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REQUISITION

COLLECTION

SET NO.

FOLDER

Requisition for the United States Government for the
International Development Research Institute, Inc.
of Moscow, Russia, and for the International
with appropriate and necessary documents.

1035618

THE INTERNATIONAL CONFERENCE
ON THE PEACEFUL USES OF
ATOMIC ENERGY

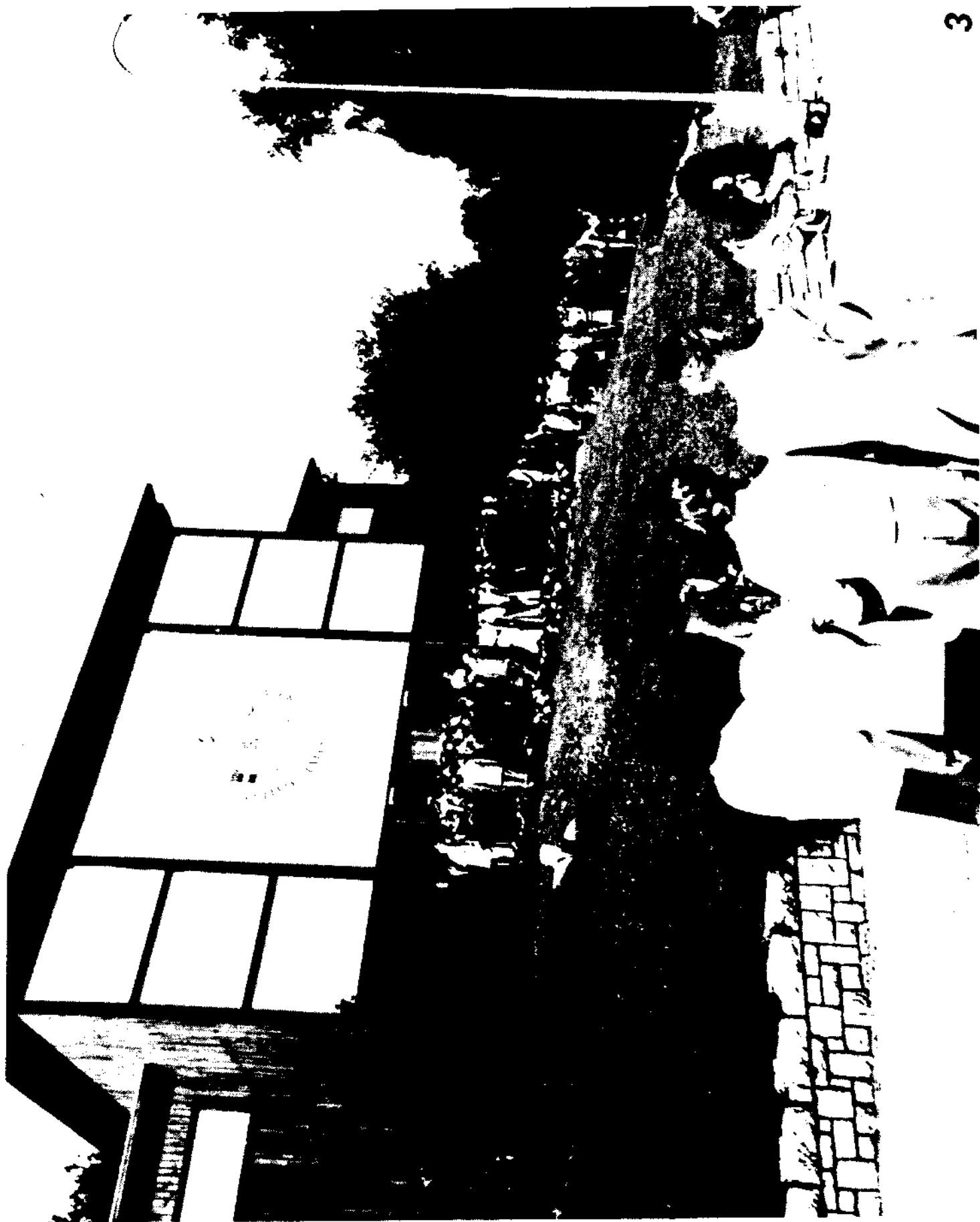
Geneva, Switzerland

August 8-20, 1955

Vol. II

Report of the United States Delegation to the International Conference
on the Peaceful Uses of Atomic Energy held by the United Nations; with
Appendices and Selected Documents

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APPENDIX V -- RESEARCH REACTOR EXHIBIT AT GENEVA

The United States Research Reactor Exhibit, featuring the operating "pool" reactor, installed in a specially designed and constructed building on the grounds of the Palais des Nations in Geneva, was officially opened on August 7 as one of the United States exhibits at the United Nations International Conference on the Peaceful Uses of Atomic Energy. There was a preview for United Nations Conference officials and news representatives at noon; at 4 o'clock, the public was admitted. On August 22, the reactor was physically turned over to the representatives of the Swiss Government, which purchased the reactor from the United States under a Bilateral Agreement of Cooperation on peaceful uses of atomic energy signed July 18, 1955. Formal documents to transfer the reactor were signed on August 20, 1955, the first nuclear reactor ever sold by one nation to another.

The reactor building was open every day during the Conference from 9 a.m. to 10 p.m., with the public admitted after 4 p.m. The public was admitted all day on Sunday. By August 22, a total of 63,373 persons had visited the reactor. (See photograph No. 3 of visitors waiting to enter reactor building on grounds of Palais des Nations.)

The building of an operating research reactor at the Geneva Conference was first proposed in November, 1954, by Dr. Thomas E. Cole, of the Oak Ridge National Laboratory, operated for the U. S. Atomic Energy Commission by the Union Carbide and Carbon Corporation. The idea was to demonstrate a type of research reactor which nations could expect to build under Bilateral Agreements of Cooperation with the United States, using uranium enriched to 20% in the fissionable 235 isotope -- the type of atomic fuel the United States had pledged to contribute to an international pool.

Construction of the reactor was formally authorized by the Atomic Energy Commission on March 2, 1955. Dr. George G. Manov, under Dr. George Weil as Technical Director, was placed in charge of the Reactor Unit, with Dr. Charles E. Winters, of Oak Ridge National Laboratory, in charge of operations. On February 14, Secretary of State John Foster Dulles had instructed U. S. Ambassador to Switzerland Frances Willis to open discussions with the Swiss Government for permission to install and operate the reactor within the limits of the Canton and City of Geneva. Permission to erect the special building had to be obtained from the United Nations and from the Swiss.

The building, designed by Mr. Donald Stewart, a Union Carbide architect, was erected in 46 days and, on July 1, was ready for installation of heavy equipment and a water demineralizer which already had been shipped in. Meanwhile, at Oak Ridge National Laboratory, the reactor had been designed, fuel elements and operating mechanism tested, and then dismantled and crated for shipment. On June 30, the reactor was loaded at Knoxville, Tennessee, aboard two Military Air Transport Service planes — a C-124 Globemaster and a C-54 cargo plane — and flown to Geneva where it arrived July 2.

By July 18, just 14 working days after its arrival, the reactor and all its equipment were installed and, on that morning, the reactor "went critical" for the first time in Geneva. Wall panels and other units of the exhibit also were in place.

At the time, President Eisenhower was in Geneva for his conference with Edgar Faure, Prime Minister of France; Nikolai Bulganin, Prime Minister of the Union of Soviet Socialist Republics; and Sir Anthony Eden, Prime Minister of the United Kingdom. On July 20, President Eisenhower spent an hour at the reactor exhibit, viewing the panels, and operating the reactor. (See photograph No. 2 of President Eisenhower examining the reactor.) He was accompanied by some 150 news representatives and photographers. While there, he made the following statement:

"I am very pleased that our country is able here to establish this reactor to help the scientists of the world to make progress along the lines of peaceful use of the atomic energy science, for the welfare of mankind.

"In the United States we have so far made agreements with 24 different nations for the use of this same type of research reactor. There are students from 19 different countries going to school in the United States, learning about the technology that is applied here. There are students from 32 countries undertaking to learn about the use of radioisotopes, and so on. So all in all this business is proceeding, and we are pleased to have a part in it. We have set aside 200 kilograms of fissionable material so far to assist in the effort.



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"I am very hopeful that more than governments will get interested in this project. I hope that private business and professional men throughout the world will take an interest, and provide an incentive in finding new ways that this new science can be used.

"In the meantime, I hope that everybody who gets a chance to see this one, will learn that there are really many, many ways in which atomic science can be used for the benefit of mankind and not destruction."

Between July 18 and August 6, there were 1,420-pre-Conference visitors. The day after the President's visit, Fleet Admiral Arthur W. Radford, Chairman, Joint Chiefs of Staff, and General Alfred A. Gruenther, Supreme Allied Commander, Europe, visited the reactor, and U.S. Ambassador to Switzerland Frances Willis viewed it on July 22.

On August 6, AEC Chairman Strauss sent a letter to the Chairman of the delegation of each of the 73 nations and 8 specialized agencies participating in the Conference, inviting each to name members of the delegation to attend an individual showing of the exhibit and to operate the nuclear reactor. For many delegates, it was the first time they had ever seen a reactor.

Tours of the reactor exhibit were arranged for individual members of Congress, including Senators Clinton P. Anderson, John O. Pastore, Bourke B. Hickenlooper, John W. Bricker, George W. Malone, John M. Butler, Alexander Wiley, William A. Purtell, and Price Daniel; and Representatives Carl T. Durham, Chet Holifield, Melvin Price, John J. Dempsey, W. Sterling Cole, Carl Hinshaw, James E. Van Zandt, and James T. Patterson.

The formal ceremonies turning over the reactor to representatives of the Swiss Government and of Reactor, Ltd., took place at noon on Saturday, August 20, with physical possession effective noon, Monday, August 22, 1955.

Official participants in the ceremony were Dr. Paul Scherrer, Chairman, Swiss Commission for Nuclear Research, acting for the Swiss Government, Dr. Walter Boveri for Reactor, Ltd., Chairman Lewis L. Strauss, acting for the United States Government, U. S. Ambassador Frances E. Willis, and Commissioner Willard F. Libby. (See photo No. 4, Chairman Strauss signs transfer papers on reactor, with Dr. Boveri, of Reactor, Ltd., on his right, Ambassador Willis on his left.)

The documents were signed, congratulations were exchanged and the reactor was formally transferred. (Memorandum of transfer in Attachment 2.)

At noon, Monday, August 22, 1955, the Swiss took physical possession of the reactor building. The tentative timetable called for erection of a building in Wurenlingen (near Zurich) by early spring of 1956 when the reactor, its equipment and exhibit panels would be moved.

The US reactor building, a low structure 50 by 80 feet with a shed roof, stained redwood and displaying the Atoms for Peace emblem on its central facade, was erected on a slope to the north of the rambling Palais des Nations, close to the Library Wing in which the U. S. Technical Exhibit was installed. The visitors entered at the main entrance on the south, and left by a west door after a circuit of the panel exhibits and the reactor.

Visitors entered the building on a level a few feet below the floor on which the reactor was installed, and had there a view of the reactor railing and superstructure and, beyond it, the glass-fronted area in which the control panels were placed. The approach to the reactor was by a ramp circling to the left from the entrance through a corridor walled with exhibit panels, then to the reactor, then out again through a second corridor which also contained exhibits.

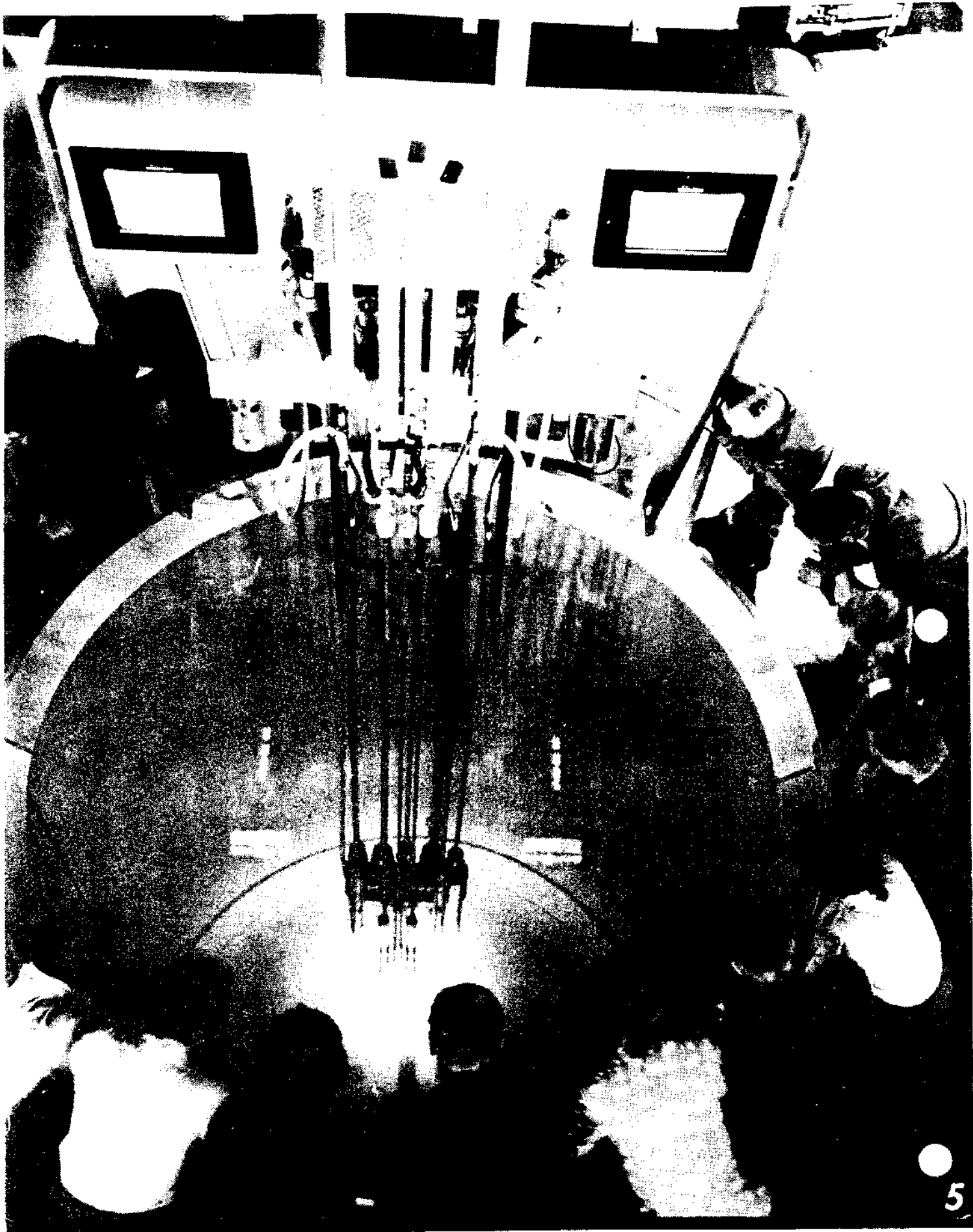
The reactor itself was in the center of the building protected by a guard rail at floor level. The reactor core was clearly



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visible in a waterfilled cylindrical iron tank 10 feet in diameter and sunk 20 feet into the earth, imbedded in solid rock (See photo No. 5, looking down into the reactor.) The superstructure of the reactor supported two strip-chart recorders of reactor activity and the drive mechanism of the control rods. Underwater lights illuminated the pool when the reactor was not operating. They were turned off when, every 15 minutes during the exhibit hours, the reactor was brought to criticality and then up to its full power of 100 kilowatts to demonstrate the blue glow of the Cerenkov effect.

The cover of the brochure on the reactor, printed in four separate editions of the four official Conference languages, was a color photograph of the reactor core when the Cerenkov effect was at its height. During the Conference, 45,000 copies of the brochure were distributed (See Attachment 3). In addition to a brief description of the reactor, the brochure also told about the various associated exhibits.

The active core of the reactor was composed of 18 kilograms uranium, enriched to 20% in Uranium 235 of a total of 3.6 kilograms, and enclosed in aluminum "sandwiches". There were 23 fuel elements compactly arranged and mounted on aluminum grid plate supported from the bottom of the tank. Three of the fuel elements contained holes designed for insertion of the boron carbide control and safety rods which had electromagnetic couplings and were motor-driven. One special piece was designed to hold a neutron source to facilitate control of the reactor during starting operations. The 13,000 gallons of ordinary water which filled the tank, and was circulated through the demineralizer, served as both coolant and moderator.

Depth of water above the reactor core was 16.5 feet which, at the standard operating power of 10 kw provided enough shielding to reduce the radiation level at the water surface to about 0.5 milliroentgens per hour, or about one-fourth the intensity given off by the surface of a radium-dial wrist watch.

The controls displayed behind the glass-fronted room were more elaborate than required for the operation of the reactor, and in fact would be adequate for a high power, short-period reactor. The pool reactor control mechanism included a completely automatic, one button, start-up, and a simple servomechanism to maintain constant power (See photo No. 6, visitors viewing control panel through glass wall.)

The panel exhibits which lined the entrance and exit passageways are described in connection with the photographs reproduced

on the following pages. All panel exhibits were labeled in the four official languages. In sequence, as viewed by the visitors, the panels were:

Panel A (Fig. 7) was a message from the President of the United States.

"The atom cannot be limited by national boundaries.

"Men of science from many countries, often working together, helped to harness its great energy for the good of mankind. The Geneva Conference on the Peaceful Uses of Atomic Energy is a tribute to the inventive genius of these men. At the same time, it demonstrates to people everywhere that continued international cooperation is essential if we are to realize man's capacity to create for himself an increasingly productive world, of living at peace.

"The great strides already made in putting atomic energy to work in industry, agriculture, medicine, and research will become evident during the course of this conference. We hope that the free exchange of technical information and ideas among leading scientists and engineers of many nations will stimulate an even greater progress months and years ahead.

"In this cause the United States is firmly dedicated to promote international cooperation and to contribute its share of scientific knowledge and resources."

Dwight D. Eisenhower
The White House
Washington, D.C.
May 3, 1955

THE WHITE HOUSE WASHINGTON

May 3, 1955

The atom cannot be limited by national boundaries. Men of science from many countries, often working together, help to harness its great energy for the good of mankind. The Geneva Conference on Peaceful Use of Atomic Energy is a tribute to the inventive genius of these men. At the same time, it demonstrates to people everywhere that continued international cooperation is essential if we are to realize man's capacity to create for himself an increasingly productive world living in peace.

The great strides already made in harnessing atomic energy to work in industry, agriculture, medicine, and research will become evident during the course of this Conference. We hope that the free exchange of technical information and ideas among leading scientists and engineers of many nations will result in even greater progress in the peaceful use of the atom.

In this sense, the United States is deeply committed to peaceful atomic energy, and we are pleased to join in the efforts of many nations to make the atom a force for good.

DWIGHT D. EISENHOWER

LA TRAVAIL REUNITE WASHINGTON

10 mai 1955

L'atome ne peut être limité par les frontières nationales.

Les hommes de science de nombreux pays, souvent travaillant ensemble, aident à dompter son immense énergie pour le bien de l'humanité. La Conférence de Genève sur l'usage pacifique de l'énergie atomique est un hommage à la géniale invention de ces hommes. Elle démontre également à tous que la coopération internationale continue est essentielle si nous voulons réaliser la capacité de l'homme de créer un monde de plus en plus productif et de vivre en paix.

Les grands progrès déjà réalisés dans l'utilisation de l'énergie atomique pour le travail en industrie, agriculture, médecine et recherche seront évidents au cours de cette Conférence. Nous espérons que l'échange libre de renseignements techniques et d'idées entre les principaux scientifiques et ingénieurs de nombreux pays aboutira à de nouvelles et plus grandes réalisations dans l'usage pacifique de l'atome.

En ce sens, les États-Unis sont profondément engagés pour l'usage pacifique de l'énergie atomique, et nous sommes heureux de nous joindre aux efforts de nombreux pays pour faire de l'atome une force pour le bien.

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DWIGHT D. EISENHOWER

PANEL A (Fig. 7)

NATURALLY OCCURRING URANIUM

CONTAINING 0.7% U-235 IS ENRICHED TO 20% U-235

MAKING POSSIBLE A RESEARCH REACTOR THAT IS

- SIMPLE, SMALL, EASY TO BUILD
- INEXPENSIVE TO OPERATE
- VERSATILE

THIS REACTOR REQUIRES LESS THAN 4 KILOGRAMS OF U-235

THE PRESIDENT OF THE UNITED STATES HAS AUTHORIZED THE ALLOCATION OF THE PROPORTIONATE UNITED NATIONS INTERNATIONAL BUREAU OF 100 KG OF U-235 IN CONCENTRATIONS ISOTOPIC UP TO 20% IN ISOTOPIC CONCENTRATIONS UP TO 20%

DE L'URANIUM A L'ETAT NATUREL

CONTENANT 0.7% DE U-235 EST ENRICHÉ A 20% DE U-235

ET QUI PERMET D'EMPLOYER UN REACTEUR D'EXPERIMENTATION

- SIMPLE, PETIT, FACILE A CONSTRUIRE
- EN FONCTIONNEMENT ECONOMIQUE
- D'UNE GRANDE AMPLITUDE D'UTILISATION

CE REACTEUR DEMANDE MOINS DE 4 KG DE GRAMMES DE U-235

LE PRESIDENT DES ETATS UNIS A AUTORISÉ L'ATTRIBUTION A L'ORGANISME INTERNATIONAL EN PERSPECTIVE DES NATIONS UNIES D'UNES 100 KG D'U-235 CONTENUES DANS DE L'URANIUM EN CONCENTRATION ISOTOPIQUE AU MAXIMUM DE 20%

EL URANIO EN FORMA NATURAL

CON 0.7% de U-235 SE ENRIQUECE HASTA EL 20% DE U-235

HACIENDO POSIBLE UN REACTOR DE INVESTIGACION

- SENCILLO, PEQUEÑO, FACIL DE CONSTRUIR
- DE FUNCIONAMIENTO ECONOMICO
- ADAPTABLE

ESTE REACTOR REQUIERE MENOS DE 4 KILOGRAMOS de U-235

EL PRESIDENTE DE LOS ESTADOS UNIDOS HA AUTORIZADO LA ASIGNACION DE 100 KG DE U-235 CONTENIDO EN URANIO EN CONCENTRACIONES ISOTOPICAS HASTA DEL 20% PARA USO DE CUALQUIER AGENCIA INTERNACIONAL FUTURA DE LAS NACIONES UNIDAS.

НАТУРАЛЬНОЕ УРАНИЙ

СОДЕРЖАЩЕЕ 0,7% U-235
УВЕЛИЧИВАЕТСЯ ДО 20% U-235

ДЕЛАЮЩЕЕ ВОЗМОЖНЫМ РАБОТУ РЕАКТОРА
ЭКСПЕРИМЕНТАЛЬНОГО

- ПРОСТАЯ, МАЛЕНЬКАЯ, ЛЕГКАЯ В ПОСТРОЙКУ
- РАБОТАЮЩАЯ ЭКОНОМИЧЕСКИ
- АДАПТИРУЕМАЯ

ЭТОМУ РЕАКТОРУ НЕ ПОТРЕБУЕТСЯ БОЛЕЕ 4 КГ U-235

ПРЕЗИДЕНТ СОЕДИНЕННЫХ ШТАТОВ РАЗРЕШИЛ ВЫДЕЛИТЬ ДЛЯ БУДУЩЕГО МЕЖДУНАРОДНОГО УЧРЕЖДЕНИЯ ОБЪЕДИНЕННЫХ НАЦИЙ 100 КГ U-235 СОДЕРЖАЩЕГОСЯ В УРАНИИ В ИЗОТОПНЫХ КОНЦЕНТРАЦИЯХ ДО 20%.

PANEL B (Fig. 8)

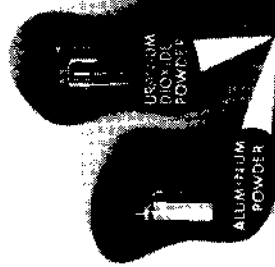
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Panel B (Fig. 8) gave a schematic cross section of the Geneva reactor with this caption:

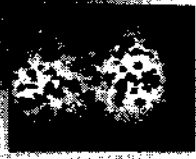
"Naturally occurring uranium containing 0.7% U-235 enriched to 20% U-235 makes possible a research reactor that is simple, small, easy to build, inexpensive to operate and versatile. This reactor requires less than 4 kilograms of U-235. The President of the United States has authorized the allocation to the prospective United Nations - International Agency of 100 kg. of U-235 containing uranium isotopic concentrations up to 20%."

Panel 7 (Fig. 10) illustrated fabrication of UO_2 -Al fuel elements of the MTR type. Actual fuel elements were used in this panel, except that the UO_2 included was of normal composition with less than 1% of Uranium 235.

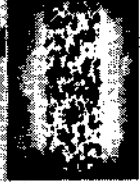
FUEL ELEMENT



POWDER



MODERATED FUEL CORE CONTACT



MODERATED FUEL-BEARING ASSEMBLY

FINISHED FUEL ELEMENT

PANEL 1 (Fig. 10)

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Fig. 11

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Fig. 11 - This panel showed a full scale reactor core assembly, prepared from dummy fuel elements, and included a control-rod, magnet assembly, and clutch. Several fuel elements were cross sectioned to permit a view of their internal construction. Inspecting this display, are Mrs. Laura Fermi, US historian of the Conference, and Dr. Thomas E. Cole, Oak Ridge National Laboratory.

Panel 3 (Fig. 12): A display of radiation detection instruments, including geiger and scintillation counters, pocket dosimeters, and film badges. Protection against radiation was demonstrated by standard items of laboratory wear, such as coveralls, shoe covers, gas masks, cotton and rubber gloves. The panel stressed that radiation could be detected through the use of proper instruments, and that personnel could be protected through proper precaution, and that respect, not fear, was the key to working safely with radiation.



PANEL 3 (Fig. 12)

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THERAPEUTIC NEUTRONS

BORON INJECTION

TUMOR CONTAINING
BORON (^{10}B - ^{11}B)

SHIELD

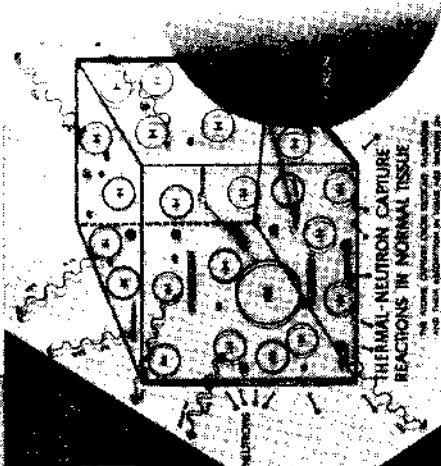
SHIELD

THERMAL NEUTRON
SOURCE

Les neutrons de
basse énergie, les neutrons
thermiques, sont la cause d'une
dérégulation alpha intense et localisée
de la tumeur.

Les intestins complexes qui contiennent
des cellules qui agissent comme localisateurs
de tumeurs, la dérégulation alpha intense et localisée
des tumeurs provoque une dérégulation
alpha localisée et intense de la tumeur.

BRUCHENBAITEN EIGENHE COELEN
MILIEU OXYGEN THERMIE MATHIEU
BRUCHENBAITEN COELEN MATHIEU
DEUTERIE OXYGEN



THERMAL-NEUTRON CAPTURE
REACTIONS IN NORMAL TISSUE

The thermal-neutron capture reactions
in normal tissue are shown. The
neutrons are captured by the
nuclei of the atoms in the tissue
and form isotopes which are stable
or have a long half-life.

Reactions de Capture de Neutrons
Thermiques en Tissu Normal

Panel 4 (Fig. 13): This panel explained neutron therapy, being intensively investigated by the Brookhaven National Laboratory as a possible treatment for cancer of the brain.

Panel 5 (Fig. 14): This panel exhibit gave technical specifications of the core of the research reactor operated at Geneva.

SPECIFICATIONS OF GENEVA CONFERENCE REACTOR CORE

MATERIALS IN CORE

U-235
U-238
Al
H₂O

These materials are specified in the following table:

NUCLEAR CONSTANTS

These constants are specified in the following table:

SPECIFICATIONS OF GENEVA CONFERENCE REACTOR CORE

Materials in Core

U-235
U-238
Al
H₂O

Nuclear Constants

These constants are specified in the following table:

CARACTERISTIQUES DU NOYAU DU REACTEUR DE LA CONFERENCE DE GENEVE

Matériaux du Noyau

U-235
U-238
Al
H₂O

Constantes Nucléaires

These constants are specified in the following table:

ESPECIFICACIONES DEL NUCLEO DEL REACTOR DE LA CONFERENCIA DE GENEVA

Materiales de la Nucleo

U-235
U-238
Al
H₂O

Constantes Nucleares

These constants are specified in the following table:

СПЕЦИФИКАЦИЯ НА ЯДРО НА РЕАКТОРА НА КОНФЕРЕНЦИЯ В ЖЕНЕВА

Материали на ядрото

U-235
U-238
Al
H₂O

Ядерни константи

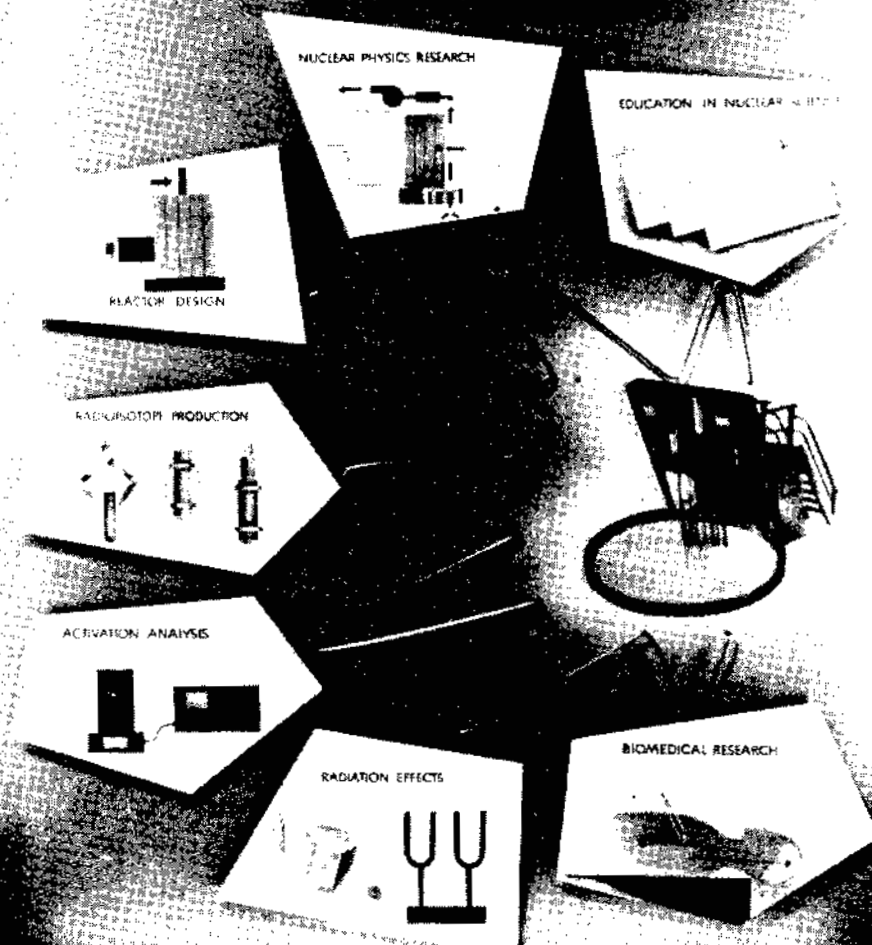
These constants are specified in the following table:

AN ENRICHED
URANIUM-235 REACTOR
HAS MANY USES

UN REACTEUR A
URANIUM-235 ENRICHÉ
A DE NOMBREUX USAGES

EL REACTOR DE
URANIO-235 ENRIQUECIDO
TIENE MUCHAS APLICACIONES

РЕАКТОР С ОБОГАЩЕННЫМ
УРАНОМ 235 ИМЕЕТ
МНОГО ПРИМЕНЕНИЙ



PANEL 6 (Fig. 15)

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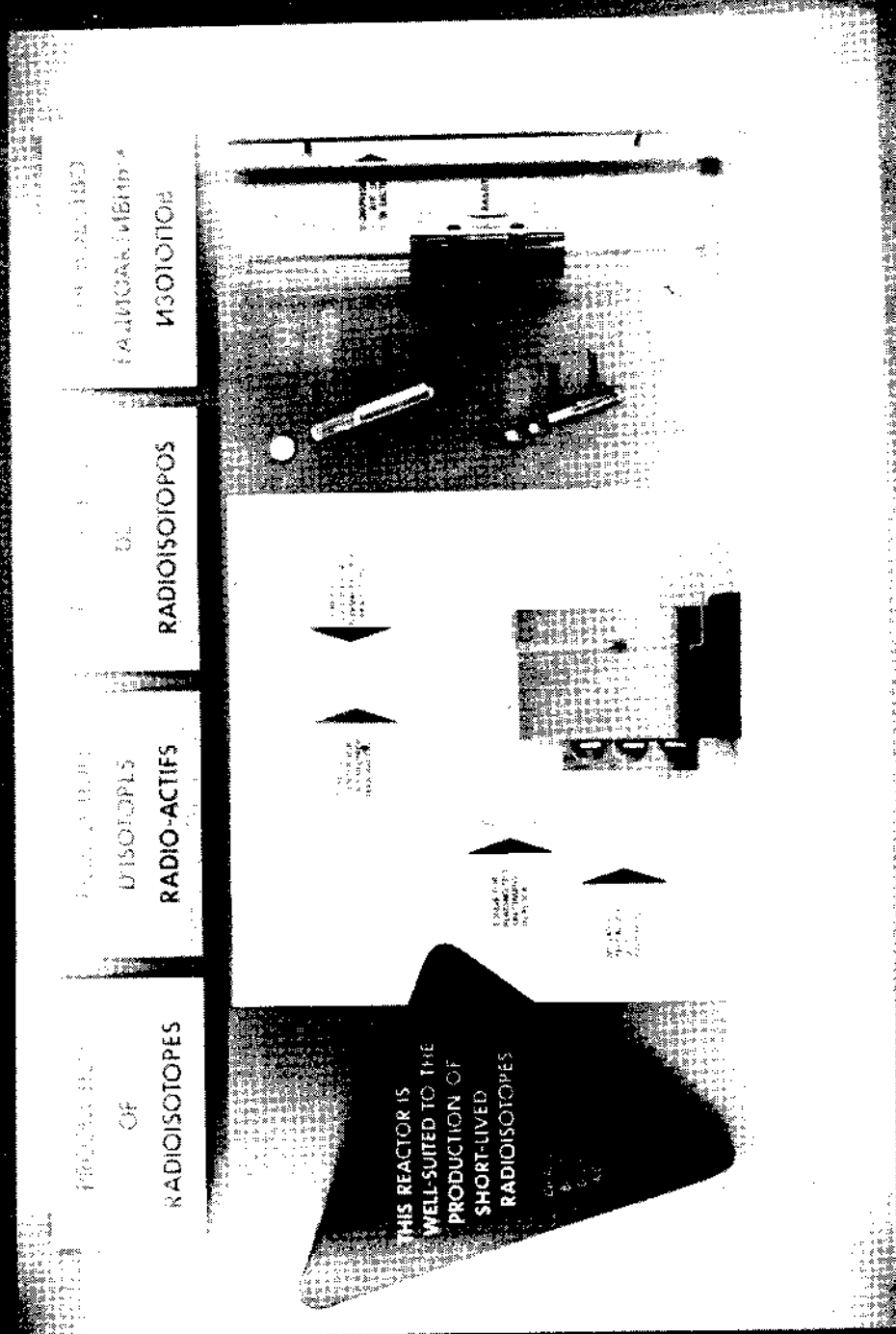
Panel 6 (Fig. 15): This panel demonstrated some uses of a research reactor of the type operated at Geneva: education of students in nuclear science, research in nuclear physics, reactor design, the production of radioisotopes, activation analysis, the studies of radiation effects, and biomedical research.

Fig. 16: A visitor operates a reactor simulator displayed at Geneva. The simulator was designed by the Leeds and Northrup Company to demonstrate the increase in a reactor flux when a control rod neutron is moved out of the fuel element lattice.



Fig. 16

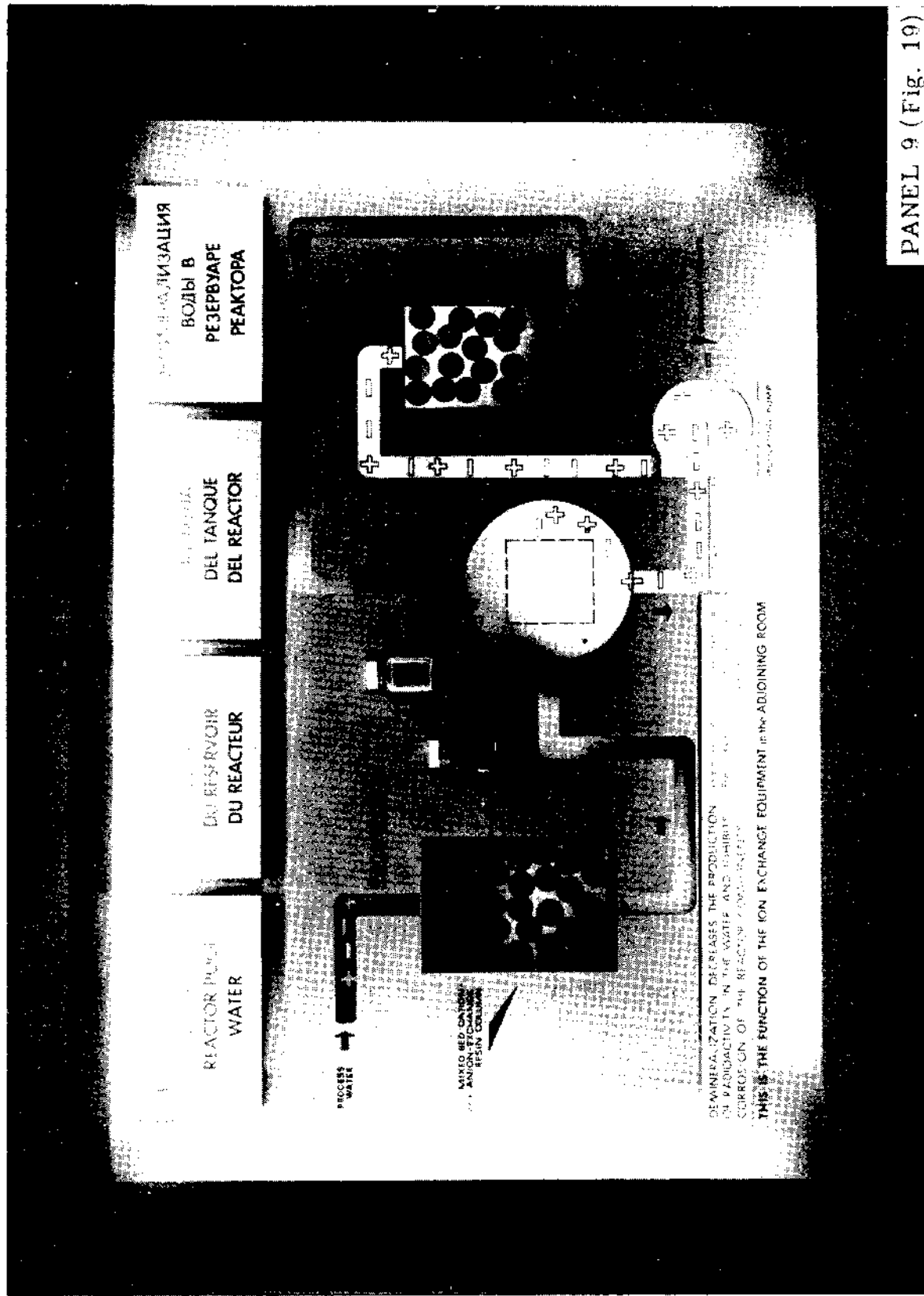
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Panel 7 (Fig. 17): This panel illustrated production of radioisotopes in a nuclear reactor, and a device colloquially referred to as a "rabbit" used to obtain short periods of irradiation.

Panel 8 (Fig. 18): This exhibit panel illustrated use of neutrons in analyzing trace quantities of various chemical methods. The principle is that specific elements are known to capture neutrons at certain rates, and that the resulting induced radioactivity is characteristic for each element. The periodic table of the elements was exhibited to illustrate those elements capable of being detected in extremely small quantities.

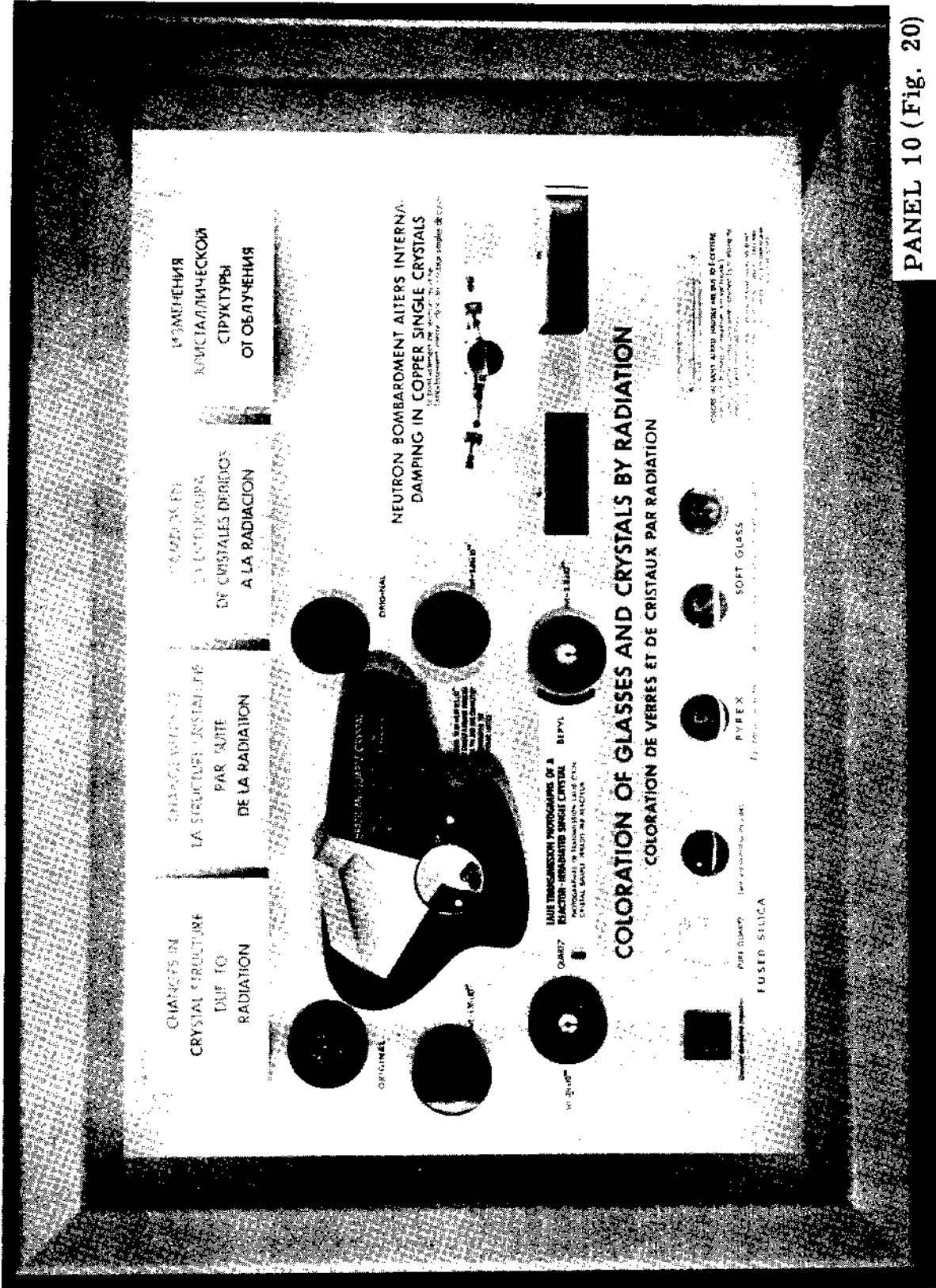


PANEL 9 (Fig. 19)

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Panel 9 (Fig. 19): This panel gave a description of the water de-mineralizer unit, used to process water for the Geneva reactor, and of the action of resins in removing positive and negative ions. The reactor must operate in demineralized water, otherwise such minerals as sodium in the water would become radioactive.

Panel 10 (Fig. 20): This exhibit panel demonstrated that changes in crystal structure due to radiation could be readily observed. The panel illustrated the effect of irradiation upon several common substances, such as Brazilian quartz, fused silica, Pyrex, soft glasses and copper crystals.



