotiation in Geneva and New York was a major highlight of US efforts to promote the concept of objective international safeguards in peaceful nuclear activities to help prevent the spread of nuclear weapons. US influence throughout this effort was focused in the search, in which SCI collaborated with AEC and ACDA, for a safeguards clause which, in the words of Ambassador Henry D. Smyth, US Representative to the IAEA, would be simultaneously effective, credible, and acceptable. The result of these efforts was Article III of the Non-Proliferation Treaty.

It was necessary, of course, to modify the language to accommodate other influential members of the international community who brought their special points of view into play in the Eighteen Nation Disarmament Committee (ENDC) initially and later in the UN General Assembly. Our allies in various parts of the world were frequently consulted on the evolution of this language. Close and constructive working relationships were maintained with the Soviet Delegation to the ENDC in an effort to arrive at language which would be acceptable to all while giving reasonable assurance that an effective safeguards program could be achieved under terms of the Treaty.

A major aspect of American efforts to obtain general acceptance of the safeguards clause of the Treaty was President Johnson's dramatic offer[16/] on December 2, 1967. On the 25th

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16/ The total offer embraced in the December 1967 Presidential statement was fulfillment of earlier gestures made by the US Government in accepting IAEA international safeguards in several key nuclear installations in this country such as the Yankee Electric Power Station, the Nuclear Fuel Services reprocessing plant, and several smaller reactors. This was construed as an effort to demonstrate our willingness to accept the international inspectorate on US soil so as to disabuse other nations of the notion that sovereignty was somehow sacrificed in this process, or commercial secrets jeopardized, or efficient management burdened by the IAEA safeguards systems.

anniversary of the first sustained nuclear chain reaction, the President announced the US would be willing to submit its peaceful nuclear program to international safeguards when the safeguards provisions of the Non-Proliferation Treaty came into effect. This represented a major achievement by the AEC in persuading American industrial circles that major foreign policy considerations involved in US efforts to achieve the Treaty should overcome any apprehensions they might have toward submitting their affairs to examination by the international safeguards inspectorate. While strictly domestic in actual application, the acceptance of international safeguards in the US was obviously undertaken for the beneficial results to be achieved in the international community; it can be construed as one of the constructive foreign policy achievements of the period--in which SCI played a major role.

2. EURATOM

One constant factor in efforts to develop and strengthen international nuclear safeguards was the special attention given to problems of the European Atomic Energy

Community (EURATOM).[17] This unique "supra-national" entity embraces civilian nuclear energy programs of France, West Germany, Italy, Netherlands, Belgium, and Luxembourg. As one manifestation of the attempt to integrate Western Europe, to produce a stronger economic base, and to mitigate political tensions, SCI was and is concerned that EURATOM be carefully cultivated in pursuit of this basic tenet of US foreign policy.

Since a key element of US foreign policy during this period has been to promote and strengthen the integration of the Western European economics, special efforts were made not to disturb the operation of the EURATOM safeguard control system. Accordingly, as a token of support for the US policy of

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17/ The Treaty of Rome, which established the European Atomic Energy Community in 1957, stipulated that the non-military nuclear programs of the six participating countries were to be subjected to a common "safety control" whereby the EURATOM Commission could satisfy itself that nuclear materials within the territories of member states were not being diverted from their intended uses (Title II, Chapter VI, Article 77). As the nuclear programs of the Community and its member states evolved, it became evident that this "control" (safeguards) system represented a major element of integration knitting together the nuclear programs of the six.

strengthening EURATOM, standard US policy to turn nuclear safeguards functions over to the IAEA was modified in the case of the six EURATOM countries.

For these countries SCI maintained that the existing system, whereby the Community Secretariat performed objective and impartial inspections of civil nuclear programs in all participating countries, was sufficient to fulfill the US requirement for international safeguards over its nuclear exports. Accordingly, EURATOM member countries were not required to submit their programs to IAEA inspection to continue receiving nuclear materials from the US.

This policy was reinforced by continuing US support for EURATOM Supply Agency functions. It was decided in 1965 that individual bilateral agreements for cooperation with EURATOM countries would be allowed to expire as they reached completion dates. US policy was to "fold in" the bilateral agreements with individual countries into the overall EURATOM agreement which would be given major emphasis on matters of supply, safeguards, researchcooperation, etc.

