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January 31, 1955 716906

TO: Paul S. Foster, Special Assistant to General Manager,  
Washington

FROM: Paul C. Aebersold, Director, Isotopes Division,  
Oak Ridge

Subject: ASSISTANCE TO INTERNATIONAL "ATOMS-FOR-PEACE" PROGRAM THROUGH  
RADIOISOTOPES

In memorandum of December 16 to you, we outlined terms covering isotope distribution for possible inclusion in bilateral agreements for cooperation and advantages permitted thereby in simplifying distribution procedures. Recent discussions with Mr. John Hall and others disclose that more direct simplification of international distribution procedures may be possible. We are now sending further requested suggestions relative to United States assistance in international distribution and utilization of radioisotopes. We have delayed sending these suggestions pending further discussions with other interested persons and a visit with Mr. Hall.

Before outlining specific suggestions, we wish to make some general comments.

Importance and Value of Radioisotope Work.

Although world wide need for propulsive and industrial power is the main motivating interest of countries in developing atomic energy programs, we were glad to hear you believe also that byproducts of atomic energy such as radioisotopes, can be almost as important to the overall health and welfare of nations. Since the inception of the isotopes program we have been eager to promote increased utilization of radioisotopes because they constitute the most immediately realizable and widely applicable benefits of atomic energy.

In addition to direct benefits from the large variety of applications of radioisotopes, encouragement of their wider utilization can have another very important aim, namely, to develop a larger source of professional and technical people familiar with radiations and radioactivity. Since radiation and radioactivity are encountered in nearly all phases of atomic energy development, an increasing number of persons trained with radioisotopes, both precedes and permits an expanding atomic program.

Appended is a document we prepared some time ago to indicate the value of isotope programs and training in international peacetime atomic energy development (Appendix A.) This indicates how a nation may initiate a broad, long-range peacetime atomic energy program by establishing one or more atomic research centers initially based mainly on radioisotope utilization. It gives as a good example Belgium, which shortly after the war sent Belgian scientists to the U.S. for radioisotope training,

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COLLECTION Paul Aebersold Papers  
BOX No. 12  
FOLDER Assistance To International "Atoms-For-Peace" Program Through Radioisotopes Jan. 31, 1955

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and returned them to university atomic research centers to assist in training further people in atomic techniques. Although it was a slow development from these humble beginnings, Belgium is today prepared to undertake a substantial reactor development program.

As early as April 1947, we prepared a memo on the large number of possible advantages, as well as certain disadvantages, in the U.S. undertaking international distribution of radioisotopes. This was used as a basis for staff considerations and final Commission approval of radioisotope export. You may be interested in excerpts (Appendix B) from a number of earlier documents, including considerations in a later staff paper, 231/10 to 231/18, in which the international distribution of radioisotopes was modified to include a wider variety of radioisotopes and irradiation services as well as distribution for industrial use. These excerpts indicate the value to the U.S. as well as to other nations in extending our program of radioisotope distribution.

#### Importance of "Sympatico" Approach.

Latin Americans place much importance in dealing with persons who are "sympatico". This is difficult to define exactly, but it means a show of genuine interest, understanding, cordiality, desire to be helpful, treatment as an equal, and consideration of their traditions, customs, and needs. This desire is of course shared by persons of all countries, and needs to be considered in the details of carrying out a program of assistance. The actual cost or value of a program is often not as important as the attitudes and approach used in carrying it out.

For example in bringing persons to this country for training, consideration should not only be given to the technical information that will be received, but also the overall treatment of the trainees. This should include avoidance of as many annoyances and embarrassments as possible, in connection with visas, clearances, passes, travel, housing, race differentiation, etc., Also the people with whom they train should be generally interested in the trainee's country, and in being of assistance, without however adopting a patronizing or superior attitude.

Special attentions that cost very little may often create the greatest appreciation. For example: learning to converse if only a few words in their native language, furnishing of abstracts or summaries translated into their language, and small special favors.