PANEL 10 (Fig. 20)

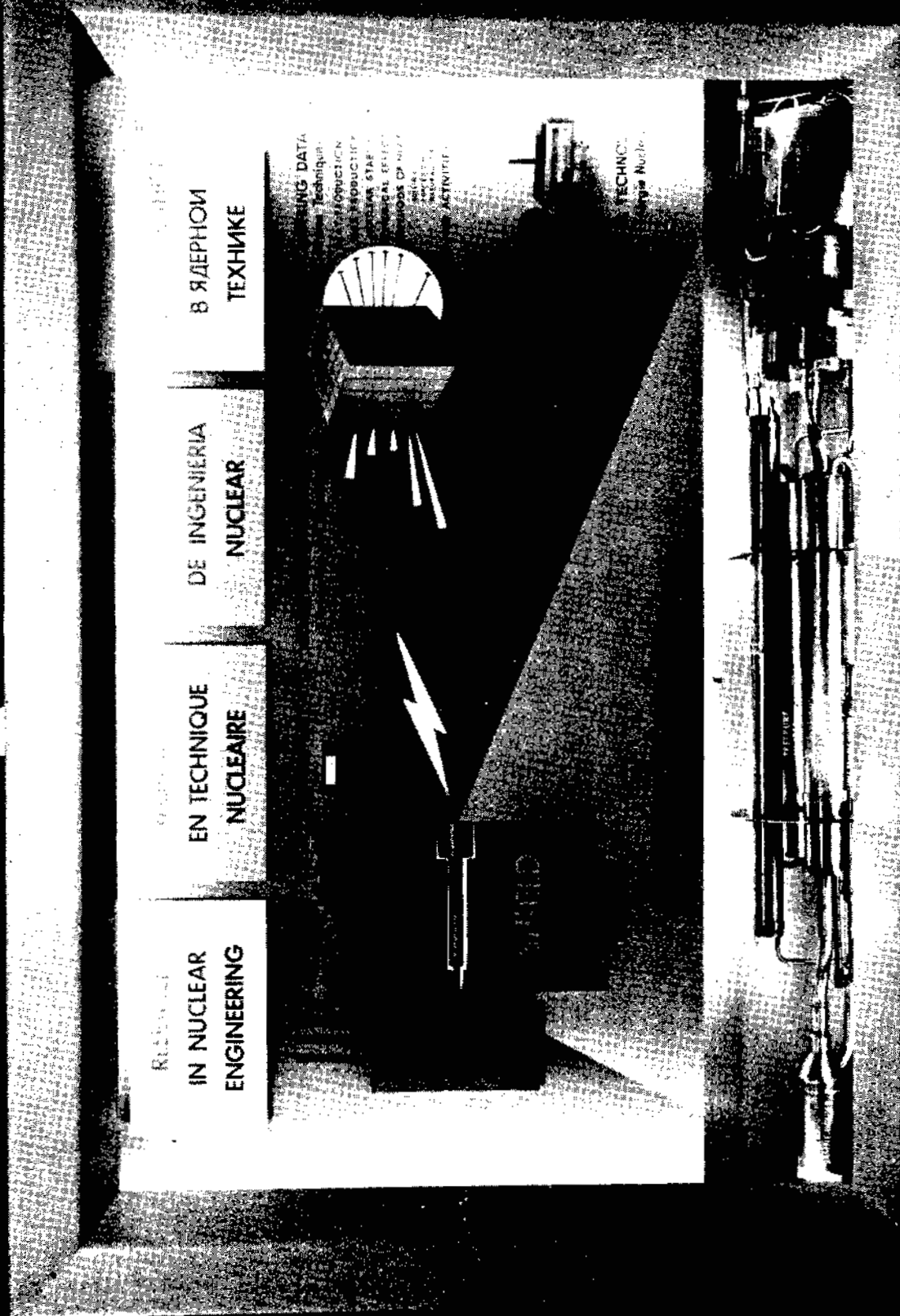
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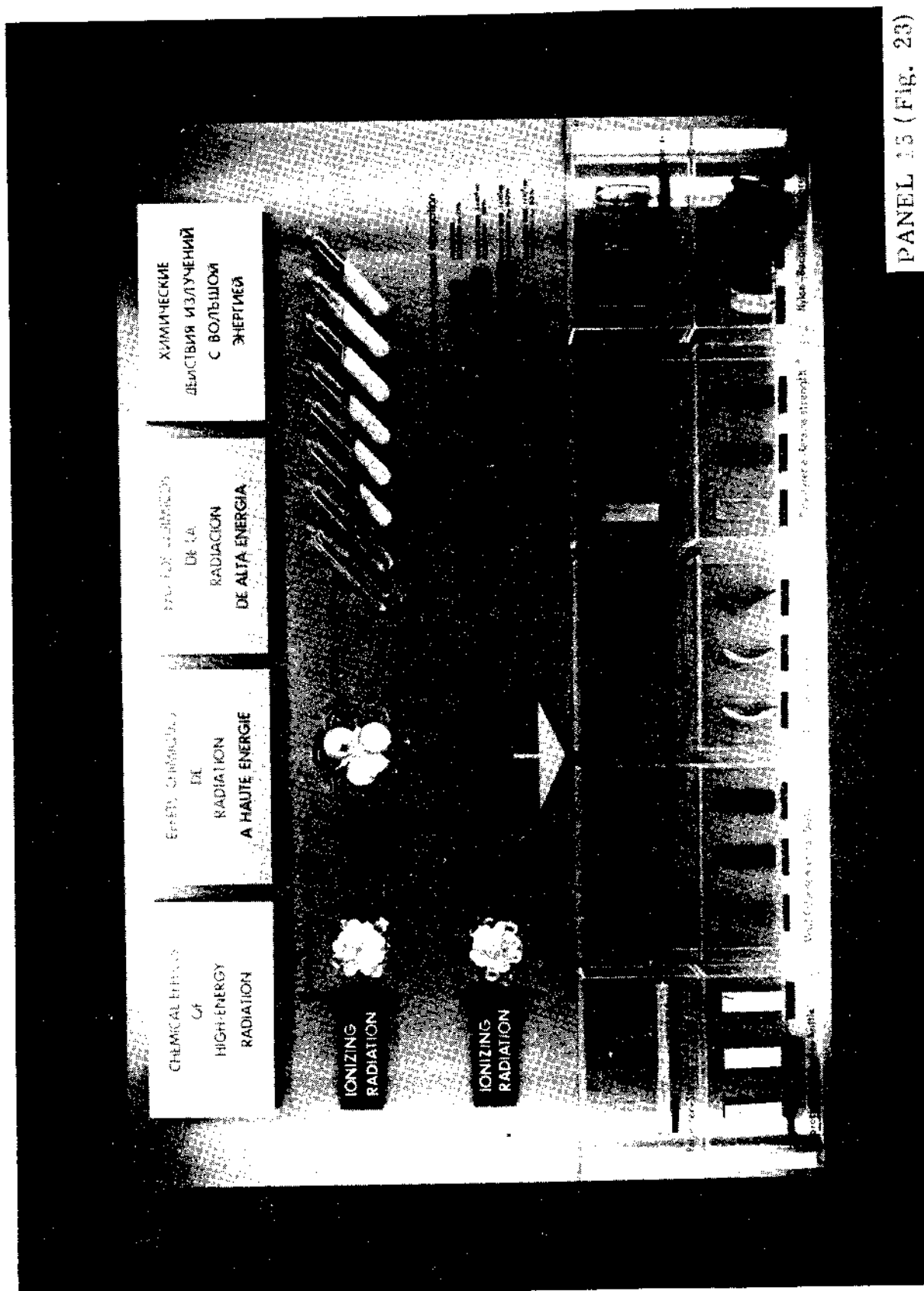
PANEL 11 (Fig. 21)

Panel 11 (Fig. 21): This panel illustrated various uses of a nuclear reactor for studies in reactor design and research: measurements of the effect of large experimental holes on the reactivity; measurements of the energy of fission of Uranium-235; the effectiveness of various shielding materials; and measurements of fission-neutron and gamma-ray spectra.

Panel 12 (Fig. 22): This panel showed the usefulness of a pool-type reactor for obtaining information on the effects of irradiating reactor components such as pumps, materials of construction, fuel elements, etc. An in-pile loop assembly was exhibited.



PANEL 12 (Fig. 22)



PANEL 15 (Fig. 23)

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Panel 13 (Fig. 23): This panel illustrated some chemical and physical effects of ionising irradiation. Two general types of changes were indicated. In the first, bonds of individual molecules are broken and cross-linking takes place. The polymerization of ethylene is an example. The second type of change is a degradation of physical properties; for example, a decrease in tensile strength, hardness, etc. Samples were included of irradiated polyesters, natural rubber, butyl rubber, phenols, cellulose, fluorothene and nylon.

Panel 14 (Fig. 24): The last panel, as a visitor left the reactor building, summarized the uses of a pool-type reactor, and featured a montage of photographs taken at the Oak Ridge School of Reactor Technology, at the Argonne National Laboratory and elsewhere. Included were a series of typical graphs obtained by students during the course of instruction.

ATTACHMENT 2 -- DAILY ATTENDANCE -- GENEVA REACTOR

	<u>Daily</u>	<u>Total</u>
July 18 - August 6	1420	1420
August 7	2050	3470
August 8	1310	4780
August 9	1155	5935
August 10	3920	12855
August 11	3629	16484
August 12	4127	20501
August 13	3771	24272
August 14	4483	28755
August 15	3949	32704
August 16	5027	37731
August 17	4866	42599
August 18	5002	47601
August 19	5729	53330
August 20	5563	58893
August 21	4480	63373

HOURS: Monday -- Saturdays: Delegates 9:00 AM -- 3:00 PM
Public 4:00 PM -- 10:00 PM

Sunday: Public 9:00 AM -- 10:00 PM

ATTACHMENT 2 -- MEMORANDUM OF TRANSFER

In accordance with Article I of an Agreement for Cooperation dated July 18, 1955 between the Government of Switzerland and the Government of the United States of America, The UNITED STATES ATOMIC ENERGY COMMISSION, on behalf of the Government of the United States of America, in consideration of the sum of One Hundred Eighty Thousand dollars (\$180,000) (U. S.), the receipt of which sum in United States currency is hereby acknowledged, does hereby TRANSFER to the GOVERNMENT OF SWITZERLAND, all right, title and interest in the research type nuclear reactor which the United States Atomic Energy Commission has constructed, located and operated, on the grounds of the Palais des Nations in Geneva, Switzerland in connection with the International Conference on the Peaceful Uses of Atomic Energy sponsored by the United Nations and held in Geneva, Switzerland in August, 1955, together with the reactor and exhibition building, associated machinery, and exhibits in the reactor building belonging to the United States Government, but not the reactor fuel. An inventory of the specific items of property hereby transferred is attached to this Memorandum as "Annex A" and made a part hereof.

This transfer is made subject to the following:

1. With respect to each item of property transferred, including the reactor - -

a) The terms, condition, provisions and guarantees of aforesaid agreement for Cooperation shall apply.

b) The transfer is on an "as is" basis, and no warranty - expressed, implied, or statutory - is made by the United States Atomic Energy Commission.

c) The Government of Switzerland shall indemnify and save harmless the United States Atomic Energy Commission and the Government of the United States of America against any and all liability (including third-party liability), loss, damages, costs or expenses of any kind and for any cause whatsoever hereafter arising out of the design, construction, installation, utilization, or transfer of the property by the United States Atomic Energy Commission or hereafter arising out of the use of the property in Switzerland.

2. The transfer is on a "where is" basis, and title shall pass at the grounds of the Palais des Nations in Geneva, Switzerland.

The Government of Switzerland shall be responsible for removing the property and restoring the grounds of the United Nations at the Palais des Nations to their condition prior to the installation there of the property transferred and without any costs to the United Nations or to the Government of the United States of America, notwithstanding any prior agreement with respect to such restoration between the United Nations and the United States.

3. This Memorandum of Transfer shall enter into force at 12:00 noon on August 22, 1955.

IN WITNESS WHEREOF THIS document has been executed by the Chairman of the United States Atomic Energy Commission, who is duly authorized to perform such act for the Commission, and accepted by the Chairman of the Swiss Commission for Nuclear Research, who is duly authorized to perform such act and to bind the Government of Switzerland to the stated conditions of the transfer.

Done at Geneva, Switzerland this 20th day of August, 1955.

Accepted:

United States
Atomic Energy Commission

For the Government of Switzerland

ATTACHMENT 3 - REACTOR BROCHURE

DISTRIBUTED AT GENEVA

United States Research Reactor



INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY

PALAIS DES NATIONS GENEVA

AUGUST 8 TO 20, 1955



1035668

Foreword

The U. S. Research Reactor exhibited in operation at the International Conference on the Peaceful Uses of Atomic Energy in Geneva is one of several types of compact, versatile and relatively inexpensive reactors that can be constructed and operated for research, educational and engineering test purposes.

This booklet describes briefly the reactor and the exhibit panels displayed in the same building. More detailed information is available in the U. S. Technical Library, near Salle XV in the Library wing of the Palais des Nations.

The U. S. Research Reactor was constructed beginning in March, 1955, at Oak Ridge National Laboratory, and assembled for testing late in May. Meanwhile, work had been started on the special building in Geneva, and by June 17 it was completed. The reactor was flown from the United States and installed in July. A period of testing preceded the official opening August 8.

The active core of the reactor is composed of uranium, enriched to 20 per cent in uranium-235, and enclosed in aluminum "sandwiches." The fuel lattice is immersed in a pool of water, giving rise to the colloquial expression "pool-type reactor." The water acts as a coolant, a moderator, and a radiation shield, and permits complete visibility of the reactor core and of experiments in progress.

The reactor operates at a power level of 10 kw. nominal and 100 kw. maximum, and contains 3.6 kg. of U^{235} .

The uranium, 20 per cent enriched, which is used in this reactor, is the same type that has been offered by the President of the United States to other nations for the construction of research reactors, in furtherance of the policy to promote worldwide peaceful uses of atomic energy. Two hundred kilograms of the material have been set aside by the President for this purpose.

President Eisenhower has also announced that the United States Government is prepared to help provide research reactors for other free nations and to contribute half of the cost, as well as to furnish the nuclear fuel required.

ABOUT THE REACTOR

The core of the reactor consists of 23 fuel elements compactly arranged and mounted on an aluminum grid plate supported from the bottom of the tank. Three of the fuel elements contain holes that are designed for insertion of control and safety rods; one special piece is designed to hold a neutron source to facilitate control of the reactor during starting operations.

The blue glow associated with the operating reactor is known as the Cerenkov effect, caused by the slowing down of high-energy radiation in the water with the release of part of the energy as visible light.*

The total loading of the reactor is approximately 18 kg. of uranium of which 20 per cent, or 3.6 kg., is U^{235} .

The pool of water in which the reactor is immersed is contained in a steel tank 10 feet in diameter and 22 feet deep, the lower 18 feet buried in the ground. The tank contains approximately 13,000 gallons of ordinary water, which has been demineralized by passing through a mixed-bed ion exchange unit that produces water of a quality approximating that of distilled water. The depth of water above the reactor core is 16.5 feet, which at the reactor operating power of 10 kw. pro-

vides sufficient shielding to reduce the radiation level at the water surface to about 0.5 mr/hour, or about one fourth of the intensity of radiation given off by the surface of a radium-dial wrist watch. The amount of radioactivity induced in the water is quite low and any traces are continuously removed by recirculating the pool water through another ion exchange unit. (See Panel 14.)

Three movable rods containing boron carbide are used to control the reactor. Electromagnets attached to each of the electric-motor-driven rod mechanisms provide a means of coupling the drive units to the control rods.

The panel behind the glass doors to the right is used to control the reactor. This assembly is more extensive than that normally employed with a reactor of this power. The nuclear instrumentation provided is adequate for high-power, short-period reactors. In addition, a completely automatic start-up has been provided, as well as a simple servomechanism to maintain constant power.

Electrical devices are used to indicate the position of the three control rods. Switches are used to limit the travel of the rods. The speeds at which the control rods may be withdrawn and, therefore, the rate of reactivity addition is limited, permitting a total

*More fully described in an article by W. H. Jordan in *The Scientific American*, a reprint of which is available in the U.S. Technical Library adjacent to Salle XV.

start-up time of about seven minutes.

The reactor control and safety system consists of three neutron-level safety channels, two counting-rate channels, one period channel, and one linear channel connected into a servo-control mechanism.

On many reactors only two safety circuits are used; on this reactor an extra circuit is provided as an additional safety measure. The radiation level is constantly measured at three locations—the control room, the water demineralization room, and the area around the reactor pool. If the radiation level should become too high at any of these points (or if the instru-

ments themselves become inoperative), an alarm is sounded and the motors on the control rods will reverse, driving the rods into the reactor core and immediately stopping the chain reaction. In addition to these safety devices, another instrument constantly samples the air in the room, measures the amount of radioactivity (if any), and sounds an alarm if the air should become contaminated.

Complete data on the nuclear characteristics will be found on Panel No. 6, to the left of the reactor pool. Technical personnel in attendance will be happy to answer questions concerning the design and operation of the reactor.

EXHIBIT PANELS

PANEL NO. 1

Fuel Elements

The reactor is operated with uranium containing 20 per cent U^{235} incorporated into aluminum, curved-plate-type fuel assemblies, which were designed specifically for service in low-temperature, high-neutron-flux research reactors.

The fuel plates consist of enriched UO_2 particles uniformly dispersed and imbedded in a matrix of aluminum powder, which is clad on all sides with

high-purity aluminum sheets. The core, or fuel-bearing, section of the composite plate is composed of 54 per cent (by weight) UO_2 and 46 per cent aluminum powder. Pressed powder cores are jacketed by the so-called "picture-frame" technique, which hermetically seals the uranium dioxide from exposure to the cooling water. The hot-rolling operation employed in fabrication results in a sound metallurgical bond between the cladding layers and core matrix. The core of the composite

fuel plate is 0.025-inch thick and the cladding on each side is 0.0175-inch thick.

Eighteen of these composite plates are assembled into a single unit, which is designated as a fuel element or assembly. The fuel plates are spaced 0.117-inch apart and brazed into a pair of aluminum spacer plates. This type of construction is employed to yield a high surface-to-volume ratio, permitting a rapid transfer of heat to the water used as a coolant.

An aluminum end-box casting is welded onto the lower end of the fuel assembly and positions the fuel element in the supporting grid. Each standard (18-plate) fuel unit contains 967 G of UO_2 or 170 G of U^{235} .

PANEL NO. 2

Reactor Section

This panel shows the mechanical arrangements of the control rod in the reactor lattice, with its associated drive mechanism. Starting with the components at the bottom of the display, the first item is the grid plate, which supports the fuel elements. Hollow cylindrical adapters on each fuel element fit in the holes in the grid and permit water to rise convectively up through the grid and the fuel plates as the neutron flux heats the fuel plates. Sections of the adapters are mounted in the grid plate.

Cutaway sections of dummy fuel elements mounted in the grid plate show the difference in construction between

the regular fuel element and the control rod fuel element. The control element has the nine center plates removed to permit the insertion of the boron carbide neutron absorber rod, which controls the neutron flux level of the reactor.

The reactor is brought to power by withdrawing the boron carbide rods from the reactor lattice. This action is only possible when the control rod is supported by the electromagnet. The electromagnet moves inside a guide tube to maintain proper alignment between the electromagnet and the boron carbide rod and connects to the rack of the drive unit through a universal joint. The clutch switch is a device that indicates whether or not the electromagnet is supporting the control rod.

A quick shutdown of the reactor is obtained by cutting off the current to the electromagnet. This drops the boron carbide rods into the lattice, thereby rapidly reducing the neutron multiplication. Each rod is equipped with a piston-type shock absorber to protect it and to prevent recoil of the rod.

PANEL NO. 3

Uses of the Enriched U^{235} Reactor

The various principal uses of an enriched U^{235} pool reactor in the fields of education in nuclear science, nuclear physics research, reactor design, radioisotope production, activation analysis,

study of radiation effects, and biomedical research are described briefly. Further details are given in subsequent panels.

(Near Panel 4)

Nuclear Reactor Simulator and Model Reactor

The neutron flux in a nuclear reactor increases when a neutron-absorbing control rod is moved out of the fuel element lattice. An electronic reactor simulator was developed at Oak Ridge National Laboratory to demonstrate the way in which the neutron flux can be made to vary in a reactor. This device has been used primarily to check the action of automatic control circuits of the reactor. In this Nuclear Reactor Simulator display, the simulator has been built into a panel to demonstrate the control of a nuclear reactor. This simulator can be operated by visitors to this building.

The instrumentation for the simulator panel includes the nuclear reactor simulator, the simulator power supply and a Log-N amplifier. The Log-N circuit amplifies the voltage from the simulator, which represents power level, and extracts period* information. The signals for the power level and the period are fed into two recorders on the panel.

The flux recorder indicates the power level of the reactor and has an

automatic "scram" or shutdown if the indicated power level exceeds a predetermined level. The period recorder indicates the rate at which the power level is changing. The automatic shutdown on this recorder is activated if the period is shorter than five seconds.

The rod control and rod position indicators are used in conjunction with the model reactor, which is a full-scale plastic facsimile of the core of the operating U. S. Research Reactor. This model can be used with the nuclear reactor simulator control panel to demonstrate the action of introducing excess reactivity (Δk) into a reactor. The control rods can be withdrawn by means of the rod control switch on the simulator panel. Changing the rod positions will also change the voltage in the simulator circuits, a larger amount causing the reactor flux level indicator to increase more rapidly, as indicated on the period recorder. As the power level indicator changes, the voltage applied to lights in the model reactor will change in the same manner; thus the model resembles a working reactor. The simulator controls can be set so $k = 1$ at a selected flux level, and the model will operate like a manually controlled reactor. A magnetic clutch arrangement allows the control rods to be dropped by a scram, thereby shutting down the reactor. The scram can be initiated manually by a scram switch, or by simulated safety circuits in the two recorders.

*The "period" is the time required for the power to change by a factor equal to e (2.7183).

PANEL NO. 4

Radiation Detection and Protection of Personnel

Special instruments for the detection of radiation are shown. There are two main types of hazard—exposure to external radiation, which penetrates the body, or actually swallowing or breathing small amounts of radioactive material. The basic concepts of protection against radiation—time, distance, shielding, and protective clothing—are demonstrated, together with practical methods for decontamination.

PANEL NO. 5

Neutron Therapy

This panel shows how a beam of neutrons from a reactor, such as the pool reactor, is used directly for killing tumor tissue in the brain, with the help of boron. It has been found that, if sodium borate is injected intravenously, the boron is taken up preferentially by the tumor tissue, absorbing three times as much as the surrounding normal brain tissue. When thermal neutrons react with boron-10, a neutron is captured and an alpha particle is ejected. Because the alpha particle is very energetic and has a short range, it produces intense ionization within the tissue. Because the range of the alpha particle in tissue is only 36 microns (or about the diameter of a sin-

gle cell) the intense alpha radiation is restricted to the tissue containing boron. Boron has a particularly great affinity or "cross section" for neutrons, roughly 700 times as great as other elements in tissue.

PANEL NO. 6

Specifications of the Reactor Core

Various data concerning the amounts and kinds of materials used in the reactor core and the nuclear constants are tabulated in this panel.

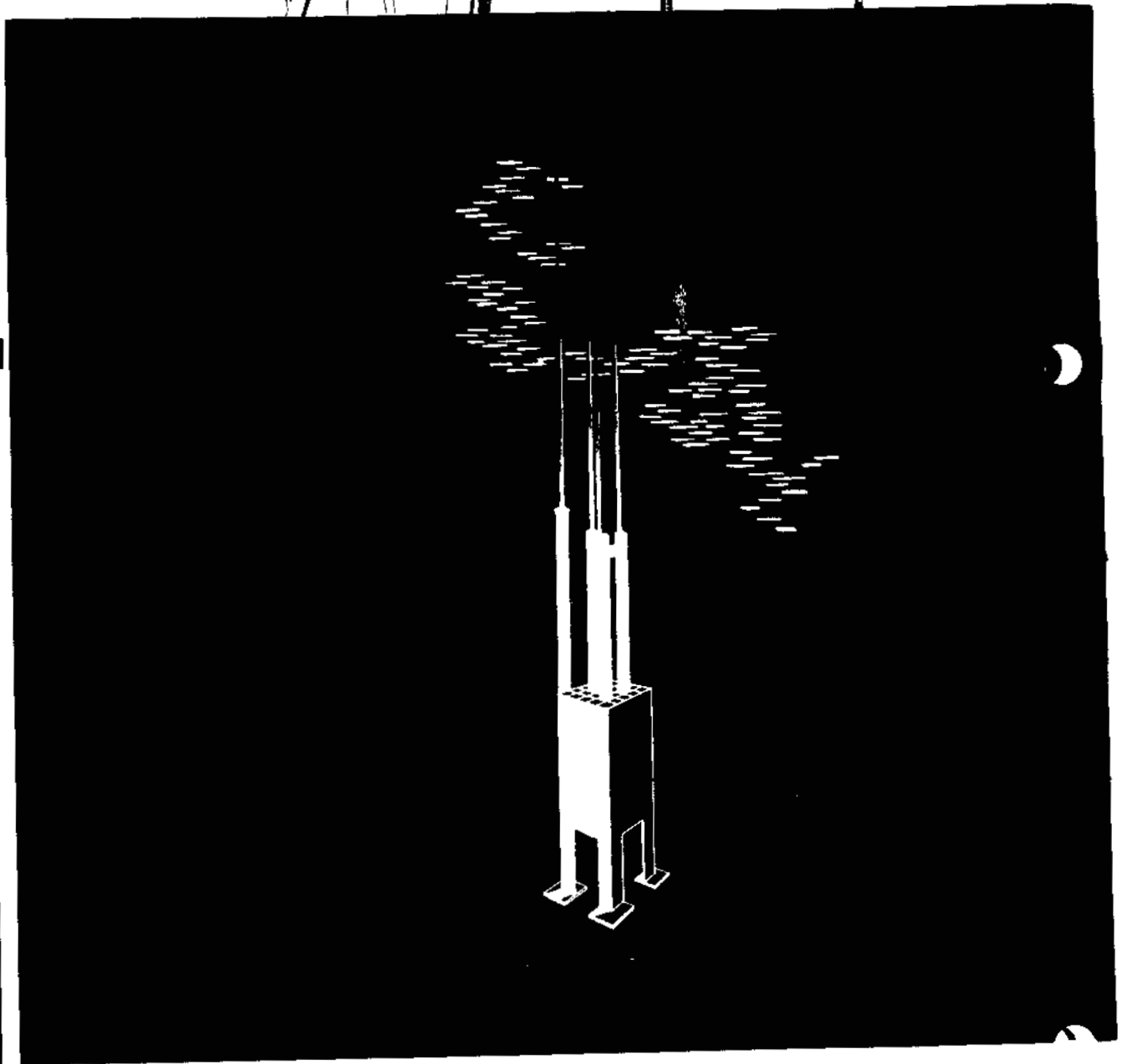
PANEL NO. 7

Reactor Design and Nuclear Research

This panel describes the use of a small reactor for research in connection with reactor design or nuclear physics.

(a) In the upper left, is an illustration of the effect of replacing part of the water reflector around an operating reactor with a void. The introduction of the void increases the neutron leakage from the reactor and hence reduces reactivity. If, then, a neutron-absorbing control rod is withdrawn an appropriate distance, the reactivity loss can be compensated for and the

CONTROL DRIVE
AND
INSTRUMENT PLATFORM



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reactor made chain reacting once again. The distance the rod is removed is a quantitative indication of the effect of the void on reactor criticality.

(b) In the upper right, is an illustration of the measurement of the energy released per U^{235} fission. One element of the reactor is isolated so that the temperature rise and flow of the cooling water can be carefully measured. The rate of fission within the fuel element is determined by observing the radioactivity of small U^{235} samples, which are separately inserted into the fuel element. The quotient of these two observations gives directly the energy released per fission.

(c) On the lower left, a shielding experiment is illustrated. In this example, a large block of shielding material is placed next to the reactor. The radiation intensity of the neutrons and gamma rays that penetrate the shield is measured with suitable instruments.

(d) At the lower right, the use of the reactor in conjunction with a thermal column is illustrated. In this example, a large block of graphite is used to slow down the fast neutrons to thermal energies. These thermal neutrons can then be used for any of a number of experiments. In the example illustrated, the thermal neutrons are used to cause fission, and the fast neutrons from the fission are measured in a spectrometer to obtain the energy spectrum of the fission neutrons. The prompt gamma rays accompanying fission can be measured in another spectrometer.

PANEL NO. 8

Research in Nuclear Engineering

One of the principal advantages of a pool-type research reactor is that it can be readily adapted to a wide variety of nuclear research. Coupled with the ease of obtaining relatively high neutron fluxes and high radiation intensities, this reactor is well adapted for performing engineering-type experiments necessary for the development of nuclear power reactors.

The experiments listed in Panel 8 comprise those which deal with the behavior of the reactor from the standpoint of heat removal, gas production, and stability, in addition to the utilization of the reactor as a neutron and gamma-ray source. In this latter regard, one important problem concerns the effect of radiation on various fluids that might be used in a nuclear power reactor of advanced design. The experimental assembly shown toward the bottom of the panel is a duplicate of the actual equipment used to irradiate an aqueous solution of a uranium salt at temperatures up to 300°C and pressures up to 2,000 pounds per square inch. In this experiment, the uranium solution is circulated by a completely sealed rotor pump of 20-liters-per-minute capacity through the cylindrical stainless steel bomb, where it is exposed to radiation. Metal samples can be placed within the bomb to test the effect of radiation on their corrosion by the solution. The remaining components of the assembly are for controlling the temperature and pressure

inside the loop and taking samples of the solution.

The in-pile loop assembly can also be used to test the radiation stability of coolants and other reactor fluids.

PANEL NO. 9

Chemical Effects of High-Energy Radiation

The effects of radiation on organic materials used in the plastic industry are shown. In general, two types of effects are observed: (1) building up, or cross-linking of simple molecules to form larger ones; (2) breakdown, or chain cleavage of complex molecules to produce smaller ones.

acrylonitrile in water, as shown in the first tube on the left. When the solution is irradiated, very active chemical groups are formed, which initiate the polymerization reaction. As the reaction proceeds, the acrylonitrile is transformed from a water-soluble monomer to a water-insoluble polymer after approximately 30,000 roentgens of radiation, as illustrated by the turbidity in the second tube. The reaction accelerates rapidly until finally the monomer is all converted and the solution has set into a stable gel in the last tube.

(b) Physical changes are produced in irradiated plastics and elastomers, as shown in the sets of various samples shown in the lower half of the panel. Both cross-linking and cleavage reactions proceed at varying rates, and the result depends on which reaction predominates, as shown in the following table:

Physical Property	Cross-Linking Predominant	Cleavage Predominant
Tensile Strength	Increased	Decreased
Hardness	Increased	Decreased
Young's Modulus	Increased	Decreased
Elongation	Decreased	Increased
Impact Strength	Decreased	
Melting Point	Increased	Decreased
Solubility	Decreased	Increased
Density	Increased	

(a) The first effect is illustrated by the polymerization of acrylonitrile, which is the monomeric parent of one of the synthetic materials used for textile fibers. The tubes all originally contained a seven per cent solution of

(c) Although the useful properties of all plastics and elastomers are ultimately destroyed by radiation, smaller doses of radiation can occasionally be used to improve a property of some plastics. For example, the melting

point of polyethylene can be raised by irradiation so that it can undergo heat sterilization without physical distortion.

PANEL NO. 10

The Reactor for Education in Nuclear Science

Students attending a reactor school may represent many different professions, among which may be mechanical, chemical and electrical engineers; physicists and chemists; mathematicians; marine architects; and many others. Actual experimental work with a reactor is one of the best teaching methods.

For some experiments, the reactor is used only as a source of neutrons. A neutron beam is useful for many experiments, such as measurement of the fission cross section of uranium and the number of neutrons emitted per fission.

For experiments with the reactor itself, the students operate the controls. In one experiment, the students insert the fuel elements one by one and, with a neutron source and a fission counter, study the approach to the "critical" loading. In another experiment, the reactor is shut down by use of the control rods. The reactor is allowed to cool off, as judged by the temperature of the uranium. It is then restarted and the negative temperature coefficient of reactivity is measured experimentally. During all these

operations the students acquire knowledge regarding the critical mass and geometry of the reactor, the speed with which control rods can be inserted or withdrawn, the positions at which neutron flux measurements are made, the time of response for changes in reactor operations, and the precautions necessary for personal safety.

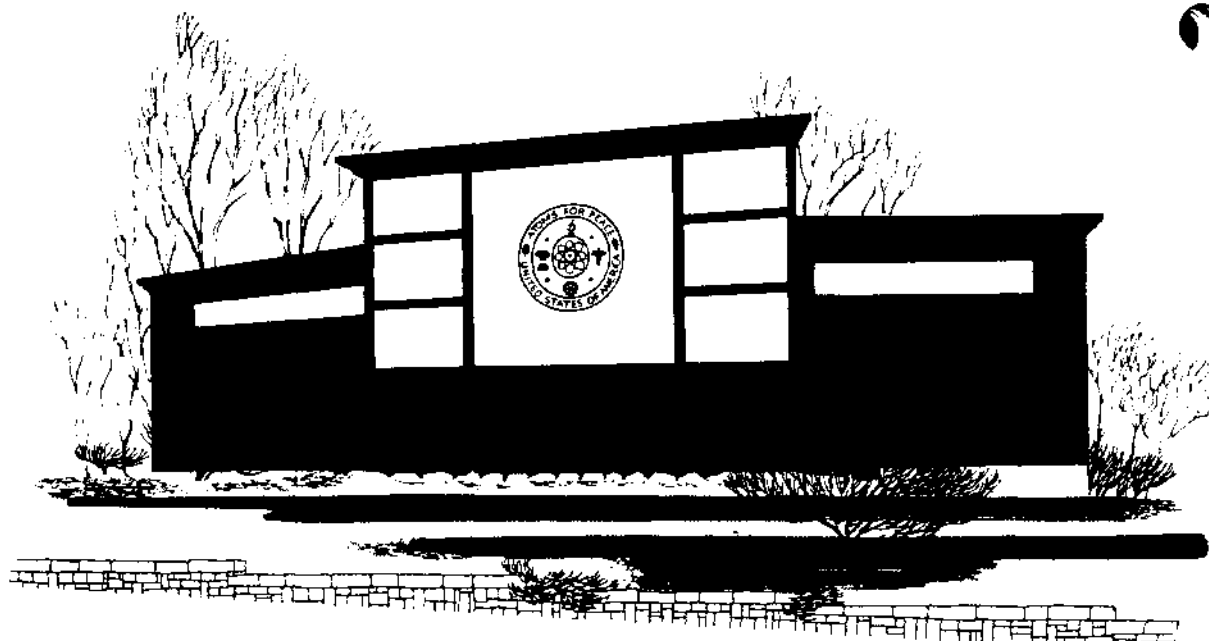
PANEL NO. 11

Production of Radioisotopes

The pool reactor is well suited for the production of millicurie quantities of most radioisotopes. Because the core is easily accessible, capsules containing materials to be irradiated can be placed adjacent to the reactor in a simple holder, and the sample later removed with long tongs. Pneumatic tubes containing light aluminum capsules can also be used to position materials outside the core for thermal neutron irradiation, or inside the core for fast neutron irradiation. The capsules are blown through the tubes with compressed air.

Short-lived radioisotopes may be produced quite conveniently, and by a system of pneumatic tubes the radioisotopes produced can be delivered to nearby laboratories in a few seconds.

With the reactor operating at 100 kw., the neutron flux approximates 5×10^{11} neutrons/cm²/sec; useful amounts of many radioisotopes can therefore be prepared with adequate specific activity for most applications, as shown in the following table:



Nuclide	Half Life	Specific Activity (mc/g element)
Na ²⁴	14.9 h	210
K ⁴²	12.4 h	14
Br ⁸²	35.5 h	180
Au ¹⁹⁸	2.7 d	3,300
Cu ⁶⁴	12.9 h	340
Sb ¹²²	2.8 d	210
As ⁷⁶	26.8 h	440
Cd ¹¹⁵	43.0 d	20
Ga ⁷²	14.2 h	150
La ¹⁴⁰	40.0 h	460
Hg ¹⁹⁷	2.7 d	150
Os ¹⁹¹	15.0 d	65
Pd ¹⁰⁹	13.1 h	220
Pr ¹⁴²	18.9 h	630
Rb ⁸⁶	19.5 d	31
W ¹⁸⁷	24.1 h	420
Y ⁹⁰	2.5 d	93

PANEL NO. 12

Neutron Activation Analysis

Neutron activation analysis involves the irradiation of a sample in the reactor (or other source of neutrons) and the subsequent identification of the radioisotopes produced by their specific radiation characteristics. The method of analysis can be made either qualitative or quantitative. For quantitative analysis, standard samples containing known concentrations of the suspected elements are irradiated at the same time as the unknown sample.

This type of analysis has proved particularly useful where the concen-

tration of the unknown element is too low to be identified by conventional methods of analysis, or where conventional methods are rendered invalid by interfering contaminants. The method is unique in that after a microquantity of element has been made radioactive, it may be diluted with amounts of the same (non-radioactive) element large enough to enable one to use ordinary chemical separation procedures while the original microquantity retains its identity.

Neutron activation analysis has been used successfully in analyzing for almost every type of substance.

PANEL NO. 13

Changes in Crystal Structure Due to Radiation

Crystals are made up of the simple orderly array of atoms, which form solids. When such an orderly atomic arrangement is exposed to bombardment with energetic neutrons, this stable array may be partially or completely destroyed by the atomic displacement.

Large changes in the physical properties of such solids may be detected by X-ray diffraction, as shown by the diffraction photographs of irradiated quartz crystals in the exhibit.

(a) Increasing amounts of neutron irradiation causes quartz crystals to expand anisotropically (unequally in different directions), eventually increasing the crystal volume by 14.7 per cent. The orderly atomic array of the crystalline lattice becomes increas-

ingly distorted until coherent X-ray diffraction patterns can no longer be observed and the crystal becomes essentially amorphous (random atomic arrangement). Oddly enough, no flaws in the crystal can be observed by the naked eye despite these large volume changes.

The Brazilian quartz crystal shown under the magnifying glass was exposed to 7.6×10^{19} neutrons/cm² and subsequently annealed at 950°C for 30 minutes. Parallel to the C-axis, and in the twin bands, two rows of holes were formed. These are nearly regularly spaced, about 0.3 mm. apart, and are about 0.05 mm. in diameter extending entirely through the 5-mm.-thick crystal. The formation of these holes is probably related to the C-axis twin bands, interstitial channels and the anisotropic expansion of quartz upon neutron bombardment. A possible explanation of this hole formation is that an A-axis strain is set up in the crystal because of the crowding of oxygen atoms into interstitial channels; the subsequent thermal diffusion of these trapped atoms out of the channels results in a strain release over some very small distance perpendicular to the C-axis. This strain relaxation may result in the generation of macroscopic holes parallel to the C-axis.

(b) The copper single-crystal tuning forks demonstrate an effect of neutron irradiation upon the damping capacity, or internal friction, of copper single crystals and, quite probably, of metal crystals in general. An irradiated specimen tuning fork "rings" while an unirradiated one does not. This is because the neutron irradiation has lessened the internal friction so that energy, which is dissipated internally in the unirradiated tuning

fork, remains as vibrational energy to be dissipated as sound in the irradiated one.

It is interesting to note that only a relatively small number of neutrons are required to produce the ringing. The ringing has been obtained with irradiations in the range of 1.5×10^{14} to 1.5×10^{18} total neutrons/cm². If it is assumed that one incident-fast neutron can produce 100 interstitial-vacancy pairs, and the average scattering cross section of copper is 6 barns, this corresponds to the production of only 0.000009 to 0.09 per cent of the possible interstitial-vacancy pairs.

(c) When electrons in insulators such as glasses or alkali halides are displaced from their normal energy levels, they may become trapped in less stable configurations. In these new configurations, the electrons are more easily excited to higher energy levels, and this may result in absorption of visible light.

The colors shown in the exhibit in KCl and KBr result from F-centers, which are electrons trapped at negative-ion vacancies. The NaCl had an amber color immediately after irradiation, but subsequent bleaching of F-centers by light, accompanied by formation of other color centers, resulted in change of color. The yellow color of LiF is thought to be due to M-centers, which consist of an electron trapped in a configuration of one positive and two negative-ion vacancies.

Colors in vitreous silica are probably due to electrons trapped at impurities in the silica. The exact nature of the color centers in glasses is not known.

PANEL NO. 14

Water Demineralization

It is desirable to remove mineral salts from the reactor cooling water to prevent the activation of various impurities, particularly sodium, and to inhibit corrosion of the reactor metal.

This exhibit is a schematic representation of the demineralization process, which produces water of about the same quality as distilled water (resistivity, approximately 500,000 ohm/cm). Ion-exchange resins (synthetic organic materials) are used to remove both the dissolved cations (e.g., Ca^{++} , Mg^{++}) and anions (HCO_3^- , SO_4^{--}). Initially, the active groups of the cation-exchange resin are saturated with hydrogen ions (H^+); these are exchanged for the mineral cations, Ca^{++} , Mg^{++} , etc. The anion resin is initially saturated with hydroxyl ions (OH^-), which are exchanged for Cl^- , HCO_3^- , SO_4^{--} , etc. The hydrogen and hydroxyl ions when released combine to form pure water; the net result is that the mineral salts are taken out and replaced with pure water.

The ion-exchange resins may be regenerated by treating the cation resin with acid (to supply H^+) and the anion resin with alkali (to supply OH^-).

The reactor cooling water absorbs some impurities from the tank wall and reactor parts, particularly extremely minute amounts of short-lived radioactive Al^{28} , Mg^{27} , and Na^{24} , which "recoil" from the reactor aluminum parts when struck by energetic neutrons in the reactor core. These impurities are also removed by recirculating the reactor water through an ion-exchange unit.

UNITED STATES REPRESENTATIVES

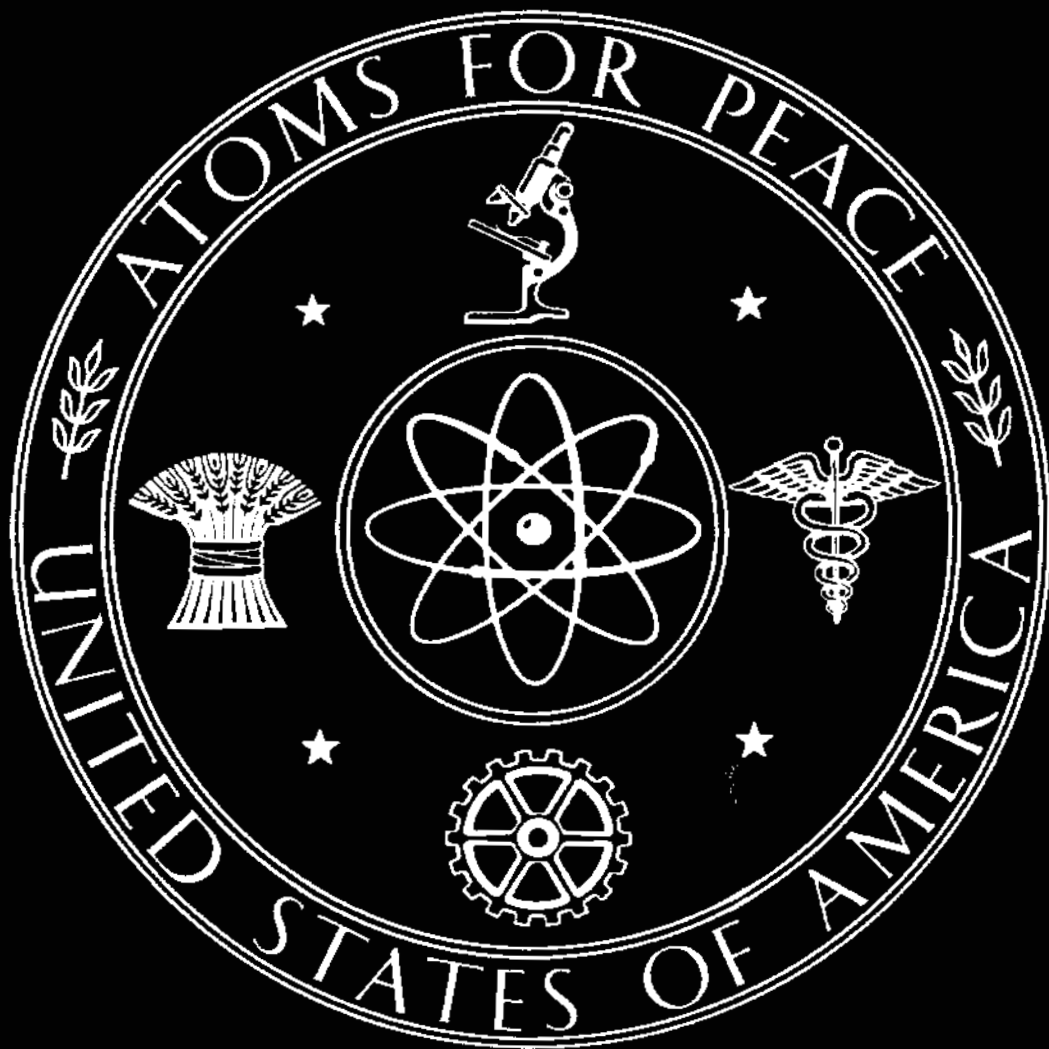
TO THE

INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY



Chairman LEWIS L. STRAUSS, Chairman, United States Atomic Energy Commission
Vice-Chairman DR. WILLARD F. LIBBY, Member, United States Atomic Energy Commission
DR. I. I. RABI, Professor of Physics, Columbia University; Vice-President
of the Conference
DR. DETLEV W. BRONK, President, National Academy of Sciences
DR. SHIELDS WARREN, Scientific Director, Cancer Research Institute,
New England Deaconess Hospital, Boston, Massachusetts
HARRY S. TRAYNOR, Executive Officer DR. GEORGE L. WEIL, Technical Director

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APPENDIX VI - THE U.S. TECHNICAL LIBRARY EXHIBIT AT GENEVA

The U.S. Technical Library exhibit installed in the Palais des Nations in Geneva for the International Conference on the Peaceful Uses of Atomic Energy included a depository collection similar to those which the United States is providing to cooperating nations. The depository collection was presented to the United Nations after the conference.

Contained in the Library were approximately 7,000 technical reports of which about 5,000 were in printed or photostat form and the remainder on microcards. This comprehensive collection provided information, that, coupled with information previously published in technical journals and books, represents the total contribution of the United States to the unclassified and declassified scientific literature on atomic energy. Guides to the literature, journals of abstracts, and librarians' manuals, were included to simplify reference. An assembled card catalog arranged by subject, author, and report number provided an index.

Books sponsored by the US Atomic Energy Commission formed an important part of the depository collection. These included the National Nuclear Energy Series, text books, and training manuals.

The Technical Library exhibit also included over 150 books on atomic energy contributed by American publishers and a display of technical and business journals published in the United States.

Booklets, pamphlets and data sheets prepared by private companies which exhibited products, equipment, and processes in the U. S. Technical Exhibit in the nearby Room XV of the Palais des Nations and the U. S. Reactor Building on the Palais grounds, were available in the Technical Library. For the convenience of delegates and visitors, a card index of this material was also available.

To summarize, the U. S. Technical Library contained:

- a. The AEC depository collection
(5200 full-size copies of printed and photostated reports, 55,000 index cards; and other materials described in Appendix 4)
- b. Books on atomic energy furnished by publishers. (150 titles)
- c. Journals containing articles on atomic energy. (82 titles)

- d. Material describing the components of the U.S. Exhibition.
(48 reports, 4 copies each)
- e. Microcards of AEC reports. (Approximately 7,000)
- f. Two microcard readers.
- g. Conference papers. (2 sets)
- h. Complimentary commercial exhibit literature.
(89 different items, approximately 17,000 copies)

Detailed lists of the above materials included in the Technical Library collection are attached as Attachments (1) List of Books, (2) List of Journals, (3) List of Exhibit Literature. A list of U. S. AEC Depository Libraries is given in Attachment 4.

The Library served three functions:

1. As a display, graphically demonstrating the very large amount of technical information generated and made available in the United States and to cooperating nations through Government and commercial channels, calling attention to the foreign depository library program.
2. As a working reference library serving the delegates and other technical people attending the Conference.
3. As a distribution point for the 8 volumes of Selected Reference Material which the Chairman at the U. S. Delegation presented to UN officials and to the Official Representatives of the various nations participating in the Conference.

A 1200-square foot room (B-130), known as the Salle Chinoise on the second floor of the Library wing of the Palais des Nations was made available by the United Nations to house the library exhibit. The UN Chief Librarian, Dr. A. C. Breycha Vauthier, provided all equipment and supplies for day-to-day operation.

On Sunday, August 7, the Library was opened at 2:00 p.m. for a press preview and remained open until 6:00 p.m. for official visitors. It was formally opened to Conference delegates and observers on August 8, and remained open from 10:00 a.m. to 9:00 p.m. daily until August 21, except on Sundays, when hours were 10:00 a.m. to 7:00 p.m. The general public could visit ~~after~~ 4:00 p.m. each day.

On the basis of attendance records maintained by the Library staff, an estimated total of 19,500 persons used or visited the Library during the Conference. The record of daily attendance is attached as Attachment 5. Approximately two-thirds of the persons

visiting the Library were delegates or observers, and one-third were from the general public.

Chairman Strauss, Dr. Libby and Dr. Rabi visited the Library on several occasions.