3. US Collaboration in the IAEA

As the principal moving power in establishing the International Atomic Energy Agency, the US has maintained

through the years a special interest in supporting its work as the best means to promote international cooperation and controls in the nuclear energy field. During the 5 years in which SCI has played a direct role and been represented on official delegations to all IAEA Board of Governors meetings and Anuual General Conferences, distinct changes have taken place.

The atmosphere in which IAEA business is conducted is quite different. Previously the Soviet Union had exploited the meetings (just as they had most other international forums) to pursue "cold war" propaganda efforts against the US and her allies. US refusal to enter into emotional and irrelevant political diatribes with the Soviets and US insistence on keeping Agency work on an objective scientific and technological basis has blunted Soviet political attacks in IAEA meetings.

A major transformation became evident as the Soviets apparently recognized that their tactics had been unfruitful. While never completely rising above the temptation to take a few oratorical jabs at US and allied foreign policies, the dominant tone of Soviet participation gradually became more constructive. During the Johnson years, US and Soviet

representatives on the Board of Governors met privately before each major session of the Board to exchange views in a relaxed and confidential manner without the intrusion of extraneous political propaganda from either side.

This is not to suggest that all barriers have disappeared. To the contrary, each delegation conducts itself guardedly and with a prudent reserve. Undoubtedly both sides recognize that the cooperative relationship is an accommodation to the mutual recognition that IAEA work is important to both country's goals--which is far different from saying that the goals of the two countries are identical or consistent.

4. US Financial Support

The US has followed the policy of cooperating fully in promoting IAEA technical assistance programs. This has involved financial support and providing US experts to assist developing countries in special problems of nuclear energy applications. American experts have repeatedly been loaned to the IAEA to take part in surveys of possible nuclear energy applications in IAEA member countries. Similarly the US has made enriched uranium available through the Agency for individual countries in their nuclear research programs. Fellowships have been offered so that participants from other

member countries could benefit from post-graduate training in the US, and nuclear equipment has been made available.

The Department of State, through SCI, has consistently supported AEC efforts to maintain a generous posture in providing training and equipment for distribution through IAEA facilities. The benefits of this policy have been evident in the tendency of many leaders in peaceful nuclear activities throughout the world to identify themselves with the United States (or more specifically with one of its national laboratories or training centers) in terms of their professional career preparation.

A troublesome point to SCI has been the recurring problem of the US financial contribution for the operational budget and the IAEA's technical assistance program. Having started with a "matching" formula, whereby the US pledged itself to contribute half the funds, the US proportionate contribution to the technical assistance program has diminished over 4 years.

SCI has consistently warned that this reduction as a matter of US policy has caused the IAEA to reduce the scope of its technical assistance program below a level which the Agency would, with ample scientific justification, wish to support. The reduced US contributions and the failure of other

member governments to contribute their full share has meant a substantial shortfall in the approved operational and technical assistance program.

One anomaly has been the reduction of the US contribution to a point substantially less than the amount which would result if we applied our standard IAEA assessed contribution formula to the approved operational level. SCI has taken the lead in efforts designed to reverse the downward trend in US voluntary contributions to the Agency, stressing the importance of programs financed from these contributions to US non-proliferation goals.

5. Peaceful Nuclear Explosions

An interesting intersection of foreign policy and advanced technology during the past 5 years has been the accelerated interest throughout the world in using nuclear explosions for major civil engineering projects. Interest has focused on the US "Plowshare" program in which the tremendous energies of nuclear weapons have been applied to peaceful purposes in experiments designed to determine how nuclear weapon technology can be adapted for major excavations or underground cavities such as canals, creation of harbors, exploitation of underground petroleum or mineral

deposits, etc.

One interesting aspect of this has been the tendency of many countries, with scientists less well-informed on current developments, to expect more immediate benefits from the Plowshare technology than the American program has thus far achieved. Impressed by the tremendous power of nuclear weapons and not fully aware of the technical problems in applying them for peaceful purposes, representatives of other countries have at times felt that the US has been "dragging its heels" in making these benefits available internationally. Brazil has been a conspicuous spokesman of this point of view, alleging that efforts of the Non-Proliferation Treaty to prevent development of nuclear explosive power by countries which do not have nuclear weapons was designed to restrain competition with nations which already have nuclear weapons.