Only a few of these points will be brought out as specific suggestions, but they need to be considered in implementing all suggestions. As you pointed out during your visit, the greatest deterrent to use of radioisotopes abroad are dollars and distance. Translated into objectives these are difficulties in obtaining training, equipment, materials, and information.

Assistance with Funds.

Several government agencies and a number of private foundations are able to make funds available for assistance in providing training, equipment, materials and information. You are already aware of the type of assistance that the State Department, Foreign Operations Administration, AEC and other government agencies may provide. On my Latin American trip I noted that the Rockefeller Foundation and the W. K. Kellogg Foundation had been of much assistance in providing funds for travel and training, as well as for equipment and materials, in setting up several of the radioisotope laboratories. Other Foundations are already giving or could be encouraged to give private assistance in carrying out certain aspects of the "Atoms-for-Peace" program. In the suggestions that will follow, no attempt is made to indicate possible sources of funds, inasmuch as these are better known by your office. It would be useful to be provided with a list of agencies and foundations that may be able to offer financial assistance in any aspect of peaceful atomic energy development.

The following information may be useful on costs for travel and living expenses for training. For short periods, say up to three months, expenses would average around \$2500. Expenses for a training period of a year would average around \$5000. This would not include salary, but in many cases this would be supplied by the institution or government sending the person.

Equipment for individual research programs involving one investigator and one or two technicians would cost in general not more than around \$4000, assuming use of existing laboratory space. Equipment for a clinical program involving rather routine uses of isotopes would cost around \$5000 for a small program, and up to \$25,000 for a set up in a large medical center capable of a variety of applications and of being a secondary distribution center, as well as handling a considerable patient load. A very good program could be established at each major university or medical center, for \$25,000 or less invested in equipment. ✓

The only recommendation I feel in a position to make on assistance with funds is: (1) Prepare and make available a list of possible sources of funds so that when a worthy candidate comes to our attention we will be able to direct requests to proper channels.

Assistance with Training.

The first step in assisting a country in atomic development is in training personnel in the many special techniques of atomic energy development. This might include non-technical as well as technical and scientific persons.

January 31, 1955

The techniques might cover everything from administration to welding. As noted above, training in radioactivity techniques is of major importance.

In regard to isotope training, it is recommended that:

1. The AEC encourage and assist the presentation of isotope and atomic energy training courses abroad sponsored by UNESCO or by countries which enter into group agreements for cooperation. Such courses reduce language difficulties and dollar costs for the foreigner. This can be effected by (a) helping train the faculty for such courses (teaching not only techniques, but how to teach techniques), (b) supplying part of faculty, (c) loaning equipment (scalars, counters, etc.,) and (d) furnishing teaching aids, such as informational material, slides, and films. \*

2. The AEC assist in training by broadening contacts between AEC or AEC contractor personnel and foreigners in unclassified work. This can be effected by (a) encouraging U.S. organizations and foundations to grant scholarships for international exchange in the field of atomic energy, including reactor development, (b) permitting greater AEC participation (including exhibits) at international congresses directly pertinent to the field of atomic energy, (c) sending more technical personnel for on-the-spot evaluation to improve liaison and assistance in programs of peacetime uses of atomic energy (reports and correspondence are notoriously poor in this respect). \*

3. The AEC encourage interested organizations, institutes, and foundations outside of AEC to offer direct technical level assistance in evaluating and establishing unclassified programs in the atomic energy field. In this way non-AEC funds and personnel (often voluntary) can be enlisted. The arrangements, however, should be coordinated at higher levels by the AEC and ground rules for cooperation established. \*

#### Assistance with Information

Although it is understood that repository libraries of all AEC unclassified documents will be furnished to cooperating nations, there is additional information not in AEC documents which would be valuable. Also in some cases a more positive and direct approach could be taken in furnishing information to groups within a country.

For example, it is recommended that:

1. The repository libraries maintain informational material available from the Isotopes Division, such as handbooks and articles on radiological safety, reference lists and selected articles on radioisotope utilization, illustrations for lectures and training courses, lists of references, possibly also the training films of the Radioisotope Series and catalogs on isotope procurement. As additional material and training aids are developed, a system would need to be devised to furnish new or updated information on a continuing basis.