Most Library visitors were delegates, technical people from industry, research institutes, hospitals, and universities. Many undertook library research. Members of the staff explained the contents of the Library and the information available to all, individually or in groups who visited the Library for the first time. Three of the staff spoke French, as well as English, and one spoke Russian.

In return for United States publications which they received in the Library, USSR delegates presented two sets of their Academy of Science Conference Proceedings on Atomic Energy (Moscow, July 1-5, 1955), three sets of Conference papers, and approximately 20 books and monographs from their collection displayed in the Russian technical exhibit.

A large number of delegates inquired about availability of materials displayed. Approximately 8,000 copies of fact sheets were provided to the delegates and other visitors. The sheets listed the contents and distribution of the libraries, including a list of the 30 which had been given under the President's "Atoms for Peace" program.

Distribution of Material to Delegates

The distribution of the 8-volume Special Reference Material collection, presented to UN officials and to official representatives of the various delegations by the United States was handled by the Technical Library. Representatives were invited to visit the Technical Library where they received the Introductory Volume, and could give the address to which they wished the rest of the volumes sent (see Appendix VIII for details).

A listing of 16 technical documents which was distributed to the delegates visiting the Library appears as Part 3 of Attachment 3. Copies of these documents were on display in the Library and given to delegates on request. One thousand copies of most items were available.

Microcards

The Technical Library collection of 11 catalog drawers of microcards represented all 7,000 AEC unclassified and declassified

reports which have not been published. Three microcard readers were loaned for the exhibit: one manufactured by Microcard Corporation, one by Microlex Corporation, and one by Eastman Kodak Company.

Commercial Exhibit Literature,
Technical and Business Periodicals,
and Books

Commercial exhibit literature relating to the U.S. Technical Exhibit was displayed on shelves along one wall of the Library. This group included 89 separate items (listed in Attachment 3) which were made available in an average of 200 copies each to all visitors of the Library - the only materials that could be handed out to the public.

Technical and business periodicals were contributed by U.S. publishers and included professional scientific journals, engineering journals, and those representing the trade and business press (list in Attachment 2). The journals attracted a great deal of attention and many visiting delegates asked how to place subscriptions.

The display of commercially published books on atomic energy was one of the most popular features of the Library collection. Designed to show the type of monographic literature available in the United States, the collection was comprehensive. Most of the books were contributed by U. S. publishers who were members of the American Book Publishers Council. One thousand copies of a mimeographed list of publications in this collection were distributed.

Presentation of U. S. Technical Library to the United Nations

On August 20, Dr. Willard F. Libby, Vice-Chairman of the U.S. Delegation, presented to the United Nations Library in Geneva, the U.S. Technical Library which had been operated as part of the United States Technical Exhibit at the Conference. The gift of the Library was received for the United Nations by Dr. A. C. Breycha Vauthier, Chief Librarian (see photo No. 9; press releases in Attachment 6).

Dr. Libby pointed out that the Technical Library presented to the United Nations would be kept up-to-date by the U.S. Atomic Energy Commission which will provide, as they are issued, all new unclassified published documents originated in the AEC program. Dr. Libby pointed out that the Library is a depository collection similar to those which the AEC maintains at 45 points in the United States and has presented to 29 other nations and to the European Organization for Nuclear Research (CERN).



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Operation of the Library was turned over to the UN Chief Librarian by the U. S. staff on August 22 and members of the UN staff were instructed in the contents and methods of operation of the Technical Library.

ATTACHMENT 1 - LIST OF UNITED STATES TECHNICAL BOOKS AND
MONOGRAPHS ON PEACEFUL USES OF ATOMIC ENERGY INCLUDED IN
U.S. TECHNICAL LIBRARY EXHIBIT.*

ANNUAL REVIEW OF NUCLEAR SCIENCE

Stanford, California, Annual Reviews, Inc.
Vol. I - 1952
Vol. II & III - 1953
Vol. IV - 1954

ATOMIC ENERGY IN INDUSTRY

New York, National Industrial Conference Board, Inc.

1. Minutes of special conference, October 16-17, 1952
2. Minutes of 2nd conference, October 29-30, 1953
3. Minutes of 3rd conference, October 13-15, 1954

ATOMIC ENERGY LAW REPORTER

New York, Commerce Clearing House, 1955

ATOMIC ENERGY PRIMER FOR MANAGEMENT

New York, National Industrial Conference Board, 1955

A FORUM REPORT

New York, Atomic Industrial Forum, Inc.

1. Business opportunities in atomic energy - May 1954
2. Nuclear reactor development - July 1954
3. The new atomic energy law - What it means to industry - November 1954
4. A forum survey - A growth survey of the atomic industry, 1955-65 -1955

BEHRENS, Charles F.

Atomic medicine, 2nd ed., Baltimore, Williams & Wilkins, 1953

BLACKWOOD, O.H. Osgood, and T.H. Ruark, A.E.

Outlines of atomic physics, 3rd ed., New York, Wiley, 1955

BLATT, John M. and WEISSKOPF, Victor F.

Theoretical nuclear physics, New York, Wiley, 1952

BLEULER, Ernst and GOLDSMITH, George J.

Experimental nucleonics, New York, Rinehart, 1952

BRADFORD, John R.

Radioisotopes in industry, New York, Wiley, 1953

*Commercially published books listed were contributed by United States publishers.

BUILDING RESEARCH ADVISORY BOARD, National Research Council - National Academy of Sciences
Laboratory design for handling radioactive materials; Research Correlation conference preceedings, BRAB Conference report No. 3, Washington, Building Research Advisory Board, National Research Council - National Academy of Sciences, 1952

CHEMICAL ENGINEERING PROGRESS SYMPOSIUM SERIES

New York, American Institute of Chemical Engineers.
No. 5, Vol. 49 - Heat transfer (Atlantic City) - 1953
No. 11, Vol. 50 - Nuclear Engineering, pt. I - 1954
No. 12, Vol. 50 - Nuclear Engineering, pt. II - 1954
No. 13, Vol. 50 - Nuclear Engineering, pt. III - 1954

CLARK, George L.

Applied X-rays, 4th ed., New York, McGraw-Hill, 1955

CORK, James M.

Radioactivity and nuclear physics, 2nd ed., New York, Van Nostrand, 1950

DEAN, Gordon

Report on the atom, New York, Knopf, 1953

DEAN, Gordon

Atom Waffen oder Isotope, Wien, Heidelberg, 1955

DEAN, Gordon

Atomo: vita e morte, Milano, Sperling & Kupfer, 1953

FEENBERG, Eugene and PAKE, George Edward

Notes on the quantum theory of angular momentum, Cambridge, Massachusetts, Addison-Wesley, 1953

FEENBERG, Eugene

Shell theory of the nucleus, Princeton, Princeton University Press, 1955

FERMI, Enrico

Elementary particles, New Haven, Connecticut, Yale University Press, 1951

GLASSTONE, Samuel, and EDLUND, Milton C.

The elements of nuclear reactor theory, New York, Van Nostrand, 1952

GLASSTONE, Samuel

Principles of nuclear reactor engineering, New York, Van Nostrand, 1955

- GLASSTONE, Samuel
Sourcebook on atomic energy, New York, Van Nostrand, 1950
- A GLOSSARY OF TERMS IN NUCLEAR SCIENCE AND TECHNOLOGY
American Society of Mechanical Engineers, New York, 1955
- GOODMAN, Clark
The science and engineering of nuclear power, Vol. I, Introduction to pile theory, 2nd ed., New York, Addison-Wesley, 1952
- GOODMAN, Clark
The science and engineering of nuclear power, Vol. II, Applications of nuclear energy, Cambridge, Mass., Addison-Wesley, 1949
- GORDY, Walter, et al.
Microwave spectroscopy, New York, Wiley, 1953
- GREEN, Alex E. S.
Nuclear physics, New York, McGraw-Hill, 1955
- GURNEY, Ronald Wilfrid
Introduction to statistical mechanics, New York, McGraw-Hill, 1949
- HAMPEL, Clifford A.
Rare metals handbook, New York, Reinhold, 1954
- HARRISON, George Russell
Atoms in action, 3rd ed., 1949, 2nd printing, New York, William Morrow, 1951
- HAUSNER, Henry H. and ROBOFF, Stanley B.
Materials for nuclear power reactors, New York, Reinhold, 1955
- HOAG, J. Barton and KORFF, Serge A.
Electron and nuclear physics, 3 ed., 1948, New York, Van Nostrand, re-printed 1954
- HOLLAENDER, Alexander, ed.
New York, McGraw-Hill
Radiation biology, 3 Vols.
High-energy radiation, Vol. I, in 2 pts., 1954
Ultraviolet and related radiations, Vol. II, 1955
Vol. 3 in preparation
- HUGHES, D. J.
Neutron optics, New York, Interscience Publishers, 1954
- HUGHES, Donald J.
Pile neutron research, Cambridge, Mass., Addison-Wesley, 1953

- KAMEN, Martin D.
Radioactive tracers in biology, 2nd ed., New York, Academic Press,
1951
- KAPLAN, Irving
Nuclear physics, Cambridge, Mass., Addison-Wesley, 1955
- KITTEL, Charles
Introduction to solid state physics, New York, Wiley, 1953
- KLUG, Harold Philip
X-ray diffraction procedures for polycrystalline and amorphous
materials, New York, Wiley, 1954
- KORFF, Serge A.
Electron and nuclear counters, 2nd ed., New York, Van Nostrand, 1955
- KORN, Granino A. and KORN, Theresa M.
Electronic analog computers, New York, McGraw-Hill, 1952
- LAPP, Ralph E. and ANDREWS, Howard L.
Nuclear radiation physics, 2nd ed., New York, Prentice-Hall, 1954
- LIBBY, Willard F.
Radiocarbon dating, Chicago, University of Chicago Press, 1951
- LINDSAY, Robert Bruce
Concepts and methods of theoretical physics, New York, Van Nostrand,
1951
- LIVINGSTON, M. Stanley
High-energy accelerators, New York, Interscience Publishers, 1954
- McADAMS, William H.
Heat transmission, 3rd. ed., New York, McGraw-Hill, 1954
- MARSHAK, Robert E.
Meson physics, New York, McGraw-Hill, 1952
- MAYER, Maria Goeppert and JENSEN, J. Hans D.
Elementary theory of nuclear shell structure, New York, Wiley, 1955
- MORSE, Philip M. and FESHBACH, Herman
Methods of theoretical physics, 2 vols., New York, McGraw-Hill, 1953
- MURRAY, Raymond L.
Introduction to nuclear engineering, New York, Prentice-Hall, 1954

NATIONAL NUCLEAR ENERGY SERIES

New York, McGraw-Hill

- Vol. I-1 - - A. Guthrie and R. K. Wakerling, Vacuum equipment and techniques, 1949
- Vol. I-5 - - A. Guthrie and R. K. Wakerling, The characteristics of electrical discharges in magnetic fields, 1949
- Vol. II-16- Manson Benedict and Clarke Williams, Engineering developments in the gaseous diffusion process, 1949
- Vol. III-1B- Karl Cohen and George M. Murphy, The theory of isotope separation as applied to the large-scale production of U 235, 1951
- Vol. III-2 - G. H. Dieke and A. B. F. Duncan, Spectroscopic properties of uranium compounds, 1949
- Vol. III-4A- Isidor Kirshenbaum, et al., Physical properties and analysis of heavy water, 1951
- Vol. III-4C- Alice H. Kimball, et al., Bibliography of research on heavy Hydrogen compounds, 1949
- Vol. III-4F- George M. Murphy, et al., Production of heavy water, 1955
- Vol. IV-8 - G. S. Monk and W. H. McCorkle, Optical instrumentation, 1954
- Vol. IV-9 - Pts. I, II, III, IV - - Charles D. Coryell and Nathan Sugarman, Radiochemical studies, 1951
- Vol. IV-9 - Pt. V - - Charles D. Coryell and Nathan Sugarman, Radiochemical studies: the fission products, 1951
- Vol. IV-9 - Pts. V, VI, VII VIII - - Charles D. Coryell and Nathan Sugarman, Radiochemical studies: the fission products, 1951
- Vol. IV-14A- Glenn T. Seaborg and Joseph J. Katz, The actinide elements, 1954
- Vol. IV-14B- Glenn T. Seaborg, et al., The transuranium elements, pts. 1 & 2, 1949
- Vol. IV-19B- Laurence L. Quill, The chemistry and metallurgy of miscellaneous materials; thermodynamics, 1950
- Vol. IV-20 - Robert S. Stone, Industrial medicine on the Plutonium Project, 1951
- Vol. IV-22B- Raymond E. Zirkle, Biological effects of external X and gamma radiation, 1954
- Vol. IV-22E- Raymond E. Zirkle, Effects of external beta radiation, 1951
- Vol. IV-22I- William Bloom, Histopathology of irradiation from external and internal sources, 1948
- Vol. IV-23 - Albert Tannenbaum, Toxicology of uranium, 1951
- Vol. V - 1 - William C. Elmore and Matthew Sands, Electronics: experimental techniques, 1949
- Vol. V - 2 - Bruno B. Rossi & Hans H. Staub, Ionization chambers and counters, 1949

- Vol. V - 3 - Alvin C. Graves and Darol K. Froman, Miscellaneous physical and chemical techniques of the Los Alamos Project, 1952
- Vol. VI- 1 - Carl Voegtlin and Harold C. Hodge, Pharmacology and toxicology of uranium compounds, pts. 1, 2, 3, & 4, 1949
- Vol. VI- 2 - Henry A. Blair, Biological effects of external radiation, 1954
- Vol. VI- 3 - Robert M. Fink, Biological studies with polonium, radium, and plutonium, 1950
- Vol. VII-1 - Charles Slessor and Stuart R. Schram, Preparation, properties, and technology of fluorine and organic fluorocompounds, 1951
- Vol. VIII-1 - Clement Rodden, et al, Analytical chemistry of the Manhattan Project, 1950
- Vol. VIII-5 - Joseph J. Katz and Eugene Rabinowitch, The chemistry of uranium, 1951

NUCLEAR SCIENCE SERIES REPORTS

Washington, National Academy of Sciences - - National Research Council

- No. 2 - Bernard T. Feld, Nuclear Electric Quadrupole Moments and Quadrupole Couplings in Molecules, including addendum, prepared, May 1949
- No. 3 - Herbert L. Anderson, Neutrons from alpha emitters, Dec. 1948
- No. 4 - A. O. Hanson and R. F. Taschek, Monoenergetic neutrons from charged particle reactions
- No. 5 - T. Lauritsen, Energy levels of light nuclei
- No. 6 - A. Wattenberg, Photo-neutron sources, 1949
- No. 7 - R. R. Wilson, et al, Particle and quantum detectors, 1950
- No. 8 - H. O. Anger, et al, Conference on absolute beta counting, 1950
- No. 9 - K. T. Bainbridge and A. O. Nier, Relative isotopic abundances of the elements, Dec. 1950
- No. 10 - James S. Allen, Recent applications of electron-multiplier tubes, 1950
- No. 11 - Robley D. Evans, Problems associated with the transportation of radioactive substances, 1951
- No. 12 - Carl L. Bailey and John H. Williams, Techniques of particle energy control with Van de Graaff accelerators, 1952

- No. 13 - George G. Manov, Status Report on standardization of radionuclides in the United States, 1953
- No. 14 - Mark G. Inghram and Richard J. Hayden, A handbook on mass spectroscopy, 1954
- No. 15 - Physical and chemical aspects of basic mechanisms in radiobiology proceedings of an informal conference, 1953
- No. 16 - Mass differences, 1954

NICKSON, James J., ed.

The basic aspects of radiation effects on living systems; symposium on radiobiology, National Research Council - National Academy of Sciences, New York, Wiley, 1952

NININGER, Robert D.

Minerals for atomic energy, 4th printing, New York, Van Nostrand, 1954

NUCLEAR PROCESSES IN GEOLOGIC SETTINGS

University of Chicago, National Research Council and National Science Foundation, 1953. Proceedings of the conference, Williams Bay, Wisconsin, September 21st - 23rd, 1953

PAULI, Wolfgang

Meson theory of nuclear forces, 2nd ed., New York, Interscience Publishers, 1948

PEASLEE, D. C. and MUELLER, H.

Elements of atomic Physics, New York, Prentice-Hall, 1955

POLLARD, Ernest C. and DAVIDSON, William L.

Applied Nuclear physics, 2nd edition, New York, Wiley, 1951

PUTNAM, Palmer Coslett,

Energy in the future, New York, Van Nostrand, 1953

RAMSEY, Norman F.,

Nuclear moments, New York, Wiley, 1953

RICE, Frances Owen and TELLER, Edward

The structure of matter, New York, Wiley, 1949

ROSE, M. D.

Multipole fields, New York, Wiley, 1955

- ROTHMAN, S. C., ed.
Constructive uses of atomic energy, New York, Harper, 1949
- SACKS, Jacob
The atom at work, New York, Ronald Press, 1951
- SACHS, Robert
Nuclear theory, Cambridge, Massachusetts, Addison - Wesley, 1953
- SAX, Irving W.
Handbook of dangerous materials, New York, Reinhold, 1951
- SCHNEIDER, P. J.
Conduction heat transfer, Cambridge, Massachusetts, Addison - Wesley, 1955
- SERGE, E.
Experimental nuclear physics, 2 vols., New York, Wiley, 1953
- SEITZ, Frederick
The modern theory of solids, New York, McGraw - Hill, 1940
- SHANKLAND, Robert S.
Atomic and nuclear physics, New York, Macmillan, 1955
- SLATER, John C.
Modern physics, New York, McGraw-Hill, 1955
- SLATER, John Clarke
Quantum theory of matter, 1st edition, New York, McGraw-Hill, 1951
- SNEED, M. Cannom, MAYNARD, J. Lewis and BRASTED, Robert C.
Comprehensive inorganic chemistry, volume I, New York, Van Nostrand, 1953
- SMYTHE, William Ralph,
Static and dynamic electricity, 2nd edition, New York, McGraw-Hill, 1950
- SMYTHE, Charles Phelps
Dielectric behavior and structure, New York, McGraw-Hill, 1955
- STACY, Ralph W. and et al.
Essentials of biological and medical physics, New York, McGraw-Hill, 1955
- SOODAK, Harry and CAMPBELL, Edward
Elementary pile theory, New York, Wiley, 1950

SOROKA, Walter W.

Analog methods in computation and stimulation, New York, McGraw-Hill, 1954

STEPHENSON, Richard

Introduction to nuclear engineering, New York, McGraw-Hill, 1954

SULLIVAN, William H.

Trilinear chart of nuclear species, New York, Wiley, 1949

THORNDIKE, Alan M.

Mesons; a summary of experimental facts, New York, McGraw-Hill, 1952

ENGINEERING RESEARCH ASSOCIATES, INC.

High-speed computing devices, New York, McGraw-Hill, 1950

TREYBAL, Robert Ewald

Liquid extraction, 1st ed., New York, McGraw-Hill, 1951

UNITED STATES ATOMIC ENERGY COMMISSION SELECTED REFERENCE MATERIAL
Washington, Government Printing Office, 1955

- Vol. I - Research Reactors
- Vol. II - The reactor handbook, Vol. 1, Physics
- Vol. III - The reactor handbook, Vol. 2, Engineering
- Vol. IV - The reactor handbook, Vol. 3, General properties of materials
- Vol. V - Neutron cross sections
- Vol. VI - Chemical processing and equipment
- Vol. VII - Isotopes..... an eight-year summary of U. S. Distribution and utilization
- Vol. VIII - pt. 1 - - Cumulated numerical list of available unclassified U. S. Atomic Energy Commission reports, TID-4000
- Vol. VIII - pt. 2 - - Nuclear science - a bibliography of selected unclassified literature, TID-3070

UNITED STATES ATOMIC ENERGY COMMISSION

Isotopes... A five-year summary of U. S. distribution, Washington, Government Printing Office, 1951

UNITED STATES ATOMIC ENERGY COMMISSION

Laboratory experiments with radioisotopes for high school science demonstrations, Washington, Government Printing Office, 1953

UNITED STATES ATOMIC ENERGY COMMISSION

Liquid-metals handbook, 2nd ed., Washington, Government Printing Office, 1952

Liquid-metals handbook - sodium potassium supplement (Na/K), Washington, Government Printing Office, 1955

UNITED STATES ATOMIC ENERGY COMMISSION

Manual of analytical methods for the determination of uranium and thorium in their ores, Washington, Government Printing Office, 1950

UNITED STATES ATOMIC ENERGY COMMISSION

Prospecting for uranium, rev., Washington, Government Printing Office, 1951

UNITED STATES ATOMIC ENERGY COMMISSION

Prospecting with a counter, Washington, Government Printing Office, 1954

UNITED STATES ATOMIC ENERGY COMMISSION

Semi-annual reports, Washington, Government Printing Office

80th Congress, 1st session, Document No. 8 - The initial report of the Commission, 1947

80th Congress, 1st session, Document No. 96 - The 2nd semiannual report, 1947

80th Congress, 2nd session, Document No. 118- The 3rd semiannual report, 1948

1947 - 1948 - Atomic energy development

July 1948 - Recent scientific and technical developments in the atomic energy program of the United States

July 1949 - Atomic energy in the life sciences

January 1950 - Atomic energy and the physical sciences

July 1950 - Control of radiation hazards in the atomic energy programs

January 1951 - AEC Contract policy and operations

July 1951 - Major activities in the atomic energy programs

January 1952 - Some applications of atomic energy in plant science

July 1952 - Major activities in the atomic energy programs

July 1953 - Major activities in the atomic energy programs

January 1954 - Fifteenth semiannual report of the Atomic Energy Commission

July 1954 - Major activities in the atomic energy programs

January 1955 - Major activities in the atomic energy programs

December 1953 - First fifteen semiannual reports to Congress - Index

UNITED STATES BUREAU OF MINES BULLETIN

Washington, Government Printing Office

- No. 556 - (reprint) Horace T. Reno, Zirconium and hafnium
(reprint) John E. Crawford, Thorium
(reprint) John E. Crawford, Uranium

UNITED STATES BUREAU OF MINES INFORMATION CIRCULAR

Washington, Government Printing Office

- No. 7669 - Charles A. Steen, et al, Uranium-mining operations of the
Utex Exploration Company in the Big Indian District, San
Juan County, Utah, 1953

UNITED STATES BUREAU OF MINES REPORT OF INVESTIGATION

Washington, Government Printing Office

- No. 5063 - R. G. Nelson, et al, The mechanical properties of
consumable-arc-melted Kroll-process zirconium

UNITED STATES FISH AND WILD LIFE SERVICE

Fishery Bulletin, Washington, Government Printing Office

- No. 80 - Theodore R. Rice, Phosphorus Exchange in marine
phytoplankton

UNITED STATES GEOLOGICAL SURVEY BULLETIN

Washington, Government Printing Office

- No. 988 A- Geology of the Uravan mineral belt, 1952
No. 1006 - Collected papers on methods of analysis for uranium
and thorium, 1954
No. 1009 B- Identification and occurrence of uranium and vanadium
minerals from the Colorado plateaus, 1954
No. 1009 F- Glossary of uranium- and thorium-bearing minerals,
1955
No. 1019 B- Bibliography of U. S. Geological Survey, Trace elements
and related reports to June 1st, 1954; 1955

UNITED STATES GEOLOGICAL SURVEY CIRCULAR

Washington, U. S. Geological Survey

- No. 220 - Selected papers on uranium deposits in the United States,
1952

UNITED STATES GEOLOGICAL SURVEY GEOPHYSICAL INVESTIGATIONS

Washington, U. S. Geological Survey.

- Map GP 120 - Airborne radioactivity survey of the Painted Desert
Area, Coconino and Navajo Counties, Arizona, 1955
Map GP 125
and 126 - Airborne radioactivity survey of part of Moffat
County, Colorado, South of 40°45', 1955
Map GP 127 - Airborne radioactivity survey of the Myton area,
Duchesne and Uintah Counties, Utah, 1955

UNITED STATES GEOLOGICAL SURVEY MINERAL INVESTIGATIONS

Washington, U. S. Geological Survey

- Field studies map FMF 16 - Preliminary geologic map showing the distribution of uranium deposits and principal ore-bearing formations of the Colorado Plateau region, 1955

UNITED STATES GEOLOGICAL PROFESSIONAL PAPERS

Washington, Government Printing Office

- No. 261 - Rare-earth mineral deposits of the Mountain Pass District, San Bernardino County, California

UNITED STATES NATIONAL BUREAU OF STANDARDS CIRCULAR

Washington, Government Printing Office

- No. 499 and 3 supplements - Nuclear data, 1950
No. 507 - X-ray calibration of radiation survey meters, pocket chambers and dosimeters, 1951
No. 515 - Energy and angle distributions of the photo-protons from deuterium, 1951
No. 527 - Electron physics, 1954
No. 542 - Graphs of the Compton energy-angle relationship and the Klein-Nishina formula from 10 kev to 500 mev, 1953

UNITED STATES NATIONAL BUREAU OF STANDARDS HANDBOOKS

Washington, Government Printing Office

- No. H27 - Safe handling of radioactive luminous compounds, 1941
No. H41 - Medical X-ray protection up to two million volts, 1949
No. H48 - Control and removal of radioactive contamination in laboratories, 1951
No. H49 - Recommendations for waste disposal of phosphorus-32 and iodine-131 for medical users, 1951
No. H50 - X-ray protection design, 1952
No. H51 - Radiological monitoring methods and instruments, 1952
No. H52 - Maximum permissible amounts of radioisotopes in the human body and maximum permissible concentrations in air and water, 1953
No. H53 - Recommendations for the disposal of Carbon 14 wastes, 1953
No. H54 - Protection against radiations from radium, cobalt 60 and cesium 137, 1954
No. H55 - Protection against betatron-synchrotron radiations up to 100 million electron volts, 1954
No. H56 - Safe handling of cadavers containing radioactive isotopes, 1953
No. H57 - Photographic dosimetry of X- and gamma "X-" rays, 1954
No. H58 - Radioactive waste disposal in the ocean, 1954
No. H59 - Permissible dose from external sources of ionizing radiation, 1954

UNITED STATES PUBLIC HEALTH SERVICE

Concepts of radiological health, Washington, Government Printing Office, 1954

UNITED STATES PUBLIC HEALTH SERVICE

Radiological health, Cincinnati, Ohio, Robert A. Taft Sanitary Engineering Center, 1954

UREY, Harold C.

The planets, their origin and development, New Haven, Conn., Yale University Press, 1952

WAHL, Arthur C. and BONNER, Norman A.

Radioactivity applied to chemistry, New York, Wiley, 1951

WILLIAMS, Russel R., Jr.

Principles of nuclear chemistry, New York, Van Nostrand, 1950

WILSON, E. Bright, et al

Molecular vibrations, New York, McGraw-Hill, 1955

WOODBURY, David O.

Atoms for Peace. New York, Dodd, Mead, 1955

YAGODA, Herman

Radioactive measurements with nuclear emulsions, New York, Wiley, 1949

ZIRCONIUM AND ZIRCONIUM ALLOYS, Symposium.

Cleveland, Ohio. American Society of Metals, 1953

Supplement to the List of Technical Books and Monographs

BETHE, Hans A. and de Hoffmann, Frederic

Mesons and fields. Evanston, Illinois; Row, Peterson and Co., 1955

BETHE, Hans A.

Elementary nuclear theory. New York, Wiley, 1947

BALLARD, Thomas J. and CONCLIN, Quentin

The uranium prospectors guide. New York, Harper and Brothers, 1955

FAUL, H., ed.

Nuclear geology; a symposium on nuclear phenomena in the earth sciences. New York, Wiley, 1954

FERMI, Enrico

Nuclear physics, Rev. ed., 1950, 4th impression, Chicago, University of Chicago Press, 1953.

FRETTER, William B.

Introduction to experimental physics. New York, Prentice-Hall, 1954

ISARD, Walter and WHITNEY, Vincent

Atomic power. New York, Blakiston, 1952

OLDENBERG, Otto

Introduction to atomic physics. 2nd ed. New York, McGraw-Hill, 1954

ATTACHMENT 2 - LIST OF JOURNALS INCLUDED IN U. S.
TECHNICAL LIBRARY EXHIBIT.

Review of Scientific Instruments
Journal of Chemical Physics
Journal of the National Cancer Institute
Physical Review
Reviews of Modern Physics
Journal of the Optical Society of America
American Journal of Physics
Chemical Engineering Progress
Endocrinology
Federation Proceedings
American Journal of Physiology
Metal Progress
Journal of Research of the National Bureau of Standards
Proceedings of the Society for Experimental Biology and Medicine
Archives of Biochemistry and Biophysics
Journal of Applied Physiology
Journal of Laboratory and Clinical Medicine
Public Health Reports
Agronomy Journal
The American Mineralogist
Journal of Applied Physics
Soil Science Society of America Proceedings
Journal of Inorganic and Nuclear Chemistry
A.M.A. Archives of Ophthalmology
Journal of Bacteriology
Journal of General Physiology
Technical News Bulletin of the National Bureau of Standards
Journal of Experimental Medicine
Journal of Clinical Endocrinology and Metabolism
A.M.A. Archives of Industrial Hygiene and Occupational Medicine
Journal of Clinical Investigation
Journal of Biological Chemistry
Journal of Cellular and Comparative Physiology
Journal of the American Chemical Society
Cancer Research
American Journal of Roentgenology and Radium Therapy and Nuclear
Medicine
Corrosion
Economic Geology
Genetics
Journal of Metals
Mechanical Engineering
Power Engineering

Chemical Engineering
Industrial and Engineering Chemistry
Consulting Engineer
Log, The
Journal of Agricultural and Food Chemistry
Aviation Age
Dun's Review and Modern Industry
Power
Western Feed and Seed
Journal of the American Ceramic Society
School Life
Electrical Manufacturing
Industrial Equipment News
Electrical Construction and Maintenance
The Reclamation Era
Wastes Engineering
Electric Light and Power
Electric Light and Power (Market Issue)
Nucleonics
Heating, Piping and Air Conditioning
Control Engineering
Chemical and Engineering News
Journal of Metals
Analytical Chemistry
Western Canner and Packer
Modern Plastics
World Oil

ATTACHMENT 3 - COMMERCIAL EXHIBIT LITERATURE
MADE AVAILABLE IN THE U.S. TECHNICAL LIBRARY

<u>Company</u>	<u>Item</u>
Anton Electronic Laboratories, Inc. 1226-1238 Flushing Avenue Brooklyn 6, New York	1. Type 222 and 224 Counter Tubes 2. Anton Medical Eye Probes. Anton Type 225 Counter Tube End Mica Window - Alpha, Beta
Beckman Instruments, Inc. 2200 Wright Avenue Richmond, California	3. Berkeley Portable Scaler Model 2080
Cambridge Instrument Company, Inc. Grand Central Terminal New York 17, New York	4. Cambridge Gamma Ray Pocket Dosimeter
The Detectron Corporation 5528 Vineland Avenue North Hollywood, California	5. DG-7 Geiger Counter DG-5 Claimstaker, DG-2 Geiger Counter 6. DS-234 Scintillatron DS-222 Scinatron, DG-9 Geiger Counter 7. DS-235 Scintillatron DS-277 Scintillator, DS-222 Scinatron 8. DS-277 Scintometer 9. DR-299 Nucliometer 390-B Bismuth Nucliometer
Allen B. DuMont Laboratories, Inc. Passaic, New Jersey	10. Type K 1328 Multiplier Phototube 11. Type 6291 Multiplier Phototube 12. Type 6292 Multiplier Phototube 13. Type 6363 Multiplier Phototube

Company

Allen B. DuMont Laboratories, Inc.
(Continued)

14. Type 6364 Multiplier Phototube

15. Type 6365 Multiplier Phototube

16. Type 6467 Multiplier Phototube

Engineers Syndicate, Ltd.
5011 Hollywood Blvd.
Hollywood 27, Calif.

17. Model SC-10 Scintillation Counter

General Electric Company

18. Components and Services for Nuclear Reactor Systems

Landsverk Electrometer Company
550 West Garfield Avenue
Glendale 4, California

19. Catalog No. G-12A, Landsverk Instruments for Radiation Measurements of Alpha, Beta and Gamma Rays, X-rays and Thermal Neutrons

La Roe Instruments, Inc.
Box 5906
Bethesda 14, Maryland

20. Radiation Detection Instrumentation for Uranium and Oil Exploration

The Microcard Corporation
Box 314
La Crosse, Wisconsin

21. Model 6B Microcard Reader

Microlex Corporation
1 Graves Street
Rochester 14, New York

22. Microlex; a new approach in Micro-Reproduction

23. Model B, Microlex Reader

Minneapolis-Honeywell Regulator Co.
Minneapolis 14, Minnesota

24. Nuclear Reactor Control

Philadelphia 44, Pennsylvania

25. RIDL Scintillation Spectrometer

National Radiac
10 Crawford Street
Newark 2, New Jersey

26. Scintillation Counter
Bulletins: #5, 6, 7, 8,
9, 10, 11.

27. Nucleonics News

Company

Nuclear Instrument and Chemical
Corporation
223 West Erie Street
Chicago 10, Illinois

Nucleonic Company of America
196 DeGraw Street
Brooklyn 31, New York

The Ohmart Corporation
2347 Ferguson Road
Cincinnati 38, Ohio

Packard Instrument Company
Post Office Box 428
LaGrange, Illinois

Radiation Counter Laboratories, Inc.

28. Nuclear Probe Type Counters
29. Geiger Counters for
Uranium Prospecting,
Isotope Labs, Civil Defense
30. The Geiger Counter Comparator
Chart
31. Operating Instructions for
NCA Geiger Tubes and
Multiplier Tubes
32. Operating Instructions, NCA
Model B6 Series Multiplier
Tubes
33. Operating Instructions for
Ore-locators Models RM2N
and RM2NA
34. RCA Multiplier Tube
35. Ohmart Density Gauges for
Slurry Measurement.
36. The Ohmart Gammameter
37. Ohmart Cells in Industry
38. Monitoring Applications of
the Ohmart Cell
39. Tri-Garb Liquid Scintillation
Spectrometer for Counting
Tritium and Carbon - 14
samples
40. Nuclear Reactor Instruments
41. The RCL Counter—RCL
Nucleonic Instrumentation

CompanyItem

Radiation Industries Co.
Box 232
Brookhaven, New York

Radiation Instrument Development
Laboratory
2337 W. 67th Street
Chicago 36, Illinois

Radiation Research Corporation
526-528 Northwood Road
West Palm Beach, Florida

Radio Corporation of America
Lancaster, Pennsylvania

Raytheon Manufacturing Co.
Newton 58, Massachusetts

42. The RCL Counter—Characteristics of RCL Radiation Counters.

43. Tissue Equivalent Radiation Detector

44. Model 2300 Scintillation Spectrometer; Model 115 Single Channel Pulse Height Analyzer; Model 43A Scintillation Counter

45. ATBEE Radioactive Battery

46. ATBEE Price List

47. RCA C7187A Multiplier Phototube

48. RCA 5819 Multiplier Phototube

49. RCA 6199 Multiplier Phototube

50. RCA 6217 Multiplier Phototube

51. RCA 6342 Multiplier Phototube

52. RCA 6372 Multiplier Phototube

53. RCA IP21 Multiplier Phototube

54. RCA IP28 Multiplier Phototube

55. Type CK 1029 Radiation Counter Tube

56. Types 1B90, CK1018, CK1019, CK1020, CK1021, CK1023, Radiation Counter Tubes.

CompanyItem

Technical Associates
140 West Providencia Avenue
Burbank, California

Sylvania Electric Products, Inc.
Bayside, New York

Tracerlab, Inc.
130 High Street
Boston, Massachusetts
2030 Wright Avenue
Richmond 3, California

57. Type CK1049 Geiger-Mueller Counter Tube
58. Juno Radiation Survey Meter - Models SRJ-3 and HRJ-3
59. Sylvania atomic fuels and reactor components
60. Technical Bulletin PM-101—Airborne Radioactivity Surveying
61. Technical Bulletin P-102 Petroleum Coke Level Indicator
62. Technical Bulletin P-104 Determination of Sulphur in Hydrocarbons
63. Technical Bulletin PM-105 Portable Well Logging Equipment
64. Beta Gauges
65. Cobalt-60 for Interstitial Therapy
66. The Keleket Dosimeter
67. Probe Type Counters
68. Radioactivity Consulting
69. Radioactivity...and the Petroleum Industry
70. Radioisotope Equipment for Medical Use
71. Selecting Nuclear Laboratory Equipment
72. SU-9 Pocket Dosimeter Charger

CompanyItem

N. Wood Counter Laboratory
5491 S. Blackstone Avenue
Chicago 15, Illinois

- 73. SU-14 Survey Meter
- 74. Glass Wall and Windowless Flow Counters
- 75. Neutron and Cosmic Ray Counters

PART II

ReprintsSourceArticle

Rare Metals Handbook
(The Brush Beryllium Co.)

- 76. Beryllium
by Bergt R. F. Kjellgren

The Sylvania Technologist
(Sylvania Electric Products,
Inc.)

- 77. Metallurgical Problems in Nuclear Power Reactors
by Henry H. Hansner and John R. Bedell

Transactions AIME

- 78. Locations and sizes of Interstitial in the Alpha-Uranium Lattice by A. J. Opinsky

Encyclopedia Britannica

- 79. Beryllium
by Charles Baldwin Sawyer

Modern Uses of Nonferrous Metals

- 80. Chapter IV -- Beryllium
by C. B. Sawyer

Journal of Metals
(Brush Beryllium Co.)

- 81. Mechanical Properties of Beryllium Fabricated by Powder Metallurgy
by W. W. Beaver and K. G. Wikie

Metal Progress

- 82. Sources, Supplies and Uses of Beryllium
by Robert F. Griffith

<u>Source</u>	<u>Article</u>
Quarterly Bulletin of the Michigan Agricultural Experiment Station	83. Some Effects of Accelerated electrons or cathode Rays of Certain Insects and on the Wheat and Flour which They Infest, Parts I & II by V. H. Baker, O. Taboadan and D. E. Wiant.
United Nations	84. The Role Which Nuclear Energy Can Play as an Energy Source in the Next 25 to 50 years by Walker L. Cisler.
Detroit Edison Co.	85. Atomic Energy and the Electric Power Industry
Oak Ridge National Laboratory with Union Carbide Co.	86. Uranium Processing Exhibit
Scientific American	87. Radiation from a Reactor by W. H. Jordan
Reinhold Publishing Co.	88. Materials for Nuclear Power Reactors.
Brookhaven National Laboratory	89. Radiation Induced Mutations in Plant Breeding

Part III

Technical Documents Available to Delegates

1. USAEC List of Research Reports for Sale. Price List No. 24,
July 1955
2. List of United States Technical Books and Monographs on the
Peaceful Uses of Atomic Energy
- 2a. Liquid Metals Handbook (Na-Nok Supplement)
3. Nuclear Science. A Bibliography of Selected Unclassified Literature (TID-3040)

4. Reactor Engineering Lectures. Stuart McLain (ANL-5424)
5. Course Outlines and Engineering Problems (ORSORT) July 1955 (TID-5261)
6. Reactor Physics Laboratory Manual (ORSORT) July 1955 (TID-5262)
7. Fundamental Chemistry for Nuclear Reactors. (TID-5260)
Sigfred Peterson, P. W. Stovall, William F. Kieffer, and
S. A. Reynolds, May 1955
8. Nuclear Power Reactors Vol. 1 & Vol. 2 (USAEC)
9. Technical Information Service, AEC (BMI-1000)
Compilation of U. S. and U. K. Uranium and Thorium
Constitutional Diagrams. H. A. Salles, and
F. A. Rough, June 1, 1955
10. Uranium Processing Exhibit. T. A. Arehart, W. K. Eisler, and
M. T. Velley (ORNL)
11. Index to Radiation Instruments Manufacturer's of the United States,
Extract from RIB-8 (Suppl. 2) July 1, 1954
12. A 100 - Channel Pulse Height Analyzer Using Magnetic Core Storage,
Preston W. Byington and C. Wilkin Johnstone.
13. Subject Headings Used in the Catalogs of the United States Atomic
Energy Commission (TID-5001 (1st Rev.))
Donald D. Dennis, ed.
First Revised Edition, March 1955
14. Corporate Author Entries Used in Cataloging Reports (TID-5059 (2nd Rev.))
15. A Glossary of Terms in Nuclear Service (Am. Soc. Mech. Eng.)

ATTACHMENT 4 - A.E.C. DEPOSITORY LIBRARIES
IN THE U.S. ATOMS-FOR-PEACE PROGRAM

PURPOSE: To encourage the dissemination of non-classified technical information on basic science related to atomic energy, and on applied nuclear science and engineering. This is one of the U.S.A.E.C. programs being carried out in support of President Eisenhower's atoms-for-peace plan.

PROGRAM: The United States Government is prepared to present to those nations requesting it, a comprehensive technical library of unclassified and declassified literature covering U.S.A.E.C. reports and abstracts of scientific and engineering reports published in the United States and abroad. The libraries are assembled at Oak Ridge, Tennessee, by the U.S.A.E.C. Technical Information Service.

CONTENT: Each library consists of:

- (1) Twenty-eight bound volumes of the National Nuclear Energy Series, Sponsored by the U.S.A.E.C.
- (2) Nine complete volumes of Nuclear Science Abstracts, covering some 50,000 technical reports and journal articles in this country and abroad.
- (3) A complete set of the U.S.A.E.C. semiannual reports, and such books as "Elements of Nuclear Reactor Theory", "Sourcebook on Atomic Energy", "Energy in the Future", etc.
- (4) Over 6,500 non-classified technical reports covering many phases of nuclear science and engineering. Of these, 1,625 are full-size copies and 4,900 are on microcards.
- (5) Over 45,000 abstract cards which index and describe the U.S.A.E.C. non-classified technical report literature.
- (6) A set of library tools such as a filing manual, subject headings list, etc., to assist the recipient libraries in organization of their collections of U.S.A.E.C. reports and card catalogues.

CONTINUING SERVICE: The U.S.A.E.C. will furnish the recipients of each library, on a current basis, new non-classified material as it is originated and processed by the U.S.A.E.C.

PHYSICAL SIZE: When packaged for shipment, each library occupies about 50 cubic feet and weighs approximately 2,000 pounds. Each unit is the equivalent of about 250 feet of library shelving and contains the equivalent of more than 150,000 printed pages. (By use of microcards, the actual size is less.)

RECIPIENTS: The reports and related bibliographic material in this collection are being provided on an exchange basis by the United States Government to the following:

Argentina	India	Republic of China
Australia	Israel	Republic of the
Austria	Italy	Philippines
Belgium	Japan	Spain
Burma	Lebanon	Sweden
Canada	The Netherlands	Switzerland
Denmark	New Zealand	Turkey
Egypt	Norway	Union of South Africa
Finland	Peru	United Kingdom
France	Portugal	European Council
Greece		for Nuclear Research

ATTACHMENT 5 - RECORD OF DAILY ATTENDANCE

AUGUST	7	Sunday	350
	8	Monday	620
	9	Tuesday	1010
	10	Wednesday	1380
	11	Thursday	1540
	12	Friday	1530
	13	Saturday	1690
	14	Sunday	980
	15	Monday	1600
	16	Tuesday	1850
	17	Wednesday	1770
	18	Thursday	1740
	19	Friday	1360
	20	Saturday	1390
	21	Sunday	670
		TOTAL	19,480

ATTACHMENT 6 - PRESS RELEASES

UNITED STATES DELEGATION PRESENTS
TECHNICAL LIBRARY TO UN GENEVA

Dr. Willard F. Libby, Vice-Chairman of the United States Delegation to the International Conference on the Peaceful Uses of Atomic Energy, today presented to the United Nations Library in Geneva the technical library which has constituted part of the United States technical exhibit at the Conference. The gift of the library was received for the UN by Dr. A. C. Breycha-Vauthier, Chief Librarian.

The Technical library will be kept up-to-date by the United States AEC which will provide as it is issued all new unclassified published material originating in the AEC program. The library is a depository collection similar to those which the AEC maintains at 42 points in the United States and has presented to 29 other nations and CERN as part of President Eisenhower's Atoms for Peace plan.

The library, which has been visited by thousands during the Conference, contains all the unclassified material published by the AEC, and volumes of abstracts of scientific and engineering reports related to atomic energy published in the open literature throughout the world. Major items in the collection include:

- (1) 28 bound volumes of the National Nuclear Energy Series sponsored by the USAEC.
- (2) Nine complete volumes of Nuclear Science Abstracts, covering some 50,000 technical reports and journal articles published throughout the world.
- (3) A complete set of the AEC semiannual reports and such books sponsored by the AEC as "Elements of Nuclear Reactor Theory", "Sourcebook on Atomic Energy", "Energy in the Future", etc.
- (4) Over 6,500 unclassified technical reports covering many phases of nuclear science and engineering. Of these, 1,625 are full-size copies and 4,900 are on microcards.
- (5) Over 45,000 abstract cards which index and describe the USAEC unclassified report literature.
- (6) A set of library tools such as a filing manual, subject heading list, etc.

The library is the equivalent of about 250 feet of library shelving and contains the equivalent of 150,000 printed pages. (By use of microcards, the actual size is less).

In making the presentation of the library, Dr. Libby said:

"During the Conference, the library served its first purpose of helping to spread knowledge among the hundreds of Delegates who have come here and used its facilities. Now we wish to make it serve a second purpose -- of continuing that spread of knowledge as a permanent part of the UN collection here, and of leaving with the United Nations a substantial and lasting reminder of our gratitude for the service of the UN to science through this Conference."

Accepting the collection, Dr. Breycha-Vauthier said:

"By handing over these collections and your promise to keep them up-to-date you have given us a new and important instrument to assist in the research in a science which has rapidly become a matter of international concern. . . . We promise to make this material widely accessible on an international basis in that spirit of helpfulness which is and always will be the policy of this library."

UN RELEASE

GIFT OF A TECHNICAL LIBRARY TO THE EUROPEAN OFFICE OF THE U.N.

This morning, in the course of a brief ceremony, Dr. Willard F. Libby, Vice-Chairman of the United States Delegation to the International Conference on the Peaceful Uses of Atomic Energy, presented to the United Nations Library in Geneva the technical library which has constituted part of the United States Exhibit at the Palais des Nations.

This generous gift comprises among others 7,000 laboratory reports which will be continually brought up to date representing the total contribution of the United States to the scientific literature on atomic energy. The library also comprises eight volumes of newly classified technical information which have just been released by the United States Atomic Energy Commission. Professor Libby, in presenting this gift, stated that it was an appropriate way to express the gratitude of the United States Delegation for the dedication and the efficiency of the United Nations staff and officers in the management of the first International Conference on the Peaceful Uses of Atomic Energy.

Mr. A. C. Breycha-Vauthier, Chief Librarian, accepted this gift on behalf of the United Nations and stressed that the United Nations library at Geneva was functioning under the terms of the Rockefeller Donation as a public library to the world at large, serving as a center of international research and an instrument of international understanding.

Mr. Breycha-Vauthier expressed his thanks to Professor Libby and assured him that the policy of the United Nations Library would always be based on a spirit of helpfulness.