The keynote of American policy in this regard has been to emphasize repeatedly that development of a nuclear explosive for peaceful applications is essentially the same as development of technology for the manufacture of nuclear weapons. To over-simplify the point, SCI, AEC, and ACDA have argued that if a country knows how to blow up a mountain with nuclear explosives, then it can just as readily blow up an enemy city with nuclear explosives--and the likelihood of devastating nuclear war has been advanced through this proliferation of

nuclear weapons capabilities.

Recognizing, however, that many countries would not be content to have denied to them the potential benefits of Plowshare technology, the US undertook some time ago a program to explore the technical and economic feasibility of nuclear explosions for civil projects. In this program, tests have been conducted within the US to determine the effectiveness, the costs, and the hazards of such explosions.

The conduct of AEC tests in the Plowshare program has frequently provoked significant policy differences among the agencies in Washington concerned with the matter. Typically the AEC would propose to the interagency "Committee of Principals" a plan for conducting a specific test in test in the Plowshare series. In the Committee of Principals the Secretaries of State and Defense, the AEC Chairman, the Special Assistant to the President on International Security Matters, and the Director of ACDA would evaluate the proposal to determine whether total US national interests would be served by the test at the time proposed. It was frequently the feeling of ACDA representatives that to conduct a test at a particular time might prove inimical to efforts to achieve a Non-Proliferation Treaty. This was based on the fear that the test might cause release of

radioactive material into the atmosphere, which--if it crossed US national boundaries--might technically be challenged as a violation of the Limited Test Ban Treaty. It was also recognized that large-scale applications of Plowshare technology to major excavation projects would require an amendment to the Limited Test Ban Treaty, since surface explosions of that size would be bound to release radioactivity into the atmosphere in quantities which could well go beyond national boundaries.

In negotiating the Non-Proliferation Treaty the US Government officially offered to make available the benefits of nuclear excavation and peaceful explosion potentialities to governments which were party to the Treaty. This was designed to induce other nations to accept the Treaty with a reassurance that they would not be foregoing permanently possible benefits which might come from application of nuclear explosions for major civil engineering projects.

This problem particularly concerned the Brazilians. At the request of President Johnson, AEC Chairman Dr. Glenn Seaborg, accompanied by Mr. Pollack and his assistant for atomic energy, Mr. Zook, visited Brazil in the summer of 1967 to discuss this and related matters with key Brazilian

officials. Unfortunately Brazil persisted that some compromise arrangement should be feasible that would enable a country such as itself to develop nuclear explosive devices for peaceful purposes without violating the Latin American Nuclear Free Zone or the Non-Proliferation Treaty.

One element of the continuing discussion of Plowshare experimentation in the US during this period has been the desire not to upset the applecart for NPT negotiations, while proceeding apace with the studies necessary to determine whether nuclear excavation was a realistic alternative to conventional methods in developing a new sea-level canal in the Isthmus of Panama or elsewhere in Central America. SCI continues to work with other concerned Federal agencies toward resolution of this dilemma.

6. Export of Nuclear Materials

As the first nation to develop nuclear energy for military purposes, the US had a head start in research and development toward application of such energy to civilian ends. We were not only ahead in developing our own industry for peaceful purposes but also led in the export of nuclear technology to other countries.

The capacity which had been developed in uranium exploration, enrichment, and reactor fuel processing enabled

us to offer economically attractive terms to prospective buyers in other countries who wished to start their own peaceful nuclear programs. Recognizing the political problems which would ensue if the US, as a benevolent monopolist in enriched uranium, were to exercise its market advantage in a discriminatory manner, we followed the practice of maintaining terms as open as possible in dealing with prospective foreign customers. Prices were public and the terms and conditions of sale were administered in an unbiased manner. Any other practice would have subjected the US to severe international criticism for using its advantage in a way which could lead to inappropriate pressures on other countries to follow political lines acceptable to the US to reap the advantages of US nuclear technology. The long-term consequences of a "hard nosed" policy would have predictably been contrary to US interests.

A continuing aspect of US nuclear supply policy abroad was the insistence that the receiving country agree to place the nuclear project under non-proliferation safeguards designed to detect any diversion of material from peaceful to military uses. This operation was initially established in terms of safeguards controls and inspections by representatives

of AEC. Later the policy was adopted to convert to trilateral agreements involving the IAEA. The continuing exception was reliance upon EURATOM safeguards to govern shipment to its six affiliated countries.