2. Certain documents such as Nuclear Science Abstracts, lists of declassified documents, reference lists, isotope catalogs, isotope summary reports, etc., be furnished directly to major universities or atomic research centers. Although repository libraries are supposed to be active in disseminating information the facts are that the closer the source of the information to the user, the more it is useful.

3. "Trainee packets" of information similar to those furnished to participants in ORINS basic training courses, be furnished to participants in isotope training courses sponsored by the UN or by nations entering into an agreement for cooperation with the U.S.

4. U.S. Information Agency libraries in isotope using countries be furnished sets of informational material available from the Isotopes Division as noted in (1) above. Also the Agency loan libraries might contain a selected set of U.S. reference books on radioisotopes, reactors, radiobiology, and atomic research. In addition films of the Radioisotope Series could be made available for loan.

5. U.S. Embassy representatives in cooperating countries be indoctrinated from time to time in peacetime aspects of the U.S. atomic energy program, and kept current with policies on procurement of isotopes, materials, services, and information. In this connection, I noted on my trip this summer a very real effort by British and Canadian representatives to be of concrete assistance in isotope procurement.

6. More use be made of exhibits on U.S. peacetime atomic energy developments, both of a general and technical nature. Traveling exhibits such as those now circulated by the American Museum of Atomic Energy in Oak Ridge, could be translated into appropriate languages and circulated to interested countries. Also scientists within the atomic energy program should be encouraged to present good technical exhibits at major international technical conferences. Increased knowledge of the vast program for peaceful atomic energy development in the U.S. would greatly assist in a cooperative attitude toward U.S. atomic efforts by the general public, as well as professional people, of other nations.

#### Assistance with Procurement of Equipment.

A great deal of red-tape and delay is encountered in obtaining equipment from the U.S. Some reasons for this are difficulty in purchasing anything requiring U.S. dollars, an extra 10% or more assessed by equipment manufacturers on foreign orders, special export license for atomic equipment, import and duty problems in most countries, inability of manufacturers to deliver from stock, and unfamiliarity with American equipment and sources of supply.

It would not be possible for U.S. government agencies or the U.N. to overcome all of these problems, but there are several ways of being of assistance. It is recommended for example that:

1. The AEC arrange to eliminate export control on all atomic equipment not in critical supply, particularly all types of research and radiation detection equipment.
2. U.S. government agencies or the U.N. make arrangements whereby foreign customers could be given assistance in buying equipment in this country and especially in expediting shipment. In some cases the State Department has arranged for American scientists to help in selecting and buying equipment and for shipment by military air transport. Private foundations supporting work in other countries also help by buying equipment directly in this country, and taking care of shipment details.
3. The U.N. help make arrangements for easy customs clearance of materials and equipment in each country and also duty free status for items to be used in non-industrial applications.

#### Reduction in Isotope Costs.

Although it has not been recommended that isotopes be made available to foreigners at less than catalog prices, some assistance could be given in helping to reduce the overall cost to ultimate users.

It is recommended that:

1. An extra amount of radioactivity be included in each shipment which would undergo significant decay loss in international shipment; for example, an amount sufficient to compensate for 24 hours decay for shipments normally requiring about one day, and a maximum of 48 hours compensation for shipments requiring more than one day. National laboratories could do this without special funds, but secondary shippers might require reimbursement.
2. Assistance be given to setting up redistribution centers within major cities or within small countries. These centers could be encouraged by simplified procurement procedures. Aid in establishment could be by various means of assistance noted above.
3. An initial supply of isotopes say up to \$100 worth be shipped free to those successfully completing radioisotope training courses sponsored by AEC or U.N. (procurement limited to within six months of return of participant to his country.) Very often when a participant returns to his country, he experiences much delay in making necessary arrangements for import of isotopes. A few initial shipments "on the house" would help establish a worthwhile customer.

Paul S. Foster

-7-

January 31, 1955.