TECHNICAL LIBRARY COLLECTIONS ON ATOMIC ENERGY
COLLECTIONS D'OUVRAGES TECHNIQUES SUR L'ENERGIE ATOMIQUE



ATTACHMENT 7 - PHOTOGRAPHS OF US TECHNICAL LIBRARY EXHIBIT

Photo No. 1: View of Information Desk, wall map of foreign depository libraries, and distribution area for technical documents presented to delegates.

United States Atomic Energy Reports
Energie Atomique - Informes EEUU

Rapports des EU sur l'Energie Atomique
Доклады об атомной энергии США



1035721

Photo No. 2: United States atomic energy reports on display
in United States Technical Library Exhibit in Geneva.

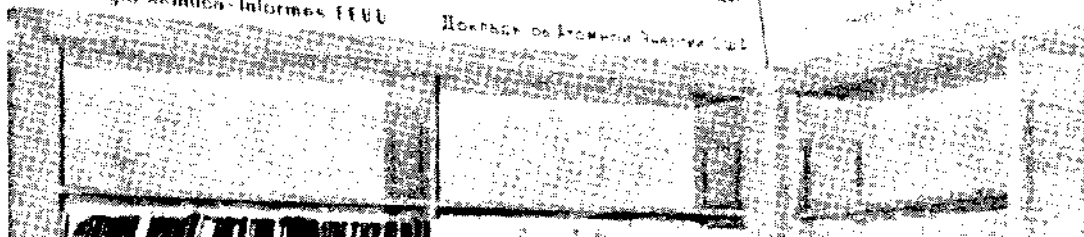
Photo No. 3: United States atomic energy reports and exhibit literature.

United States Atomic Energy Reports

Rapports des EU sur l'Énergie Atomique

Energie Atomica - Informes FEU

Результаты работы по атомной энергии США

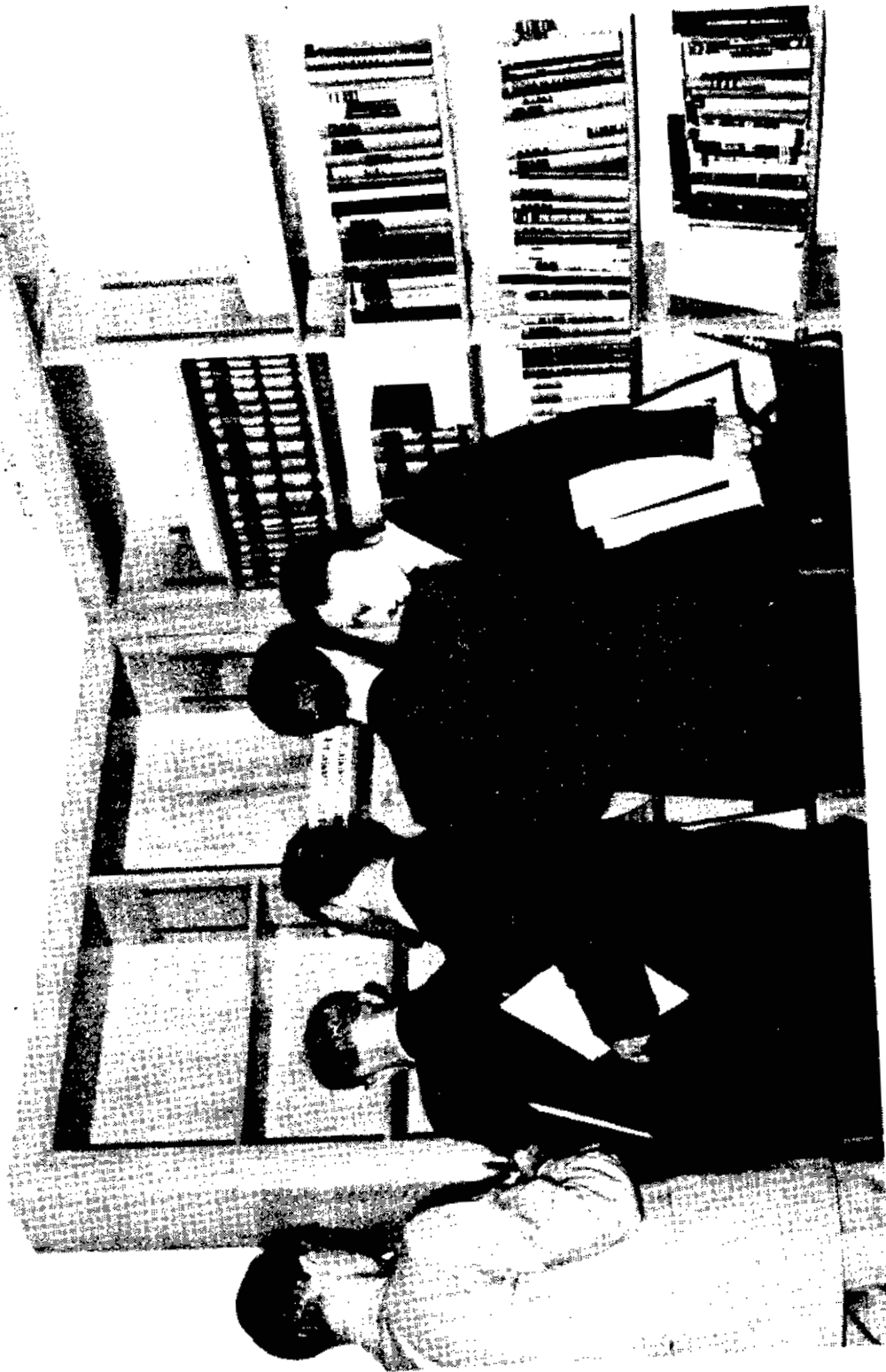




1035725

Photo No. 4: Display of Selected Reference Material.

Photo No. 5: Commercially published books on display in
United States Technical Library Exhibit.



No. 5

1035728

Microcards

United States Atomic Energy Reports

Microfiches

Rapports des EU sur l'Energie Atomique

Microfichas

Energía Atómica-informes EEUU.

Микроснимки

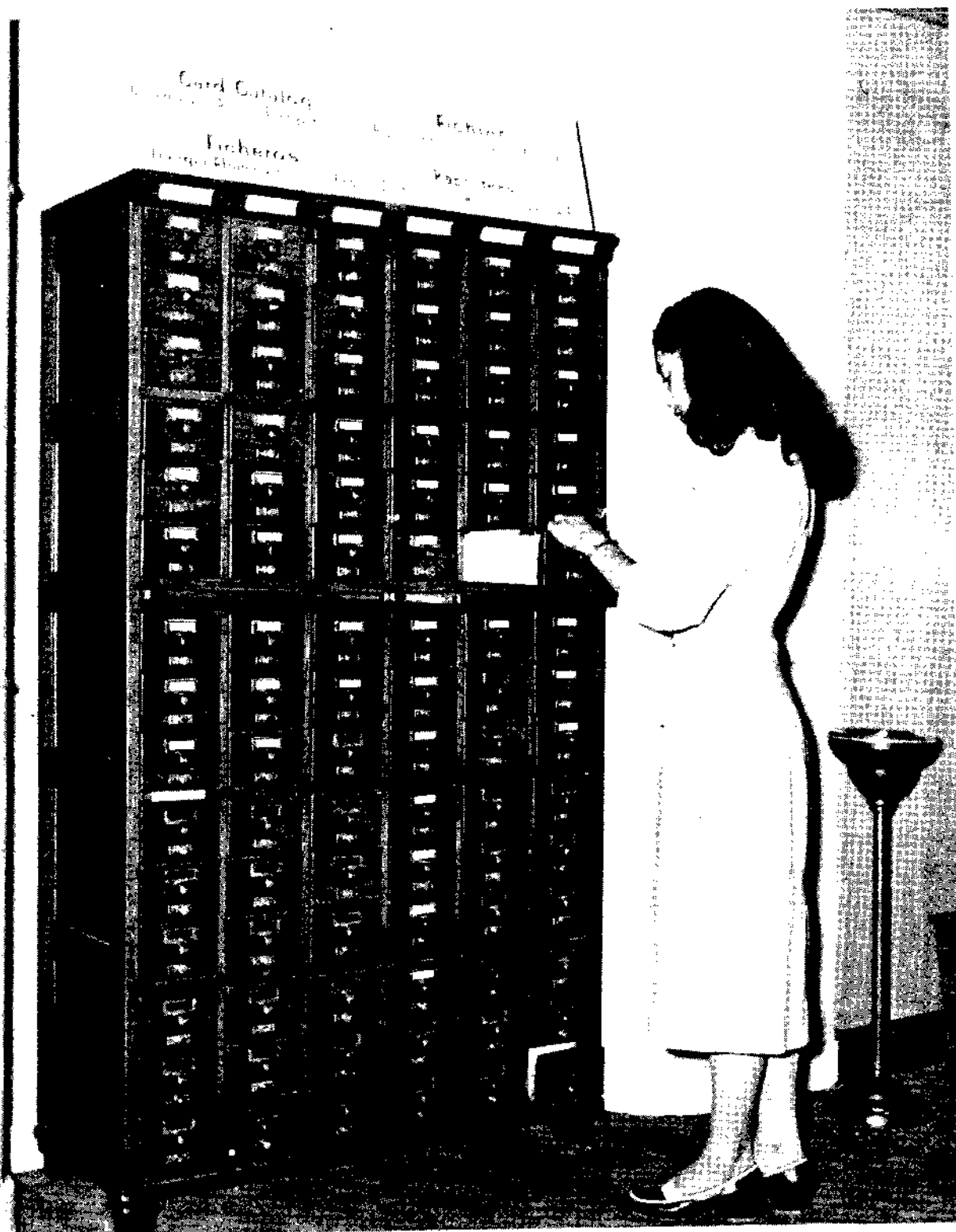
Доклады США об Атомной Энергии



1035129

Photo No. 6: Microcard file in United States Technical
Library Exhibit.

Photo No. 7: Card catalog of United States Technical Library
for use of Conference Delegates.



No. 7

1035732

Representative United States Technical and Business Periodicals

Evaluating Atomic Energy, Research and Application to Potential Uses

Selection de quelques revues complémentaires techniques et commerciales des E.U.

Contenant des articles sur l'Energie Atomique et son application à des fins pacifiques

Избранные журналы, технические и торгово-деловые издательства США, содержащие статьи об Атомной Энергии и ее применении для мирных целей

Содержат материалы о мирном использовании атомной энергии и информации об атомной энергии

Log

Aviation

Engineering

Chemistry

Physics

Mathematics

Biology

Geology

Astronomy

Medicine

Law

Economics

History

Literature

Art

Music

Sports

Travel

Education

Health

Environment

Social Sciences

Humanities

Languages

Religion

Philosophy

Politics

Military

Navy

Air Force

Army

Marine Corps

Coast Guard

Space

Nuclear

Atomic

Energy

Research

Development

Innovation

Technology

Industry

Commerce

Finance

Banking

Insurance

Real Estate

Transportation

Communication

Information

Data

Computing

Software

Hardware

Telecommunications

Internet

Mobile

Satellite

Representative United States Technical and Business Periodicals

Evaluating Atomic Energy, Research and Application to Potential Uses

Selection de quelques revues complémentaires techniques et commerciales des E.U.

Contenant des articles sur l'Energie Atomique et son application à des fins pacifiques

Избранные журналы, технические и торгово-деловые издательства США, содержащие статьи об Атомной Энергии и ее применении для мирных целей

Содержат материалы о мирном использовании атомной энергии и информации об атомной энергии

Log

Aviation

Engineering

Chemistry

Physics

Mathematics

Biology

Geology

Astronomy

Medicine

Law

Economics

History

Literature

Art

Music

Sports

Travel

Education

Health

Environment

Social Sciences

Humanities

Languages

Religion

Philosophy

Politics

Military

Navy

Air Force

Army

Marine Corps

Coast Guard

Space

Nuclear

Atomic

Energy

Research

Development

Innovation

Technology

Industry

Commerce

Finance

Banking

Insurance

Real Estate

Transportation

Communication

Information

Data

Computing

Software

Hardware

Telecommunications

Internet

Mobile

Satellite

[illegible]

Photo No. 8: Technical and business periodicals on display
in Geneva.

APPENDIX VII - FILM PROGRAM AT GENEVA

The United States contributed 9 of 22 scientific and documentary films shown in the United Nations film program at the Conference. The United Kingdom presented 5 films, the USSR 3, France 2, Canada 2, and Norway 1. With one exception, all US films were screened in four languages: English, French, Russian and Spanish. About half the 20 showings daily were US films. From the first previews to the press, on Sunday, August 7, to the final showings Sunday, August 21, the film program was consistently well attended in all language versions.

The daily film programs were held in a theatre of the Palais des Nations which seated about 300 persons. The program began every day at 10:00 a.m. and continued to 10:00 p.m. without interruption. At least two hours of films in each of the four languages were shown daily, the scheduled hours for each language rotating from day to day.

Films presented at Geneva by the various countries were as follows:

United States

(All in English, French, Russian, and Spanish unless otherwise indicated.)

"Nuclear Reactors for Research", produced by North American Aviation, Inc., 15 minutes, 16 mm., color, explained the basic design of the small homogeneous water-boiler reactor type; described the components and the various steps in the construction of a small homogeneous reactor. Operation of the reactor was described and research uses illustrated.

"Sodium-Graphite Reactor Progress Report", produced by North American Aviation, Inc., 17 minutes, 16 mm., color, depicted a number of experiments devoted to the development of the sodium-graphite reactor, with special emphasis on the development of the fuel element. A number of sequences of the testing of components were shown.

"Developing Homogeneous Reactors", produced by Oak Ridge National Laboratory and AEC-Washington, 23 minutes, 16 mm., black and white, depicted some of the most important states in the development, construction, operation and dismantling of Homogeneous Reactor Experiment No. 1, which was designed to operate at 1,000 kw.

Testing of the most important reactor features was shown, along with the most important steps in assembling the reactor. Operation of the reactor was pictured. The film closed with scenes of the reactor being disassembled to make room for HRE-2.

"Construction of the Argonne Research Reactor", produced by Argonne National Laboratory, 12½ minutes, 16 mm., black and white, showed some important stages in the construction of CP-5, the Argonne research reactor, which was a heavy water reactor operating at a normal power level of 1,000 kw. By showing various stages in the construction of this reactor, the film illustrated many of the important design features.

"Safety Experiments with a Boiling Reactor", produced by Argonne National Laboratory, 19½ minutes, 16 mm., black and white, recorded a series of safety experiments with a prototype boiling water reactor, consisting of a pressure vessel containing an assembly of uranium-bearing plates submerged in water, plus a control mechanism. After showing a number of reactor excursions, some of which expelled the water from the reactor, the last planned experiment in the film showed the deliberate destruction of the reactor assembly, when the reactor was made to "run away".

"Borax", in English only, produced by Lookout Mountain Laboratory, USAF, for Argonne National Laboratory and AEC-Washington; subtitle: "Construction and Operation of a Boiling Water Power Reactor", 14 minutes, 16 mm., black and white. This picture could be considered a sequel to "Safety Experiments with a Boiling Reactor." Using the safety experiments as a base, Argonne scientists proceeded to the next step: attaching a generating system to a boiling water type reactor. Electricity produced from "Borax" was used for an hour on July 17, 1955, to light and power Arco, Idaho--the first US community to be lighted exclusively on a city-wide basis by nuclear power. The picture showed the construction and operation of the reactor power plant and the lighting of Arco. This film was shown only once, for news representatives, on August 12, 1955, in the Palais des Nations projection room. (See Appendix XVII, for press release.)

"Radioisotopes: Their Application to Humans as Tracer Studies and for Therapeutic Use", produced by the Medical Film Guild, Ltd., New York City, 32 minutes, 16 mm., color, gave a comprehensive review of the uses of radioisotopes in human applications as tracer studies and for therapeutic use: radioactive iodine, sodium, iron, calcium, lanthanum, strontium, cobalt, phosphorus, gold and the neutron capture therapy involving boron for treatment of brain tumors.

"The Radioisotope in General Science", produced by the US Army Surgeon-General, 46 minutes, 16 mm., black and white, showed radioisotopes as a research tool adaptable to tracer investigations in all branches of general science by tracing 8 experiments illustrating how radioisotopes can be used in metallurgy, chemistry, biochemistry and

plant physiology, shown in the order of increasing complexity as follows: (1) self-diffusion of solid copper, (2) study of vapor pressure over metallic silver, (3) exchange of chloride ions in solid and liquid, (4) exchange of sodium and potassium through cell wall, (5) re-arrangement of atoms within a molecule--Wolff re-arrangement of a diazoketone, (6) metabolism of cholesterol from sodium acetate in liver, (7) fate of carbon atoms during metabolism of glycine in blood, and (8) tracing the chemical path of carbon during photosynthesis in algae. Methodology of tracer research was illustrated and techniques such as isotope dilution and two-dimensional paper chromatography were introduced.

"A Is For Atom", produced by the General Electric Company, a color-animation film, 15 minutes, 16 mm., explained the rudiments of atomic structure, the fission process, and peacetime applications.

United Kingdom

"Calder Hall", a documentary in color showing the construction of Britain's first full-scale power reactor, showing the engineering problems encountered in constructing a large reactor.

"Project 074", a film which took its name from the official designation of a radioactive tracer technique developed by Britain's Atomic Energy Research Establishment for engine wear research.

"The Linear Accelerators", a film introducing the theory of nuclear transmutations and the production of hard X-rays with laboratory accelerated particles. A 4 mev linear accelerator was shown in action.

"A New Tool for Industry", showing a variety of applications of radioisotopes in industrial research and production similarly employed in the US for purposes of precision and perfection of product.

"Steel and Atomic Energy", black and white film on the Calder Hall project stressing the special steels needed, construction of the graphite pile, the uranium imported for the pile and how used, and scenes in the factory where the special steels were made.

U.S.S.R.

"First in the World", an information film in color depicting the Soviet 5,000 kw reactor, the first built exclusively for the successful generation of electricity. This film was also shown in the USSR Technical Exhibit by back-projection.

"Power Station", another film on the Soviet reactor showing in more detail the construction of the reactor and certain problems of operation and maintenance, addressed primarily to nuclear scientists.

"Biological Action of Radiation on Microbes", a film notable for its fine details of photography in this field of medical research; exclusively scientific.

Canada

"Highway of the Atom", a color documentary of popular interest introducing atomic energy from the Canadian scene and development.

"On the Spot - Hidden Power", another documentary, black and white; a visit to Canada's Chalk River reactor.

France

"U 235", a film showing a variety of uses of atomic energy for industrial purposes in France.

"Construction of the Marcoule Industrial Centre", a film showing aspects of construction of an industrial atomic research establishment in France.

Norway

"A Visit to Jenner", atomic research in Norway, Norway's atomic research center and activities there.

APPENDIX VIII - SELECTED REFERENCE MATERIAL

In addition to the information on peaceful uses of atomic energy contained in the papers presented by United States delegates, in the technical library, research reactor exhibit, and the films, the United States presented to the Official Representatives of the 73 nations and 8 UN specialized agencies taking part in the Conference, and to conference and UN officials, handsomely bound blue and gold 8-volume sets of highly technical information.

The first token presentation of these volumes of Selected Reference Material was made by Chairman Strauss at a luncheon for UN Conference Officials given August 9 by the United States Official Representatives at the Perle du Lac restaurant in Geneva. This was accomplished by personal presentation of a special introductory volume. Chiefs of national delegations were notified in letters from the Chairman dated August 6 that a set was being reserved for each official representative and was available through the United States Technical Library at the Palais des Nations, and that additional sets could be shipped from the United States to whatever address each wished. (See attachment 1.) Copies of the special Introductory Volume, printed in four languages, and illustrated with color photographs, were distributed in Geneva, and 36 of the 8 volume sets.

The Introductory Volume carried, as a dedication, the statement from President Eisenhower which was displayed on placards both at the United States Technical Exhibit and at the Research Reactor Exhibit. In a preface to the volume, Chairman Strauss said:

"Interchange of scientific and technical knowledge will greatly facilitate the work of the scientists and engineers whose skills will be devoted to the future development of the peaceful uses of atomic energy.

"The United States has made available to the world's scientific community a large body of such data. In honor of this historic Conference and to stimulate further exploration and development of the beneficial applications of nuclear energy, the United States Atomic Energy Commission has prepared this special collection of technical data for the use of the delegates and the nations represented.

"The purpose of this collection is to provide information concerning the ways that we have found in which fissionable materials can be put to work in nuclear reactors for research purposes and for the production of power and radioisotopes.

"It is our sincere hope that this material will be of practical value to the men and women of science and engineering in whose hands the great power of the atom is becoming a benign force for world peace."

The presentations at the luncheon were made to the President, the Secretary General, the Deputy Secretary General and six Vice-Presidents of the Conference, and to the Senior Officers of the United Nations present in Geneva. These included Dr. Homi J. Bhabha (India), President of the Conference; the following vice-presidents: General Bernardino C. de Mattos (Brazil); Dr. W. B. Lewis (Canada); Professor Francis Perrin (France); Professor D. V. Skobel'tzin (USSR); Sir John Cockcroft (United Kingdom); Dr. I. I. Rabi (US); Conference Secretary General, Dr. Walter G. Whitman (US), and Deputy Conference Secretary General, Dr. Viktor S. Vavilov (USSR). The sets were presented also to Secretary-General Dag Hammarskjöld, of the United Nations, and to two United Nations Under Secretaries, Ralph Bunche (US) and Ilya S. Tchernychev (USSR), who assisted Dr. Whitman on Conference plans.

Boxed sets and Introductory Volumes were displayed at the Technical Library. The reception of the material was excellent. The remarks of recipients at Mr. Strauss' luncheon were highly favorable. Attendants at the Technical Library reported that recipients were much impressed by the wealth of information contained, and there were many requests for extra copies.

Additional paper-bound copies of the 8-volumes of the set are for sale by the Superintendent of Documents, Government Printing Office, Washington, D. C. (Price list in Attachment 2).

Early in the planning stages for US participation in the Conference, AEC decided it should plan to collect and make available to participants at Geneva atomic energy information in AEC files which would be useful to foreign countries entering the atomic energy field, but which did not lend itself to presentation as part of the official program.

As finally assembled, materials on the highest technical level made up the bulk of the publication, with emphasis on engineering drawings and engineering data rather than on purely scientific literature already quite well covered in published literature.

The eight volumes of the Selected Reference Material collection were:

- Volume 1. Research Reactors
- Volume 2. Reactor Handbook-Physics
- Volume 3. Reactor Handbook-Engineering
- Volume 4. Reactor Handbook-Materials
- Volume 5. Neutron Cross Section
- Volume 6. Chemical Processing
- Volume 7. Eight-Year Isotope Summary
- Volume 8. Information Sources

Tables of Contents of the Volumes are given in Attachment 3.

ATTACHMENT 1 - LETTER TO CHIEFS OF DELEGATIONS

Dear Mr. Chairman:

The United States Atomic Energy Commission has prepared for presentation to each of the official Representatives of the countries attending the International Conference on the Peaceful Uses of Atomic Energy, an eight-volume set of Selected Reference Material on Atomic Energy.

These volumes constitute another part of President Eisenhower's program to promote the peaceful uses of atomic energy throughout the world.

You are cordially invited to visit the United States Technical Library Exhibit in the library on the first floor of the Palais des Nations where a set of these volumes is being reserved for each of your Representatives. At your request, the United States Government will arrange for shipment of the volumes to an address you may wish to designate.

Sincerely yours,

/s/ Lewis L. Strauss

Lewis L. Strauss, Chairman
United States Delegation to the
International Conference on the
Peaceful Uses of Atomic Energy

ATTACHMENT 2 - PRICE LIST FOR SELECTED REFERENCE MATERIAL ON ATOMIC ENERGY

An eight-volume set of Selected Reference Material on Atomic Energy was prepared by the United States Atomic Energy Commission for presentation to representatives of nations attending the International Conference for the Peaceful Uses of Atomic Energy in Geneva. Volumes One through Seven, in paper covers, may now be purchased from the Superintendent of Documents, United States Government Printing Office, Washington 25, D. C. Although Volume Eight, "Information Sources", is not offered for public sale, it is based in large part on TID-4000, "Cumulated Numerical List of Available Unclassified USAEC Reports", February 1955, and TID-3070, "Nuclear Science—A Bibliography of Selected Unclassified Reference", April 1955. These latter two publications are being sold through the Office of Technical Services, United States Department of Commerce, Washington 25, D. C.

Listed below are the titles and prices of the sale publications corresponding to volume numbers in the specially bound set of Selected Reference Material.

<u>Selected Reference Material</u>	<u>Sale Publication</u>	<u>Price*</u>
Volume One	TID-5275 Research Reactors	\$2.00
Volume Two	AECD-3645 Reactor Handbook, Vol. 1, "Physics"	\$4.25
Volume Three	AECD-3646 Reactor Handbook, Vol. 2, "Engineering"	\$5.50
Volume Four	AECD-3647 Reactor Handbook, Vol. 3, "Materials"	\$3.50
Volume Five	BNL-325 Neutron Cross Section	\$3.50
Volume Six	TID-5276 Chemical Processing and Equipment	\$2.00
Volume Seven	Isotopes -- An Eight-Year Summary of U. S. Distribution and Utilization	\$2.00
Volume Eight	(1) TID-4000 Cumulated Numerical List of Available Unclassified USAEC Reports	\$1.00
	(2) TID-3070 Nuclear Science— A Bibliography of Selected Unclassified References	\$0.80

* For foreign orders, include 25% extra to cover postage.

ATTACHMENT 3 - TABLES OF CONTENTS OF SELECTED REFERENCE MATERIAL

Volume 1 - Research Reactors

INTRODUCTION

Uses of Reactors, Reactor Classification, Performance and Costs,
Safety Problems, and Reactor Abbreviations.

CHAPTER 1. LIGHT-WATER-MODERATED REACTOR: TYPE I. HOMOGENEOUS --
ENRICHED FUEL

One-Watt Solution-Type
Reactor

General Design Features
Core and Fuel-Handling System
Graphite Reflector
Safety and Control Rods
Instrumentation
Shield
Operating Characteristics
Experimental Facilities
Fast-Neutron Measurements
in Thermal Column
Experimental Uses

Graphite Reflector
Control and Safety Rods
Instrumentation
Experimental Facilities
Critical Experiment
Operating Characteristics

Fifty-Kilowatt Solution-Type Reactor

Five-Hundred-Watt Solution-
Type Reactor

General Design Features
Core and Fuel-Handling System
Cooling System
Gas-Handling System

General Design Features
Core and Fuel-Handling System
Cooling System
Gas-Handling System
Reflector and Shielding
Control System
Instrumentation
Experimental Facilities
Operating Characteristics

Appendix

CHAPTER 2. LIGHT-WATER-MODERATED REACTOR: TYPE II. HETEROGENEOUS--
ENRICHED FUEL

Description of Facility

Reactor
Building
Pool and Water Supply
Reactor Supporting Structure
Instruments and Instrument Bridge
Health-Physics Instruments

Reactor Assembly

Fuel Elements
Grid Plate and Core Stacking
Reflector
Shield

Control and Safety System

Control Rods and Actuators
Control and Safety Instruments
Control Circuits
Safety Circuits

The Reactor Assembly

Nuclear Characteristics of
Reactor Core
Fuel Elements
Safety Rods and Actuators

Performance and Operating Characteristics Control and Safety

Typical Critical Loadings	Reactivity Calculations
Control-Rod Effectiveness	
Temperature Coefficient	U-235 Requirements
Neutron Spectrum of Reactor	Excess Reactivity Requirements
Flux Traverses	Kinetics
Gamma Leakage Spectrum	Quasi-Equilibrium Power Levels
Neutron Attenuation in the Water Shield	
Gamma Attenuation in the Water Shield	

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Experimental Methods

Fuel-Loading Requirements
Fuel-Element Specifications

Water-Temperature Rise
Partial Reflectors
Duct Effects
Radiation Levels and Induced
Activities
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Distributed-Poison Calibration
Method
Power-Level Determinations
Temperature Coefficient Determinations

Reactor Shielding

Induced Activities

Induced Activity in Tank Wall

Radioactivity in Pool Water

Used Fuel-Element Shielding

Operating Procedures

Operating Procedures

Instrument and Circuit Checks
Normal Startup
Normal Operation
Reactor Reloading
Moving the Reactor and Reactor Bridge

Routine
Startup
Manual

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Cost of Bulk-Shielding Facility
Costs for a New Facility
Aquarium Reactor

Appendix B. Component List: BSF
or Similar Facility

Appendix C. Drawings

Description of Facility

Reactor and Supporting Structure
Pool and Water Supply
Building
Radiation Effects and Shielding
Health-Physics Provisions

CHAPTER 3. LIGHT-WATER-MODERATED REACTOR: TYPE III. HETEROGENEOUS --
ENRICHED FUEL

Part I. Design

Brief General Description
Need and Uses of the Materials-
Testing Reactor
A Brief Design History
Summary of Costs for Completed
Plant

Engineering Description of the Reactor

The Reactor
Reactor Tank System
Active Lattice
Control Rods
Reflector
Thermal Shield
The Biological Shield

Experimental Facilities
Reflector and Lattice Positions
Horizontal and Down-Beam Experi-
mental Holes
Vertical Experimental and Instru-
ment Holes
Thermal Column
Shuttle Tubes

Reactor Cooling
Process-Water-System Description
Reactor Cooling-Air System

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General Description
Canal Purge System
Canal Flushing
Canal Lighting
Canal Crane

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Control Instrumentation
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Compensated Ionization Chamber
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Water-Monitor Chambers
Boron Thermopiles
Other Instruments
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Calculations

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ment
Two Further "Clean" MTR-Like
Assemblies
A Series of Criticals Approach-
ing the MTR Design in Detail
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Reactor-Theory Computations for the
MTR Design

Flux Calculations
Reactivity Losses

Heat Production, Transfer, and Removal

Shielding

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Flux Mapping
Attainment of Full Power Rating
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 Weight of the 5 x 5 Core
 Burn-up of the 5 x 5 Core
 Reactivity Calculations
 Miscellaneous Experiments
 The Effect of Xenon on the
 Operation of the MTR
 Temperature and Pressure Measurements
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 Gamma Heating
 Reactivity Losses Due to Voids in Re-
 flector (3 x 9 Array)
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 Flux Traverses
 Burn-up

Observations and Conclusions

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 ment Holes
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 Safety Aspects of MTR Experimental
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 of Work Areas
 Conclusion

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 Area Survey and Monitoring
 Routine Daily Surveys
 Special Surveys
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- Personnel Monitoring and Protection
 - Personnel Monitoring Devices
 - Pickup and Reading Schedule
 - Permanent Monitor Installations
 - Anticontamination Clothing
 - Masks and Hoods
 - Contamination Procedure
 - Prohibitions
 - Urinalysis
- Instruments
- Duties of the Shift Health Physicist
- Waste Disposal
 - Dry Wastes
 - Contaminated Equipment
 - Liquid Wastes
- Decontamination
- Transfer of Materials
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 - General Health-Physics Activities
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 - Exposure of Personnel to External Radiation
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Thermal Expansion
Shielding and Further Reactor
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General Description

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Costs
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Additional Safety Systems
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Systems
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Loading Procedure
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- Chapter 1.4 Reactor Statics; Theory and General Results
- Chapter 1.5 Reactor Statics; Experimental and Numerical Results
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- Chapter 2.1 Sources of Radiation
- Chapter 2.2 Permissible Levels of Radiation
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SECTION 2. RADIATION SHIELDING

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Chapter 1.3 Physical and Thermodynamic Properties of Light and Heavy Water	Chapter 1.9 Thermal-Stress Analysis
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Chapter 1.6 Spatial Distribution of Heat Generation.	Chapter 1.12 Calculation of Water Activity
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C. Clinical Research	R. Biosynthesis of Labeled Compounds
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G. Metabolite Physiology in Animals	V. Radiochemistry
H. Non-Metabolite Physiology in Animals	W. Radiation Detection
I. Injurious Agent Physiology in Animals	X. Radiation Physics
	Y. Nuclear Properties of Isotopes
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BB. Isotope Techniques	Bibliography
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Volume 8 - Information Sources

SECTION 1

Technical Papers Contributed by the United States
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A Guide to the Scientific and Technical Literature
of the United States Atomic Energy Commission

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Numerical Index of United States Atomic Energy
Commission Reports

APPENDIX IX - US EXHIBIT OF MOBILE HEALTH AND SAFETY LABORATORY

In addition to the US Technical Exhibit within the Palais des Nations, and the Research Reactor, the United States sponsored a third technical exhibit -- a new Mobile Radiological Unit, installed in a truck semi-trailer, which was placed on the Palais grounds to the east of the northern Library Wing that housed the Belgian, USSR, UK, and US technical exhibits. Planned and constructed for the Atomic Energy Commission for use in field tests of actual or potential radiation, and other toxic hazards, the unit was visited by 25,000 persons, some 500 a day being delegates, during the two weeks of the Conference.

The mobile laboratory, housed in a 35 x 8 foot trailer, contained radiation monitoring and analytical equipment for use near laboratories or industrial establishments where radioactive materials are used. It was designed so that specific instruments may be removed or installed to meet specific requirements. It contained also fume hoods, especially designed to provide, in limited space, the same ventilation as full-scale equipment, air compressors, electrical generation equipment, and a liquified petroleum gas system, in addition to supplies of deionized water, or re-agents and other chemical equipment, standard radiometric equipment, benches for repairs of equipment. To facilitate decontamination, all exposed surfaces are of smooth-finish plastic or stainless steel, and with a minimum of crevices. Generating equipment, gas supply, and all transformer networks are enclosed in a fireproof compartment forward.

As exhibited at the Conference, the trailer contained the following equipment, representative of units available for particular surveys:

Radon equipment consisted of chambers, pre-amplifier, amplifier and power supply, which permitted determination of radium burden by measuring concentration of radon in human breath. The equipment was capable of measurement of 5×10^{-4} curies of radon in 1 liter, automatically recording the rate of radon and daughter-product alpha emission.

Uranium fluorimeter, using a photomultiplier tube to measure fluorescence, could detect uranium at levels of 10^{-10} grams fused with sodium fluoride. It can be used to determine the quantity of uranium in urine.

Gamma detector, consisting of a 16-inch photomultiplier tube and a liquid organic phosphor, can directly measure the concentration of gamma emitters in the lungs or other portions of the body.

MOBILE RADIOLOGICAL UNIT

Le Laboratoire Radiologique Mobile

Unidad Radiological Movil

ПОДВИЖНАЯ РАДИОЛОГИЧЕСКАЯ УСТАНОВКА



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U.S.A.E.C.

DIVISION OF BIOLOGY AND MEDICINE — WASHINGTON, D. C.

DIRECTION DE LA BIOLOGIE ET DE LA MÉDECINE
DIVISION DE BIOLOGIA Y MEDICINA
ОТДЕЛ БИОЛОГИИ И МЕДИЦИНЫ

JOHN C. BUGHER, M.D., DIRECTOR

HEALTH AND SAFETY LABORATORY — NEW YORK, N. Y.

LABORATOIRE SANITAIRE ET DE SÉCURITÉ
LABORATORIO DE SALUBRIDAD Y SEGURIDAD
ЛАБОРАТОРИЯ ЗДРАВООХРАНЕНИЯ

MERRIL EISENBUD, DIRECTOR

ОТДЕЛЕНИЕ ПО
ИЗЛУЧЕНИЯМ

SECTION DE IRRADIACION
SERVICE DU RAYONNEMENT
RADIATION BRANCH

HANSON BLATZ*

ОТДЕЛЕНИЕ ПО
ПРОМЫШЛЕННОЙ ГИГИЕНЕ

SECTION DE HYGIENE INDUSTRIAL
SERVICE D'HYGIÈNE INDUSTRIELLE
INDUSTRIAL HYGIENE BRANCH

WILLIAM HARRIS*

АНАЛИТИЧЕСКОЕ
ОТДЕЛЕНИЕ

SECTION ANALITICA
SERVICE D'ANALYSES
ANALYTICAL BRANCH

HARRIS D. LEVINE*

JOHN H. HARLEY*

* WITH TRAILER IN GENEVA

* CON EL REMOLQUE, EN GINEBRA

* AVEC LA REMORQUE À GENÈVE

* С прицепом в Женеве

1035758

MOBILE RADIOLOGICAL LABORATORY

This mobile radiological unit, a permanent, operating laboratory, contains many instruments designed and fabricated by the AEC's Health and Safety Laboratory in New York to implement the techniques it employs in the evaluation of radiological hygiene conditions. Samples collected in the field are sent to the Laboratory for analysis or, under some circumstances, the Laboratory may be sent, via this trailer, to the sampling area.

LABORATOIRE RADIOLOGIQUE MOBILE

Ce laboratoire radiologique mobile est doté de nombre d'instruments mis au point et fabriqués par le laboratoire sanitaire, pour assurer la bonne exécution de techniques servant à l'évaluation de l'état radiologique du milieu. Les échantillons récoltés sur place sont envoyés au laboratoire aux fins d'analyse et, dans certains cas, c'est le laboratoire lui-même, c'est-à-dire la remorque, que l'on envoie à la région où doivent être recueillis ces échantillons.

LABORATORIO RADIOLOGICO MOVIL

Esta unidad radiológica móvil, constituida por un laboratorio permanente de trabajo, contiene muchos instrumentos ideados y fabricados por el Laboratorio de Seguridad y Salubridad de la AEC en Nueva York, para dar curso a las técnicas empleadas en la valoración de los problemas radiológicos. Se envían al laboratorio, para su análisis, muestras recogidas en el campo o, en ciertas condiciones, el mismo laboratorio puede enviarse por este remolque, a la región de obtención de muestras.

ПОДВИЖНАЯ РАДИОЛОГИЧЕСКАЯ ЛАБОРАТОРИЯ

Эта подвижная радиологическая установка — постоянная рабочая Лаборатория — содержит много приборов, сконструированных и изготовленных Лабораторией здравоохранения Комиссии по атомной энергии в Нью-Йорке: эти приборы служат для осуществления методики, применяемой Лабораторией, в оценке радиологических условий. Пробы, собранные на периферии, посылаются в Лабораторию на анализ или, при некоторых условиях, Лаборатория посылается в этом прицепе в район отбора проб.

INSTRUMENTATION DU LABORATOIRE RADIOLOGIQUE MOBILE **INSTRUMENTOS DEL LABORATORIO RADIOLOGICO MOVIL** **ПРИБОРЫ ПОДВИЖНОЙ РАДИОЛОГИЧЕСКОЙ ЛАБОРАТОРИИ**

FUME HOODS — especially designed to provide, in limited area, the same ventilation functions performed by full scale laboratory equipment.

NOTES À VAPEURS — Spécialément étudiées pour assurer, dans une zone délimitée, la même ventilation que celle qui est prévue dans les grands laboratoires à poste fixe.

CAMPANAS DE GASES — Ideadas especialmente para dar, en superficies limitadas, un efecto de ventilación equivalente al del equipo de laboratorio de tamaño normal.

ДЫМОТВОДЯЩИЕ КОЛПАКИ специально сконструированы так, что дают такую же вентиляцию малой площади, какую дает полное лабораторное оборудование.

GAMMA SPECTROMETER — sorts and records incident gamma photon energies into discrete bands by means of single channel discriminator of unique design.

SPECTROMÈTRE À RAYONS GAMMA — Sépare et enregistre l'énergie des photons gamma incidents sur bandes séparées au moyen d'un discriminateur à un seul canal, de conception entièrement inédite.

ESPECTROMETRO DE RAYOS GAMMA — Mediante discriminador de un solo canal, selecciona y hace

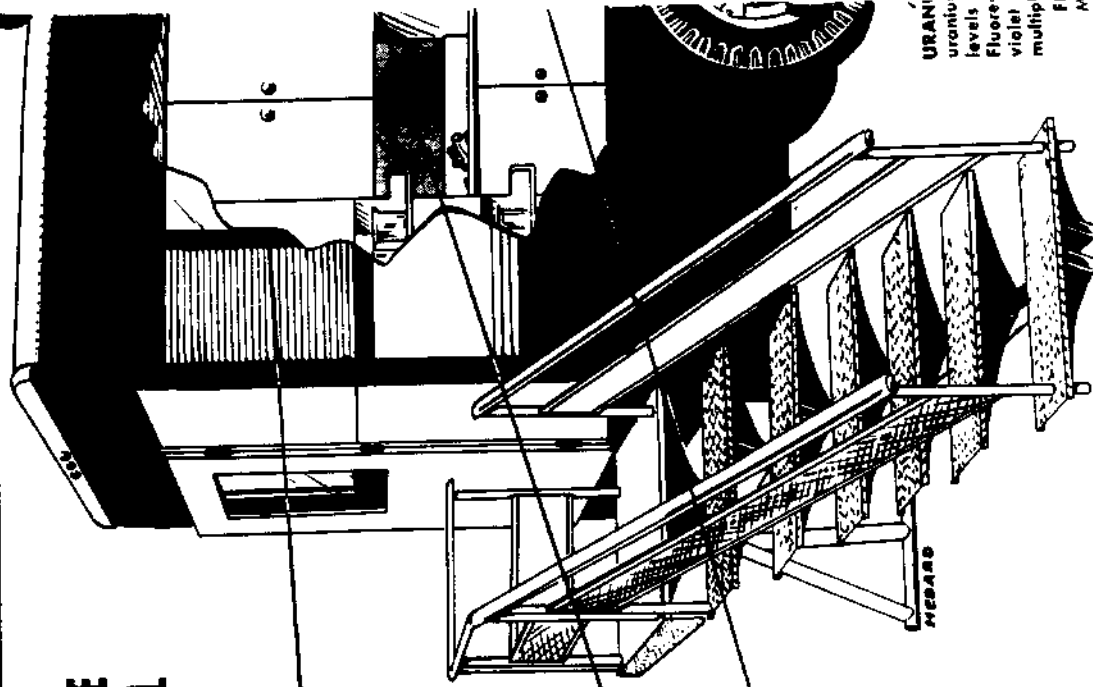
ABSORBER CHANGER — measures beta activity of 4 samples with 24 absorbers in fixed sequence. Resultant absorption curves enable identification of emitters.

JEU D'ABSORBEURS INTERCHANGEABLES — Mesure l'activité bêta de 4 échantillons au moyen de 24 absorbeurs disposés dans une succession donnée. Les courbes d'absorption ainsi réalisées permettent d'identifier les émetteurs.

JUEGO DE ABSORBEDORES INTERCAMBIABLES — Mide la actividad

beta de cuatro muestras por medio de 24 absorbentes dispuestos en una secuencia determinada. Las curvas de absorcion asi obtenidas permiten identificar los emisoras.

beta de cuatro muestras. Los resultados de las curvas de absorcion permiten identificar los emisoras.



URANI
uranio
levels
Fluore
violet
multip

УРАНИЙ ФЛУОРИМЕТР измеряет уран, сплавленный с фтористым натрием, при уровнях 10-15 грам в сплаве. Флуоресцентный свет, отфильтрованный от ультрафиолетового, измеряется фотомножительной лампой.

1035760

EXTRAPOLATION CHAMBER — measures dose rate at surface of beta emitters of infinite or lesser thickness. Measuring chamber is standard capacitor with variable dimensions. Ionization current is read on vibrating reed electrometer.

CHAMBRE D'EXTRAPOLATION — Mesure le régime de dosage à la surface d'émetteurs bêta d'épaisseur infinie ou finie. La chambre de mesure est constituée par un condensateur standard de dimensions variables. On lit le courant d'ionisation sur un électromètre à ancre vibrante.

CAMARA DE EXTRAPOLACION — Mide el régimen de dosificación en la superficie de emisoras de partículas beta de espesor infinito o menor. La cámara de medición es un condensador normal de dimensiones variables. La corriente de ionización se lee en un electrómetro de lengüeta vibratoria.

ЭКСТРАПОЛЯЦИОННАЯ КАМЕРА — измеряет дозировку у поверхности бета-излучателей бесконечной толщины или меньших толщин. Измеряющая камера представляет собой образцовый конденсатор с переменными размерами. Ионизационный ток отсчитывается на вибрационном электростанции.

TAPE COUNTER — automatically counts beta activity of as many as 100 samples sealed in reel of plastic tape. Records when predetermined time or count is reached. System can also identify emitters by decay.

COMPTEUR À RUBAN — Compte automatiquement l'activité bêta d'un nombre d'échantillons pouvant aller jusqu'à 100, scellés dans une bobine en ruban plastique. Annonce automatiquement le moment où l'on atteint un temps ou un comptage prédéterminé. Le même système peut également identifier les émetteurs par leur désintégration.

CONTADOR DE CINTA — Cuenta automáticamente la emisión beta de hasta 100 muestras encerradas en un carrete de cinta de material plástico. Graba, cuando se ha alcanzado un lapso o recuento predeterminado. El sistema puede también identificar emisoras por medio de la desintegración.

ЛЕНТОЧНЫЙ СЧЕТЧИК АВТОМАТИЧЕСКИ считает бета-активность до 100 образцов, заделанных в рулон пластмассовой ленты. Ведет запись при достижении заданного счета или времени. Устройство может также распознавать излучатели по их распаду.

GAMMA DETECTOR — a 16" photomultiplier in conjunction with a liquid organic phosphor measures concentration of gamma emitters in any portion of body.

DETECTEUR D'ÉMISSION GAMMA — Un tube photomultiplicateur de 406 mm mesure la concentration des émetteurs de rayons gamma dans toutes les régions de l'organisme au moyen d'une substance fluorescente organique liquide.

DETECTOR DE EMISION GAMMA — Un fotomultiplicador de 406 mm, junto con substancia orgánica líquida fluorescente, mide la concentración de los emisoras de rayos gamma en cualquier parte del cuerpo.

ОБНАРУЖИТЕЛЬ ГАММА-ИЗЛУЧЕНИЯ — Шестнадцатидюймовый фотоумножитель в сочетании с жидким органическим фосфором измеряет концентрацию гамма-излучателей.

RADON EQUIPMENT — measures radium burden in humans from 1 liter breath sample. System permits measurement down to 5×10^{-14} curies of radon.

DISPOSITIF À RADON — Détermine la dose de radium contenue dans l'organisme humain, en faisant le comptage sur un échantillon d'un litre d'air expiré. Le dispositif permet la mesure de quantités infinitésimales telles que 5×10^{-14} curie de radon.

EQUIPO PARA RADON — Mide la cantidad de radio acumulada en el hombre por muestras de un litro del aire exhalado. El sistema posibilita la medida de cantidades tan infinitesimales como 5×10^{-14} curies de radon.

РАДОННЫЙ ПРИБОР измеряет содержание радия в человеке по 1 литру образца дыхания. Устройство позволяет измерять до 5×10^{-14} рад.

AUTOMATIC DUST COUNTER — simultaneously measures ambient gamma activity and the beta activity of airborne dust.

COMPTEUR AUTOMATIQUE À POUSSIÈRE — Mesure simultanément l'activité gamma du milieu ambiant et l'émission bêta des poussières aériennes.