The emergence of enriched uranium as the technically and economically preferred source of energy for reactors in most countries, coupled with available excess capacity in US Government-owned gaseous diffusion plants for enrichment of uranium, soon solved US supply problems envisioned for the future. A system was devised whereby the US would agree to "toll enrich" the uranium supplied by prospective foreign customers. In other words, the purchaser would provide the raw material (either from his own resources or by purchase on the world market) and would then bring it to the US where he would purchase for a fee the services of our gaseous diffusion plants. There his natural uranium would be converted to enriched uranium for more efficient use in his power reactor. Thus the US found itself selling services (of which it had abundant capacity) rather than selling raw ingredients (which might later be needed for domestic consumption). This new policy of toll

enrichment is now reflected in five agreements for cooperation in the peaceful nuclear field negotiated on behalf of the Department by SCI in cooperation with the AEC. 18/

The offer of toll enrichment services to upgrade the economic utility of the customers' raw product did not entirely succeed in allaying the uneasiness of some nations. Many were reluctant to see a large amount of their future energy resources inextricably dependent upon a single source of supply--i.e., the US uranium enrichment program. Influential figures in many countries expressed a disinclination to depend on a continuing supply of enriched uranium from the US since they feared our supply might capriciously be turned on or off on the basis of our attitude toward their foreign or domestic political policies. SCI remains deeply involved in the State/AEC effort to convince other nations of the political safety of dependence on the US as a source of nuclear fuel.

7. Uranium Enrichment Facilities

Several basic considerations have deterred foreign countries from competing with the US in building gaseous

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18/ Agreements with Japan, Norway, Philippines, Sweden, Switzerland.

diffusion plants to produce enriched uranium, and other countries' dependence on such production from the US generates international problems which have been the concern of SCI. Difficulties for other nations in building production plants include: the tremendous capital costs (each US plant represents an average investment of $1.3 billion), the need for large amounts of cheap electricity to power the compressors, and the complexities of the technology involved in producing an economical and efficient uranium enrichment operation.

On this latter point, the US has maintained strict security classification over key elements of the technology. The fact that Great Britain, the Soviet Union, Communist China, and France have all presumably been able to develop their own facilities independently makes clear, of course, that if a foreign government has sufficient incentive and invests enough scientific manpower and capital it can come up with the answer. Nevertheless it is certainly in the US national interest to deter development of this technology in additional countries if it is to be used to produce military weapons. Consequently, the technology has remained rigidly classified.

Evolution of advanced techniques for efficient

alternatives to the gaseous diffusion process is just over the horizon in several countries. Here again the technology has been classified, so it is not easy to say just where the Dutch, Germans, Japanses, French, British, or Brazilians may be at a particular point in their research. However, in reducing costs of operating ultra-high speed gas centrifuge installations--at least on a laboratory basis--one can see a potentially cheaper means of enriching uranium fuel.

Since gas centrifuge plants can be built on a smaller scale and may require less imput of electrical power for their operation, they are more readily concealable than the gaseous diffusion plants which have been used heretofore. This adds an additional hazard from the standpoint of possible clandestine operation for military applications.

US policy in this field has not been totally developed yet. SCI has suggested careful consideration of alternatives as to whether the US should assist or try to deter development of isotope separation plants in foreign countries, whether encouragement should be given to single-nation development or multi-national enterprises, the extent of US financial and technological assistance, and the attitude we should take on security control of technology which heretofore has been so carefully classified.

8. Special Problems

a. South Africa

One of the more interesting combinations of technological and political problems involving SCI during the past several years has been whether to renew our bilateral agreement with South Africa for non-military nuclear cooperation. The previous agreement was scheduled to terminate in 1967, unless extended. The time period in which this problem became critical coincided with a period when South Africa's political popularity reached a low point both abroad and within the US. Many groups urged the US not to consider renewal of a nuclear agreement with South Africa during this period. On the other hand, SCI and others recognized that South Africa held the third largest deposits of uranium in the free world and consequently was intimately related to a worldwide non-proliferation policy. South Africa has consistently played a constructive role in the IAEA and in other informal arrangements for application of international safeguards to foreign exports. To terminate summarily the cooperation between the US and South Africa in peaceful nuclear research might well have alienated an element of the South African community which had been essentially liberal in its

outlook on domestic racial issues. Another significant factor was the desirability of maintaining IAEA safeguards within South Africa itself, to allay suspicions of other African states that the South African nuclear research program had some sinister military implications. This benefit might well have been lost if we had withdrawn our cooperation. The decision to continue was also affected by the distinct possibility that South Africa would turn elsewhere--specifically to France--for future cooperation in the nuclear field if we should sever our relationships.