4. Under special circumstances or within certain agreements for cooperation, radioisotopes shipments be sent prepaid. Payment for shipping charges in U.S. dollars is sometimes difficult to arrange at the receiving end, particularly by new groups or countries with extreme dollar shortage.

We would be pleased to develop further details on recommendations which it may be desirable to implement. Also we will be pleased to assist in carrying out activities recommended.

  
Paul C. Aebersold

cc: Mr. John Hall  
Dr. T. Johnson  
Dr. J. Bugher  
Mr. M. Salisbury  
Dr. N. Woodruff

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VALUE OF ISOTOPE PROGRAMS AND TRAINING IN  
INTERNATIONAL PEACETIME ATOMIC ENERGY DEVELOPMENT

(Isotopes Division, May 1954)

For a nation to establish a broad long-range peacetime atomic energy program it must start with existing educational and research institutions. These are the sources of future as well as present scientists, professional workers and specialists for the field. Accordingly, the nation must stimulate universities and institutes to undertake broad programs of research and training in atomic energy.

The pattern established in the U.S. is too ambitious for most nations, but some guidance can be obtained. For example, the U.S. has established several large national laboratories devoted chiefly to development of peacetime aspects of atomic energy. A smaller country may not have sufficient funds and personnel to establish a large national atomic energy laboratory. This would draw too many persons away from existing academic and research institutions. Belgium, for example, first approached this problem by setting up five peacetime atomic energy centers at its major universities. Existing facilities and personnel at these universities were used initially, but as experience and funds grew, the centers established special facilities and personnel for portions of the atomic energy program. When the country became ready to establish a major laboratory for greater concentration on utilization of atomic energy, these centers had trained sufficient personnel to staff such a national laboratory.

A major limitation in an atomic energy program is the rate of build up of trained personnel. Consequently a national program might be patterned after that of Belgium, namely the establishment of a number of atomic research centers at major universities followed at an appropriate time by the establishment of a national laboratory for major scale atomic developments.

The United States could furnish technical teams to assist in the setting up and initial functioning of atomic research centers at institutes or universities chosen by each government. Initially each center would use existing facilities and personnel with the cooperation of appropriate university departments. Departments of medicine, science, engineering, agriculture, etc., would administer projects within their respective specialties but would cooperate in formulating and coordinating the center's program. Make up of the teams supplied by the United States would depend on the emphasis desired at particular atomic research centers. The funds required for equipment and facilities at each center would vary from around \$50,000 to over \$1,000,000 depending on the desired program and available funds. The United States might not help with funds but could furnish help in designing, procuring, and installing facilities.

The most immediately realizable peacetime benefits of atomic energy are radioisotopes. They are not only extremely powerful research tools in an investigational fields, but have many practical applications in medicine and industry. Radioisotopes would play a major role in many projects undertaken at the atomic energy research centers.

Encouragement of wide utilization of radioisotopes in a nation's research projects would have another important aim, namely, to develop a large resource

## Appendix A

of professional and technical people familiar with radiations and radioactivity. Since radiation or radioactivity are encountered in nearly all phases of atomic energy development, an increasing number of persons trained with radioisotopes is essential to an expanding atomic program.

Because of the very extensive utilization of radioisotopes in the United States in all fields, it would be possible to recruit outside of AEC facilities persons or teams appropriate for assisting projects involving radioisotopes, no matter how broad or detailed. The AEC could assist visiting scientists to obtain information or training at appropriate centers in the U.S.

Examples of applications of radioisotopes that could be undertaken at atomic research centers are as follows:

In Science: a. As tracer atoms to study: (1) details of biochemical and physiological processes in all kinds of plants and animals, (2) mechanisms and kinetics of all types of organic and inorganic reactions, (3) kinetics of atoms and physical states of liquids, solids, alloys, etc.; b. As sources of radiation for (1) nuclear physics studies, (2) radiochemistry, (3) radiobiology.