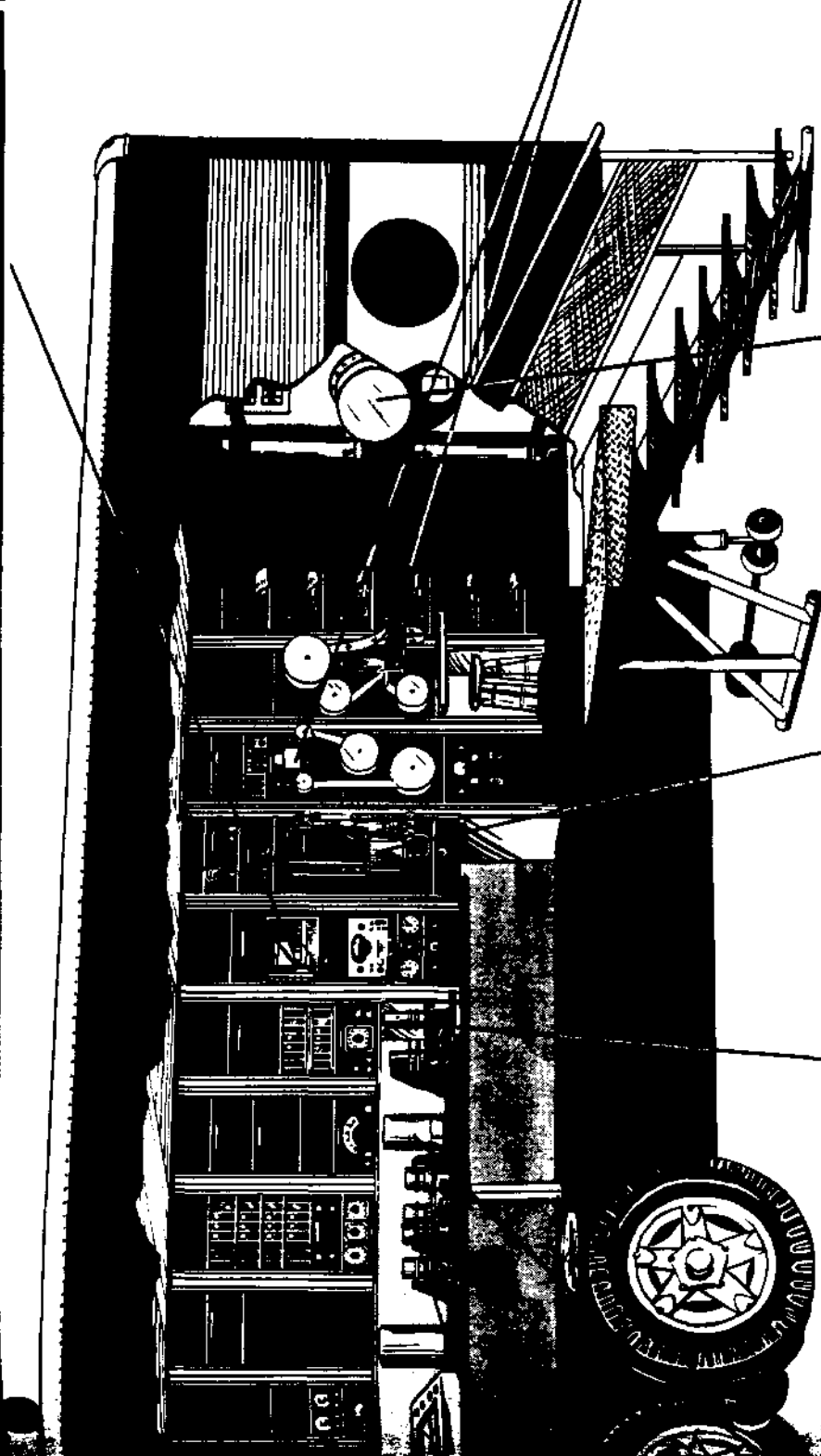
CONTADOR AUTOMATICO DEL POLVO — Mide, simultáneamente, la actividad gamma del medio ambiente y la emisión de partículas beta del polvo acompanyado por el aire.

АВТОМАТИЧЕСКИЙ ПЫЛЕСЧЕТЧИК одновременно измеряет окружающую бета- и гамма-активность пыли, содержащейся в воздухе.

URANIUM — measures sodium fluoride, at times in a lesion. Separated from ultra by photo-

À URANIUM — Mesure le sodium fondue avec le gramme. La lumière des filtres séparés photomultiplicateur.

DE URANIO — Mide con fluoruro de sodio, en pequeñas porciones, la luz fluorescente. El tubo mide la luz fluorescente mediante filtros, de



1035761

PORTABLE FIELD RADIATION DETECTION EQUIPMENT

MATÉRIEL PORTATIF DE DÉTECTION DU RAYONNEMENT SUR P
EQUIPO PORTATIL DE DETECCION DE LA IRRADIAC
ПЕРЕНОСНАЯ АППАРАТУРА ДЛЯ ОБНАРУЖЕНИЯ ИЗЛУЧЕ

EQUIPMENT FOR SAMPLING AIRBORNE DUST

MATÉRIEL D'ÉCHANTILLONNAGE DES POUSSIÈRES AÉRIENNES

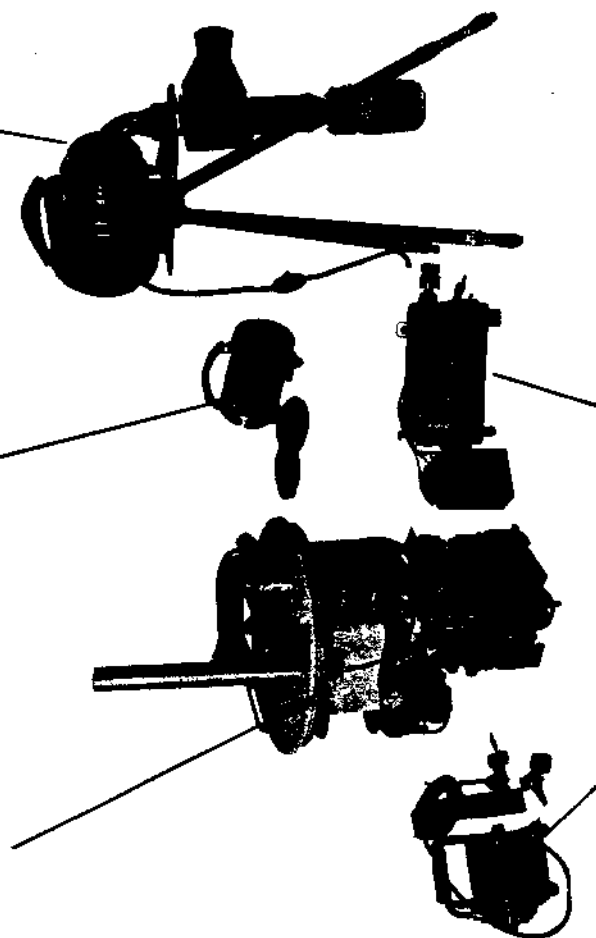
EQUIPO DE TOMA DE MUESTRAS DE POLVO ACARREADO POR EL AIRE

АППАРАТУРА ДЛЯ ОТБОРА ПРОБ ПЫЛИ, СОДЕРЖАЩЕЙСЯ
В ВОЗДУХЕ

COFFEE POT AIR SAMPLER
ÉCHANTILLONNEUR D'AIR DU GENRE "CAFETIÈRE"
ТОМАМУЭСТРАС ДЕ АИРЕ ТИПО "САФЕТЕРА"
ВОЗДУШНЫЙ ПРОБООТБОРНИК В ВИДЕ КОФЕВНИКА

AUTOMATIC DUST SAMPLER-COUNTER
COLLECTEUR AUTOMATIQUE ET COMPTEUR DE POUSSIÈRES
ТОМАМУЭСТРАС — КОНТАДОР АВТОМАТИКО ПАРА ПОЛВО
АВТОМАТИЧЕСКИЙ ПЫЛЕВОЙ
ПРОБООТБОРНИК-СЧЕТЧИК

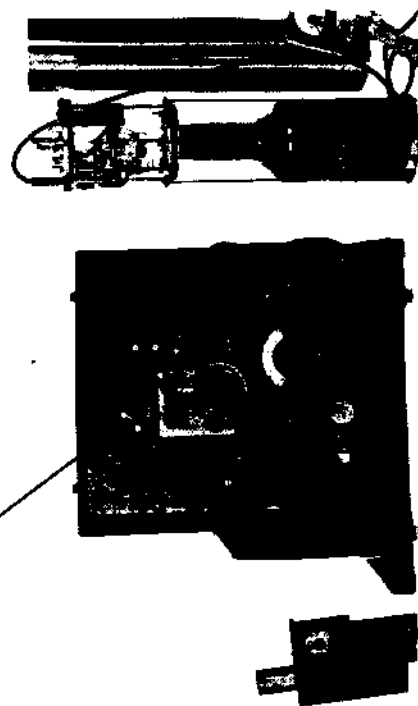
HIGH VOLUME AIR SAMPLER
ÉCHANTILLONNEUR D'AIR SUR GRAND VOLUME
ТОМАМУЭСТРАС ДЕ АИРЕ ДЕ ВОЛЮМЕН ГРАНДЕ
ВОЗДУШНЫЙ ПРОБООТБОРНИК С
БОЛЬШИМ ОБЪЕМОМ



BATTERY OPERATED DUST SAMPLER
ÉCHANTILLONNEUR DE POUSSIÈRE À BATTERIE
ТОМАМУЭСТРАС ДЕ ПОЛВО АЛИМЕНТАДО ПОР БАТЕРИА
БАТАРЕЙНЫЙ ПЫЛЕВОЙ ПРОБООТБОРНИК

LOW VOLUME AIR SAMPLER
ÉCHANTILLONNEUR D'AIR SUR PETIT VOLUME
ТОМАМУЭСТРАС ДЕ АИРЕ ДЕ ВОЛЮМЕН ПЕQUEÑO
ВОЗДУШНЫЙ ПРОБООТБОРНИК С МАЛЫМ
ОБЪЕМОМ

FIXED VOLUME BETA CHAMBER
CHAMBRE À ÉMISSION BETA À VOLUME FIXE
САМАРА ДЕ ПАРТИКУЛАС БЕТА ДЕ ВОЛЮМЕН КОНСТАНТЕ
БЕТА-КАМЕРА С ПОСТОЯННЫМ ОБЪЕМОМ



SCINTAMETER
SCINTAIRE
CONTAADOR DE CENTELLOS
СЦИНТАМЕТР

SCINTAIR
SCINTAIR
CONTAADOR "SCIN
СЦИНТАЭР

EQUIPMENT FOR DIRECT FIELD MEASUREMENT OF RADIATION

MATÉRIEL DE MESURE DIRECTE DU RAYONNEMENT SUR P
EQUIPO PARA MEDIDA DIRECTA DE LA IRRADIACION EN EL C
АППАРАТУРА ДЛЯ ПРЯМЫХ ПОЛЕВЫХ ИЗМЕРЕНИЙ ИЗЛУЧЕНИЯ

1035762

ZnS POLYETHYLENE ENERGY FLUX METER

INDICATEUR POLYÉTHYLÉNIQUE DE FLUX D'ÉNERGIE AU ZnS
 CONTADOR DE FLUJO DE ENERGIA DE POLIETILENO, AL ZnS
 ZnS-ПОЛИЭТИЛЕНОВЫЙ ИЗМЕРИТЕЛЬ ПОТОКА ЭНЕРГИИ

5" ZnS SCINTILLATION DETECTOR

DÉTECTEUR À SCINTILLATIONS DE 127 MM AU ZnS
 DETECTOR DE CENTELLEO DE 127 MM AL ZnS
 5-ДЮЙМОВЫЙ ZnS СЦИНТИЛЯЦИОННЫЙ ДЕТЕКТОР

2" ZnS SCINTILLATION DETECTOR

DÉTECTEUR À SCINTILLATIONS DE 51 MM AU ZnS
 DETECTOR DE CENTELLEO DE 51 MM AL ZnS
 2-ДЮЙМОВЫЙ ZnS СЦИНТИЛЯЦИОННЫЙ ДЕТЕКТОР

FAST NEUTRON PROPORTIONAL COUNTER

COMPTÉUR D'IONISATION ÉQUIVALENTE À UN ÉCHANTILLON DE TISSU
 CÁMARA DE IONIZACIÓN EQUIVALENTE A TEJIDOS
 БЫСТРО-НЕЙТРОННАЯ РАБОТАЮЩАЯ РАВНОЗНАЧНОСТЬ ТКАНИ

PORTABLE TISSUE EQUIVALENT ION CHAMBER RATE METER

COMPTÉUR PROPORTIONNEL À NEUTRONS RAPIDES
 CONTADOR PROPORCIONAL DE NEUTRONES RAPIDOS
 БЫСТРО-НЕЙТРОННЫЙ ПРОПОРЦИОНАЛЬНЫЙ СЧЕТЧИК

FAST NEUTRON PROPORTIONAL COUNTER

COMPTÉUR PROPORTIONNEL À NEUTRONS RAPIDES
 CONTADOR PROPORCIONAL DE NEUTRONES RAPIDOS
 БЫСТРО-НЕЙТРОННЫЙ ПРОПОРЦИОНАЛЬНЫЙ СЧЕТЧИК

LONG COUNTER

DETECTEUR DE TYPE ALLONGÉ, AU BF₃
 CONTADOR LARGO DE BF₃
 ДЛИННЫЙ BF₃ СЧЕТЧИК

GRAPHITE-CO. FILLED ION CHAMBER

CHAMBRE D'IONISATION EN GRAPHITE REMPLIE DE CO₂
 CÁMARA DE IONIZACIÓN DE GRAFITO LLENA DE CO₂
 ГРАФИТОВАЯ ИОННАЯ КАМЕРА НАПОЛНЕННАЯ СО₂

EQUIPMENT FOR THE DIFFERENTIAL ANALYSIS OF MIXED NEUTRON FIELDS

MATÉRIEL POUR L'ANALYSE DIFFÉRENTIELLE DES CHAMPS DE NEUTRONS MIX
 EQUIPO PARA EL ANALISIS DIFERENCIAL DE CAMPOS DE NEUTRONES MEZCLAD
 АППАРАТУРА ДЛЯ ДИФАНАЛИЗА СМЕШАННЫХ НЕЙТРОННЫХ ПОЛЕ

1035763

AILER DESIGN

trailer has been constructed to permit maximum flexibility in functions performed in the field. Although only one chemical hood has been installed for demonstration, others are normally carried for use as the need arises. A supply of water is also carried, in tanks beneath the trailer, as are supplies of reagents, other chemical equipment, conventional counting units, benches for servicing electronic units, etc.

The selection of equipment now in the trailer was based on a decision to demonstrate certain instruments and techniques. When the trailer is on an actual mission, these instruments can be replaced at the headquarters laboratory with units designed to perform the particular functions required.

ORGANISATION DE LA REMORQUE

La remorque a été réalisée de manière à lui donner un maximum d'adaptabilité aux fonctions qu'elle exerce sur place. Bien qu'il n'ait été installé qu'une seule hotte d'évacuation des produits chimiques pour cette démonstration, elle est normalement pourvue d'autres dispositifs du même genre, à employer en cas de besoin. Une réserve d'eau est également transportée dans des citernes installées sous la remorque, ainsi que des réactifs, du matériel de laboratoire chimique, des dispositifs classiques de comptage, des établis pour les travaux à exécuter sur les éléments électroniques, etc.

Le matériel actuellement installé dans la remorque a été choisi pour faire la démonstration de certains instruments et techniques. Quand la remorque est effectivement en mission, ces instruments peuvent être remplacés au laboratoire central par des unités étudiées pour l'exécution des travaux qui en seront spécifiquement attendus.

PROYECTO DEL REMOLQUE

Este remolque se fabricó para facilitar la adaptabilidad máxima de las funciones realizadas en el campo. Aunque se instalara solamente una cámara para esta demostración, se dispone normalmente de otras para uso, en caso necesario. Se lleva, además, agua en depósitos debajo del remolque y también reactivos, otros equipos químicos, aparatos contadores clásicos, bancos para el trabajo en elementos electrónicos, etc.

La selección del equipo que se verá en este remolque, se fundó en la decisión de mostrar ciertos elementos y técnicas. Cuando el remolque esté en misión, estos instrumentos pueden reemplazarse, en el laboratorio central, por elementos ideados para las funciones particulares necesarias.

КОНСТРУКЦИЯ ПРИЦЕПА

Прицеп сконструирован для обеспечения максимальной гибкости функций при выездных работах. Хотя на этой выставке монтирован только один химический колпак. В запасе имеется еще несколько для использования их по мере необходимости. Имеется также запас воды (в банках под прицепом). запасы реактивов, химическая аппаратура, обычные счетчики, верстаки для обслуживания электронных приборов и т. п.

Набор аппаратуры, находящейся в прицепе в настоящее время, основан на решении продемонстрировать некоторые приборы и приемы. При поездках прицепа приборы эти могут заменяться в стационарной лаборатории другими в зависимости от требований частного случая.

UNITED STATES

ATOMIC ENERGY COMMISSION

HEALTH AND SAFETY LABORATORY, P.O. BOX 30, ANSONIA STATION, NEW YORK 23, NEW YORK

1035764

Tape counter can be used for counting beta activity in large numbers of samples heat-sealed in reels of plastic tape and automatically passed through a G-M detector. The count is recorded at a pre-determined time or level.

Absorber changer would permit identification of beta emitters from absorption curves. The equipment was designed to read simultaneously on four samples with records taken automatically at each of 24 filter positions.

Gamma spectrometer, by means of a single channel discriminator, can identify and record gamma energies in discrete bands.

Automatic dust counter, consisting of a 24-position pneumatically-operated sample changer and a dual alpha-beta detector, can measure activity of air-borne dust, counting and recording automatically either sequentially or repetitively for each sample.

Extrapolation chamber would permit a count of the surface dose rate of beta emitters, and consisted of a standard capacitor and vibrating reed electrometer for reading ionization current.

Portable radiation detection instruments for sampling airborne dust, for direct field measurements of radiation, and for the differential analysis of mixed neutron fields were included in the Geneva exhibit and would normally be carried as required in the trailer during field operations.

A brochure, printed in four languages, was distributed at the exhibit in Geneva. Its 8 pages described the Mobile Laboratory, and included photographs of special instruments and a cut-away illustration of the inside of the trailer with the placing of various instruments and equipment indicated.

APPENDIX X — EDUCATIONAL AND COMMERCIAL EXPOSITION

An educational and commercial exposition, incorporating a trade fair, was held in Geneva during the International Conference. The exposition was not an official part of the Conference but was held under the auspices of the Swiss Federal Council, the United Nations, the State Council of the Republic and Canton of Geneva, and the Administrative Council of the City of Geneva. Approximately 150 industrial exhibits from as many firms in eight countries, plus the educational shows of France, the United Kingdom, and the United States, filled the 170,000 square feet of the Palais des Exposition, situated in downtown Geneva several miles from the Palais des Nations where the Conference was held. It was estimated by sponsors that about 40,000 persons visited the exposition.

The exposition literature listed France as having 49 exhibitors, the United Kingdom 37, Switzerland 23, the United States 20, West Germany 11, Belgium 5, and the Netherlands and Lichtenstein, one each. The United States Government did not officially sponsor commercial participation in the exposition, but notified individual concerns that might be interested so that they could, if they wished, arrange independently to have exhibits there.

France, the United Kingdom, and the United States sponsored educational displays, that of the United States being one of the United States Information Agency's "Atoms for Peace" shows which previously had been exhibited in Western Europe. The USIA show also included 18 exhibits from US industrial, Government and academic organizations, in addition to the 20 commercial concerns that made independent arrangements. (full list of 38 US participants listed in Attachment 1).

ATTACHMENT 1 - US CONTRIBUTORS TO PALAIS DES EXPOSITIONS EXHIBITS

US Organizations contributing to the USIA educational exposition:

Alco Products, Inc., Schenectady, N.Y.
American Machine and Foundry Co., New York City
Anton Electronic Laboratories, Inc., Brooklyn, N.Y.
S. Blickman, Inc., Weehawken, N.J.
Boston Museum of Science, Boston, Mass.
Central Research Laboratories, Redwing, Minn.
Corning Glass Works, Corning, N.Y.
El-Tronics, Inc., Philadelphia, Pa.
General Electric Co., Schenectady, N.Y.
P. M. Lennard Co., Inc., Harrison, N.J.
Lovelace Foundation for Medical Education and Research,
Albuquerque, N.M.
Newport News (Va.) Shipbuilding and Drydock Co.
Nuclear Instrument and Chemical Corp., Chicago, Ill.
Penberthy Instrument Co., Seattle, Wash.
Radiation Counter Laboratories, Skokie, Ill.
Tracerlab, Inc., Boston, Mass.
Westinghouse Air Brake Co., Pittsburgh, Pa.
Westinghouse Electric Corp., Pittsburgh, Pa.

US Participants in Commercial Exposition:

AMF Atomics Inc., New York City
Anton Electronic Laboratories, Brooklyn, N.Y.
Atomic Development Securities Co., Washington, D.C.
Babcock & Wilcox Co., New York City
Bendix Research Laboratories, Detroit, Mich.
Daystrom, Inc., Archbald, Pa.
General Dynamics Corp., New York City
General Electric Co., Schenectady, N.Y.
High Voltage Engineering Corp., Cambridge, Mass.
Walter Kidde Nuclear Laboratories, Inc., Garden
City, N.Y.
Foster Wheeler Corp., New York City
Micro Metallic Corp., Glen Cove, N.Y.
Nuclear Development Corp. of America (NDA), White Plains, N.Y.
Vitro Corp. of America, New York City
Westinghouse Electric International, New York City
Weston Electrical Instrument Corp., Newark, N.J.
Tracerlab, Inc., Boston, Mass.
National Research Corporation, Cambridge, Mass.
P. M. Lennard Co., Inc., Harrison, N.J.
Union Carbide and Carbon Corporation, New York City

APPENDIX XI - ADDRESS BY PRESIDENT DWIGHT D. EISENHOWER

BEFORE THE GENERAL ASSEMBLY OF THE UNITED NATIONS

(December 8, 1953)

MADAME PRESIDENT, MEMBERS OF THE GENERAL ASSEMBLY:

When Secretary General Hammarskjöld's invitation to address this General Assembly reached me in Bermuda, I was just beginning a series of conferences with the Prime Ministers and Foreign Ministers of Great Britain and of France. Our subject was some of the problems that beset our world.

During the remainder of the Bermuda Conference, I had constantly in mind that ahead of me lay a great honor. That honor is mine today as I stand here, privileged to address the General Assembly of the United Nations.

At the same time that I appreciate the distinction of addressing you, I have a sense of exhilaration as I look upon this Assembly.

Never before in history has so much hope for so many people been gathered together in a single organization. Your deliberations and decisions during these somber years have already realized part of those hopes.

But the great tests and the great accomplishments still lie ahead. And in the confident expectation of those accomplishments, I would use the office which, for the time being, I hold, to assure you that the Government of the United States will remain steadfast in its support of this body. This we shall do in the conviction that you will provide a great share of the wisdom, the courage, and the faith which can bring to this world lasting peace for all nations, and happiness and well being for all men.

Clearly, it would not be fitting for me to take this occasion to present to you a unilateral American report on Bermuda. Nevertheless, I assure you that in our deliberations on that lovely island we sought to invoke those same great concepts of universal peace and human dignity which are so cleanly etched in your Charter.

Neither would it be a measure of this great opportunity merely to recite, however hopefully, pious platitudes.

A Danger Shared by All

I therefore decided that this occasion warranted my saying to you some of the things that have been on the minds and hearts of my legislative and executive associates and on mine for a great many months — thoughts I had originally planned to say primarily to the American people.

I know that the American people share my deep belief that if a danger exists in the world, it is a danger shared by all — and equally, that if hope exists in the mind of one nation, that hope should be shared by all.

Finally, if there is to be advanced any proposal designed to ease even by the smallest measure the tensions of today's world, what more appropriate audience could there be than the members of the General Assembly of the United Nations?

I feel impelled to speak today in a language that in a sense is new — one which I, who have spent so much of my life in the military profession, would have preferred never to use.

That new language is the language of atomic warfare.

The atomic age has moved forward at such a pace that every citizen of the world should have some comprehension, at least in comparative terms, of the extent of this development, of the utmost significance to every one of us. Clearly, if the peoples of the world are to conduct an intelligent search for peace, they must be armed with the significant facts of today's existence.

My recital of atomic danger and power is necessarily stated in United States terms, for these are the only incontrovertible facts that I know. I need hardly point out to this Assembly, however, that this subject is global, not merely national in character.

The Fearful Potentials

On July 16, 1945, the United States set off the world's first atomic explosion.

Since that date in 1945, the United States of America has conducted 42 test explosions.

Atomic bombs today are more than 25 times as powerful as the weapons with which the atomic age dawned, while hydrogen weapons are in the ranges of millions of tons of TNT equivalent.

Today, the United States' stockpile of atomic weapons, which, of course, increases daily, exceeds by many times the explosive equivalent of the total of all bombs and all shells that came from every plane and every gun in every theatre of war in all of the years of World War II.

A single air group, whether afloat or land-based, can now deliver to any reachable target a destructive cargo exceeding in power all the bombs that fell on Britain in all of World War II.

In size and variety, the development of atomic weapons has been no less remarkable. The development has been such that atomic weapons have virtually achieved conventional status within our armed services. In the United States, the Army, the Navy, the Air Force, and the Marine Corps are all capable of putting this weapon to military use.

But the dread secret, and the fearful engines of atomic might, are not ours alone.

In the first place, the secret is possessed by our friends and allies, Great Britain and Canada, whose scientific genius made a tremendous contribution to our original discoveries, and the designs of atomic bombs.

The secret is also known by the Soviet Union.

The Soviet Union has informed us that, over recent years, it has devoted extensive resources to atomic weapons. During this period, the Soviet Union has exploded a series of atomic devices, including at least one involving thermo-nuclear reactions.

No Monopoly of Atomic Power

If at one time the United States possessed what might have been called a monopoly of atomic power, that monopoly ceased to exist several years ago. Therefore, although our earlier start has permitted us to accumulate what is today a great quantitative advantage, the atomic realities of today comprehend two facts of even greater significance.

First, the knowledge now possessed by several nations will eventually be shared by others — possibly all others.

Second, even a vast superiority in numbers of weapons, and a consequent capability of devastating retaliation, is no preventive, of itself, against the fearful material damage and toll of human lives that would be inflicted by surprise aggression.

The free world, at least dimly aware of these facts, has naturally embarked on a large program of warning and defense systems. That program will be accelerated and expanded.

But let no one think that the expenditure of vast sums for weapons and systems of defense can guarantee absolute safety for the cities and citizens of any nation. The awful arithmetic of the atomic

bomb does not permit of any such easy solution. Even against the most powerful defense, an aggressor in possession of the effective minimum number of atomic bombs for a surprise attack could probably place a sufficient number of his bombs on the chosen targets to cause hideous damage.

Should such an atomic attack be launched against the United States, our reactions would be swift and resolute. But for me to say that the defense capabilities of the United States are such that they could inflict terrible losses upon an aggressor -- for me to say that the retaliation capabilities of the United States are so great that such an aggressor's land would be laid waste -- all this, while fact, is not the true expression of the purpose and the hope of the United States.

To pause there would be to confirm the hopeless finality of a belief that two atomic colossi are doomed malevolently to eye each other indefinitely across a trembling world. To stop there would be to accept helplessly the probability of civilization destroyed -- the annihilation of the irreplaceable heritage of mankind handed down to us from generation to generation -- and the condemnation of mankind to begin all over again the age-old struggle upward from savagery toward decency, and right, and justice.

Surely no sane member of the human race could discover victory in such desolation. Could anyone wish his name to be coupled by history with such human degradation and destruction.

Occasional pages of history do record the faces of the "Great Destroyers" but the whole book of history reveals mankind's never-ending quest for peace, and mankind's God-given capacity to build.

It is with the book of history, and not with isolated pages, that the United States will ever wish to be identified. My country wants to be constructive, not destructive. It wants agreements, not wars, among nations. It wants itself to live in freedom, and in the confidence that the people of every other nation enjoy equally the right of choosing their own way of life.

No Idle Words or Shallow Visions

So my country's purpose is to help us move out of the dark chamber of horrors into the light, to find a way by which the minds of men, the hopes of men, the souls of men everywhere, can move forward toward peace and happiness and well being.

In this quest, I know that we must not lack patience.

I know that in a world divided, such as ours today, salvation cannot be attained by one dramatic act.

I know that many steps will have to be taken over many months before the world can look at itself one day and truly realize that a new climate of mutually peaceful confidence is abroad in the world.

But I know, above all else, that we must start to take these steps — NOW.

The United States and its allies, Great Britain and France, have over the past months tried to take some of these steps. Let no one say that we shun the conference table.

On the record has long stood the request of the United States, Great Britain, and France to negotiate with the Soviet Union the problems of a divided Germany.

On that record has long stood the request of the same three nations to negotiate an Austrian State Treaty.

On the same record still stands the request of the United Nations to negotiate the problems of Korea.

Most recently, we have received from the Soviet Union what is in effect an expression of willingness to hold a Four Power Meeting. Along with our allies, Great Britain and France, we were pleased to see that this note did not contain the unacceptable pre-conditions previously put forward.

As you already know from our joint Bermuda communique, the United States, Great Britain, and France have agreed promptly to meet with the Soviet Union.

The Government of the United States approaches this Conference with hopeful sincerity. We will bend every effort of our minds to the single purpose of emerging from that Conference with tangible results toward peace — the only true way of lessening international tension.

We never have, we never will, propose or suggest that the Soviet Union surrender what is rightfully theirs.

We will never say that the peoples of Russia are an enemy with whom we have no desire ever to deal or mingle in friendly and fruitful relationship.

On the contrary, we hope that this Conference may initiate a relationship with the Soviet Union which will eventually bring about a free intermingling of the peoples of the East and of the West — the one sure, human way of developing the understanding required for confident and peaceful relations.

Instead of the discontent which is now settling upon Eastern Germany, occupied Austria, and the countries of Eastern Europe, we seek a harmonious family of free European nations, with none a threat to the other, and least of all a threat to the peoples of Russia.

Beyond the turmoil and strife and misery of Asia, we seek peaceful opportunity for these peoples to develop their natural resources and to elevate their lives.

These are not idle words or shallow visions. Behind them lies a story of nations lately come to independence, not as a result of war, but through free grant or peaceful negotiation. There is a record, already written, of assistance gladly given by nations of the West to needy peoples, and to those suffering the temporary effects of famine, drought, and natural disaster.

These are deeds of peace. They speak more loudly than promises or protestations of peaceful intent.

For the Benefit of Mankind

But I do not wish to rest either upon the reiteration of past proposals or the restatement of past deeds. The gravity of the time is such that every new avenue of peace, no matter how dimly discernible, should be explored.

There is at least one new avenue of peace which has not yet been well explored — an avenue now laid out by the General Assembly of the United Nations.

In its resolution of November 28th, 1953, this General Assembly suggested — and I quote — "that the Disarmament Commission study the desirability of establishing a subcommittee consisting of representatives of the Powers principally involved, which should seek in private an acceptable solution . . . and report on such a solution to the General Assembly and to the Security Council not later than 1 September 1954."

The United States, heeding the suggestion of the General Assembly of the United Nations, is instantly prepared to meet privately with such other countries as may be "principally involved", to seek "an acceptable solution" to the atomic armaments race which overshadows not only the peace, but the very life, of the world.

We shall carry into these private or diplomatic talks a new conception.

The United States would seek more than the mere reduction or elimination of atomic materials for military purposes.

It is not enough to take this weapon out of the hands of the soldiers. It must be put into the hands of those who will know how to strip its military casing and adapt it to the arts of peace.

The United States knows that if the fearful trend of atomic military buildup can be reversed, this greatest of destructive forces can be developed into a great boon, for the benefit of all mankind.

The United States knows that peaceful power from atomic energy is no dream of the future. That capability, already proved, is here — now — today. Who can doubt, if the entire body of the world's scientists and engineers had adequate amounts of fissionable material with which to test and develop their ideas, that this capability would rapidly be transformed into universal, efficient, and economic usage.

To hasten the day when fear of the atom will begin to disappear from the minds of people, and the governments of the East and West, there are certain steps that can be taken now.

Proposal for Joint Atomic Contributions

I therefore make the following proposals:

The Governments principally involved, to the extent permitted by elementary prudence, to begin now and continue to make joint contributions from their stockpiles of normal uranium and fissionable materials to an International Atomic Energy Agency. We would expect that such an agency would be set up under the aegis of the United Nations.

The ratios of contributions, the procedures and other details would properly be within the scope of the "private conversations" I have referred to earlier.

The United States is prepared to undertake these explorations in good faith. Any partner of the United States acting in the same good faith will find the United States a not unreasonable or ungenerous associate.

Undoubtedly initial and early contributions to this plan would be small in quantity. However, the proposal has the great virtue that it can be undertaken without the irritations and mutual suspicions incident to any attempt to set up a completely acceptable system of world-wide inspection and control.

The Atomic Energy Agency could be made responsible for the impounding, storage, and protection of the contributed fissionable and other materials. The ingenuity of our scientists will provide special safe conditions under which such a bank of fissionable material can be made essentially immune to surprise seizure.

The more important responsibility of this Atomic Energy Agency would be to devise methods whereby this fissionable material would be allocated to serve the peaceful pursuits of mankind. Experts would be mobilized to apply atomic energy to the needs of agriculture, medicine, and other peaceful activities. A special purpose would be to provide abundant electrical energy in the power-starved areas of the world. Thus the contributing powers would be dedicating some of their strength to serve the needs rather than the fears of mankind.

The United States would be more than willing -- it would be proud to take up with others "principally involved" the development of plans whereby such peaceful use of atomic energy would be expedited.

Of those "principally involved" the Soviet Union must, of course, be one.

Out of Fear and Into Peace

I would be prepared to submit to the Congress of the United States, and with every expectation of approval, any such plan that would:

First -- encourage world-wide investigation into the most effective peacetime uses of fissionable material, and with the certainty that they had all the material needed for the conduct of all experiments that were appropriate;

Second -- begin to diminish the potential destructive power of the world's atomic stockpiles;

Third -- allow all peoples of all nations to see that, in this enlightened age, the great powers of the earth, both of the East and of the West, are interested in human aspirations first, rather than in building up the armaments of war;

Fourth -- open up a new channel for peaceful discussion, and initiate at least a new approach to the many difficult problems that must be solved in both private and public conversations, if the world is to shake off the inertia imposed by fear, and is to make positive progress toward peace.

Against the dark background of the atomic bomb, the United States does not wish merely to present strength, but also the desire and the hope for peace.

The coming months will be fraught with fateful decisions. In this Assembly; in the capitals and military headquarters of the world; in the hearts of men everywhere, be they governors or governed, may they be the decisions which will lead this world out of fear and into peace.

To the making of these fateful decisions, the United States pledges before you — and therefore before the world — its determination to help solve the fearful atomic dilemma — to devote its entire heart and mind to find the way by which the miraculous inventiveness of man shall not be dedicated to his death, but consecrated to his life.

APPENDIX XII - ADDRESS OF LEWIS L. STRAUSS, CHAIRMAN,
U.S. ATOMIC ENERGY COMMISSION, BEFORE THE LOS
ANGELES WORLD AFFAIRS COUNCIL -- "A FIRST STEP
TOWARD THE PEACEFUL USE OF ATOMIC ENERGY."

(April 19, 1954)

The technical limitations of photography in 1863 spared Abraham Lincoln the daily exhortations of "Just one more, Mr. President", but it would have been an intensely interesting archive for this generation to be able to see the expressive face of the great President -- for instance, just as he had delivered his address at Gettysburg. The ubiquitous camera no longer spares our Presidents. There is a flashlight photograph of President Eisenhower taken within a few moments after he had resumed his seat in the great assembly hall of the United Nations and just as the prolonged applause had begun -- applause which is almost unknown in that august chamber -- and which was the precursor of the world-wide acclaim that greeted his historic address. The picture is a very moving one. It is the face of a man who had succeeded in communicating his profoundest convictions to his hearers while they were responding spontaneously and with obvious feeling. What may well be a great moment in the history of the world is recorded and epitomized in that photograph.

By now a great deal has been said about the December 8th address. It was not a hastily put together speech. It is true that the invitation to appear before the General Assembly of the United Nations was only received while the President was in Bermuda and it presented an appropriate, indeed, an ideal forum for the occasion. But the speech itself had been long in composition and even longer in the President's mind. Every paragraph, every word in it had been weighed and considered by him. He had written and rewritten it and could have delivered it had he cared to do so without benefit of manuscript.

Like other great addresses, it was not long -- only some 3,000 words. Edward Everett's oration at Gettysburg on the famous day in 1863 took upwards of an hour to deliver and is forgotten. President Eisenhower's brief speech had two major purposes. One was to tell the world in the new language of the atomic age of what humanity faced if it could not escape another war. The other purpose was to propose an alternative to the headlong race of nations toward that precipice.

The first part was roughly two-thirds of the speech. In measured phrases which could not be misunderstood, the President described the force of the new weapons with which science and engineering had stocked the military arsenals of at least three nations. He said that he sought that day to speak in a language which he would have preferred never to use, — the new language of atomic warfare. "Atomic bombs," he said, "today are more than 25 times as powerful as the weapons with which the atomic age dawned, while hydrogen weapons are in the ranges of millions of tons of TNT equivalent." He continued, "Today, the United States' stockpile of atomic weapons, which, of course, increases daily, exceeds by many times the explosive equivalent of the total of all bombs and all shells that came from every plane and every gun in every theatre of war in all the years of World War II."

But so profound was the effect of the latter part of the address — so great the yearning of the world for some light in the gathering gloom of an atomic armament race — so welcome any hope for reducing the threat of atomic destruction by any amount or means — that there was surprisingly little note of the content of the first part of the address. It was, in fact, overshadowed in both news and editorial reaction.

The current series of weapons tests at our Pacific Proving Ground, however, has effectively dramatized the earlier part of the speech. I hope it has reminded many who had almost forgotten the fact, that the Soviets tested a thermonuclear device in August of last year. A little examination of the calendar also reveals that had we not begun our researches when we did, we might now be in a position of weapon inferiority to the Soviet Union — a condition with consequences of disastrous weight for the future of the presently free world.

I would like to speak to you tonight about both parts of that address, retrospectively about why we made A-bombs, why we decided to make H-bombs and, if the time permits, about what, in my humble judgement, lies ahead. It is an extensive catalog and I know that I can only treat each part briefly.

GENESIS OF PRESIDENT'S PLAN

To begin with, we in the United States undertook to make the atomic bomb because we had good reason to believe that the Germans were working on it. It was clear that we had no recourse but to see that we were not outstripped in armament, especially by a nation as irresponsibly and belligerently led as Hitler Germany. After we made the bomb, we used it. We used it to bring the war with Japan to an abrupt close and then rested on our military and scientific achievements.

The next step — our offer to share our monopoly with the world — despite its lack of success was one of the most satisfactory and proud pages of American history. It was satisfactory because its motivation was altogether meritorious. The blame for our failure to exercise this blight on the lives of our generation must be placed by history squarely where it belongs, on the heads and hands of the men in the Kremlin. In cynical but effective fashion, they used every diplomatic stratagem to delay, confuse, and destroy the proposal. In this they succeeded. It now appears that it may well have been because they had atomic weapon plans of their own.

The failure, therefore, of the Baruch proposals left the United States with no alternative but to press forward with the development of its atomic arsenal, and this too was done.

The Soviet achievement of atomic weapon capability eventuated sooner than most had expected — much sooner. Our intelligence arrangements, fortunately inaugurated in time, enabled us to know almost as quickly as the Russian high command and months before the Russian people learned, that a test had been made. We announced it on September 23, 1949.

The Soviets conducted further tests in the autumn of 1951 and again last summer. That last series began with a very large explosion in which we were able to say that a thermonuclear reaction had occurred, that is, the fusion of nuclei of light elements.

I have already referred to the cataclysmic possible consequences of this test had we been unready for its impact. Fortunately, we were prepared. When the fact that the Soviets had an atomic bomb capability was demonstrated in 1949 and with negotiations for international control and inspection deadlocked by them, President Truman took a decision. He was aware that a lead in numbers of weapons — a quantitative superiority which we believed that we then enjoyed, even if we were sure that we could hold it — would become of less and less importance relatively until it was meaningless. Our only hope was to maintain the status quo by having a qualitative superiority. The President gave the order to the Commission on January 31, 1950 to proceed with work on what was then generally called the "super" bomb, that is to say, a weapon employing as its chief source of energy the principle of nuclear fusion rather than of nuclear fission.

The success of American scientists and engineers in this new effort is by now well known, and we have no less an authority than Sir Winston Churchill for the considered opinion that it has been our continued possession of weapon superiority which has preserved the world from further large-scale aggression and another bath of blood.

Imagine the condition if we did not possess retaliatory power which neutralized the great Soviet manpower plus their atomic weapon potential. With that power possessed or useable by them alone, they could exert authority over small adjacent nations with the whole world eventually ending up in the maw of Communism and slavery.

The alternative, however, of "two atomic colossi doomed malevolently to eye each other indefinitely across a trembling world" which was the vivid metaphor used by the President, is likewise an unacceptable condition though to a far less degree than the consequence of submission to Communism. Because it represents an instability which could be triggered into a war of great destruction, President Eisenhower had given the subject long and concerned thought.

Out of his deliberations came the conviction that a new factor, a new dimension, would have to be emphasized before any hope would be entertained. The answer lay in the atom itself, in its latent power to become not the master and destroyer but the servant of man.

This was the genesis of the President's proposal and its first great virtue is that it can be undertaken "without the irritations and mutual suspicions incident to any attempt to set up a completely acceptable system of worldwide inspection and control."

You will recall the heart of his proposal was that the governments principally concerned to the extent permitted by elementary prudence should begin now and continue to make joint contributions from their stockpiles of normal uranium and fissionable materials to an "International Atomic Energy Agency". He envisaged that agency as established under the aegis of the United Nations. Such details as the ratio of contribution, the procedures, etc., he felt should be discussed in "private conversations" between the contracting parties. He assured the delegates of the nations to whom he was addressing himself that any partners of the United States, acting in good faith with us, would find us not unreasonable or ungenerous.

Private conversations have ensued. There is an impression I find -- probably because these conversations are private -- that nothing is going on and that the proposal is dormant. This is not the case. The President's idea has been formulated into a concrete plan. The plan has been discussed with certain friendly governments. Just one month ago today it was handed to the Soviet Ambassador in Washington for transmittal to his government. This step followed the private conversations which had begun in January and were continued by Secretary Dulles when the Foreign Ministers met in Berlin.

Why did the members of the Soviet delegation in the audience at the United Nations, caught off their guard, applaud with all the other delegates there present? And why after the first reactions of

denegation and disdain did the Soviet government at last respond? The answer to that must have been because of the impact of what followed. For the President had said:

"The United States would seek more than the mere reduction or elimination of atomic materials for military purposes. It is not enough to take this weapon out of the hands of the soldiers. It must be put into the hands of those who will know how to strip its military casing and adapt it to the arts of peace. The United States knows that if the fearful trend of atomic military buildup can be reversed, this greatest of destructive forces can be developed into a great boon, for the benefit of all mankind. The United States knows that peaceful power from atomic energy is no dream of the future. That capability, already proved, is here -- now -- today. Who can doubt, if the entire body of the world's scientists and engineers had adequate amounts of fissionable material with which to test and develop their ideas, that this capability would rapidly be transformed into universal, efficient, and economic usage."

At this point, I am privileged to state that it is the President's intention to arrange through a national scientific organization to convene an international conference of scientists at a later date this year. This conference, which it is hoped will be largely attended and will include the outstanding men in their professions from all over the world, will be devoted to the exploration of the benign and peaceful uses of atomic energy. It will be the first time that any such body has been convoked, and its purpose, also in the words of the President, will be "to hasten the day when the fear of the atom will begin to disappear from the minds of people and the governments of the East and of the West."

WHAT IS THE PRESIDENT'S PROPOSAL?

A few moments ago I mentioned the fact that the President's proposal had been formulated into a plan. It might be useful to state something affirmative about what the proposal is and is not to give a frame of reference within which the practical potentials of a World Atomic Bank can be discussed.

The United States proposal is not just another move in the chess game of world politics nor is it primarily a disarmament formula. It does not endanger the atomic weapons secrets of any nation that now has or may possess such secrets.

It does not involve suddenly placing trust where yesterday trust could not be reposed. Implementing the proposal requires no reliance upon impossible enforcement provisions nor does it depend on an interpretation of good faith.

It is not a prescription for technical alleviation of disease that still scourges too many parts of the world nor will it in a day — or a year — solve the desperate struggle for daily bread where that now exists. It will not — on any precisely measurable timetable — turn deserts into lush meadows nor provide the energy to lift grinding toil from the backs of those now living in underdeveloped areas.

The accumulative effect of the operation of the proposed agency will do these things:

It will accelerate the application of peaceful uses of the atom everywhere.

It will divert amounts of fissionable material from atomic bomb arsenals to uses which will benefit mankind, and these amounts will steadily increase as long as the peace is maintained.

It will foster the dissemination of information for peaceful uses to atomic scientists everywhere.

It will stimulate the acquisition of new fundamental data and theory on which all progress depends.

It will provide an opportunity for nations which are atomic have-nots, either individually or by combining with others, to acquire atomic facilities best suited to their individual needs.

It will increase man's knowledge of his own body and that of the plants and animals that nourish him and the insects and pests that threaten him, to the end that the healing art will be advanced and new ways found to increase the world's food supply. And man's useful life span will be prolonged.

It will encourage young and imaginative minds in many countries to seek useful careers in the new disciplines of science and engineering to the end that they may contribute to improving the economy and living standards of their respective countries.

And, perhaps, most important of all, the successful operation of the International Atomic Energy Agency will contribute mightily to focussing world attention and understanding on the potential of atomic energy to enrich the lives of all of us and thus dispel some of today's doubts and fears that its only use would be to destroy us.

Only in the last few days legislation has been introduced designed to amend the Atomic Energy Act in part to facilitate the President's plan.

Moreover, in the hearings when they take place on the measure and on possible declassification of data regarding industrial utilization

of atomic energy, we will be prepared to answer satisfactorily any questions about the impairment of the security of information. I would not be here tonight if I felt that America's participation in the International Atomic Energy Agency need endanger any secrets vital to our national defense.

PROSPECTS FOR MANY APPLICATIONS

It has been less than 12 years since the power of the atom was harnessed within a nuclear reactor. In that brief interval, the achievements in peaceful uses of its energy have been varied and important. Here in the United States these results have come along steadily and in increasing numbers despite our necessary concentration on military applications in behalf of our own defense and the defense of the free world.

There is no need here to inventory in detail the multiple applications of atomic energy which we have already found in the areas of medicine, biology, agriculture, and industry. We need only to note that notwithstanding, the surface has barely been scratched. Progress has also been made in other countries where the imaginations of men have been fired by the problems and the possibilities.

I do wish to emphasize a less widely known aspect of atomic progress — the advances in new fundamental knowledge. We have seen almost a dozen new elements isolated, identified, and fitted into the periodic table. In this still young art, we have witnessed the confirmation of the principle of breeding atomic fuel. Successful application of this principle will greatly extend the use of the normal uranium which would be contributed to the International Atomic Energy Agency.

Such advances in fundamental knowledge will be one of the high purposes of the new atomic agency. It is no risky extrapolation from what we now know to prophesy that in time — whether it be a few years or a decade or a generation — there will come discoveries to enrich the lives of all of us fully as important as those we have already witnessed.