Initially, the US attempted to persuade South African representatives to adopt a policy parallel to that of Canada (the world's major uranium producer along with South Africa): to refuse to sell uranium to any country unless accompanied by a pledge of only peaceful uses for uranium exported under suitable international safeguards. South Africa declined, since the sale of uranium to the three western nuclear powers (US, UK, and France) would not in their view risk the proliferation of nuclear weapons.

After the ENDC in Geneva had arrived at a formula whereby international safeguards would be required under the NPT only in countries which did not already have nuclear weapons (because of Soviet refusal to accept safeguards

internally), it became clear that the US could not make its earlier more categorical policy prevail within the South African framework. The South African Government constantly emphasized its opposition to the proliferation of nuclear weapons in additional countries. They reaffirmed their policy of requiring international safeguards on every sale of South African uranium except to the US, UK, and France which already possessed the weapons. On the basis of this pledge, totally consistent with the draft terms of the NPT, the President decided on July 14, 1967, to extend for a 10-year period the civil agreement for cooperation in the peaceful application of nuclear energy with South Africa.

b. Romania

For several years Romania has had under study plans calling for construction of a nuclear power reactor. In this connection, Romanian officials informally approached the US on the possible purchase of US reactor and fuel. SCI consistently urged that the Romanian interest be encouraged and accommodated, subject to their agreement to international safeguards on the plant and its fuel. SCI has held that this would not only conform with President Johnson's concept of bridge-building in improving US relations

with Eastern European Communist countries, but that introduction of international safeguards on this scale into a Communist country would be a major step toward US non-proliferation goals.

As the Romanian plans developed, a preference emerged for a nuclear power plant based on natural uranium fuel and heavy water. As a result, the Romanians have turned to the British and the Canadians for assistance on this project. However, the Romanians have indicated an interest in purchasing the heavy water component for this power project from the US; this time SCI urged successfully that the Romanians be encouraged. A US manufacturing company will be permitted to offer a bid to Romania for construction of the heavy water plant.

The decision is based on the conviction that no military advantage will accrue to Romania or to her Communist allies. At the same time, US goals in that area of the world could well be enhanced by diminishing Romania's economic dependence on the Soviet Union and by introducing international nuclear safeguards into the Eastern European Communist bloc.

G. Desalting and Water for Peace Program

1. Desalting

The Department of the Interior supported early a [106]

program for research and development of low-cost processes for converting sea and brackish water into fresh water to meet our future water needs. The AEC at the same time was investigating the application of nuclear energy to desalting techniques.

In 1964, President Johnson asked the two agencies to prepare a plan for an aggressive and imaginative program to advance large-scale economic desalting of sea waters.

In his message to the Third International Conference on the Peaceful Uses of Atomic Energy in Geneva in August 1964, he said, "The time is coming when a single desalting plant powered by nuclear energy will produce hundreds of millions of gallons of fresh water--and large amounts of electricity--every day." The President further noted, "We have begun cooperative exchanges (in desalting) with Mexico, with Israel and the Soviet Union."

By the close of 1964 significant cooperative efforts were underway. Witness the following events:

(1) President Johnson's remarks at the 18th Annual Dinner of the Weizmann Institute of Science on February 6, 1964, in New York included: "This nation has begun discussions with representatives of Israel on cooperative research in using nuclear energy to turn salt water into

fresh water." In June 1964, Prime Minister Eshkol and President Johnson agreed that the US and Israel would undertake joint studies on desalting problems and expressed the hope for rapid progress toward large-scale desalting in Israel.

(2) A US-USSR agreement in the field of desalination, including the use of atomic energy, was signed in Moscow on November 18, 1964.

(3) The US and Mexico agreed in principle to a joint study to evaluate the technical and economic feasibility of installing a large combination nuclear power-desalting plant in Mexico.

(4) US teams visited the UAR to consult on a proposed desalting project, and Tunisia to discuss the current state of power and water technology.

The increasing interest displayed by other countries in US participation and assistance in desalting programs indicated to SCI the desirability of (1) developing policy guidelines and criteria to govern US participation in these activities, and (2) providing a means for close coordination among the several departments and agencies with responsibility for desalting activities. This seemed especially necessary

during the early years when new ground was being broken in this field.