In Agriculture: a. As tracer atoms to study: (1) mechanism of photosynthesis, (2) uptake and utilization of all types of plant nutrients including commonly used fertilizers, (3) absorption and exchange of ions in soil to determine soil fertility, (4) physiology of normal and diseased plants, (5) action of plant growth regulators, weed killers and insecticides, (6) metabolism and movement of insects, larvae, etc., (7) dietary role and metabolic use of essential elements in animal husbandry, (8) biochemistry of production of animal food products, (9) diseases in domestic animals; (b) As sources of radiation: (1) to study genetic changes or produce new genetic forms, (2) to treat certain animal diseases.

In Medicine: a. As tracer atoms to study: (1) uptake, distribution and elimination of a wide variety of elements and compounds in human subjects, (2) details of biochemical processes in both normal and diseased states, (3) functional activities and physiological processes of body tissues and organs, (4) fate and action of drugs, hormones, vitamins, etc., (5) mechanism of action of poisons, toxicants, carcinogens, etc., (6) synthesis and degradation of amino acids, proteins, hydrocarbons, fatty acids, etc; b. As sources of radiation for (1) producing beams of radiation for deep therapy, (2) applicators for treating surface lesions, (3) interstitial injection of needles or solutions for treating cancer, (4) introducing into body cavities to alleviate fluid formation, (5) selective internal deposition in certain body tissues to treat for such diseases as hyperthyroidism, thyroid cancer, polycythemia vera, leukemia, etc.

In industry: a. As tracer atoms to study: (1) details of all kinds of industrial chemical reactions or physical processes, (2) action of various kinds of chemical agents such as soaps, detergents, polymerizers, etc., (3) a wide variety of metallurgical problems such as vapor pressure, corrosion, diffusion, plating, etc., (4) penetration, movement or transfer of materials from one region or boundary into another; b. As sources of radiation for: (1) marking

fluids or objects to follow their course through pipes or process equipment, (2) radiographic testing, (3) gaging of thickness or density of industrial sheet material or coatings, (4) measuring circulation rates in industrial processes, (5) controlling packaging operations, (5) difficult analytical problems, (6) static elimination, (7) phosphorescent materials, (8) ionisation or sterilization purposes.

August 27, 1947

The Honorable George C. Marshall,  
Secretary of State,  
U. S. Department of State,  
Washington 25, D.C.

My dear Mr. Secretary:

The United States Atomic Energy Commission has approved a plan for the foreign distribution of radioisotopes to qualified users. There is inclosed a memorandum setting forth the factors which the Commission has considered in reaching the decision that this action is in the best interest of the United States.

During the past year radioisotopes have been distributed to a wide variety of institutions within the United States with no restrictions other than those which concern health and the effective use of the materials. Our producing and distributing facilities are now more than adequate to meet all national needs. Being assured that the current distribution program is sound and workable and that security has not been prejudiced, the Commission wishes now to take steps to make available certain selected radioisotopes to foreign doctors and scientists for therapy and research.

The most careful consideration has been given to the question as to whether or not the distribution of selected radioisotopes to scientists in other countries will adversely affect the national security. The Commission is of the opinion that the type of radioisotopes involved, in the quantities and under the conditions prescribed, will not contribute to atomic energy research in other countries except to the extent that radioisotopes are tools which can contribute to any nation's general scientific research program. The view may be taken, therefore, that to this extent their distribution is detrimental to this country's welfare. It is the Commission's judgement, however, that the advantages the United States will gain from taking steps at this time to make available the use of radioisotopes for humanitarian purposes outweigh this consideration.

There is also inclosed a procedural outline of the plan. Inasmuch as this matter involves questions of foreign policy and the relations of the United States with other governments, the Commission requests the concurrence of the Department of State in this action and would appreciate any comments and suggestions you desire to make.

Sincerely yours,

UNITED STATES ATOMIC ENERGY COMMISSION

David E. Lilienthal

Chairman

C O P Y  
Appendix B Exhibit 2.