ATOMIC ENERGY AS A SOURCE OF POWER

Near the end of his speech, the President said, "A special purpose (of the International Atomic Energy Agency) would be to provide abundant electrical energy in the power-starved areas of the world." There has been a very substantial recent development in this area. I would recall to you that within the last year the Atomic Energy Commission in testimony before Congressional committees felt

it necessary to discount the possibility that, under foreseeable conditions, there was any prospect for the large-scale investment of private capital in the development of nuclear power until the Commission had demonstrated its economic feasibility.

Today, less than one year since that statement, we have had nine proposals from large companies and groups of companies to undertake to build and operate the first large civilian power plant. It has been awarded to one, the Duquesne Light Company of Pittsburgh, whose proposal will save the Government some 30 million dollars of the cost of its construction and operations. Other companies also see the possibility of getting in on the development of nuclear power even at this early and economically undemonstrated stage, and other projects are under discussion with them.

This is an important milestone in the short life history of atomic energy. Competent engineers say that fossil fuel reserves, at least those that constitute presently available sources of supply, are rapidly dwindling. In Europe and elsewhere, nuclear power is now envisaged as the most promising energy source for the future.

Here, then, lies one ready opportunity for the proposed new atomic energy agency.

To me, the kind of thinking that would be stimulated by the mobilization of scientific and engineering minds, which should result from the operation of the world bank of atomic materials, would be unlimited since it is geared to man's imagination and his resourcefulness.

A HELPFUL FIRST STEP

For the first time since the discovery of fire, we have come into possession of a force with which we can enrich our lives incalculably or, failing to make that choice, we can wreck a large part of what we have inherited from the accumulated art, heart, and spirit of the generations that preceded us.

In an effort to temper optimism, yet preserve the great faith that the President's plan deserves, I have mentioned its immediate limitations. It will not be within its scope to cure the ills of the world with a single stroke and it does not pretend to insure against future war. It would be unfortunate if it were represented as other than what it is, for that is so very much, — an understandable, reasonable, feasible, constructive, and hopeful first step toward making atomic energy the servant of man.

My old chief, former President of the United States, Herbert Hoover, to whose Quaker convictions the possibilities of warfare are so fundamentally revolting, after listening to President Eisenhower's speech, said, "I pray it may be accepted by all the world." We may well join our prayers to his to ask that Divine Providence guide the hearts and minds of all men of all nations to grasp this opportunity to "shake off the inertia imposed by fear and make positive progress toward peace."

APPENDIX XIII - SPEECHES OF U.S. REPRESENTATIVES

BEFORE UNITED NATIONS

Address of John Foster Dulles, Secretary of State,
on International Cooperation in Developing the
Peaceful Uses of Atomic Energy

(September 23, 1954)

PARTNERSHIP FOR PEACE

I come to this opening of the Ninth General Assembly with a deep sense of the significance of this occasion. This annual gathering of the representatives of 60 nations represents mankind's most hopeful effort to achieve peace with justice. Here is made manifest the close interdependence of today's world, and also, the vast opportunity for constructive results which lie in good partnership efforts.

The Nature of Peace

The people of the United States believe wholeheartedly in the principles set out in the Charter of the United Nations. That document marks a milestone in the understanding of the nature of peace. It recognizes that peace is not a passive concept, but a call to action. It is not enough to dislike war and to denounce it. War has been hated through the ages. Yet war has been recurrent through the ages. One reason is that men have never put into the winning of peace, efforts comparable to those which they put into the winning of a war.

Mankind will never have lasting peace so long as men reserve their full resources for tasks of war. To preserve peace and to do so without the sacrifice of essential freedoms, require constant effort sustained courage and at times a willingness to accept grave risks. That is the true spirit of peace.

During the past year, many nations have actively worked together on behalf of a just and durable peace. There have been moments when, it seemed, the scales between general war and peace were precariously balanced. That hazardous equation still exists. But at least we see the hazard and strive to shift the balance in favor of peace.

The efforts of the past year are not to be appraised merely by whether they in fact produced concrete settlements. The making of intelligent, resolute and united efforts for just settlements has itself contributed to peace. It shows a dynamic spirit and a vigilance which are a warning to any potential aggressor.

In the past, peace has often been lost by default. That, let us resolve, shall not happen again.

I cannot, of course, touch on all of the manifold activities which have recently occurred within and without this Organization. I shall focus mainly on political efforts with which my own country was associated as an active partner. Let me first speak of the Organization of American States. The inter-American system rests on a long tradition of cooperation for freedom and peace in this hemisphere. Faithfulness to that tradition, and pride in it, have served to spare this hemisphere from such wars as have tragically ravaged Europe and Asia during the last century and more. Last March, the Caracas Conference of the American States decided and declared that if international communism gained control of the political institutions of any American state, that would be a danger to the peace and security of them all, and call for collective action to remove the threat.

However aggressive communism may be judged elsewhere, we of this hemisphere, with no exception, know that its intrusion here would open grave conflicts, the like of which we have not known before.

In Guatemala, there developed an identifiable threat to the peace and security of this hemisphere. The American States exchanged views about this danger, and were about to meet to deal with it collectively, when the Guatemalan people themselves eliminated the threat.

In this connection, there was occasion for the United Nations to apply the principles of our Charter which, while affirming the universal jurisdiction of this Organization, call for the use of regional arrangements before resort to the Security Council (Articles 33 and 52). These provisions had been hammered out in the course of debate at San Francisco, when our Charter was adopted. The American States at that time urged that their tested relationship should be coordinated with, and not totally replaced by, the United Nations, which they felt might prove undependable because of veto power in the Security Council. So it was decided to make regional association a major feature of the United Nations peace system.

This year the Organization of American States showed anew that it is ready, able and willing to maintain regional peace. Thereby, the provisions of the United Nations Charter have been vindicated and the foundation for peace in the American hemisphere has been solidified.

Germany

Last year, I said here that "the division of Germany cannot be perpetuated without grave risks". In an effort to eliminate that risk, I went to Berlin last January to confer with the Foreign Ministers of the other three occupying powers. We there joined with Britain and France in presenting a proposal for the unification of Germany through free elections, to be supervised by the United Nations or some comparable, impartial body. The Soviet Union countered with proposals which added up to an extension of the Soviet orbit to the Rhine. Accordingly, the dangerous division of Germany still persists. But, I may add, something else persists—that is our resolve, in the spirit of peace, to end the cruel injustice being done to Germany.

Austria

Last year I also spoke of an Austrian Treaty as being long overdue. I pointed out that as between the occupying powers there was "no substantial item of disagreement". At the Berlin Conference the three Western occupying powers eliminated the last vestige of disagreement by accepting the Soviet version of every disagreed article. It seemed, for a fleeting moment, that the Austrian Treaty might be signed. But then the Soviet Union improvised a new condition. It said that it would not free Austria from Soviet occupation until a German Peace Treaty was concluded.

There cannot be a German Peace Treaty until Germany is united. So, Austria continues to be an indefinitely occupied nation. Nevertheless, here again, we do not accept as final the denial of justice to unhappy Austria—the first victim of Hitlerite aggression and the object of the 1943 Moscow pledge of freedom and independence. The three Western powers, constant in the spirit of peace, have again within recent days urged that the Soviet Union sign the Austrian State Treaty as a deed which, far more than platitudinous words, will show whether other matters can fruitfully be discussed.

European Unity

The problem of peace in Europe has become more complicated because of the recent set-back to the consummation of the European Defense Community. That concept came from recognition that the best guarantee of permanent peace in Europe was an organic unity which would include France and Germany. Also, if this unity merged the military forces of these two and other European countries, that would assure their non-aggressive character. Such forces would clearly be unavailable except as the whole community recognized the need for defensive action.

The votes of Communist deputies more than accounted for the parliamentary majority which in one country shelved the EDC. Thus, they acted to perpetuate European divisions which have recurrently bred wars. However, the free nations concerned do not accept with resignation the perpetuation of what, historically, has been the world's worst fire hazard. They are alert to the peril and are working actively to surmount it.

Korea

Last year, when I spoke here about Korea, I was able to report an armistice. That, I said, was not because the communist aggressors loved peace, but because they had come up against an effective military barrier. I went on to say, "The Korean Political Conference, if the communists come to it, will afford a better test". It took seven months of arduous negotiation to bring about the Political Conference. When it occurred at Geneva, the United Nations side proposed the unification of Korea on the basis of free all-Korean elections to be supervised by the United Nations. This proposal was rejected by the communist side. They insisted that the United Nations must itself be treated as an instrument of aggression, and be debarred from any further activity in Korea.

This counterproposal, insulting to the United Nations, was unanimously rejected by those who proudly hailed the Korean action of the United Nations as the first example in all history of an international organization which had in fact acted effectively against armed aggression.

The United States does not believe that the unification of Korea must await another war. We have exerted all the influence we possess in favor of a peaceful solution of the Korean problem, and we have not lost faith that this solution is possible.

Southeast Asia

At the Geneva Conference the belligerents in Indochina also dealt with the problem of peace. An eight-year conflict of mounting intensity was brought to a close. We can all rejoice that there has been an end to the killing. On the other hand, we cannot shut our eyes to the fact that several hundred thousand in North Viet-Nam have at their desire been transferred to non-communist areas, and that there still remain millions unwillingly subject to an alien despotism. In this case, an end to fighting has been bought at a heavy price, and the final result is still obscure.

One result, however, has been the driving home to the nations interested in Southeast Asia of the importance of a collective organization for defense against further aggression. At Manila this month, eight nations met and negotiated and signed a treaty calling for collective defense against aggression.

The Manila Pact constitutes significant action taken under the Charter of the United Nations, which recognizes the inherent right of individual and collective self-defense. Those who cry out when others exercise their inherent right of self-defense only expose their own aggressive purposes.

Self-determination

The Manila Conference did much more than extend the area of collective security. It adopted the Pacific Charter. Thereby, the eight nations — Asian and non-Asian — which met at Manila proclaimed in ringing terms the principles of self-determination, self-government, and independence. This Charter, and the spirit of fellowship which gave it birth, should serve once and for all to end the myth that there is inherent incompatibility between East and West. The peoples of Asia who are already free, or who seek freedom, need not remain weak, divided and unsupported in the face of the new imperialism which has already reduced to colonial servitude 800,000,000 people, of what were once fifteen truly independent nations.

Atomic Energy

The past year has been marked by intensive efforts in the field of atomic energy. The United States has sought to share its commanding position in this field in ways that would permit many to join in a great new adventure in human welfare. We hoped to turn atomic energy from being an instrument of death into a source of the enrichment of life.

I vividly recall December 8, 1953, when we here heard President Eisenhower propose that the nations possessing atomic material would cooperate under the auspices of the United Nations to create a world atomic bank into which they would each contribute fissionable material which would then be used for the purpose of productivity rather than destruction. I shared the drama of that moment and sensed the universal applause which then greeted that proposal — applause which echoed around the world.

Because it seems that oftentimes negotiations publicly conducted with the Soviet Union tend to become propaganda **contests**, President Eisenhower proposed that these new negotiations should be

privately conducted. The United States, after consultation with others, then submitted a concrete, detailed proposal to carry out President Eisenhower's great conception. I myself met several times with the Soviet Foreign Minister at Berlin and at Geneva to discuss this matter. We are quite willing that all documents exchanged between the United States and the USSR during these negotiations be published.

We hoped and believed that if the Soviet Union would join with the United States, the United Kingdom and other nations possessing fissionable material and atomic "know-how", this act of cooperation might set a pattern which would extend itself elsewhere.

The plan we submitted could not have hurt anyone. It was motivated by the hope of lifting the darkest cloud that hangs over mankind. Its initial dimensions were not sufficient to impair the military capability of the Soviet Union, and there was no apparent reason for its rejection. Above all, it was a practicable, easily workable plan, not dependent on elaborate surveillance.

Nevertheless, the proposal was in effect rejected by the Soviet Union last April. Its rejection was not because of any alleged defects in the plan itself. Any such would certainly have been negotiable. The Soviet position was in effect to say — we will not cooperate to develop peacetime uses of atomic energy unless it is first of all agreed to renounce all those uses of atomic energy which provide the free nations with their strongest defense against aggression.

To date, the Soviet Government has shown no willingness to participate in the implementation of President Eisenhower's plan except on this completely unacceptable condition. Yesterday, when it was known that I would speak on this topic today, the Soviet Union broke a five months silence by delivering a note affirming its readiness to talk further. But the note still gave no indication that the USSR had receded from its negative position.

The United States remains ready to negotiate with the Soviet Union. But we shall no longer suspend our efforts to establish an international atomic agency.

The United States is determined that President Eisenhower's proposal shall not languish until it dies. It will be nurtured and developed. We shall press on in close partnership with those nations which, inspired by the ideals of the United Nations Charter, can make this great new force a tool of the humanitarian and of the statesman, and not merely a fearsome addition to the arsenal of war.

The United States is proposing an agenda item which will enable us to report on our efforts to explore and develop the vast possibilities for the peaceful uses of atomic energy. These efforts have been and will be directed primarily toward the following ends:

(1) The creation of an international agency, whose initial membership will include nations from all regions of the world. It is hoped that such an agency will start its work as early as next year.

(2) The calling of an international scientific conference to consider this whole vast subject, to meet in the spring of 1955 under the auspices of the United Nations.

(3) The opening early next year, in the United States, of a reactor training school where students from abroad may learn the working principles of atomic energy with specific regard to its peacetime uses.

(4) The invitation to a substantial number of medical and surgical experts from abroad to participate in the work of our cancer hospitals—in which atomic energy techniques are among the most hopeful approaches to controlling this menace to mankind.

I would like to make perfectly clear that our planning excludes no nation from participation in this great venture. As our proposals take shape, all nations interested in participating and willing to take on the responsibilities of membership will be welcome to join with us in the planning and execution of this program.

Even though much is denied us by Soviet negation, nevertheless much remains that can be done. There is denied the immense relaxation of tension which might have occurred had the Soviet Union been willing to begin to cooperate with other nations in relation to what offers so much to fear and so much to hope. Nevertheless, there is much to be accomplished in the way of economic and humanitarian gains. There is no miracle to be wrought overnight. But a program can be made and vitalized to assure that atomic energy can bring to millions a better way of life. To achieve that result is our firm resolve.

Limitation of Armament

Closely allied to this question of peaceful uses of atomic energy is the whole vast and complex question of disarmament.

At this Assembly last year, the United States affirmed its ardent desire to reduce the burden of armament. I stated here that the United States would vigorously carry forward the technical studies on armament control and limitation which are vital to any solution of this problem.

Last spring, the United States participated in discussions in London with the Soviet Union, the United Kingdom, France and Canada on a Sub-committee of our Disarmament Commission to see whether

a fresh approach to the problem could achieve a solution acceptable to the Soviet Union as well as to the free world. The record of these meetings has now been made public.

It shows that representatives of Canada, France, the United Kingdom and the United States tried with patience and ingenuity to explore all avenues of agreement with the Soviet Union which would be consistent with the security of all nations. Once more, we made clear, as we have again and again in the past, that we seek to eliminate the use of atomic energy for any purposes but those of peace.

These efforts were met by a flat refusal by the Soviet Union even to discuss our proposals on their merits. The crux of the Soviet Union's position was that, before it will engage in real negotiations on disarmament, it insists upon a paper ban by the major powers of the use of nuclear weapons. The great shield, the supreme deterrent, must first be abandoned, leaving the free nations exposed to the Communists' unrivalled manpower. Once that inequality has been assured, then, -- perhaps -- the Soviet Union will negotiate further from its position of assured supremacy. Such procedure would not increase the security of any free nation.

Reluctantly, we must conclude that the Soviet Union has at present no serious desire to negotiate on the disarmament problem. But we shall continue to hope, and to seek, that the Soviet Union may ultimately come to cooperate on a program which could end the wasteful diversion of vast economic wealth and bring it into the constructive service of mankind.

Charter Review

No doubt you will have observed that many of the efforts for peace to which I have referred were conducted outside of the United Nations itself. It should not, however, be forgotten that the organs of the United Nations are themselves steadily carrying forward activities which contribute substantially even though not spectacularly, to the political, economic and social conditions which are the foundation for peace. The United States wishes to pay a high tribute to those who perform these indispensable tasks.

If many major political developments have occurred outside the immediate framework of the United Nations, that is due to two causes -- one good, one bad:

The Charter of the United Nations itself provides that the parties to any dispute which would endanger international peace and security should first of all seek a solution by negotiations, resort to regional agencies, or other peaceful means of their own choice.

Only when these methods fail should there be resort to the Security Council. In other words, the Security Council of the United Nations was never intended to be a court of first instance, but only a court of last resort. In this sense, the unprecedented peace efforts of the past year fall within the pattern which our Charter itself prescribes.

A second cause exists, and it is disturbing. It is the fact that the membership of the United Nations falls far short of representing the totality of those nations which are peace-loving, which are able and willing to carry out the obligations of the Charter and which are indispensable parties to many critical international problems. Fourteen nations are now debarred from membership only through the use—in reality the abuse—of the so-called "veto" power. None of these is in the category of communist China, which has been found by the United Nations to be guilty of aggression. All fourteen are fully qualified for membership. Unless ways can be found to bring peace-loving, law-abiding nations into this organization, then inevitably the power and influence of this organization will progressively decline.

We are approaching the tenth anniversary of the founding of the United Nations. All of the member governments and their peoples may properly be thankful for the great accomplishments of the United Nations and for its unique service as a forum for international discussion. However, this coming anniversary must be made more than a date for self-congratulations. It is the time to take account of weaknesses of our organization and of ways in which it can be made to function better as a guarantor of peace and justice and as a center for harmonizing the actions of nations. That, indeed, was the idea of the founders, who planned for a Charter Review Conference to be called at the next annual session of our Assembly.

Conclusion

The search for peace has had its high hopes and its deep frustrations. But after the frustration, there is always renewed hope. On behalf of the United States I would say in my closing words that we believe that international peace is an attainable goal. That is the premise that underlies all our planning. We propose never to desist, never to admit discouragement, but confidently and steadily so to act that peace becomes for us a sustaining principle of action. In that we know that we shall not be alone. That is not merely because we have treaties of alliance and bonds of expediency. It is because the spirit of peace is a magnet that draws together many men and many nations, and makes of them a fellowship of loyal partners for peace.

Statement by Ambassador Henry Cabot Lodge, Jr., United States Representative in Committee I, on International Cooperation in Developing the Peaceful Uses of Atomic Energy: Report of the United States of America

(November 5, 1954)

Mr. President:

I. The Sequel of the President's Proposal.

Almost eleven months ago many of us in this building heard a speech by President Eisenhower, who had flown here directly from a conference in Bermuda. His speech addressed itself to the overwhelming problems which then confronted the whole world, and still confront it today.

One problem was the danger of atomic war -- wherein one nation could, by surprise attack, inflict grievous atomic damage on the United States, and in return receive atomic retaliation of fearsome proportions, leaving a ruin of mangled bodies, cultures, and economic and political systems after the atomic dust had settled.

President Eisenhower knew, and said, that merely to present the threat and to promise retaliation was neither an adequate nor a true picture of the feelings of the purposes of the United States.

In the name of the human race; in the name of civilization; in the name of truly peaceful purpose -- there had to be the promise of something more than earth-shattering explosions.

The President knew, and said, that such a speech had better be left unspoken unless he could add a message of peaceful hope.

In considering how best to present his message of hope, he was faced with a historical fact of controlling significance: -- the years-long, stubborn problem of negotiating a system for reduction and control of armaments and for the effective elimination of nuclear weapons.

Seven years of debate and negotiations had failed to bring the world closer to this goal.

The President, therefore, decided that to make a proposal which would be wholly within the framework of the trying debates of the past would not be considered, by you or the peoples of the world, an act of hopeful sincerity promising early progress.

He wanted to make an offer removed from the aura of past dejection and failure; he wanted to make an offer whose outstanding and unmistakable characteristic was that it was feasible -- that it was do-able -- that men and nations of good will and peaceful purpose could accept easily, and without having to lose face by having to reverse previously stated positions.

And so, on December 8, 1953, standing in the great hall upstairs and before this great Assembly, President Eisenhower said:

"I therefore make the following proposals:

"The Governments principally involved, to the extent permitted by elementary prudence, to begin now and continue to make joint contributions from their stockpiles of normal uranium and fissionable materials to an International Atomic Energy Agency. We would expect that such an Agency would be set up under the aegis of the United Nations.

"The ratios of contributions, the procedures and other details would properly be within the scope of the 'private conversations' I have referred to earlier.

"The United States is prepared to undertake these explorations in good faith. Any partner of the United States acting in the same good faith will find the United States a not unreasonable or ungenerous associate.

"Undoubtedly initial and early contributions to this plan would be small in quantity. However, the proposal has the great virtue that it can be undertaken without the irritations and mutual suspicions incident to any attempt to set up a completely acceptable system of world-wide inspection and control."

The President described the main purpose of the new international agency in these words: "to devise methods whereby this fissionable material would be allocated to serve the peaceful pursuits of mankind." He mentioned specifically the fields of agriculture, medicine, and electric power. Then he added:

"The United States would be more than willing -- it would be proud to take up with others 'principally involved' the development of plans whereby such peaceful use of atomic energy would be expedited.

"Of those 'principally involved' the Soviet Union must, of course, be one."

The President wished to take every precaution in order to insure that the Soviet Government would take this proposal at its serious, sincere, long-term, face value, and not interpret it as a short-term propaganda trick.

To insure this, he did two things. First, our Ambassador in Moscow was instructed to advise Mr. Molotov, in advance of the delivery of the speech, that it would contain material of serious import, and that we wished the Soviet Government so to consider it. Besides, after the speech was made, and awaiting an initiative from the Soviet Union to hold private conversations, all individuals and Agencies of the United States Government were instructed to remain silent as to the details of the proposal and to confine themselves, if the need for explanation arose, to a simple reiteration of the President's own text and the statement that we were awaiting word from the Soviet Union.

The President's second concern had to do with this very body — the United Nations. When he received Secretary-General Hammarskjöld's invitation to address you, he chose to make his proposal before this body and no other — because he wished the world to know that in this overwhelmingly important matter, he turned to the United Nations as the international organism most appropriate both to hear the original enunciation of the proposal and to participate in the development of the plan.

You all know the positive and hopeful response which greeted the President's proposal from all parts of the world. This response has greatly heartened the United States in its work with other States in developing a plan of action.

You know too that there was one disappointment — a rejection by the USSR of the President's proposal until the United States would agree to an unconditional and un-safeguarded ban on the use of atomic weapons. The story of that is contained in a United Nations document which is before you, Document A/2738 of 27 September 1954. Beginning on April 27 and continuing throughout this exchange of notes, the Soviet Union insisted that our new hope be shackled to the long debates of the past, where the difficulties of even the smallest progress had been so amply demonstrated.

True enough, the Soviet Union told us in a note delivered on September 22, 1954 — the day before the Secretary of State made his opening address to the General Assembly — that it was keeping the door open on a tiny crack. Actually the door had been thrown wide open on December 8, 1953 by the United States, and has been kept wide open by the United States ever since. The door is still open.

On learning of the essentially negative Soviet attitude, the United States lost no time in proceeding with conversations with

other states -- conversations whose initiation had awaited only a clear expression of the Soviet position. The States with which we have been conferring are those which have either developed raw material resources or advanced atomic energy programs and are engaged in developing this great force -- namely, the United Kingdom, France, Canada, Australia, Belgium, Union of South Africa, and Portugal. It is significant that all of us agreed that, despite the refusal of the Soviet Union to participate, we should move ahead with formation of the Agency. Our discussions have made some progress, as we shall later point out.

It was in these circumstances that Secretary of State Dulles spoke to this Assembly last September 23rd and said:

"The United States is determined that President Eisenhower's proposal shall not languish until it dies. We are determined that it shall be nurtured and developed. And we shall press on in close partnership with those nations which, inspired by the ideals of the United Nations, can make this great new force a tool of humanitarianism and of statesmanship, and not merely a fearsome addition to the arsenal of war.

"The United States is here proposing an agenda item which will enable us to report further on our efforts to explore and to develop the vast possibilities for the peaceful uses of atomic energy. These efforts have been and will be directed primarily toward the following ends:

"1. The creation of an international agency whose initial membership will include nations from all regions of the world--and it is hoped that such an agency will start its work as early as next year.

"2. The calling of an international scientific conference to consider this whole vast subject, to meet in the spring of 1955, under the auspices of the United Nations.

"3. The opening early next year in the United States of a reactor training school where students from abroad may learn the working principles of atomic energy, with specific regard to its peacetime uses.

"4. An invitation to a substantial number of medical and surgical experts from abroad to participate in the work of our cancer hospitals, in which atomic energy techniques are among the most hopeful approaches to controlling this menace to mankind.

"I want to make it perfectly clear that our planning excludes no nation from participation in this great venture."

Just this past Wednesday, November 3, President Eisenhower announced that the United States had delivered to the Soviet Ambassador in Washington a reply to the Soviet note of September 22, and that the President hoped that this would start a new phase in the U.S.-Soviet negotiations which might be more fruitful than the past efforts. The President reiterated, however, that the United States is determined to proceed with likeminded states in establishing an international agency to make this great power available to mankind generally as a boon which would benefit us all.

This is the history, briefly told, of the first year of efforts to create an international organization to ensure world cooperation in the peaceful uses of the atom.

The thought that has governed all our suggestions is that what we propose to do is feasible — is doable.

However, before we probe the future of international cooperation in this field, let us see where we stand today; let us review briefly the scientific developments that have brought us beyond the threshold of the atomic age.

II. The Threshold of the Atomic Age.

This moment of our discussion is a moment of excitement and challenge in the science and art of the atom. We in this hall are dealing with something more than the resolutions and amendments and forms of organization which are the tools of our diplomatic trade. We are dealing with the knowledge of a force, the mastery of a force, whose gigantic power of destruction is exceeded only by its power for human good.

Even we, as laymen, are aware of the thrilling sense of discovery in the minds of the scientists who have been able to put this gift in our hands. If we can share that sense of discovery, then we hope that our diplomatic progress will be a worthy match for the physical progress that has been brought about by the most adventurous scientific minds of our century.

A few key facts of that atomic progress show clearly that we have already passed the threshold of the peaceful atomic age. The summary which follows herewith will not touch on the achievements in other countries, which are equally promising and of which we shall doubtless hear more in the course of this debate.

We are in the presence of a whole range of atomic discoveries. Of all these discoveries, one of the most advanced for human benefit today stems from the use of the radio-active isotope. Many elements long known to physics, such as gold, cobalt and carbon, can be changed

in atoms: transform into new versions of themselves — radiogold, radiostrontium, radiocarbon, and so forth. A change in their atomic structure makes them give off rays. These rays have two main uses. They can bring about changes in living things. And they can be used as tracers, giving off signals to detection machines, to control the intricate processes of industry or to reveal new facts about the growth and diseases of plants and human beings that has never before been known to man.

Here are a few examples of how these isotopes have already been applied in the United States. Many of these are already well known to technicians in other countries.

First, consider the changing of living things by radiation.

Use of isotopes of iodine, radioactive cobalt and other elements have brought great progress in the killing of cancerous cells, far more effectively than the old X-ray machines.

Radiation has made it possible to preserve and store food without spoiling throughout the winter and spring.

In the development of new agricultural strains, radiation has been used to speed up many times over the genetic mutations from which new and better strains are derived — strains which resist disease and produce better foods and fibers in greater abundance.

Second, consider the use of isotopes as tracers, the applications in this realm of scientific discovery are already multitudinous and in theory are without limit. For instance:

In manufacturing flat sheets — metal, paper, plastic, or any material — their thickness is kept constant by measuring the strength of atomic radiation through the moving sheets.

In welding and riveting, radiation photography shows up flaws which were once extremely difficult to detect.

In oil pipelines, a radioactive pellet is dropped in the flowing pipe to signal the exact moment when a new kind or grade of oil arrives at its destination.

In agriculture, radioactive tracers mixed into fertilizers show exactly when and how efficiently the fertilizer is absorbed by growing plants — thus saving tremendous waste.

In the poultry industry, chicken feed is traced through the body of the hen until it is converted into an egg — showing what kind of feed should be given, and at what time, to produce eggs most efficiently.

In fish breeding, tracers have shown where simple chemical treatment could be used to convert sterile bogs into lakes swarming with food fish.

In medicine, tracer research has given us a new synthetic material for blood transfusion; tracers are used to detect faulty blood circulation before it is fatal, and to perform many other miracles of diagnosis; tracers have brought new discoveries about diabetes, thyroid disorders, blood diseases, and in fact, the entire process by which the living body is nourished and sustained.

In control of epidemics, tracers have been used to follow the migration of disease-bearing flies and mosquitoes, which is an essential step in stamping out these scourges.

These, at the beginning of the atomic age, are a few of the discoveries already made and put to work. Still other projects are well under way, among which perhaps the most extraordinary is the research into the mysterious process of plant growth called photosynthesis — the understanding of which may some day enable us to manufacture vast quantities of inexpensive food out of common chemicals. The effect of this on the standard of living can be conjectured.

Everyone of these advances has at its center the use of radioactive atoms. Most of these can be produced in comparatively small atomic reactors. In the United States the chief factory for these isotopes is the Oak Ridge National Laboratory. From Oak Ridge in the past eight years nearly 50,000 shipments of isotopes have been sent out to factories, laboratories, hospitals and universities. Most of these have been sent within the United States, — but over 2,800 have gone to 50 countries abroad.

It is fitting that the most imposing and most difficult application of atomic energy should be mentioned last: the production of electric power. This is a subject of intensive engineering research in the United States today. This year the Atomic Energy Commission launched a five-year program for the building of five experimental power reactors in the United States, all radically different in design. None of these is expected to produce power at prices that compete with power plants that burn coal and other conventional fuels. But they will tell us a great deal about the future of atomic power. For the knowledge we shall all gain from them, these plants will be worth the investment. They point the way to an age when all countries can be assured of abundant electric power, even where natural fuels are scarce. On the basis of this power, new industries can grow to enrich the lives of many millions of people.

One fact stands out about the atomic power reactor, even today in the minds of laymen, and that is its great complexity. This calls for expert knowledge, and is another reason why smaller reactors should be built in as many parts of the world as possible. These small research reactors can be built in a year's time for well under \$500,000 in many cases. They will produce most of the radioactive isotopes whose multitude of uses I have tried to describe. They will thus make possible a great increase both in research and in the practical application of the atom in medicine, farming, and industry. But beyond this, they will afford training grounds throughout the world at which a new generation of atomic scientists, engineers and technicians will learn the principles of reactor technology. Having mastered the research reactor, we will then — be moving towards what the world scarcely yet possesses — a body of men trained in all the techniques which will be needed to bring us practical atom power.

Mr. Chairman, the brief report just given on atomic progress in the United States describes many startling advances — discoveries which have already made the world a richer place. Yet these are no more than the nuggets which lie at the surface of a newly discovered mine. They are enough to give us some notion of the undiscovered wealth that lies below.

To tap that wealth in peace and cooperation should be a noble enterprise for the nations of the world. It is fitting that the discovery which brings us together in peace comes from the hands of one of the truly global fellowships of mankind — the fellowship of science, which knows no national boundaries and seeks truth and human betterment. There could be no more fitting salute to this world fellowship of science than our common determination to share some of the atomic knowledge and wealth we already possess — in order that all of us may possess more.

In this spirit, the United States is prepared to make contributions of several kinds to the next forward steps in the atomic field.

III. Next Step Forward

Having thus crossed the threshold of the atomic age, we come to the question of the next steps by which we can explore this new world. Here we reach the specific activities which we contemplate for the international agency. We believe that the Agency should encourage world-wide research in and development of the peaceful uses of atomic energy; it should arrange for nuclear materials to meet the needs of research, development and practical application to all manner of peaceful activities, including the eventual production of power. We believe the Agency should foster the interchange of information on peaceful uses. We expect that the international agency will conduct its activities in such a way as to prepare for the time when the use of atomic energy for peace becomes the predominant and perhaps the exclusive use of this great force.

The Agency should be created by a treaty which in our opinion should define the standards and principles governing the organization in the discharge of its functions. All states which originally ratified the agreement should become Members of the Agency, and there should be a provision for accepting additional members. We believe that members should accept an obligation to supply materials and information for the work of the Agency, financial support, facilities for open discussion and contacts among scientists engaged in peaceful research activities.

There is so much to be done that it would be inconceivable for the international agency to carry on all the activities from the outset. As a practical matter the international agency can carry on only a few of the activities in the immediate future — those most suitable to it. Nevertheless, the other activities will and must proceed simultaneously since they are all part of the basic program of steady forward movement into the atomic age.

We are prepared to start discussion with other countries for the conclusion of bilateral agreements which will make it possible for us, under our laws, to furnish technical information, technical assistance, and necessary amounts of fissionable material for the construction and operation of research reactors to be located abroad.

Now, let me tell you about the program which the United States is prepared to carry out pending the creation of the agency, partly as a result of the recent amendments to our own Atomic Energy Act. All these activities will be coordinated with the international agency's own program and may later be undertaken by the agency itself. No one has to be a scientist to appreciate the fact that basic to success in the development and use of power producing reactors in any country is the existence of a body of trained technical men.

I shall now speak in terms of what the United States Government is prepared to do in 1955 — next year — in this field of training.

First comes the field of nuclear reactors. We are prepared to establish a Reactor Training School early in 1955. The first course of this school would deal not only with atomic power theory, but the application of that theory.

Our present plans call for inviting between thirty and fifty scientists and engineers from overseas to study practical reactor engineering, in order to furnish sufficient basic science and engineering knowledge to permit the members of this group not only to understand the theory, but to become competent to operate reactors.

Initially the atomic information available to the members of this course will be non-secret. But as the United States and other

countries conclude the bilateral agreements required by the Atomic Energy Act of 1954, additional information will be made available. From the outset, however, the courses offered will give scientists and engineers a basic knowledge of the all-important experimental phases and principles of research reactors; and these are the essential training ground for the far more complicated power reactor.

Second, comes the field of safety. Because we are dealing with a power which is both a danger and a boon, it is necessary also that special training courses in radiation safety and medicine should be instituted simultaneously with any training in atomic power development. We propose, therefore, to establish under the sponsorship of the United States Atomic Energy Commission the following courses which will be open to all other nations:

Industrial Medicine — a one to two-year course given by the American universities having a relationship to the Atomic Energy Commission in the medicinal treatment required in industries concerned with atomic energy activity.

Industrial Hygiene — courses in the techniques of maintaining healthful conditions in industries dealing with hazardous atomic materials.

Radiological Physics and the Theory and Use of Radiation Instruments — instruction to be given at the Brookhaven National Laboratory.

Third in our training program comes the vast field of atomic biology and medicine. The Argonne Cancer Hospital at the University of Chicago, the Brookhaven National Laboratory, and the Cancer Research Hospital at the Oak Ridge Institute of Nuclear Studies will be open for one to two-year courses on the use of atomic energy in medicine and biology, for approximately five to ten foreign students per course.

The field of cancer is so important, and other countries have made such strides, that we do not wish to restrict our collaboration simply to the study of our techniques. We are therefore prepared to invite as many as 150 competent and distinguished visitors in the field of cancer research from overseas to visit our cancer research facilities during 1955. These guests will not only be free to study our facilities and techniques, but will also be encouraged to exchange views with our doctors and scientists.

Fourth and last in our training program comes the field of radioisotope tracer techniques, whose rapid development we have already discussed. In this field, until now, the Atomic Energy Commission has been able to conduct only a limited training program

for foreign scientists. The Commission is now prepared to establish special courses for foreign technicians to begin early in 1955 — these courses to cover a four-week period and to be divided into laboratory work, lectures on laboratory experiments, and seminars on special topics. The laboratory experiments would cover the use of instruments, the purification and separation of radioactive from inert materials, and the application of various isotope techniques to all fields of research.

Stated in statistical terms, the training courses we propose in safety, medicine, and biology would bring basic knowledge and training to more than 250 technical men from other nations in the course of the next twelve to fifteen months — the limitation on numbers being imposed not by our desire to restrict the sharing of this knowledge, but simply by our ability to absorb this number of observers, students and trainees effectively and efficiently within our present facilities.

So much for our early plans for training. Closely allied to this is the question of written information about the atom. We anticipate that from the outset the international agency will carry on a series of information and service activities, obtaining information from the operations of Member States in connection with their own atomic energy programs and from the Agency's own activities. Here is a brief outline of the type of information materials which the United States is prepared to make available in 1955 to the International Agency when it is set up.

Contrary to popular belief, the United States has, ever since the beginning of its atomic development, made available through published documents of the Atomic Energy Commission and articles in scientific journals, a vast body of research material on the peaceful uses of atomic energy. Yet the aura of mysterious monopoly still persists in the popular imagination.

You may be surprised, as I was, to realize that up to now, the publication by the United States of documents available to all on the peaceful uses of atomic energy comes to more than 10,000 papers totalling more than 200,000 pages of data.

Always mindful of the day when it might be beneficial to present this material in package form despite the fact that it has always been available in individual items, we have accumulated ten complete libraries of our own material, which we are prepared to give to the principal technical libraries of cooperating nations. And we will provide more than ten if there is a demand for more.

Besides these libraries of our own material, we are prepared to provide complete sets of index cards, and our journals of the past seven years, abstracting 50,000 scientific and technical books and reports, published in all countries.

Stated in physical dimensions, what we are prepared to furnish to each one of these foreign libraries is the equivalent of more than 300 linear feet of published reports, and over 200,000 index cards.

Furthermore, we will add to all of these libraries as the material is published, asking only in return that the cooperating nations provide their collections of official non-secret papers, not available in the general scientific literature, to be placed in the appropriate libraries in the United States.

In addition to training and publication, there is a third step which we must take in the field of research and development. We must further develop the practical applications of the atom to medicine, agriculture and other peaceful activities including the eventual production of power. The international agency will immediately encourage the development of such research activities and will seek to arrange for nuclear materials to meet the needs of research all over the world. It must be recognized, however, that the bulk of research on the atom will continue to be carried on by individual states.

These are the chief forward steps which we in the United States contemplate for 1955. As the President has assured you, atomic materials for projects sponsored by this Agency will be set aside for that purpose. We are confident that corresponding contributions to the common enterprise will be made by others. Some steps will be taken by individual states, others by the international agency and others partly by the states and partly by the Agency. In every case we should be guided by the principle that the Agency will concentrate on those things which cannot be done, or done not so well, by states and private groups acting alone.

All these steps together, during this coming year — 1955 — will bring us measurably further along the road that leads into the peaceful atomic age.

The United States initiated its Atoms for Peace Proposal through the United Nations. We hope that it will be possible to create the kind of international organization which will be competent rapidly, effectively and fairly to bring this priceless boon to untold millions beyond our shores.

It is our belief that a relationship should be established between the Agency and the United Nations similar to that of the Specialized Agencies. The exact terms of the relationship must, of course, await creation of the Agency itself. The Agency will be created by negotiations among interested governments. These negotiations, already in progress, will lead to the conclusion of a treaty subject to the usual constitutional processes of ratification. The International Atomic Energy Agency would consult and cooperate as

appropriate with other United Nations bodies whose work might be related to that of the agency, as well as with national atomic energy organizations and regional organizations such as the Organization for European Nuclear Research (CERN).

It would not be practicable to spell out the possible relationships any more precisely at this time until we know better just exactly what the agency will look like when it comes into being. While there has been a certain amount of general agreement among the states which are negotiating the creation of this agency on some of the administrative features, it does not seem possible to go into these negotiating matters in great detail now. You will recognize that the negotiations must take into consideration the views of the eight negotiating states in the light of their special position in the atomic energy field and also of other states which we hope will participate. In the main the negotiations have followed the line which we indicated in the March 19 outline which we submitted to the Soviet Union and which is before the Committee. But there may be changes.

It may be appropriate at this point to mention one problem that has come up in the negotiations. Originally the United States visualized that the international agency would hold fissionable materials itself. But after the Soviet rejection of the United States proposals, all the negotiating states concluded that it might be preferable that the agency act as a clearing house for requests made to the agency by the various beneficiaries. The donor state would earmark fissionable materials for the agency's operations and would transfer those fissionable materials directly to the projects approved by the agency. Since the resources of the agency obviously will be limited, it seems more useful to us to use the resources available to the agency for additional programs rather than for expensive custodial arrangements.

As I said earlier in this statement, the desire and purpose of the United States is that what we do shall remain within the area of the feasible and doable and not become hampered by being placed in the context of unending arguments or insuperable vetoes. We are proceeding as rapidly as possible, determined that this hopeful enterprise shall not be deterred nor delayed nor interminably frustrated by any who may not wish the blessing of atomic energy to be spread throughout the world.

The resolution which we intend to co-sponsor will reflect this desire to go forward as rapidly as possible for the benefit of the entire world.

IV. International Conference.

One further way in which the United Nations can contribute materially, in advance, towards the goal of extending to all peoples

the benefits of atomic energy is by convening an international conference to discover the field in which progress would be technically feasible and to develop procedures whereby the nations of the world can make known their wants.

The United States intends to support a conference fully and will send as our representatives qualified scientific and technical persons of the highest calibre that we possess. Our Atomic Energy Commission will remove restrictions from information and make it available, in the hope, thereby, of contributing to the value of the conference. Other states will undoubtedly do as much.

The United States has long believed that such a conference of scientists and of government officials concerned with their nation's atomic energy development would materially contribute to the knowledge of the participants and correspondingly benefit their countries. The opportunity to exchange information and become better acquainted with each other's problems in the vast field now opening before our eyes as the beneficial uses of atomic energy become both more feasible and more numerous would be fruitful.

Most of the participants in the conference will undoubtedly be government representatives many of whom will be experts in the field. The United States believes it appropriate also to invite representatives of various specialized agencies, whose tasks are such that the discussions at the conference would be of direct interest. We include in this category such agencies as UNESCO, the ILO, the WHO, and the FAO.

In order to organize the conference, issue invitations, prepare an agenda and rules of **procedure**, the Secretary General of the United Nations should act on the advice of a committee composed of representatives of certain states Members of the United Nations. For this advisory committee of states, we have in mind a membership which would meet two essential qualifications: knowledge of atomic energy development and appropriate geographic representation.

We recommend that the Conference should discuss topics such as probable world power requirements, the possible contribution of atomic energy to meet deficits in conventional fuels, the economics of nuclear power, the health and safety aspects of atomic energy, among other matters. Discussions could be held on nuclear technology, on reactor application in research and power on medical and biological applications of atomic energy, on industrial application of radioactive products.

We know that its reports and conclusions would be of great import both to the International Atomic Energy Agency, when it is established, and to individual countries so far as their own atomic energy program are concerned.

Conclusion.

We intend to co-sponsor a draft resolution in this Committee which will reflect the views just expressed. We believe it will indicate the best pattern for practical United Nations participation in this great work of international cooperation in developing the use of the atom for peace. In co-sponsoring this resolution the United States would express its wish to proceed with you on the fulfillment of this program — whose only purpose in the words of President Eisenhower last December, is "to find the way by which the miraculous inventiveness of man shall not be dedicated to his death, but consecrated to his life."

APPENDIX XIV - UNITED NATIONS NOTIFICATION TO THE UNITED STATES ON
CONFERENCE: INVITATION; GENERAL ASSEMBLY RESOLUTION;
TOPICAL AGENDA; RULES OF PROCEDURE; NOTIFICATION FROM
USSR

1 February 1955

Sir,

I have the honour, in pursuance of Resolution 810 (IX) of 4 December 1954, to invite your Government to participate in the International Conference on the Peaceful Uses of Atomic Energy. The Resolution, a copy of which is enclosed, provides in its Part B that "all States members of the United Nations or of the specialized agencies" are to be invited to participate in the Conference.

The Advisory Committee established by the General Assembly Resolution has now concluded its first session at the Headquarters of the United Nations, and with its advice the following actions affecting the organization and procedure of the Conference have been taken:

The Conference is to convene in Geneva on 8 August 1955, and will continue in session for twelve working days, that is through 20 August 1955.

The Topical Agenda which constitutes the general programme of the Conference has been prepared, and is enclosed as Annex I.

The Rules of Procedure for the Conference have been formulated, and are enclosed as Annex II.

The Agenda and Rules of the Conference have been prepared in pursuance of the above-mentioned Resolution of the General Assembly.

The Secretary-General has informed the Advisory Committee of his decision, in accordance with his understanding of the views of the Committee, to name Dr. Homi Bhabha of India as President of the Conference.

Six Vice-Presidents will be appointed by the Secretary-General of the United Nations following designation of individual nominees by the following States: Brazil, Canada, France, the Union of Soviet Socialist Republics, the United Kingdom of Great Britain and Northern Ireland, and the United States of America. Their names will be announced as soon as possible.

The Chairman and Rapporteurs of Sections will be appointed and their names announced in due course.

Professor Walter G. Whitman of the Massachusetts Institute of Technology has been engaged by the Secretary General as an officer of the United Nations Secretariat and assigned to serve as Conference Secretary General. A Deputy to him will be announced in due course.

The Secretary-General has appointed a United Nations internal working party to assist him on matters relating to the Conference. The members of this working party are: Mr. Ralph J. Bunche, Mr. Gunnar Randers and Mr. Ilya S. Tchernychev.

May I draw your attention particularly to certain provisions in the Rules of Procedure for the Conference to the effect that:

Each participating State "may be represented at the Conference by no more than five representatives . . . The representatives may be accompanied by such number of advisers as may be required, in the general interest of the Conference, to ensure adequate presentation and discussion of technical papers". (Rule 2)

The lists of representatives and proposed advisers of each participating State are to be submitted not later than fourteen days before the opening of the Conference. (Rule 4)

In view of the limited time available for presentation of the Conference, the titles and the requested 500-word abstracts of all papers intended to be presented at the Conference are to be submitted to the Secretary-General of the United Nations, if possible, not later than 15 May, while the full texts of the papers themselves are to be submitted to him not later than 1 July. (Rule B, Annex)

The travel and other expenses of participants in the Conference are not to be an obligation of the United Nations. (Rule 24)

With regard to the representation of each participating State, it should be noted that in paragraph 3 of Part B of the General Assembly resolution and in Rule 2 of the Rules of Procedure for the Conference, reference is made to the inclusion among the representatives, where possible, of "individual experts competent in the atomic energy field."

Having in mind the urgency of the time-factor, I would like to emphasize the necessity that the Secretary General be informed at your Government's earliest convenience as to the nature and probable number of papers relating to the Agenda which it may expect to submit.

In this latter connection, I may refer to a notification from the Government of the Union of Soviet Socialist Republics which is enclosed as Annex III.

I would appreciate notification, at an early date, of your Government's intention with regard to participation in the Conference in response to this invitation.

Accept, Sir, the assurances of my highest consideration.

Dag Hammarskjold
Secretary General
United Nations

The Secretary of State,
Department of State,
Washington 25, D. C.