On SCI's recommendation an interdepartmental Committee on Foreign Desalting Programs was established by the Secretary of State in December 1964. The Director of SCI was chairman and other representatives, at the Assistant Secretary level, were from the Department of Interior, Agency for International Development, Atomic Energy Commission, Bureau of the Budget, and the President's Office of Science and Technology. The Committee was to assure that all facets of the international ramifications of desalting were under central review, were in harmony with other US relationships with concerned countries, and were consonant with the general international economic and political policies of the US.

As an effort to further US goals in desalination and to dramatize President Johnson's pledge, on many occasions, to share US desalting technology with other nations, the Departments of State and Interior decided to sponsor a First International Symposium on Water Desalination, which was held in Washington, October 3-9, 1965. It brought together delegations from 65 nations

and 6 international organizations. More than 2,400 persons attended.

Following the Symposium, Mexico-USA-IAEA signed an agreement providing for a study of the practicality of a large, nuclear-powered water desalting-electric power plant to help meet the needs of northwestern Mexico and southwestern US; preliminary agreement was reached with Saudi Arabia which would lead to construction of a dual-purpose plant for Jidda; and cooperative programs in desalting were explored with Italy, Greece, and Kuwait. The role of the Committee on Foreign Desalting Programs was clearly an active one.

An increasing awareness developed, however, in SCI as well as in other areas of the Government, that the heavy emphasis on the promise of desalting could well be detracting attention from the more basic problems affecting a country's water resource development. Desalting was a tool of water resource development, not a panacea. Perspective was needed.

2. Water for Peace

On October 7, 1965, in remarks to the Delegates to the First International Symposium on Water Desalination, President Johnson launched the Water for Peace Program.

The President noted that the need for water is worldwide and so is the responsibility for promoting its beneficial use and full development. He pledged US support and assistance in developing resources through a "massive cooperative international effort to find solutions for man's water problems." The specifics of the program included:

a. A call to all nations to join the US in creating an international fund to bring the fruits of science and technology to all corners of a parched and thirsty world.

b. An offer to contribute to an international crash program to deal with world water resources.

c. The convening within a year of another large conference to deal with all the world's water problems.

d. An increase in US support for scientists now working on water problems for the UN.

e. An offer to send our best experts abroad when requested.

f. A program of grants and fellowships for scientists from other lands to study water resources in the US.

The Secretary of State assigned the responsibility

of responding to SCI, and sought the cooperation of the Department of the Interior.[19/]

The Secretary proposed a conference for May 1967. Responsibility for its technical aspects would rest with the Department of the Interior. He further proposed establishment of an Interdepartmental Committee on Water for Peace, under chairmanship of the Department of the Interior, to be comprised of agencies having a direct interest in the program. The Committee would define the scope of the program, develop an integrated program of technical, financial, and other assistance consistent with the goals of the President's Water for Peace Program, and recommend necessary legislative and budgetary action to implement those aspects of the Program.

An interdepartmental task force attached to the Committee for almost a year endeavored to survey the world's water problems and consider further actions which could advance the international cooperative effort called for by the President.

In August 1966, Interior's Assistant Secretary for Water and Power Development and SCI's Director, Mr. Pollack, submitted jointly the recommendations of the Interdepartmental

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19/ Letter from Secretary Rusk of November 5, 1965, to Secretary Udall.

Committee on Water for Peace to the Secretaries of State and Interior. The recommendations covered many useful steps to be taken to assure coordination in water resource development. From these the Committee selected 12 actions for early and priority attention.

On August 31, 1966, the Secretaries of State and Interior commended the Water for Peace Report of the Interdepartmental Committee to the President's attention and recommended his approval especially of the priority program. In a confidential letter of the same date from the two Secretaries, preliminary cost estimates for the initial priority program were presented which were to be refined as the President deemed appropriate and as the necessary new legislation developed that would be indicated.

The confidential memorandum to the President also noted that, while one recommendation of the Committee was that a Water for Peace Office be established to coordinate international water resource efforts, to serve as a central point to stimulate interest in international water programs, and to insure effective discharge of US commitments under the Water for Peace Program, the Secretaries did not attempt to delineate "at this juncture" precisely how this effort would be organized.