August 28, 1947

Dear Mr. Lilienthal:

I have received your letter of August 27, 1947, addressed to the Secretary, in which you state that the United States Atomic Energy Commission has approved a plan for the foreign distribution of radioisotopes to qualified users.

I note that these valuable products of United States atomic energy plants will now be available in the service of mankind and that, to this extent at least, we are able to advance toward the beneficent use of this new force. This initiative should promote harmony and good feeling among nations.

Based on your assurances that this offer on our part does not prejudice our national safety, and in view of the checks and safeguards set up in the distribution scheme as you outline it in the enclosure to your letter, the Department of State sees no objection from the point of view of foreign policy.

Sincerely yours,

/s/ Robert A. Lovett

Acting Secretary

The Honorable  
David E. Lilienthal,  
Chairman, United States  
Atomic Energy Commission  
Washington 25, D.C.

cc: Snapp  
Strauss  
Wilson  
MLC

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C O P Y  
Appendix B, Exhibit 3.

UNITED STATES  
ATOMIC ENERGY COMMISSION

1947

NOTE TO CORRESPONDENTS AND EDITORS:

The announcement that the United States will make radioisotopes for medical and biological research available to users outside of the United States was made in a telegraphic message from President Truman to Dr. E. V. Cowdry, President of the Fourth Annual International Cancer Research Congress, meeting at Hotel Jefferson, St. Louis, Mo., September 3-7. Text of President Truman's telegram to Dr. Cowdry follows:

DR. E. V. COWDRY, PRESIDENT  
FOURTH INTERNATIONAL CANCER RESEARCH CONGRESS  
HOTEL JEFFERSON  
ST. LOUIS, MISSOURI

SUPPLEMENTING MY EARLIER MESSAGE I WANT TO ADVISE YOU THAT IT IS NOW POSSIBLE FOR THE UNITED STATES TO TAKE AN IMPORTANT FORWARD STEP TOWARD GREATER INTERNATIONAL COOPERATION IN THE FIELD OF MEDICAL AND BIOLOGICAL RESEARCH. ON BEHALF OF THE PEOPLE OF THE UNITED STATES I AM PLEASED TO ANNOUNCE TO THE FOURTH INTERNATIONAL CANCER RESEARCH CONGRESS THAT PROGRESS IN THE PRODUCTION OF RADIOISOTOPES BY THE UNITED STATES ATOMIC ENERGY COMMISSION NOW PERMITS LIMITED DISTRIBUTION TO QUALIFIED RESEARCH WORKERS IN OTHER COUNTRIES OF RADIOISOTOPES PRINCIPALLY FOR MEDICAL AND BIOLOGICAL RESEARCH. I KNOW THAT THE REPRESENTATIVES OF THE UNITED STATES ATTENDING THE CANCER RESEARCH CONGRESS SHARE MY HOPE THAT THE OPEN, IMPARTIAL, AND TRULY INTERNATIONAL CHARACTER OF MEDICAL RESEARCH WILL CARRY OVER INTO THE REALM OF OTHER PROBLEMS OF WORLD CONCERN. THE SHARING BY AND AMONG ALL NATIONS OF BOTH THE MEANS AND THE RESULTS OF CANCER RESEARCH WILL REDUCE THE LOSS OF LIFE AND HUMAN SUFFERING FROM DISEASE THROUGHOUT THE WORLD.

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Appendix B, Exhibit 4.

Staff papers AEC 231/10 (March 24, 1950) to AEC 231/18 (July 3, 1951) contain the considerations for broadening the scope of the program for international distribution of radioisotopes by:

- a. Increasing the number of items distributed;
- b. Adding special irradiations to the services now available;
- c. Modifying the conditions under which the materials may be exported and used.

In particular the advantages as well as possible disadvantages are rather thoroughly covered in AEC 231/17, which contains answers to nine questions on the broadened program raised by the Chairman of the Joint Committee on Atomic Energy (Senator Brian Mc Mahon).

Many of the same considerations discussed in the above noted staff papers are still appropriate in planning increased assistance to other nations in peacetime development of atomic energy, and particularly in promoting wide spread applications of isotopes.