UNITED NATIONS GENERAL ASSEMBLY RESOLUTION 810 (IX)

INTERNATIONAL CO-OPERATION IN DEVELOPING THE PEACEFUL
USES OF ATOMIC ENERGY

Adopted by the General Assembly at its 503rd plenary meeting on
4 December 1954

The General Assembly,

Believing that the benefits arising from the momentous discovery of atomic energy should be placed at the service of mankind,

Desiring to promote energetically the use of atomic energy to the end that it will serve only the peaceful pursuits of mankind and ameliorate their living conditions,

Recognizing, the importance and the urgency of international cooperation in developing and expanding the peaceful uses of atomic energy to assist in lifting the burdens of hunger, poverty and disease,

Believing, also that all nations should co-operate in promoting the dissemination of knowledge in the realm of nuclear technology for peaceful ends,

A

CONCERNING AN INTERNATIONAL ATOMIC ENERGY AGENCY

Recalling the initiative of the President of the United States of America, embodied in his address of 8 December 1953,

Noting that negotiations are in progress, and the intention that they should continue, for the establishment as quickly as possible of an International Atomic Energy Agency to facilitate the use by the entire world of atomic energy for peaceful purposes, and to encourage international cooperation in the further development and practical application of atomic energy for the benefit of mankind,

1. Expresses the hope that the International Atomic Energy Agency will be established without delay;

2. Suggests that, once the Agency is established, it negotiate an appropriate form of agreement with the United Nations;

3. Transmits to the States participating in the creation of the Agency, for their careful consideration, the record of the discussion of this item at the present session of the General Assembly;

4. Suggests that Members of the United Nations be informed as progress is achieved in the establishment of the Agency and that the views of Members which have manifested their interest be fully considered;

B

CONCERNING THE INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY

1. Declares the interest and concern of the General Assembly in helping in every feasible way to promote the peaceful applications of atomic energy;

2. Decides that an international technical conference of Governments should be held, under the auspices of the United Nations, to explore means of developing the peaceful uses of atomic energy through international cooperation and, in particular, to study the development of atomic power and to consider other technical areas - such as biology, medicine, radiation protection; and fundamental science - in which international cooperation might most effectively be accomplished;

3. Invites all States Members of the United Nations or of the specialized agencies to participate in the conference and to include among their representatives individual experts competent in the atomic energy field;

4. Suggests that the international conference should be held no later than August 1955 at a place to be determined by the Secretary General and by the Advisory Committee provided for in paragraph 5 below;

5. Requests the Secretary General, acting upon the advice of a small committee composed of representatives of Brazil, Canada, France, India, the Union of Soviet Socialist Republics, the United Kingdom of Great Britain and Northern Ireland and the United States of America, to issue invitations to this conference, to prepare and circulate to all invitees a detailed agenda, and to provide the necessary staff and services;

6. Suggests to the Secretary-General and the above-mentioned Advisory Committee that, in making plans for the international conference, they consult with competent specialized agencies, in particular the Food and Agriculture Organization, the World Health Organization, and the United Nations Educational, Scientific and Cultural Organization;

7. Invites the interested specialized agencies to designate persons to represent them at the conference;

8. Requests that the Secretary General circulate for information a report on the conference to all Members of the United Nations, and to other Governments and specialized agencies participating in the conference.

ANNEX I

TOPICAL AGENDA FOR THE INTERNATIONAL CONFERENCE

ON THE PEACEFUL USES OF ATOMIC ENERGY

PLENARY SESSIONS

Time
Provisionally
Allotted

Session A: The Need for a New Power Source I

1/2 Hr.	A.1	Keynote address - President
1-1/2 Hr.	A.2	<u>Survey Papers on Estimated World Power Requirements in 1975 and 2000</u>

In order to set the stage for discussions of the effect of nuclear energy on the world power problem, it is necessary to project the world's power requirements for some 50 years. This is a difficult extrapolation to make because of the power demand now going on. Thus as a prelude to a discussion of the needs of individual countries for power and heat, it is natural to include such a survey.

1 Hr.	A.3	<u>Survey Papers on the Alternate Power Sources</u>

Nuclear energy can only be viewed in the proper light if one realizes that there are other sources of power for the future. (One paper on conventional sources and one on unconventional sources of power would be presented.)

Session B: Need for a New Power Source II

3 Hr.	B.1	<u>Individual Countries' Needs and Possibilities for Power and Heat</u>

These papers are aimed at pointing up the spectrum of problems and solutions for power and heat needs in various countries

B.1 (Cont'd.) during the next 50 years. An attempt could be made to give all of the estimates of cost and demand on the same basis so that by juxtaposing them it should be possible to determine where the need is greatest. Each nation is invited to furnish all available data and the Conference Organization would make a summary of the papers submitted. Typical papers dealing with some characteristic regions or specific conditions of industrial development will also be selected for presentation. Special emphasis shall also be put on the study of the economic significance of nuclear power for pre-industrialized countries, for countries in a phase of transition from an agricultural economy to an industrialized one, and for countries already industrialized.

Session C: The Role of Nuclear Energy

1 Hr	C.1	<u>Survey Papers on the Natural Occurrence of U and Th</u>
		Each nation is invited to furnish all available data and the Conference Organization would make a summary of the papers submitted. A few of these papers would also be selected for presentation.
1 Hr.	C.2	<u>The Maximum Plausible Role Which Nuclear Energy Can Play as an Energy Source During the Next 25 to 50 Years</u>
		These papers shall make references to methods of utilization of uranium and thorium. Reference to the possible use of atomic energy for propulsion could also be made here.
1 Hr	C.3	<u>Economics of Nuclear Power</u>
		These papers could be concerned with the economic problems involved in estimating the operating costs and fuel costs for a nuclear power system.

Session D: The Building of a Nuclear Energy Enterprise

1 Hr. D.1 Capital Investment Required for Nuclear Energy

These papers might be primarily concerned with the capital costs of various components of a nuclear power enterprise; for example, the reactor portion of a power system, the straight steam portion of the power system, the chemical plant and the enrichment plant.

2 Hr. D.2 Experience with Existing Nuclear Energy Power Plants with Reference to the Ways of Development of Atomic Power

Session E: Health and Safety Aspects of Nuclear Energy

1 Hr. E.1 Biological Effects of Radiation

This could include a discussion of the human exposures which have occurred. It could emphasize the experimental results which are available on animals.

1/2 Hr. E.2 Ecological Considerations Related to Nuclear Energy

These papers could be a discussion of the ecological problems which result from selective destruction of a given species in the food web, either because of hypersensitivity to radiation or the ability to concentrate certain radio-nuclides to levels far above those of the environment.

1-1/2 Hr. E.3 Reactor Safety and Location of Power Reactors

A thorough consideration could be given to the problems which result from locating power reactors near large centers of population. The problems to be discussed could be the probable accidents which could occur from sudden additions of reactivity or failure of mechanical safety devices. The containment problem should be emphasized.

- E.3 (Cont'd.) Special consideration should be given to any widespread dispersal of fission products and also to the effects of radiations on persons close to the reactors.

Session F: Production and Use of Isotopes

- 1 Hr. F.1 The Importance of Isotopes in Technology and Industry
- There would be survey papers which might outline the uses of isotopes in science and industry. They should summarize some of the important results that have been achieved by the use of isotopes.
- 1 Hr. F.2 The Importance of Isotopes in Medicine, Biology and Agriculture
- 1 Hr. F.3 Waste Disposal Problems
- Consideration could be given to the long-term storage and disposal problems, and to the possibility of contaminating water supplies. Air-borne particulates, oceanological and geological problems should also be considered.

Session G: Problems Relating to Large Quantities of Radioactivity

- As we go further into the nuclear energy business more people have come to grips with the problems of handling large quantities of concentrated radioactivity. These papers could summarize the present state of this art with regard to the design of facilities and the techniques of the chemistry.
- 1 Hr. G.1 The Problems of Producing and Distributing Large Quantities of Radioisotopes
- 1 Hr. G.2 The Current Status of Techniques and Methods for Handling Massive Quantities of Highly Active Radioisotopes
- 1 Hr. G.3 Administrative and Legal Problems of Widespread Use of High-Level Radiation Sources

Examples which could be covered are:

- (1) Training of industrial personnel - radioisotope use and health aspects.
- (2) Industrial health and safety: radiological health-safety codes (need for nation-wide, uniform codes); development of boiler codes involving special metals such as zirconium, and for doubleclad vessels.
- (3) Insurance, workman's compensation, accidental contamination of large areas (10,000 homes); government versus private insurance company coverages.
- (4) Government-industry relationships.
- (5) Spreading of radioactive contamination.

REACTOR SESSIONS

Session P.1: Research Reactors

1 Hr.	P.1.1	<u>Survey Papers on Types and the Needs They Fill</u> These papers could compare the technical aspects with regard to utility of the various types of research reactors. Cost information on the reactors should be made available in order to make comparisons most pertinent.
2 Hr.	P.1.2	<u>General Principles and Practical Experience with Research Reactors</u> These papers could discuss the operating principles which should be used for research reactors as well as the applications for such reactors to radioisotope production, engineering-scale irradiation experiments, and basic research experiments. Opportunity will be given for discussion.

6 Hr. Sessions P.2, P.3: Research Reactors - Descriptions

The complete details of some research reactors could be discussed. Each paper could point out the operating data and special virtues and shortcomings of the reactor.

3 Hr. Session P.4: Power Reactors (Systems for Development)

P.4.1 Survey Papers on Fuel Cycles and Reactor Types

These survey papers could emphasize the complementary character of the fast and thermal systems together with the ephemeral character of the non-regenerative systems. It would be appropriate to emphasize the many approaches to nuclear power. Emphasis should be placed on the prospects of development of the systems under consideration rather than on the prototype reactors which will be discussed in detail later on. In all of the papers which follow in Sessions P.5 and P.6, emphasis could be placed on the technical principles which have motivated the particular development and design decisions. Comparison shall be made between the use of natural uranium, enriched uranium and thorium, and pure fissile materials.

Sessions P.5, P.6:

1-1/2 Hr. P.5.1 Fast Neutron Reactors

A summary could be given of the experiments on breeding ratio, flux distribution and neutron spectrum in fast neutron reactors. The discussion could include remarks on the control problems of fast reactors in general. Finally, the effect of chemical reprocessing costs on the ultimate fast reactor design could be discussed.

4-1/2 Hr.

P.5.2

Thermal Neutron Reactors

This includes reactors designed to use natural uranium, enriched uranium, U-233, and recycled fuels, whether of the homogeneous or heterogeneous lattice type.

Papers are invited to cover at least the following principal types:

- (a) Liquid Metal Fueled Reactor
- (b) Aqueous Homogeneous Reactor
- (c) Boiling Water Reactor
- (d) Fluidized Solid Fueled Reactor
- (e) Sodium Cooled Reactor
- (f) Pressurized Water Reactor
- (g) Beryllium Moderated Reactor

6 Hr.

Sessions P.7, P.8:

Power Reactors (Prototypes)

Descriptions of prototype reactors including construction costs, problems of leaks and pumps, corrosion and control problems, with particular attention given to the manner in which the results of prototype experiments are to be interpreted in evaluating the final design of full-scale systems.

Sessions R.1, R.2:

Technology Sessions

1 Hr.

R.1.1

Methods of Prospecting for Uranium and Thorium

2 Hr.

R.1.2

Chemical Treatment of Low-Grade Ores and Ore Concentrates of Uranium and Thorium

2 Hr.

R.1.3

Production of U Metal and Th Metal from High-Grade Ores and Concentrates

1 Hr.

R.1.4

Analytical Methods Applicable to Raw Material Production

3 Hr.

Session R.3:

Production Technology of Special Materials

These will include D₂O, zirconium (separation from hafnium and preparation of the metal), beryllium and beryllium oxide and graphite.

3 Hr.

Session R.4: Chemical Aspects of Nuclear Reactors

These survey papers could outline the various problems, which are chemical in nature, associated with reactors — such as Water-Moderated Graphite, Homogeneous, Sodium-Cooled, and beryllium and beryllium oxide reactors. In particular, some attention could be paid to the chemical aspects of corrosion and mass transfer.

Session R.5:

2 Hr.

R.5.1

Chemical Processing of Irradiated Uranium and Thorium Fuel Elements

This will include solvent-extraction processes, high-temperature processing and volatility processes.

1 Hr.

R.5.2

Storage and Separation of Fission Products

The problems which are involved in separating and permanently storing fission products could be discussed. The various schemes for permanent disposal could be evaluated together with some practical experience in handling concentrated fission products. Attention could be given to the fixing of fission products permanently in agglomerate or ceramic masses.

3 Hr.

Session R.6:

R.6.1

Metallurgy of Th, U and Their Alloys

R.6.2

Fabrication of Fuel Elements (including the canning problem)

Session R.7:

Liquid Metals Technology

1 Hr.

R.7.1

The Problems of Handling Liquid Metals

1 Hr.

R.7.2

Liquid Metal Heat Transfer

1 Hr.

R.7.3

Corrosion Problems in Liquid Metal Systems

Session R.8: Problems of Waste Treatment and Disposal

- 1 Hr. R.8.1 Operating Problems Involved in Disposal in the Ground
- 1 Hr. R.8.2 Disposal in the Sea
- 1 Hr. R.8.3 Airborne Problems

REACTOR PHYSICS SESSIONS

- 6 Hr. Sessions Q.1, Q.2: Equipment and Techniques Used in Measuring Cross Sections Important to Reactor Design ...

including neutron velocity selectors, neutron crystal spectrometers and in-pile neutron cross section measurements.

- 3 Hr. Session Q.3: Results of Cross Section Measurements Important to Reactor Design ...

including cross section of fissile materials, moderators, coolants, structural materials and fission products. Also of η (number of neutrons released per neutron absorbed) and α [the ratio of the capture cross section (σ_c) to the fission cross section (σ_f)] λ .

- 3 Hr. Session Q.4: Selected Topics in Neutron Physics Connected with Reactors ...

(such as neutron decay, certain (n, γ) or (γ , n) reactions, fission process, gamma ray spectrum in fission).

- 3 Hr. Session Q.5: Measurement of Integral Quantities Important to Reactor Design

[such as ν (neutrons per fission),
 L (diffusion length),
 τ (slowing down length),
 λ tr (transport mean free path, resonance integrals.)]

- Session Q.6: Zero Energy, Exponential and Critical (or Model) Experiments

6 Hr. Sessions Q.7. Q.8: Reactor Calculation Techniques and Comparison Experiments

For example:

1. Critical mass
2. Flux and power distribution
3. Temperature effects
4. Control problems
5. Long-term reactivity changes
6. Lattice calculations

REACTOR CHEMISTRY AND METALLURGY SESSIONS

Session S.1: The Fission Process as Connected with Reactors

1 Hr. S.1.1 Survey Papers

2 Hr. S.1.2 Details of the Fission Process

(such as information on the yield of various fission products as follows: fine structure, energy dependence, variations between isotopes)

3 Hr. Session S.2: Chemistry of the Fission Products

Including: solution chemistry of gross fission products, volatility properties, chemistry of individual fission products (such as elements 43 and 61)

Session S.3: Problems of Doing Chemistry on Highly Radioactive Materials

1-1/2 Hr. S.3.1 Design of Facilities

1-1/2 Hr. S.3.2 Techniques and Results

Heavy Element Chemistry

	<u>Session S.4:</u>	<u>Heavy Element Chemistry</u>
1 Hr.	S.4.1	<u>Surveys of Chemistry of Transuranics</u>
2 Hr.	S.4.2	<u>Chemistry of Specific Heavy Elements</u> <u>(such as Pu, Np)</u>
	<u>Sessions S.5, S.6,</u> <u>and S.7:</u>	<u>Radiation Chemistry and Radiation Damage</u>
9 Hr.		Including: effects of radiation on materials of use in reactors as fuels, moderators, coolants, or structural materials; effects of radiation on solutions; effects of radiation on the properties of metals, alloys and semi-conductors.

BIOLOGICAL AND MEDICAL SESSIONS

	<u>Sessions M.1, M.2:</u>	<u>The Application of Nuclear Energy in the Solution of Special Problems in Biomedical Research</u>
6 Hr.		The use of nuclear energy in medicine, for example: 1. Diagnostic procedures -- at least one general summary talk on this subject. 2. Therapeutic procedures: (a) neoplastic diseases. Talks under this heading might include deep radiation therapy, radioisotopes as therapeutic agents, and neutron capture reactions in therapy of neoplasms; (b) the treatment of non-neoplastic disease with radioisotope techniques. 3. The use of radioactive tracer techniques in the study and elucidation of metabolic disease processes.

	<u>Sessions M.3, M.4:</u>	<u>Utilization of Nuclear Energy in the Solution of Special Public Health Problems</u>

6 Hr.

1. In problems involving the epidemiology of communicable disease.
2. Sanitary engineering problems.
3. Problems related to nutrition; such as: the availability of rare elements and rare elements requirements in human nutrition; the improvement in the nutritive value of diets and dietary constituents.

3 Hr.

Session M.5: Genetic Effects (including the fields of Botany and Zoology)

3 Hr.

Session M.6: Radiation Injury and Protection

1. Modes of radiation injury.
2. Maximum permissible exposure standards.
3. Health and safety activities in reactor operations.
4. Health and safety requirements in the transport of radioactive materials.
5. Health protection in chemical processing plants.
6. Biochemical and other protective aids.

3 Hr.

Session M.7: Topics of Biochemistry and Biology in Relation to Radioactive Radiation

This will include the use of radioactive isotopes and the use of radiation as a tool.

3 Hr.

Session M.8: Topics of Animal and Plant Physiology in Relation to Radioactive Radiation

This will include the use of radioactive isotopes and the use of radiation as a tool.

- 3 Hr. Session M.9: Utilization of Nuclear Energy in the Resolution of Special Problems in Agriculture and Silviculture, Including:
1. Plant genetics and crop improvement.
 2. The movement of various components from soil to plants, to include a discussion of fertilizers and other materials affecting plant nutrition.
 3. The role of rare elements.
 4. Utilization of nuclear energy in tropical agriculture.
 5. Pests and diseases.
- 3 Hr. Session M.10: Environmental Mechanisms (Biological Studies)
1. The inter-relationship of radioactive contamination and its implications in and effect on world ecology.
 2. Nuclear energy and the atmosphere.
 3. Nuclear energy and oceanology.
- 3 Hr. Session M.11: Public Health Aspects Attendant on the Large Scale Utilization of Atomic Energy
1. Environmental contamination. This could be a general discussion of the various types of contaminating radioactive materials, the circumstances of the occurrence of such contamination, and methods for control.
 2. Biological cycles of fission products in land forms.
 3. Biological cycles of fission products in aquatic systems.

THE APPLICATIONS OF RADIOISOTOPES TO RESEARCH AND INDUSTRIAL PROBLEMS

3 Hr. Session I.1: Tracers in General Research

Broad papers describing the special usefulness of radioisotopes in industry and research.

6 Hr. Sessions I.2, I.3: Developments in Dosimetry, Instrumentation, and Remote Controls

1. Alpha, beta, gamma and neutron dosimetry covering the range from low levels important to mutation studies to high levels necessary to produce chemical effects.
2. Advances in instrumentation.
3. Advances in remote control and servo-mechanisms; automatic sequence-times operations; safety control mechanisms.

3 Hr. Session I.4: Application of Isotopes in Process and Quality Control

Such as:

New developments in beta gauges and in automatic control systems.

Extraction columns: separation of rare earths; application to other industrial problems such as separation of petroleum hydrocarbons by classes.

Tracing mechanism of reactions: catalysis, cracking, reforming, etc.

Continuous chemical analysis, carbon-hydrogen ratio detector, "octane rating" of gasolines.

Materials testing: Xerography, radiographic inspection boiler codes; service-simulated wear testing, improvements in high-pressure lubricants; new developments in mechanics and metallurgy.

Possible applications of radioactive materials in an "automatic factory."

3 Hr.

Session I.5: Industrial Utilization of Fission Products

1. Quantities of fission products that might be available at various levels of an atomic-power economy.
2. Industrial utilization of radiation effects, such as: on plastics, petroleum hydrocarbons, organic compounds (Teflon, etc.); types of research presently underway; initiation of chemical reactions; estimate of costs of irradiation in specific examples.
3. Radiation - sterilization of foods: fundamental studies (enzyme destruction, oxidation effects, inhibition of reactions), feeding studies; economic aspects of radiation-sterilization.
4. Direct conversion of radiation into electricity.

CLOSING PLENARY SESSION

3 Hr.

Session H:

1. The possible role of thorium in nuclear energy.
2. Communications from states participating in the Conference concerning measures for assistance to other countries in the use of atomic energy for peaceful purposes.
3. Technical education and training of personnel in the field of nuclear energy.
4. Closing remarks, including a report on the highlights of the Conference prepared with the aid of the presiding officers of the different sessions, will be made by the President of the Conference at this plenary session.

EVENING LECTURES

Evening sessions should be arranged in which lectures of a high standard, but of a general character, will be given by scientists of world repute on subjects such as:

1. Accelerators for particles
2. Elementary particles and mesons
3. Nuclear forces
4. Nuclear structure
5. The neutron
6. Isotopic dating
7. Uses of radioactive substances in biology and medicine
8. Free radicals
9. New elements

ANNEX II

RULES OF PROCEDURE OF THE INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY

To be Convened in Geneva on 8 August 1955, in Pursuance of
Resolution 810 (IX) of the General Assembly of the United
Nations of 4 December 1954

CHAPTER I - AGENDA, PARTICIPATION AND CREDENTIALS

Rule 1

The Conference shall consider items included in the detailed Agenda and Programme prepared by the Secretary General of the United Nations with the advice of the Advisory Committee in accordance with paragraph 5 of resolution 810 (IX) of the General Assembly of 4 December 1954, and circulated to the invitees to the Conference on 1 February.

Rule 2

Each State invited to the Conference in accordance with paragraph 3 of resolution 810 (IX) of the General Assembly may be represented at the Conference by not more than five representatives, including, to the extent possible, individual experts competent in the atomic energy field. The representatives may be accompanied by such number of advisers as may be required, in the general interest of the Conference, to ensure adequate presentation and discussion of technical papers.

Rule 3

The representation of each interested specialized agency, invited to the Conference in accordance with paragraph 7 of resolution 810 (IX) of the General Assembly, should be on the basis of an agreement with the Secretary-General of the United Nations, bearing in mind that such representation shall not exceed five for any specialized agency.

Rule 4

The list of representatives of each participating State shall be issued either by the Head of the State, or Government, or by the Minister of Foreign Affairs or his nominee and communicated to the Conference Secretary General in good time and in any case not less

than fourteen days before the convening of the Conference. Lists of proposed advisers shall be sent to the Conference Secretary General not less than fourteen days in advance of the opening of the Conference.

Rule 5

The Conference Secretary General, in consultation with the representatives designated by the Secretary General of the United Nations as President and Vice-Presidents of the Conference, shall examine the lists of representatives, which shall constitute the credentials of the representatives to the Conference, and shall circulate to the Conference for its information a report on this examination.

CHAPTER II - OFFICERS OF THE CONFERENCE

Rule 6

The officers of the Conference shall comprise the following: the President, the Vice-Presidents, the Chairmen and Rapporteurs of sections. They shall be appointed by the Secretary General of the United Nations in advance of the Conference from among representatives eminent in the fields of concern to the Conference, and in their selection regard shall be had to an equitable geographical distribution of posts.

The Conference Secretary General shall also be an officer of it.

The Secretary General of the United Nations shall place the list of officers before the Conference at its first plenary session for affirmation.*

Rule 7

The Secretariat of the Conference shall comprise a Conference Secretary General, his Deputy and such other staff provided by the Secretary General of the United Nations as may be required by the Conference.

* It is the view of the Advisory Committee and the Secretary General that, it being desirable to avoid nominations of and debate on officers in a Conference of this nature and size, and since there is important work to be done by the Officers of the Conference during its preparatory stage, the sense of the Rule is that the Conference would approve the list of officers by acclamation.

Rule 8

The Conference Secretary General, acting under the authority of the Secretary General of the United Nations, and in accordance with the rules and obligations applying to members of the United Nations Secretariat, shall be primarily responsible for the preparation of the Conference and for making all necessary arrangements for meetings, and shall direct all other work connected with the Conference. He may designate another member of the Conference Secretariat to take his place at any meeting of the Conference.

Rule 9

The Conference Secretary General and his Deputy may, subject to the provisions of rule 11, make oral as well as written statements to the Conference concerning any matter relating to it.

CHAPTER III - ORGANIZATION OF THE WORK OF THE CONFERENCE

Rule 10

The work of the Conference shall be conducted in plenary meetings and in meetings of sections, in accordance with a programme prepared and distributed to participants in advance of the Conference by the Secretary General of the United Nations in consultation with the Advisory Committee.

Rule 11

The President shall declare the opening and closing of each plenary meeting of the Conference, accord the right to speak and, subject to these rules of procedure, shall have complete control of the proceedings in the meeting and the maintenance of order therein. The President may call a speaker to order if his remarks are not relevant to the subject under discussion. He may limit the time to be allowed to speakers, limit the number of times each participant may speak on any question, close the list of speakers or close the discussions. He may suspend or adjourn a meeting or adjourn the discussion on the item under consideration.

Rule 12

Participants may address meetings of the Conference only through recognition by the presiding officer. The presiding officer shall call upon speakers in the order in which they express their desire to speak.

Rule 13

No proposals requiring adoption by voting shall be submitted or entertained by the Conference. The presiding officer of any meeting may, however, ascertain the sense of the meeting on matters not relating to the substance of an item on the agenda.

Rule 14

At the request of the President, one of the Vice-Presidents designated by the President may preside over any plenary meeting of the Conference. A Vice-President acting as President shall have the same powers and duties as the President.

Rule 15

The meetings of each section of the Conference shall be presided over by the chairman of the section, whose powers and functions shall be similar to those of the President of the Conference at plenary meetings as provided in rules 11 and 12.

Rule 16

The rapporteur of each section shall keep the President and the Conference Secretary General informed of the progress, trends and major points emerging in the discussions of the section.

CHAPTER IV - LANGUAGES

Rule 17

English, French, Russian and Spanish shall be the languages of the Conference.

Rule 18

Speeches made in one of the languages of the Conference shall be interpreted into its other languages.

Rule 19

A participant may employ a language other than one of the four languages of the Conference subject to the condition that he shall himself provide for interpretation into one of the four languages. Interpretation into the other languages by an interpreter of the Secretariat may be based on the interpretation given in the first language.

CHAPTER V - RECORDS

Rule 20

Verbatim records of all plenary and section meetings shall be established by the Secretariat in the four languages. These records shall be for inclusion in the Proceedings of the Conference. They shall be available in provisional form to participants in the Conference as soon as possible.

CHAPTER VI - PUBLICITY OF MEETINGS

Rule 21

All plenary and section meetings of the Conference shall be held in public.

CHAPTER VII - PUBLICATION OF PROCEEDINGS

Rule 22

The Proceedings of the Conference, which shall be compiled by the Conference Secretary General, shall be published by the Secretary General of the United Nations in the languages of the Conference and shall include in addition to introductory material relating to the convening of the Conference, its organization and composition, the records of plenary and section meetings and all conference papers, as provided in Rule C of the Annex to these Rules, together with the abstracts referred to in Rule B of the Annex.

Rule 23

In addition to the distribution of the Proceedings of the Conference to the participating Governments and specialized agencies, each officer of the Conference and each author of a paper accepted for the Conference shall be entitled to one copy without cost.

CHAPTER VIII - EXPENSES

Rule 24

Expenses of whatever nature incurred by participants in the Conference shall not be an obligation of the United Nations. All other costs involved in holding the Conference shall be defrayed by the United Nations.

Rule A

The subjects of all papers shall be in conformity with the purpose of the Conference as defined in Resolution 810 (IX) of the General Assembly and accordingly shall be dealt with and presented only from the scientific and technical points of view.

Rule B

Papers for presentation at the Conference shall be submitted to the Secretary General of the United Nations in original and three copies, in one of the languages of the Conference. An abstract of each paper in original and three copies, not exceeding 500 words, shall also be submitted. In order to facilitate the preparations for the Conference, abstracts and full texts of papers should be submitted at the earliest possible date. In any case, the full texts of the papers themselves shall be submitted to the Secretary General of the United Nations not later than 1 July, while the titles and abstracts shall be submitted, if possible, not later than 15 May. Supplements to papers, where necessary to bring them up to date, may be submitted up to 1 August.

Rule C

All papers submitted by participants in the Conference, if they conform to Rule A, shall be considered as Conference papers and whether or not presented orally at a session of the Conference in full or in part, shall be included in the Proceedings of the Conference. Since, owing to limitations of time, all papers submitted cannot be presented orally at the Conference, a selection of those papers to be presented orally in full or in part shall be made by a panel (or panels) of qualified scientists, designated by the Secretary General of the United Nations on the advice of the Advisory Committee, and serving for this purpose as members of the United Nations Secretariat. The Secretary General shall consult with the Advisory Committee on the results of such review.

Rule D

Assignments by Governments for the preparation of papers for the Conference should be offered only to their own nationals.

Rule E

All papers prepared and submitted in advance in accordance with Rule B shall be distributed without delay to all States participating in the Conference for their confidential information before the opening of the Conference. With regard to communications which

may not have been submitted in advance of the opening of the Conference, such communications shall be distributed to the participants as soon as possible after their submission to the Secretary-General of the United Nations or their delivery before the Conference.

ANNEX III

In accordance with the Rules of Procedure of the Conference, the Government of the Union of Soviet Socialist Republics has stated its intention to submit under item D.2 of the Topical Agenda a paper titled: "The U.S.S.R.'s First Atomic Power Plant for Industrial Purposes and Methods of Developing Atomic Power."

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As additional information of this nature is received, the Governments participating in the Conference will be informed.

APPENDIX XV - CONFERENCE PROGRAM AS ISSUED BY UNITED NATIONS IN GENEVA

DETAILED PROGRAM

Session 1, Monday, 8 August: Morning.
Opening of Conference: Presidential Address.

Session 2, Monday, 8 August: Afternoon.

WORLD ENERGY NEEDS

2.1 Survey Papers on Estimated Future
 Power Needs over the Next 50 Years:
 Alternative Power Sources

			<u>Time in</u> <u>minutes</u>
Chairman			5
P/902	(UN)	"World energy requirements in 1975 and 2000" N.B. Guyol	20
Panel Discussion on:			
P/326	(France)	"Estimation of energy require- ments" P. Ailleret	25
P/757	(UK)	"The World's needs for a new source of energy" E.A.G. Robinson and G. H. Daniel	
P/802	(USA)	"Energy requirements and economic growth" E. S. Mason	
GENERAL DISCUSSION			10

2.2

Individual Countries' Needs and
Possibilities for Power
and Heat

Chairman

5

P/1116 (UN) "Contribution of nuclear energy
to future world power needs"
P. Sevette 30

Additional remarks by:

(Each speaker to have approximately 10 minutes) 75

P/868 (India) "The role of atomic power in
India and its immediate possi-
bilities"
H. J. Bhabha

P/125 (Brazil) "The Brazilian plan of electri-
fication and the possibilities
of nuclear power"
E. Motta Rezende

P/962 (Yugoslavia) "Requirements and possibilities
of production of energy in
Yugoslavia"
A. Blazek et al.

P/987 (Australia) "Electric power in Australia --
1955-2004"

P/949 (Belgium) "Probable evolution of energy
needs in Belgium and the possible
role of nuclear energy"
R. Van Mele

P/799 (Czecho-
slovakia) "Prospects of power development in
Czechoslovakia and the part to be
played by nuclear energy for peace-
ful purposes"
A. Sevcik

P/1060 (Japan) "Japan's energy utilization, the
present and the future"
K. Aki

P/998 (Argentina) "Energy needs and resources of the
Argentine Republic"
G. Mendivelzua

GENERAL DISCUSSION

10

Session 3, Tuesday, 9 August: Morning

THE BUILDING OF A NUCLEAR ENERGY ENTERPRISE

3.1 Experience with Nuclear Power Plants

			<u>Time in minutes</u>
P/615	(USSR)	"The first atomic power station in the USSR and the prospects of atomic power production" D. I. Blokhintsev and N. A. Nikolayev	45
		DISCUSSION	15
P/851	(USA)	"Design and operating experience of prototype boiling water power reactor" J. R. Dietrich et al.	45
		DISCUSSION	15

3.2 Capital Investment Required for
Nuclear Energy

		Chairman	5
P/391	(UK)	"Capital investment required for nuclear energy" J.M. Hill and S.W. Joelin	20
P/477	(USA)	"Capital investment required for nuclear energy" W.K. Davis	20
		DISCUSSION	15

Session 4, Tuesday, 9 August: Afternoon

FACTORS IN THE USE OF NUCLEAR ENERGY

4.1 Economics of Nuclear Power

			<u>Time in minutes</u>
	Chairman		5
P/476	(USA)	"Economics of nuclear power" J.A. Lane	25
P/390	(UK)	"The cost of power and the value of plutonium from early nuclear power stations" J.A. Jukes	25
	DISCUSSION		20
<u>4.2</u>	<u>The Role of Thorium</u>		
P/867	(UK)	"The possible role of thorium in nuclear energy" J.V. Dunworth	20
	DISCUSSION		
<u>4.3</u>	<u>Legal and Administrative Problems</u>		
	Chairman		5
P/1063	(Japan)	"Administrative and legal prob- lems on the use of radioisotopes in Japan" K. Suzue	15
P/400	(UK)	"Administrative and legal problems of widespread use of high-level radiation sources - industrial health and safety. Radiological health-safety codes" W Binks	15
P/778	(WHO)	"The general problems of protection against radiations from the public health point of view"	15
P/319	(USA)	"The achievement of radiation pro- tection by legislation and other means" L. S. Taylor	15
	DISCUSSION		10

Session 5, Wednesday, 10 August: Morning

THE ROLE OF NUCLEAR POWER IN THE NEXT 50 YEARS

			<u>Time in Minutes</u>
Chairman			5
P/893	(UN)	"Some economic implications of nuclear power for under-developed countries" E.S. deBreuver	15
P/11	(Canada)	"An economic forecast of the role of nuclear power in Canada" J. Davis and W.B. Lewis	25
P/327	(France)	"Integration of nuclear energy among the means of energy production" P. Ailleret and P. Taranger	25
P/758	(UK)	"The role of nuclear energy in relation to other methods of electricity generation" J.M. Kay	10
P/145	(Brazil)	"Economic significance of nuclear power for Brazil" B.C. de Mattos and J. da Costa Ribeiro	20
Remarks by:			
P/1002	(Argentina)	"Role of Atomic Energy in the Argentine Republic" P.E. Iraolagoitia	10
P/475	(USA)	"The economic potential of nuclear energy" K.M. Mayer	25
P/389	(UK)	"The contribution of nuclear power to United Kingdom and world energy up to 1975" J.D. Cockcroft	25
DISCUSSION			20

Session 6, Wednesday, 10 August: Afternoon

HEALTH AND SAFETY ASPECTS OF NUCLEAR ENERGY

6.1

Biological Effects of Radiation

			<u>Time in Minutes</u>
Chairman			5
P/392	(UK)	"The experimental animal for study of the biological effects of radiation" J.F. Loutit	20
P/616	(USSR)	"The influence of the ionizing radiations on animal organisms" A.V. Lebedinski	20
P/478	(USA)	"Physical dosimetry and clinical observances on four human beings involved in an accidental critical assembly excursion" R.J. Hasterlik and L.D. Marinelli	15
P/617	(USSR)	"Two cases of acute radiation sickness in man" A.K. Guskova and G.D. Baisogolov	15
DISCUSSION			15

6.2

Reactor Safety and Location of
Power Reactors

Chairman			5
P/853	(USA)	"The safety of nuclear reactors" C.R. McCullough et al.	20
P/481	(USA)	"Experimental determinations of the self-regulation and safety of operating water-moderated reactors" J.R. Dietrich	20
P/394	(UK)	"Radiological hazards from an escape of fission products and the implications in power reactor locations" W.C. Marley and T.M. Fry	20
DISCUSSION			25

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Session 7, Thursday, 11 August: Morning

THE USE OF RADIOACTIVE ISOTOPES

			<u>Time in Minutes</u>
Chairman			20
<u>7.1</u>	<u>Isotopes in Technology and Industry</u>		
P/308	(USA)	"Importance of isotopes in technology and industry" P.C. Aebersold	15
P/395	(UK)	"Recent developments of radioisotopes used in industry" H. Seligman	15
DISCUSSION			20
<u>7.2</u>	<u>Isotopes in Medicine, Biology and Agriculture</u>		
P/309	(USA)	"Radioisotopes in medicine" S. Warren	15
P/618	(USSR)	"The utilization of radioactive isotopes in biology and agriculture in the USSR" A.L. Kursanov	15
P/780	(FAO)	"The uses of atomic energy in food and agriculture"	15
DISCUSSION			15
<u>7.3</u>	<u>Waste Disposal Problems</u>		
P/398	(UK)	"Long-term aspects of fission product disposal" E. Glueckauf	20
P/310	(USA)	"The management and disposal of radioactive wastes" A. Wolman and A.E. Gorman	10
DISCUSSION			20

Session 24, Saturday, 20 August: Afternoon

CLOSING GENERAL SESSION

<u>24.1</u>	<u>International Co-operation in the Peaceful Uses of Atomic Energy</u>		<u>Time in Minutes</u>
P/619	(USSR)	"Assistance of the Soviet Union to other countries in the peaceful application of atomic energy" A.N. Lavrishchev	20
P/805	(USA)	"International co-operation in atomic energy developments" W.F. Libby	20
		COMMENTS	20
<u>24.2</u>	<u>Education and Training of Personnel in Nuclear Energy</u>		
		Chairman	10
P/893	(UNESCO)	"Training of research staff in the field of peaceful uses of atomic energy"	20
		DISCUSSION	10
<u>24.3</u>	<u>Closing Presidential Address</u>		

PHYSICS AND REACTOR SESSIONS (6A - 23A)

Session 6A, Wednesday, 10 August: Afternoon

SPECIAL TOPICS IN NUCLEAR PHYSICS

			<u>Time in minutes</u>
P/714	(Ukr.SSR)	"Inelastic scattering of fast neutrons by atomic nuclei" M.V. Pasechnik	15
P/581	(USA)	"Gamma rays from neutron inelastic scattering" R.B. Day	20
P/588	(USA)	"Angular distribution and non- elastic neutron scattering" M. Walt et al	
		DISCUSSION	
P/830	(USA)	"The theoretical prediction of neutron cross sections of non- fissionable elements for energies up to 10 Mev." V.F. Weisskopf	25
		DISCUSSION	
P/650	(USSR)	"Investigation of the neutron B-decay" P.E. Spivak et al	15
		DISCUSSION	10
P/651	(USSR)	"Thermal neutron capture gamma rays" L.V. Groshev et al	15
		DISCUSSION	10

P/941	(Poland)	"Investigation of the structure of molecules and the structure of liquids by scattering of thermal neutrons"	J. Janik	15
P/870	(India)	"Thermal inelastic scattering of cold neutrons in polycrystalline solids"	K.S. Singwi and L.S. Kothari	15
		DISCUSSION		10

Session 7A, Thursday, 11 August: Morning

FISSION PHYSICS

				<u>Time in minutes</u>
P/911	(Denmark)	"Collective motion in atomic nuclei"	Aage Bohr	30
P/593	(USA)	"Fission physics and nuclear theory"	J.A. Wheeler	30
P/993	(Yugo- via)	"The time involved in the fission process"	D. Popovic	10
P/1089	(Romania)	"Statistics of photographic fission tracks and range estimates of fragments"	J.S. Auslander and T. Visky	10
		DISCUSSION		20
P/897	(Brazil)	"Studies of nuclear photoeffect"	M.D. da Souza Santos et al	15

P/884	(Norway)	"Angular correlation of fission neutrons"	K. Skaravåg	20
		AND		
P/891	(Norway)	"High energy gamma rays from short-lived fission products"	A. Lundby et al	
		DISCUSSION		15
P/592	(USA)	"Determination of fission quantities of importance to reactors"	R.B. Leachman	20
		DISCUSSION		10

Session 8A, Thursday, 11 August: Afternoon

RESEARCH REACTORS

8A.1

Survey Papers on Types

				<u>Time in minutes</u>
P/946	(UNESCO)	"Report on research reactors"	L. Kowarski	30
P/484	(USA)	"The nuclear reactor in basic science"	A.H. Snell	20
P/401	(UK)	"Research reactors"	E. Bretscher et al	20
		DISCUSSION		20

8A.2

General Principles and Practical Experience

P/888	(Norway)	"Practical experiences with the JEEP Reactor"	T.J. Barendregt et al	20
		DISCUSSION		5
P/762	(UK)	"Experience with B.E.P.O."	R.F. Jackson	20
		DISCUSSION		10

P/485	(USA)	"Materials Testing Reactor experimental program and reactor operation"	R.L. Doan and J.R. Huffman	30
		DISCUSSION		10

Session 9A, Friday, 12 August: Morning

RESEARCH REACTORS AND DESCRIPTIONS

				<u>Time in minutes</u>
P/623	(USSR)	"A heavy water research reactor" (Description of reactor)	A.I. Alichanow et al	20
P/387	(France)	"The Saclay pile, 2 years' experience in heat transfer of pressurized gases"	J. Yvon et al	20
P/915	(Switzer- land)	"Description of the Swiss research reactor"	F. Alder et al	15
		DISCUSSION		20
P/860	(USA)	"The Brookhaven reactor"	M. Fox	15
P/488	(USA)	"Design and description of water boiler reactors"	L.D.P. King	20
		DISCUSSION		10
P/621	(USSR)	"The experimental nuclear reactor with ordinary water and enriched uranium"	Y.G. Nikolayev	
		AND		20
P/622	(USSR)	"A 2000 kilowatt thermal power nuclear reactor for research purposes"	Y.G. Nikolayev	

P/490	(USA)	"The Materials Testing Reactor and related research reactors"	
		A.M. Weinberg et al	20
		DISCUSSION	20

Session 10A, Friday, 12 August: Afternoon

RESEARCH REACTORS, DESCRIPTIONS — FUEL CYCLES
(concluded):

10A.1 Research Reactors, Descriptions
(concluded)

			<u>Time in minutes</u>
P/620	(USSR)	"Reactor for physical and technical investigations"	
		Compiled by G.N. Kruzilin	20
P/402	(UK)	"The experimental facilities of E.443"	
		H.J. Grout and F.W. Fenning	15
		DISCUSSION	20

10A.2 Fuel Cycles

P/4	(Canada)	"Some economic aspects of nuclear fuel cycles"	
		W.B. Lewis	30
P/403	(UK)	"Fuel cycles and types of reactors"	
		J.V. Dunworth	30
P/862	(USA)	"Survey of fuel cycles and reactor types"	
		A.M. Weinberg	30
		DISCUSSION	35

Session 11A, Saturday, 13 August: Morning

DESIGN OF REACTORS FOR POWER PRODUCTION

			<u>Time in minutes</u>
P/333	(France)	"Utilization of the energy released in the graphite-moderated, air- cooled pile G1" P. Chambadal and M. Pascal AND	35
P/337	(France)	"Design of the dual purpose pile G2" P. Ailleret et al	
P/492	(USA)	"A graphite-moderated nuclear power plant design" A.B. Carson	20
P/493	(USA)	"A sodium graphite reactor 75,000 electrical kilowatt power plant" C. Starr	20
		DISCUSSION	30
P/936	(Nether- lands)	"The design of a small scale prototype of a homogeneous power reactor fuelled with a uranium oxide suspension" H. de Bruyn et al AND	35
P/938	(Nether- lands)	"Power reactors fuelled with 'dry' suspensions of uranium oxide" H. de Bruyn et al	
P/494	(USA)	"Liquid metal fuel reactor" F.T. Miles and C. Williams	20
		DISCUSSION	20

Session 12A, Saturday, 13 August: Afternoon

DESIGN OF REACTORS FOR POWER PRODUCTION
(concluded)

			<u>Time in minutes</u>
P/335	(France)	"Complete automatic control of nuclear reactors" J. Weil	20
		DISCUSSION	10
P/405	(UK)	"The Dounreay fast reactor project" J.W. Kendall and T.M. Fry	20
P/814	(USA)	"Review of fast power reactors" W.H. Zinn	20
		DISCUSSION	20
P/495	(USA)	"Heavy water reactors for industrial power including boiling reactors" H.P. Iskenderian et al	20
P/624	(USSR)	"Homogeneous power-producing water boiler" A.I. Alichanow et al	25
P/496	(USA)	"Aqueous homogeneous power reactors" R.B. Briggs and J.A. Swartout	25
		DISCUSSION	20

Session 13A, Monday, 15 August: Morning

POWER REACTORS, PROTOTYPES

			<u>Time in minutes</u>
P/815	(USA)	"Description of the pressurized water reactor (PWR) power plant at Shippingport, Pa." J.W. Simpson et al	35

		DISCUSSION	15
P/879	(Norway)	"Preliminary study of an experimental pressurized heavy water reactor"	
		O. Dahl	20
		DISCUSSION	10
P/497	(USA)	"The engineering design of a prototype boiling water reactor power plant"	
		J.M. Harrer et al	30
		DISCUSSION	15
P/498	(USA)	"The homogeneous reactor test"	
		H.E. Beall and J.A. Swartout	40
		DISCUSSION	15

Session 14A, Monday, 15 August: Afternoon

POWER REACTORS, PROTOTYPES (concluded)

			<u>Time in minutes</u>
P/499	(USA)	"The sodium reactor experiments"	
		W.E. Parkins	40
		DISCUSSION	20
P/406	(UK)	"The graphite-moderated gas-cooled pile and its place in power production"	
		C. Hinton	40
		DISCUSSION	20
P/501	(USA)	"The engineering design of ERB II, a prototype fast neutron reactor power plant"	
		A.H. Barnes et al	
		AND	40

P/813	(USA)	"Operating experience and experimental results obtained from a NaK cooled fast reactor"	H.V. Lichtenberger et al	
				DISCUSSION 20

Session 15A, Tuesday, 16 August: Morning

EQUIPMENT AND TECHNIQUES USED IN MEASURING CROSS SECTIONS
IMPORTANT TO REACTOR DESIGN

				<u>Time in minutes</u>
P/576	(USA)	"Neutron velocity selectors used at reactors"	D.J. Hughes	25
P/640	(USSR)	"Mechanical neutron velocity selector"	V.I. Mostovoi et al	25
P/641	(USSR)	"A neutron spectrometer with the mechanical interrupter"	V.V. Vladimirovski	
			DISCUSSION	15
P/421	(UK)	"Neutron spectrometers based on pulsed sources"	E.R. Wiblin	25
P/577	(USA)	"Time-of-flight techniques applied to fast neutron measurements"	L. Cranberg	20
P/580	(USA)	"Recent advances in neutron detection"	L.M. Bollinger	15
P/806	(USA)	"Time-of-flight instrumentation for neutron spectrometers"	W.A. Higinbotham	15
			DISCUSSION	15

P/573	(USA)	"Techniques for measuring elastic, non-elastic, and transport neutron cross sections"	R.F. Taschek	20
			DISCUSSION	5

Session 16A, Tuesday, 16 August: Afternoon

EQUIPMENT AND TECHNIQUES (concluded):
CROSS SECTIONS OF NON-FISSIONABLE MATERIALS: DELAYED NEUTRONS

<u>16A.1</u>		<u>Equipment and Techniques</u> (concluded)		<u>Time in minutes</u>
P/356	(France)	"Testing of materials using the Chatillon pile-oscillator"	D. Breton	20
			DISCUSSION	10
P/642	(USSR)	"A neutron spectrometer based on measuring the slowing down time of neutrons in lead"	A.A. Bergman et al	30
			DISCUSSION	15
<u>16A.2</u>		<u>Cross Sections of Non-Fissionable Materials</u>		
P/832	(USA)	"The determination and evaluation of fundamental thermal neutron cross sections"	J.A. Harvey	10
			DISCUSSION	10
P/591	(USA)	"Summary of cross section measurements of the fission product poison Xe135"	S. Bernstein and E.C. Smith	30
			DISCUSSION	15

16A.3Delayed Neutrons

P/831 (USA)

"Delayed neutrons"

G.R. Keepin

25

DISCUSSION

Session 17A, Wednesday, 17 August: Morning

CROSS SECTIONS OF FISSIONABLE MATERIALS

(This session is ordered by topic and the same paper may appear more than once.)