On September 3, 1966, President Johnson, at the dedication of the Summersville, West Virginia dam, stated that he was committed to a Water for Peace Program. Many recommendations of the initial priority program were then enumerated by the President in his address. Despite efforts by State and Interior to backup the President's call for a "massive cooperative international effort" by some new budgetary action, the Bureau of the Budget included no specific funds for the Water for Peace Program in the President's budget.

Early in 1967 it became increasingly clear to SCI that many countries were having doubts as to US intentions in launching the Water for Peace Program and calling for an international Conference. Despite the President's statement of October 1965 and his recommitment in September 1966 to a Water for Peace Program, no other outward sign was evident of the scope of the Government's thinking, the efforts it contemplated, or the role it envisioned for international organizations and foreign governments.

Even the Water for Peace Conference, the preparations for which had been going on in parallel, was in difficulty. Congress appropriated $500,000 for the Conference in the closing hours of its Second Session, but only after the President personally intervened with the Speaker of the House to have the bill reported out. The amount represented a reduction by Congress and the Bureau of the Budget of the original estimate of $1,200,000 needed for a Conference of the type and magnitude envisioned.

Agreement was finally reached with the Bureau of the Budget that the Interdepartmental Committee Report on Water for Peace could be printed and distributed in advance of the Conference with the expressed hope that it would be "useful to participants at the International Conference on Water for Peace" and on the basis that it seems "probable that it contains material which should be helpful in discussions and should stimulate action along constructive lines." No estimates of funding levels required for the various program elements were included, but at least the preliminary US thinking on the scope and direction of its participation in a "massive cooperative international effort" was available to all interested parties.

In addition, conversations began in earnest with

the Budget Bureau on establishment of a Water for Peace Office--SCI's view being that if the US Government was not able to announce any programmatic initiatives in time for the Water for Peace Conference, it could at least establish that it had organized itself to give credence to the importance that the President attached to his Water for Peace Program.

The International Conference on Water for Peace, held in Washington, May 23-31, 1967, by the strictest of standards was a complete success. Ninety-four countries were represented together with 24 international organizations; 635 official delegates, 61 participants from international organizations, and over 2,000 observers attended. Over 600 papers submitted for the Conference are published in Proceedings and form a basic technical library of world water resources and problems.

On May 22, 1967, the President assigned to the Secretary of State responsibility for overall direction and coordination of the international water-related activities of the US Water for Peace Program.

On May 25, 1967, the Secretary of State established the Water for Peace Office separate from SCI and under direct supervision of the Under Secretary for Political

Affairs. The separate, high-level organizational status of the new office was mainly the result of Budget Bureau insistence that the Presidential initiative required "visibility".

With the appointment of an Interim Director for the Water for Peace Office, June 24, 1967, SCI's formal responsibility in the water resource field ended. SCI, however, during the next 12 months continued to administer the day-to-day activities in this field as a service to the new office which was to be without staff until June 1968. A permanent Director of the Office was appointed on April 29, 1968.

3. More Detailed SCI Initiatives

SCI's specific response to interest generated by desalting and the Committee on Foreign Desalting Programs included the following events:

a. The US participated in a preliminary water resource study with Greece with special emphasis on the feasibility of desalting, possibly in combination with an electric power plant, as a means for providing a needed fresh water supply to the Athens area.

b. Further discussions and consultations were held with the United Arab Republic, Tunisia, and Italy.

c. The engineering feasibility study, jointly financed by the US and Israel, of a large-scale nuclear power-desalting plant for Israel was completed. The US-Israel Joint Board, formed to administer this study, submitted its report on February 15, 1966, to the two Governments. The report concluded that a dual purpose plant of the size required was technically feasible. SCI was called upon to act as the focal point of a staff study which would recommend to the Secretary, and subsequently to the President, what the continuing interest and extend of US involvement should be in the proposed project. Acting on the Secretary's general recommendation, President Johnson, at his news conference on October 14, 1966, announced the assignment of Ambassador-at-Large Ellsworth Bunker to begin to review proposals which had been made for the desalting-electric power project in Israel.

d. The possibility of providing the Spanish town of Palomares with a gift of a small desalting plant to meet local potable water needs was considered. Such a gesture would symbolize US recognition of the friendship and cooperation demonstrated by the people of Spain, particularly those in Palomares, on the occasion of the US Air Force accident with the loss of several nuclear weapons.