Time in
minutes17A.1Low Energy Pu Cross-Sections

P/422 (UK)

"Cross-sections of the plutonium isotopes"

J.F. Raffle and
B.T. Price

20

Additional Comments

P/645 (USSR)

"Fission and total cross-sections of some heavy nuclides for monochromatic neutrons as measured by a mechanical neutron velocity selector"

Y.V. Adamchuk et al

5

P/646 (USSR)

"Time-of-flight measurement of the total neutron cross-section of uranium 233, uranium 235 and plutonium 239"

S.J. Nikitin et al

5

P/354 (France)

"Measurement of cross sections of fissile materials for slow neutrons"

A. Berthelot and
G. Vendryes

5

P/589 (USA)

"The total and fission cross-sections of plutonium"

B.R. Leonard

5

<u>17A.2</u>		<u>Low-Energy U-235 Cross Sections</u>	
P/586	(USA)	"The low-energy cross sections of U-235"	
		V.L. Sailor et al	20
		Additional Comments	
P/641	(USSR)	See session 15A	5
P/645	(USSR)	See this session	5
P/646	(USSR)	See this session	5
P/423	(UK)	"Slow neutron cross-sections of the uranium isotopes"	
		J.E. Lynn and N.J. Pattenden	5
<u>17A.3</u>		<u>Low-Energy U-233 Cross-Sections</u>	
P/644	(USSR)	"Determination of the absorption cross section and of the radiation capture cross section of uranium 233 for pile neutrons"	
		G.H. Kukavadse et al	
		AND	
P/645	(USSR)	See above	
P/646	(USSR)	See above	
		Additional Comments	
P/423	(UK)	See above	5
		DISCUSSION of 17A.1, 17A.2, 17A.3	15
		UN SUMMARY OF RESULTS	10
<u>17A.4</u>		<u>High Energy Cross-Sections</u>	
P/355	(France)	"Study of the variation with energy of the fission cross sections of U-233, U-235, Pu-239 for fast neutrons"	
		A. Berthelot	25

P/594	(USA)	"Techniques for measurement of fast neutron flux"	
		B.C. Diven	10
		DISCUSSION	10

Session 18A, Wednesday, 17 August: Afternoon

PROPERTIES OF FISSIONABLE MATERIALS
(ν , k , d): RESONANCE ANALYSIS

			<u>Time in minutes</u>
P/657	(USSR)	"Measuring the neutron multiplication factor effective number of secondary neutrons for thermal fission of uranium and plutonium"	
		P.E. Spivak and B.G. Yerozolinsky	15
P/658	(USSR)	"Number of fission neutrons per one captured thermal neutron in U-233, U-235 and Pu-239"	
		A.I. Alichanov et al	15
P/660	(USSR)	"Number of fission neutrons per one captured thermal neutron for natural uranium"	
		N.A. Burgow	10
P/425	(UK)	"Neutron Yields from fissile nuclei"	
		P.A. Eggelstaff and H.E. Sanders	20
P/587	(USA)	"Measurement of capture to fission ratio of U-235, and U-233, and Pu-239 by a new method"	
		H. Palevsky	20
P/595	(USA)	"Capture to fission ratio of Pu-239 and U-235 for intermediate energy neutrons"	
		W.R. Kanne et al	10

		DISCUSSION	30
P/585	(USA)	"Analysis of the velocity selector results on fissile materials" H.A. Bethe	30
P/590	(USA)	"Status of information on reactor material cross sections" H. Hurwitz Jr.	20
		DISCUSSION	10

Session 19A, Thursday, 18 August: Morning

INTEGRAL MEASUREMENTS

			<u>Time in minutes</u>
P/661	(USSR)	"A study of neutron diffusion in beryllium, graphite and water by the impulse method" A.V. Antonov et al)	30
		AND)	
P/662	(USSR)	"A study of Be as a neutron moderator" A.K. Drasin et al)	
P/359	(France)	"Measurement of diffusion length of thermal neutrons in beryllium oxide" J.C. Koechlin et al	10
P/872	(India)	"On the determination of diffusion and slowing down constants of ordinary water and beryllium oxide using a pulsed neutron source" R. Ramanna et al	15
		DISCUSSION	10

P/360	(France)	"Measurement of a complex diffusion length in a solid or liquid to determine the transport mean free path for thermal neutrons"	J. Horowitz and V. Raievski	25
		DISCUSSION	10	
P/789	(Sweden)	"Measurements on a subcritical reactor with a pulsed neutron source"	N.G. Sjostrand	15
P/933	(Nether- lands)	"Determination of neutron capture to fission ratio in different uranium samples"	T.J. Barendregt and M. Bustraan	15
		DISCUSSION	10	
P/597	(USA)	"Status of experimental and theoretical information on neutron slowing down distribution in homogeneous media"	J.E. Wilkins et al	20
P/357	(France)	"Time of flight spectrometer equipment used at the Saclay pile. Study of inelastic scattering of slow neutrons"	B. Jacrot et al	10
		DISCUSSION	10	

Session 20A, Thursday, 18 August: Afternoon

RESONANCE INTEGRALS; FISSION PRODUCT POISONING; CRITICALITY OF SOLUTIONS

20A.1

Resonance Integrals

Time in
minutes

P/659	(USSR)	"Measurements of resonance absorption integrals for various

		materials and the multiplication co-efficient (effective number of secondary neutrons) of resonance neutrons for fissionable isotopes"	
		P.E. Spivak et al	20
P/833	(USA)	"Resonance capture integrals"	
		R.L. Macklin and H.S. Pomerance	20
P/948	(Nether- lands)	"Computation of the effective resonance integral"	
		E.F.M. van der Held	5
P/427	(UK)	"Studies on the neutron resonance absorption of U-238"	
		V.S. Crocker	5
P/883	(Norway)	"Measurements of the effective resonance integral of uranium with the pile oscillator"	
		V.O. Eriksen et al	5
		DISCUSSION	10
<u>20A.2</u>		<u>Fission Product Poisoning</u>	
P/5	(Canada)	"Experiments on some character- istics of the N.R.X. Reactor, Part I"	
		D.G. Hurst	
P/6	(Canada)	"Experiments on some character- istics of the N.R.X. Reactor, Part II"	
		A.G. Ward	30
P/835	(USA)	"Reactivity changes and reactivity lifetime of fixed fuel elements in thermal reactors"	
		B.I. Spinrad et al	15
P/432	(UK)	"Long term reactivity changes in natural uranium reactors"	
		D.J. Littler	5
		DISCUSSION	10

20A.3Criticality in Solutions

P/834	(USA)	"Small thermal homogeneous critical assemblies"	A.D. Callihan et al	30
P/428	(UK)	"Plutonium-water critical assemblies"	C.C. Horton and J.D. McCullen	10
			DISCUSSION	15

Session 21A, Friday, 19 August. Morning

ZERO ENERGY AND EXPONENTIAL EXPERIMENTS

				<u>Time in minutes</u>
P/600	(USA)	"Exponential experiments with slightly enriched uranium rods in ordinary water"	E. Kouts et al	30
			AND	
P/601	(USA)	"Pressurized water reactor (PWR) critical and exponential experiments"	S. Krasik and A. Radkowsky	
			DISCUSSION	15
P/790	(Sweden)	"Some experience from measurements on an exponential pile of uranium and heavy water"	R. Persson et al	
			AND	
P/791	(Sweden)	"Characteristics of the Swedish heavy water reactor"	E. Hellstrand et al	

P/361	(France)	"Neutron study on two heavy water piles"	J. Horowitz	20
P/605	(USA)	"Exponential experiments on uranium D ₂ O lattices"	E.R. Cohen	20
P/623	(USSR)	"Heavy water research reactor (results of critical experiments)"	A.I. Alichanov et al	10
		DISCUSSION		20
P/429	(UK)	"The experimental basis of lattice calculations"	P.W. Mummery	25
P/607	(USA)	"Normal uranium graphite moderated reactors - a comparison of theory and experiments. Water-cooled lattices"	P.F. Gast	10
		AND		
P/606	(USA)	"Uranium graphite lattices Part I - the Brookhaven reactor"	I. Kaplan and J. Chernik	
		DISCUSSION		10

Session 22A, Friday, 19 August: Afternoon

ZERO ENERGY EXPERIMENTS OF FAST REACTORS AND REACTOR KINETICS

22A.1 Zero Energy Experiments (concluded)

			<u>Time in minutes</u>
P/404	(UK)	"Experimental studies on fast-neutron reactors at A.E.R.E."	
		L.R. Shepherd	25
P/598	(USA)	"The fast exponential experiment"	
		F.C. Beyer et al	25

P/609	(USA)	"A survey of the theoretical and experimental aspects of fast reactor physics"	R. Avery et al	10
			DISCUSSION	30

22A.2

Reactor Kinetics

P/755	(Israel)	"Stability conditions in the non-linear dynamics of heterogeneous reactors"	H.J. Lipkin and R. Thieberger	20
P/934	(Netherlands)	"The influence of temperature on the transfer function of a D ₂ O reactor"	J. Pelser	15
P/334	(France)	"Kinetic problems of a power reactor and analogue machines"	P. Braffort	10
P/610	(USA)	"Kinetics of stationary reactor systems"	T.A. Welton	25
			DISCUSSION	20

Session 23A, Saturday, 20 August: Morning

Time in
minutes

REACTOR THEORY

P/611	(USA)	"Survey of neutron thermalization theories"	E.R. Cohen	20
P/433	(UK)	"Calculation of the fine structure of the thermal neutron flux in a pile by the spherical harmonics method"	J.H. Tait	10
			DISCUSSION	5

P/608	(USA)	"Comparison of theory and experiment for intermediate assemblies" H. Hurwitz and R. Erlich	20
P/430	(UK)	"Method for calculating the critical mass of an intermediate reactor" M.E. Mandl and J. Howlett	10
P/664	(USSR)	"Application of the method of effective boundary conditions for calculating the critical dimensions of reactors" A.D. Galanin	10
		DISCUSSION	10
P/669	(USSR)	"Heterogeneous methods of reactor calculations. Survey of results and comparison with experiments" S.M. Feinberg	25
P/649	(USSR)	"Theory of resonance absorption in heterogeneous systems" I.I. Gurevich and I.Y. Pomeranchouk	10
P/666	(USSR)	"The thermal utilization factor in a heterogeneous reactor" A.D. Galanin	10
P/1003	(Argentina)	"Lattice calculations on natural uranium-beryllium oxide and natural uranium-beryllium metal in a cylindrical reactor" O. Gamba et al	10
		DISCUSSION	10
P/656	(USSR)	"Equation for the importance of neutrons, reactor kinetics, and the theory of perturbation" L.N. Ussachoff	10

P/796	(Czecho- slo- vakia)	"Remarks about the Milne problem with cylindrical symmetry" L. Trlifaj	10
P/667	(USSR)	"Effective boundary conditions for 'grey' bodies" D.F. Zaretsky	10

CHEMISTRY, METALLURGY AND TECHNOLOGY SESSIONS (6B-23B)

Session 6B, Wednesday, 10 August: Afternoon

OCCURRENCE OF URANIUM AND THORIUM

			<u>Time in Minutes</u>
	Chairman		5
P/1114	(UN)	"The natural occurrence of uranium and thorium"	
		P. F. Kerr	30
		DISCUSSION	15
P/470	(USA)	"Nuclear fuel for the world power program"	
		J.C. Johnson	20
		DISCUSSION	10

Panel Discussion on Uranium and Thorium Occurrences:

Moderator P.F. Kerr (UN)

Designated members representing:

Argentina	)	
Australia	)	
Belgium	)	
Brazil	)	
Canada	)	
France	)	
India	)	90
Italy	)	
Japan	)	
Portugal	)	
UK	)	
USA	)	

GENERAL DISCUSSION 10

Session 7B, Thursday, 11 August: Morning

PROSPECTING FOR URANIUM AND THORIUM

			<u>Time in Minutes</u>
		Chairman	10
P/764	(UK)	"Methods of prospecting for uranium and thorium" C.F. Davidson and S.H.U. Bowie	20
P/1	(Canada)	"Uranium prospecting in Canada - ground and aerial surveys" A. H. Lang	15
		DISCUSSION	10
P/763	(UK)	"Instrumental developments in the prospecting, mining and chemical processing of nuclear materials" H. Bisby et al.	15
P/994	(Yugo- slavia)	"Radiation detectors with halogen counters for use in prospecting" A. Milojevic et al.	10
		DISCUSSION	10
P/132	(Brazil)	"Air survey applied to the search for radioactive minerals in Brazil" D.A. MacFadyen and S.V. Guedes	15
P/625	(USSR)	"Aeroradiometric prospecting for uranium and thorium deposits and the interpretation of gamma anomalies" V.I. Baranov	10
		DISCUSSION	10
P/503	(USA)	"Techniques for prospecting for uranium and thorium"	15
P/626	(USSR)	"Radiohydrogeological method in prospecting for uranium deposits" A.A. Saukoff	15

P/869	(India)	"Remote location of uranium and thorium deposits"	
		K.G. Vohra	15
		DISCUSSION	10

Session 8B, Thursday, 11 August: Afternoon

THE FISSION PROCESS: FACILITIES FOR HANDLING HIGHLY RADIOACTIVE MATERIALS

8B.1

The Fission Process

			<u>Time in Minutes</u>
		Chairman	10
P/614	(USA)	"Survey of radiochemical studies of the fission process"	
		L.E. Glendenin and E.P. Steinberg	20
P/718	(USA)	"Spontaneous fission correlation"	
		A. Ghiorso	20
		DISCUSSION	15
P/881	(Norway)	"The distribution of nuclear charge in low energy fission"	
		A.C. Pappas	20
		DISCUSSION	10

8B.2

Facilities for Handling
Highly Radioactive Materials

		Chairman	10
P/438	(UK)	"An atomic energy radiochemical laboratory - design and operating experience"	
		R. Spence	20
P/725	(USA)	"Hot laboratory facilities for a wide variety of radiochemical problems"	
		P.R. Fields and C.H. Youngquist	20

P/673	(USSR)	"Metal research 'hot' laboratory" compiled by N. F. Pravdjuk	20
		DISCUSSION	15

Session 9B, Friday, 12 August: Morning

CHEMISTRY OF FISSION PRODUCTS

9B.1 Solution Chemistry of Gross Fission Products

			<u>Time in Minutes</u>
		Chairman	5
P/724	(USA)	"Chemical processing intense radiation fields" R.P. Hammond	20
		DISCUSSION	10
P/719	(USA)	"Solvent extraction chemistry of fission products" F.R. Bruce	20
		DISCUSSION	10
P/837	(USA)	"Anion exchange studies of the fission products" K.A. Kraus and F. Nelson	20
		DISCUSSION	10

9B.2 Chemistry of Individual Fission Products

		Chairman	5
P/437	(UK)	"The chemistry of ruthenium" J.M. Fletcher and F.S. Martin	20
		DISCUSSION	5
P/671	(USSR)	"Some chemical properties of technetium" J.B. Gerlit	20

P/1023 (Argentina)	"Determination of half-life of Tc ¹⁰² "	)	
	AND	)	
P/1026 (Argentina)	"Determination of half-life of Tc ¹⁰⁵ "	)	15
	J. Flegenheimer and	)	
	W. Seelmann-Eggebert	)	
	DISCUSSION		5
P/436 (UK)	"The condition of fission product iodine in irradiated uranium metal"		
	G.N. Walton et al.		20
	DISCUSSION		5

Session 10B, Friday, 12 August: Afternoon

HEAVY ELEMENT CHEMISTRY

10B.1 Surveys of Chemistry of Transuranics

			<u>Time in Minutes</u>
	Chairman		5
P/726 (USA)	"Thermodynamics of the heavy elements"		
	B.B. Cunningham		20
	DISCUSSION		5
P/440 (UK)	"Electronic configuration of the actinide elements"		
	J.K. Dawson and		
	G.R. Hall		20
	DISCUSSION		5

10B.2 Methods of Separating Heavy Elements

P/728 (USA)	"Radiochemical separation methods for the actinide elements"		
	E.K. Hyde		20

Remarks by authors of			
P/674 and P/677	(USSR)	I.K. Shvetsov and A.M. Vorobyev	15
	(USSR)	G.N. Yakovlev and D.S. Gorbenko-Germanov	
P/929	(Nether- lands)	J. Kooi	10

GENERAL DISCUSSION 10

10B.3 Chemistry of Specific Heavy Elements

P/736	(USA)	"Some recent developments in the chemistry of neptunium" J.C. Hindman et al	20
P/838	(USA)	"A review of americium and curium chemistry" R.A. Penneman and L.B. Asprey	20
P/676	(USSR)	"Spectrophotometric studies of the behaviour of americium ions in solutions" G.N. Yakovlev and V.N. Kosyakov	15

DISCUSSION 15

Session 11B, Saturday, 13 August: Morning

EFFECTS OF RADIATION ON REACTOR MATERIALS

			<u>Time in minutes</u>
		Chairman	10
P/744	(USA)	"Radiation damage in reactor materials" D.S. Billington	20
P/681	(USSR)	"Effect of irradiation on structure and properties of fissionable materials" S.T. Konobeevsky et al	20

P/443	(UK)	"Damage occurring in uranium during burn-up"	
		S.F. Pugh	20
		DISCUSSION	20
P/746	(USA)	"Irradiation damage to artificial graphite"	
		W.K. Woods et al	20
P/442	(UK)	"The effects of irradiation on graphite"	
		G.H. Kinchin	20
		DISCUSSION	15
P/680	(USSR)	"The effect of irradiation on the structure and properties of structural materials"	
		S.T. Konobeevsky et al	20
		DISCUSSION	15

Session 12B, Saturday, 13 August: Afternoon

EFFECTS OF RADIATION ON LIQUIDS

			<u>Time in minutes</u>
		Chairman	10
P/738	(USA)	"A survey of recent American ... the radiation	

P/683	(USSR)	"Radiolytic oxidation of organic compounds"	
		Nathalie Bach	20
		DISCUSSION	10
P/7	(Canada)	"Experience with heavy water systems in the NRX reactor"	
		R.F.S. Robertson	15
P/679	(USSR)	"Radiolysis of water in the presence of H ₂ and O ₂ under the action of reactor irradiations, fission fragments and X-rays"	
		P.I. Dolin and B.W. Ershler	15
P/445	(UK)	"Effect of radiation on heterogeneous systems of air or nitrogen and water"	
		J. Wright et al	15
		DISCUSSION	15

Session 13B, Monday, 15 August: Morning

EFFECTS OF RADIATION ON SOLIDS

			<u>Time in minutes</u>
		Chairman	5
P/749	(USA)	"The theory of lattice displacements produced during irradiation"	
		F. Seitz and J.S. Koehler	20
		DISCUSSION	10
P/750	(USA)	"Theoretical aspects of radiation damage in metals"	
		G.J. Dienes	20
P/444	(UK)	"Radiation damage in non-fissile materials"	
		J.H.O. Varley	20
		DISCUSSION	15

P/362	(France)	"Modification produced in non-metallic materials by radiation and the thermal healing of these effects"	
		G. Mayer et al	20
		DISCUSSION	10
P/753	(USA)	"A review of investigations of radiation effects in ionic and covalent crystals"	
		J.H. Crawford Jr. and M.C. Wittels	20
		DISCUSSION	10
P/751	(USA)	"Interpretation of radiation damage to graphite"	
		G.R. Hennig and J.G. Hove	20
		DISCUSSION	10

Session 14B, Monday, 15 August: Afternoon

TREATMENT OF URANIUM AND THORIUM ORES AND ORE CONCENTRATES

			<u>Time in minutes</u>
		Chairman	10
P/519	(USA)	"Recovery of uranium from its ores"	
		G.G. Marvin et al	25
<u>Discussion in Recovery of Uranium from its Ores:</u>			
P/2	(Canada)	"Canadian Practice in ore dressing and extractive metallurgy of uranium"	
		A. Thunæs	
P/339	(France)	"Method for chemical processing of low-grade uranium ores"	
		P. Mouret and P. Pagny	

P/521	(USA)	"Some unusual problems met in the recovery of uranium from a very low-grade ore" M.D. Hassialis and R. Musa
P/524	(USA)	"Recovery of uranium from phosphates by solvent extraction" R.S. Long et al
P/784	(Sweden)	"Recovery of uranium from uranium bearing alum shale" E. Svenke
P/871	(India)	"An ion exchange process for the recovery of uranium from carbonate leach solutions" J. Shankar et al
P/977	(Portugal)	"Some aspects of the chemical treatment of Portuguese uranium ores" F. Videira et al
P/986	(Australia)	"Acid pressure leaching of uranium ores" P.M.J. Gray
P/997	(South Africa)	"The South African uranium industry" C.S. McLean and T.K. Prentice

(Each member to have approximately 15 minutes)

130

GENERAL DISCUSSION

15

Session 15B, Tuesday, 16 August: Morning

PRODUCTION OF METALLIC URANIUM AND THORIUM: ANALYTICAL METHODS IN RAW MATERIAL PRODUCTION

15B.1

Production of Metallic Uranium and Thorium

Time in minutes

Chairman

5

P/407	(UK)	"Production of uranium metals" L. Grainger	20
P/341	(France)	"Preparation of pure uranium metal" B. Goldschmidt and P. Vertes	20
P/636	(USSR)	"Metallurgy of thorium" G.E. Kaplan	}
		AND	
P/635	(USSR)	"Powder metallurgy of thorium" G.A. Meyerson	
		DISCUSSION	15
<u>15B.2</u>		<u>Analytical Methods in Raw Material Production</u>	
		Chairman	5
P/952	(USA)	"Analysis of uranium and thorium raw materials" C.J. Rodden	20
P/627	(USSR)	"Physico-chemical methods of uranium production control" A.P. Vinogradov	15
		Remarks by authors of	
P/942	(Poland)	A. Soltan	10
P/964	(Yugosla- via)	M.W. Susic	10
P/630	(USSR)	G.R. Golbek et al	10
P/1008	(Argen- tina)	I.G. de Fraenz and W. Seelmann-Eggebert	10
		GENERAL DISCUSSION	15

Session 16B, Tuesday, 16 August: Afternoon

PRODUCTION TECHNOLOGY OF SPECIAL MATERIALS

<u>16B.1</u>			<u>Heavy Water</u>	<u>Time in minutes</u>
		Chairman		5
P/819	(USA)	"Survey of heavy water production processes" M. Benedict		20
P/774	(Israel)	"Design of isotope separation plants: Some basic design equations for the distillation process" I. Dostrovsky and Y. Lehrer		15
P/927	(Switzerland)	"Final concentration of heavy water by rectification" P. Baertschi and W. Kuhn		15
P/958	(Yugoslavia)	"Efficiency of some catalysts in the exchange reaction between heavy water and hydrogen" P. Savic et al		15
		DISCUSSION		15
P/410	(UK)	"Infra-red methods for the analysis of heavy water" J. Gaunt		15
P/631	(USSR)	"On methods of isotopic analysis of heavy water" K.V. Vladimirovsky et al		15
		DISCUSSION		10
<u>16B.2</u>			<u>Graphite</u>	
		Chairman		5

P/343	(France)	"Production of nuclear graphite in France"	P. Legendre et al	15
P/534	(USA)	"The production and properties of graphite for reactors"	L.M. Currie et al	15
P/943	(Poland)	"Some experiments concerning pile materials"	B. Buras	10
		DISCUSSION		10

Session 17B, Wednesday, 17 August: Morning

PRODUCTION TECHNOLOGY OF SPECIAL MATERIALS (concluded)

<u>17B.1</u>		<u>Zirconium</u>		<u>Time in minutes</u>
		Chairman		5
P/533	(USA)	"Zirconium metal production"	S.M. Shelton et al	20
P/347	(France)	"Separation of zirconium from hafnium"	J. Hure and R. Saint-James	20
P/876	(India)	"Separation of hafnium from zirconium by vapour phase de-chlorination"	B. Prakash and C.V. Sundaram	20
		GENERAL DISCUSSION		20

<u>17B.2</u>	<u>Beryllium</u>
	Chairman

5

P/633	(USSR)	"Techniques for manufacturing items of pure beryllium and beryllium oxide for use in nuclear reactors" compiled by G.A. Meyerson	20
P/820	(USA)	"Status of beryllium technology in the USA" A.R. Kaufmann and B.R.F. Kjellgren	20
P/345	(France)	"Sintering of beryllium oxide" R. Caillat and R. Pointud	20
P/1015	(Argentina)	"Purification of beryllium oxide" A.E. Cairo and M.B. Crespi	15
		GENERAL DISCUSSION	15

Session 18B, Wednesday, 17 August: Afternoon

METALLURGY OF THORIUM, URANIUM AND THEIR ALLOYS: FABRICATION OF FUEL ELEMENTS

<u>18B.1</u>		<u>Metallurgy of Thorium, Uranium and their Alloys</u>	
			<u>Time in minutes</u>
		Chairman	5
P/555	(USA)	"Physical metallurgy of uranium" F.G. Foote	20
P/786	(Sweden)	"The solid state reaction between uranium and aluminum" R. Kiessling	15
		DISCUSSION	10
P/556	(USA)	"The metallurgy of thorium and its alloys" O.N. Carlson et al	15
		DISCUSSION	10

<u>18B.2</u>		<u>Fabrication of Fuel Elements</u>	
		Chairman	5
P/825	(USA)	"The metallurgy of reactor fuels" J.P. Howe	20
P/561	(USA)	"Dispersion type fuel elements" C.E. Weber and H.H. Hirsch	15
		DISCUSSION	10
P/953	(USA)	"MTR-type fuel elements" E.J. Boyle and J.E. Cunningham	20
P/947	(Nether- lands)	"On the possibility to improve the heat transfer of uranium and aluminum surfaces in contact" F. Boeschoten	20
		GENERAL DISCUSSION	10

Session 19B, Thursday, 18 August: Morning

LIQUID METAL TECHNOLOGY

<u>19B.1</u>		<u>Handling Liquid Metals</u>	
			<u>Time in minutes</u>
		Chairman	5
P/123	(USA)	"Sodium and sodium potassium alloy for reactor cooling and steam generation" T. Trocki et al	25
P/866	(UK)	"Liquid metal handling" S.G. Bauer	25
		DISCUSSION	15

<u>19B.2</u>		<u>Liquid Metal Heat Transfer</u>	
		Chairman	5
P/639	(USSR)	"Heat transfer of molten metals" M.A. Mikheyev et al	25
		DISCUSSION	10
<u>19B.3</u>		<u>Corrosion in Liquid Metals Systems</u>	
		Chairman	5
P/119	(USA)	"Corrosion by liquid metals" L.F. Epstein	20
P/787	(Sweden)	"Observations on the corrosion of uranium in liquid sodium" H. Mogard	10
P/829	(USA)	"Basic technology of sodium graphite reactor" S. Siegel et al	20
		GENERAL DISCUSSION	15

Session 20B, Thursday, 18 August: Afternoon

CHEMICAL ASPECTS OF NUCLEAR REACTORS

			<u>Time in minutes</u>
		Chairman	5
P/900	(UK)	"Chemical problems of power reactors" R. Hurst and J. Wright	20
P/821	(USA)	"Survey of homogeneous reactor chemical problems" C.H. Secoy	20
P/348	(France)	"Behavior of heavy water in piles of the C.E.A." J. Chenouard et al	20
		GENERAL DISCUSSION	15

P/535	(USA)	"Aqueous corrosion of aluminium alloys at elevated temperatures" J.E. Draley and W.E. Ruther	20
P/880	(Norway)	"Corrosion of aluminium and aluminium alloys in aqueous solutions at high temperatures" K. Carlsen	15
P/537	(USA)	"Aqueous corrosion of zirconium and its alloys at elevated temperatures" D.E. Thomas	20
		DISCUSSION	15
P/811	(USA)	"Aqueous uranium and thorium slurries" A.S. Kitzes and R.N. Lyon	15
		DISCUSSION	10

Session 21B, Friday, 19 August: Morning

CHEMICAL PROCESSING OF IRRADIATED FUEL ELEMENTS

			<u>Time in minutes</u>
		Chairman	10
P/414	(UK)	"Criteria for the selection of separation processes" C.M. Nicholls	20
		DISCUSSION	10

Solvent Extraction

P/822	(USA)	"Reprocessing reactor fuel and blanket materials by solvent extraction" F.L. Culler (This may also include reference to P/541 by the same author)	20

P/349	(France)	"Solvent extraction of plutonium from uranium irradiated in atomic piles"	B. Goldschmidt et al	20
P/785	(Sweden)	"Extraction of uranium and plutonium with tetrabutylammonium nitrate, cupferron and neocupferron as complexing agents"	E. Haeffner et al	10
P/540	(USA)	"The solvent extraction separation of U-235 and thorium from fission products by means of tributyl phosphate"	A.T. Gresky	20
P/824	(USA)	"Practical limitations of solvent extraction processes"	R.E. Tomlinson	15
		GENERAL DISCUSSION		25
P/551	(USA)	"The chemical processing of aqueous homogeneous reactor fuel"	D.E. Ferguson	20
		DISCUSSION		10

Session 22B, Friday, 19 August: Afternoon

CHEMICAL PROCESSING OF IRRADIATED FUEL ELEMENTS (concluded):
SEPARATION AND STORAGE OF FISSION PRODUCTS

22B.1

Chemical Processing of
Irradiated Fuel Elements
(concluded)

				<u>Time in minutes</u>
		Chairman		5
P/823	(USA)	"Survey of separation processes"	S. Lawroski	20

P/350	(France)	"Method for extraction of uranium 233 from thorium irradiated in atomic piles"	
		A. Chesne and R. Regnaut	20
		DISCUSSION	10
P/544	(USA)	"Pyrometallurgical processing of nuclear materials"	
		H.M. Feder	20
P/545	(USA)	"The purification of uranium reactor fuel by liquid metal extraction"	
		A.F. Voigt	20
		DISCUSSION	10
<u>22B.2</u>		<u>Separation and Storage of Fission Products</u>	
		Chairman	5
P/415	(UK)	"Chemical processing of fission product solutions"	
		E. Glueckauf and T.V. Healy	20
P/552	(USA)	"The design and operation of high-level waste storage facilities"	
		C.R. Anderson and C.A. Rohrmann	15
P/553	(USA)	"Processes for high-level waste disposal"	
		L.P. Hatch and B. Manowitz	15
		DISCUSSION	10

Session 23B, Saturday, 20 August: Morning

WASTE TREATMENT AND DISPOSAL

23B.1

Disposal in the Ground

			<u>Time in minutes</u>
		Chairman	5
P/565	(USA)	"Disposal of liquid wastes to the ground" R.E. Brown et al	20
P/12	(Canada)	"Waste disposal into the ground" C.A. Mawson	20
		DISCUSSION	15

23B.2

Disposal in the Sea

		Chairman	5
P/418	(UK)	"The discharge of radioactive waste products in the Irish Sea - Part I" H. Seligman	30
P/419	(UK)	(see above) Part II H.J. Dunster	
P/420	(UK)	(see above) Part III D.R.R. Fair and A.S. McLean	
		DISCUSSION	15
P/569	(USA)	"Disposal of radioactive wastes at sea" C.E. Renn	15
		DISCUSSION	10

23B.3

Airborne Problems

		Chairman	5
P/571	(USA)	"Air and gas cleaning for nuclear energy processes"	
		L. Silverman	20
		DISCUSSION	20

BIOLOGICAL AND MEDICAL SESSIONS (8C - 18C)

Session 8C, Thursday, 11 August: Afternoon

RADIOACTIVE ISOTOPES AND NUCLEAR RADIATIONS IN MEDICINE - Therapy

			<u>Time in minutes</u>
	Chairman		5
P/685	(USSR)	"Medical application of some radioactive isotopes" A. V. Kozlova	20
P/446	(UK)	"Some problems of radio- therapeutics" J. S. Mitchell	20
	DISCUSSION		10
P/179	(USA)	"Teletherapy devices with radioactive isotopes" M. Brucer	15
	DISCUSSION		10
P/925	(Switzer- land)	"Internal radioactive isotope therapy of neoplastic diseases by means of radioactive sus- pensions" J. H. Muller	15
P/367	(France)	"Utilization of colloidal chromium radicphosphate in malignant tumor therapy" A. Chevallier and C. Burg	10
	DISCUSSION		10
P/183	(USA)	"Radioactive isotopes in hematologic therapy" J. H. Lawrence	15
	DISCUSSION		10

P/970	(Portugal)	"An accurate method for treatment of hyperthyroidism with I^{131} " V. H. Franco et al	10
P/177	(USA)	"Use of the nuclear reactor for neutron capture therapy of cancer" L. E. Farr et al	15
		DISCUSSION	15

Session 9C, Friday, 12 August: Morning

RADIOACTIVE ISOTOPES AND NUCLEAR RADIATIONS IN MEDICINE (continued) -
Diagnosis and Studies of Disease

			<u>Time in minutes</u>
		Chairman	5
P/768	(UK)	"The use of radioactive isotopes in diagnostic procedures" W. V. Mayneord	20
P/684	(USSR)	"Experience in clinical and diagnostic application of some radioactive isotopes in the USSR" M. N. Fateyeva	20
		DISCUSSION	10
P/181	(USA)	"Scanning of positron-emitting isotopes in diagnosis of intracranial and other lesions" G. L. Brownell and W. H. Sweet	15
P/754	(USA)	"The dynamic aspects of erythropoiesis in normal and pathologic states as indicated with the radioactive isotope tracer technique" J. R. Rose and A. Miller	15
		DISCUSSION	10

P/769	(UK)	"The speed of iodine metabolism" E. E. Pochin	15
P/9	(Canada)	"Further clinical studies of thyroid and salivary gland function with radioiodine" C. H. Jaimet and H. G. Thode	10
P/365	(France)	"The role of genetic factors in the development of congenital myxoedema" M. Bernheim et al	10
P/1097	(Romania)	"Influence of the dynamics of the central nervous system on iodine fixation in the thyroid" S. Miledu et al	10
		DISCUSSION	15
P/199	(USA)	"Tissue specific antibodies as carriers of radioactive materials for the treatment of cancer" W. F. Bale and I. O. Spar	15
		DISCUSSION	10

Session 10C, Friday, 12 August: Afternoon

RADIOACTIVE ISOTOPES AND NUCLEAR RADIATIONS IN MEDICINE (concluded) -
Diagnosis and Studies of Disease

			<u>Time in minutes</u>
		Chairman	5
P/178	(USA)	"The use of isotopes in bio- chemical and medical research" A. Baird Hastings	30
		AND	
P/840	(USA)	"The use of isotopes in analysis of metabolic disorders" DeWitt Stetten, Jr.	

P/180	(USA)	"The use of radiosodium and radiopotassium tracer studies in man"	B. A. Burrows and J. F. Ross	15
		DISCUSSION		15
P/447	(UK)	"The absorption of vitamin B ₁₂ and the pathogenesis of vitamin B ₁₂ deficiency"	D. L. Mollin and E. L. Smith	20
P/711	(Ukr.SSR)	"Application of radioactive isotopes to the study of the biochemistry of muscles"	D. L. Ferdman	20
P/921	(India)	"Synthesis of 4:4' - diaminodiphenylsulphone-S ³⁵ (DDS) and its use in leprosy research"	P. Saraiya et al	15
		DISCUSSION		15
P/224	(USA)	"Utilization of nuclear energy in public health problems on the epidemiology of communicable diseases"	D. W. Jenkins	20
P/140	(Brazil)	"A new radioactive method for marking mosquitoes and its application"	M. B. Aragao et al	10
		DISCUSSION		15

Session 11C, Saturday, 13 August: Morning

BIOLOGICAL EFFECTS OF RADIATION
Modes of Radiation Injury
and Radiation Hazards

Time in
minutes

Chairman

5

Modes of Radiation Injury

P/82	(USA)	"Commentary on the modes of radiation injury" A. M. Brues	20
P/450	(UK)	"Modes of radiation injury (medical aspects)" E. Rock-Carling	15
P/692	(USSR)	"Some aspects of the immunity of the organism exposed to action of ionizing radiation" I. A. Pigalyev	20
		DISCUSSION	15

Carcinogenesis and Metabolism of Bone-Seeking Isotopes

P/847	(USA)	"The use of isotopes in study of skeletal physiology and metabolism" W. F. Neuman	15
P/88	(USA)	"The deposition of radioactive substances in bone" F. E. Hoecker	15
P/242	(USA)	"The association of irradiation with cancer of the thyroid in children and adolescents" D. E. Clark	15
		DISCUSSION	15

Effects on Reproductive System and on Fetus

P/77	(USA)	"Hazards to the embryo and fetus from ionizing radiation" Liane B. Russell and W. L. Russell	15
P/257	(USA)	"Effects of daily low doses of X-rays on spermatogenesis in dogs" G. W. Casarett and J. B. Hursh	10

P/1070	(Switzerland)	"Dominant lethal factors and embryonic mortality after irradiation at 180 Kev and 31 Mev"	H. Fritz-Niggli	10
			DISCUSSION	10

Session 12C, Saturday, 13 August: Afternoon

BIOLOGICAL EFFECTS OF RADIATION (continued) -
Mechanisms of Radiation Injury; Protection and Recovery

				<u>Time in minutes</u>
		Chairman		5
		<u>Mechanisms of Radiation Injury</u>		
P/899	(UK)	"Biological damage resulting from exposure to ionizing radiations"		
		L. H. Gray		20
P/898	(UK)	"Comparative studies of the biological effects of radiation and of radiomimetic chemical agents"		
		A. Haddow		15
		DISCUSSION		10
P/904	(India)	"Cytological and cytochemical effects of radiation in actively proliferating biological systems"		
		A. R. Gopal-Ayenger		10
P/690	(USSR)	"Biological effects of ionizing radiation on microorganisms"		
		M. N. Meissel		15
P/371	(France)	"The problem of the biological action of low doses of ionizing radiation"		
		H. Markovich		15

P/691	(USSR)	"On the nature of changes in metabolism under irradiation effects"	N. M. Sissakian	15
			DISCUSSION	15

Protection and Recovery

P/78	(USA)	"Studies on protection by treatment before and after exposure to X- and gamma radiation"	A. Hollaender and G. E. Stapleton	20
P/940	(Belgium)	"Tissue and cell damage due to radiation; their consequences and their repair"	J. Maisin et al	15

Session 13C, Monday, 15 August: Morning

BIOLOGICAL EFFECTS OF RADIATION (concluded) - Genetic Effects; Human Implications

RADIOACTIVE ISOTOPES AND IONIZING RADIATIONS IN AGRICULTURE - Radiation-induced Genetic Changes and Crop Improvement

<u>13C.1</u>	<u>Genetic Effects; Human Implications</u>			<u>Time in minutes</u>
		Chairman		5
P/238	(USA)	"The genetic structure of Mendelian populations and its bearing on radiation problems"	B. Wallace	20
P/235	(USA)	"Genetic effects of radiation in mice and their bearing on the estimation of human hazards"	W. L. Russell	20

P/449	(UK)	"The genetic problem of irradiated human populations"	
		T. C. Carter	20
		DISCUSSION	25
<u>13C.2</u>		<u>Radiation-induced Genetic Changes and Crop Improvement</u>	
		Chairman	5
P/110	(USA)	"The contribution of radiation genetics to crop improvement"	
		W.R. Singleton et al	20
P/793	(Sweden)	"The production of beneficial new hereditary traits by means of ionizing radiation"	
		L. Ehrenberg et al	15
P/890	(Norway)	"Studies on genetic effects in plants of chronic gamma-radiation"	
		K. Mikaelson	15
P/101	(USA)	"Ionizing radiations as a tool for plant breeders"	
		R. S. Caldecott	15
		DISCUSSION	20

Session 14C, Monday, 15 August: Afternoon

RADIOACTIVE ISOTOPES AND IONIZING RADIATIONS IN AGRICULTURE (concluded) -
Tracer Studies in Agriculture

			<u>Time in minutes</u>
		Chairman	5
P/10	(Canada)	"Studies of special problems in agriculture and silviculture by the use of radioisotopes"	
		J. W. T. Spinks	20

P/1049	(Japan)	"Studies on plant nutrition, fertilizers and soil by use of radioactive isotopes" S. Mitsui	10
		DISCUSSION	10
P/104	(USA)	"Applications of radioactive isotopes to the study of soils and fertilizers" L. A. Dean	
		AND	
P/112	(USA)	"Uptake and transport of mineral nutrients in plant roots" E. Epstein and S. B. Hendricks	
P/460	(UK)	"Factors affecting the availability to plants of soil phosphates" R. Scott-Russell et al	15
		DISCUSSION	10
P/694	(USSR)	"The use of tracer atoms in studying the application of fertilizers" V. M. Klechkovski	
		AND	20
P/695	(USSR)	"Determination of the assimilation capacity of soil phosphates and fertilizers with the aid of radioactive isotopes of phosphorus" A. V. Sokolov	
P/716	(Bye.SSR)	"Co ⁶⁰ in the study of the role of cobalt as a micro-element in plant nutrition" O. K. Kedrov-Zikhman	15
		DISCUSSION	15
P/106	(USA)	"Utilization of radioactive isotopes in resolving the effectiveness of foliar absorption of plant nutrients" H. B. Tukey et al	15

P/105	(USA)	"The use of radioactive isotopes to ascertain the role of root-grafting in the translocation of water, nutrients and disease-inducing organisms among forest trees"	J. E. Kuntz and A. J. Riker	15
		DISCUSSION		10

Session 15C, Tuesday, 16 August: Morning

RADIOACTIVE ISOTOPES IN PHYSIOLOGY AND BIOCHEMISTRY

<u>15C.1</u>		<u>Animal Physiology</u>		<u>Time in minutes</u>
		Chairman		5
P/90	(USA)	"Radioactive isotopes in animal physiology and nutrition - mineral metabolism"	C. L. Comar	15
P/908	(Denmark)	"Isotopes in Permeability Studies"	H. H. Ussing	15
P/1119	(Switzerland)	"Problems Related to the Posterior Hypophysis Studied by Radioactivity"	A. Jentzer	15
		DISCUSSION		10
P/275	(USA)	"Use of I ¹³¹ in study of the influence of climatic factors on thyroid activity and productivity of livestock"	C. Blincoe and S. Brody	15
P/1047	(Japan)	"Studies on the metabolism of calcium and phosphorus in the laying hen"	R. Sasaki	15
		DISCUSSION		15

15C.2Plant Biochemistry

		Chairman	5
P/697	(USSR)	"Tracer atoms used to study the products of photosynthesis depending on the conditions under which the process takes place"	
		A. A. Nichiporovich	15
P/259	(USA)	"The photosynthetic cycle"	
		M. Calvin and J. A. Bassham	15
		DISCUSSION	15
P/715	(Bye.SSR)	"C ¹⁴ in the study of the biosynthesis of chlorophyll"	
		T. N. Godnev and A. A. Shlyk	15
P/459	(UK)	"Some aspects of sucrose metabolism in plants"	
		H. K. Porter and J. Edelman	15
		DISCUSSION	10

Session 16C, Tuesday, 16 August: Afternoon

RADIOACTIVE ISOTOPES IN PHYSIOLOGY AND BIOCHEMISTRY (concluded) -
General Biochemistry

			<u>Time in minutes</u>
		Chairman	5
P/456	(UK)	"Some recent applications of tritium in biological research"	
		B. F. Glascock	15
P/710	(Ukr.SSR)	"The use of radioactive isotopes in the study of the functional biochemistry of the brain"	
		A.V. Palladin and G.E. Vladimirov	15
		DISCUSSION	10

	Chairman	5
P/451	(UK)	"Radiation injury and protection - maximum permissible exposure standards"
	W. Binks	15
P/89	(USA)	"Maximum permissible exposure standards"
	R. S. Stone	15
P/79	(USA)	"Maximum permissible concentration of radioactive isotopes in air and water for short period exposure"
	K. Z. Morgan et al	15
	DISCUSSION	15
P/689	(USSR)	"Health protection of workers exposed to ionizing radiations"
	A. A. Letavet	15
P/307	(ILO)	"The protection of workers against ionizing radiations"
	DISCUSSION	15
P/792	(Sweden)	"Measurements of low-level radioactivity, particularly the gamma radiation from living subjects"
	R. M. Sievert	15
	DISCUSSION	10
<u>17C.2</u>		<u>Hazards Related to Uranium Mining</u>
P/370	(France)	"The problem of radon in uranium mines"
	H. Jammet and J. Pradel	20
P/85	(USA)	"Industrial hygiene of uranium processing"
	M. Eisenbud and J. A. Quigley	15
	DISCUSSION	10

Session 18C, Wednesday, 17 August: Afternoon

SAFETY STANDARDS AND HEALTH ASPECTS OF LARGE-SCALE USE OF ATOMIC ENERGY
(concluded)

<u>18C.1</u>		<u>Hazards Related to Reactor and Chemical Processing</u>	<u>Time in minutes</u>
		Chairman	5
P/8	(Canada)	"Health and safety activities in reactor operations and chemical processing plants" A. J. Cipriani	20
P/240	(USA)	"Radiation exposure experience in a major atomic energy facility" H. M. Parker	20
P/452	(UK)	"Control of radiation hazards in the operation of medium powered experimental reactors" W. G. Marley and B. S. Smith	15
P/845	(USA)	"Approaches to treatment of poisoning by both radioactive and non-radioactive elements encountered in atomic energy operations" J. Schubert	15
		DISCUSSION	20
<u>18C.2</u>		<u>Ecological Problems Related to Reactor Operation</u>	
		Chairman	5
P/278	(USA)	"The absorption of fission products by plants" J. H. Rediske and F. P. Hungate	15

P/280	(USA)	"The accumulation of radioactive substances in aquatic forms"	
		R. F. Foster and J. J. Davis	15
P/281	(USA)	"Radioactivity in terrestrial animals near an atomic energy site"	
		W. C. Hanson and H. A. Kornberg	15
P/393	(UK)	"The behaviour of ^{131}I , ^{89}Sr and ^{90}Sr in certain agricultural food chains"	
		A. C. Chamberlain et al	15
		DISCUSSION	20

RADIOACTIVE ISOTOPES SESSIONS (19C - 23C)

Session 19C, Thursday, 18 August: Morning

GENERAL USES, PRODUCTION AND HANDLING OF RADIOACTIVE ISOTOPES

			<u>Time in Minutes</u>
	Chairman		5
<u>19C.1</u>	<u>General Aspects</u>		
P/985	(Australia)	"The use of radioisotopes in Australia" C. E. Eddy	15
P/801	(Czechoslovakia)	"Report on the use of radioisotopes in the Czechoslovakian Republic" C. Simane	15
P/146	(USA)	"Radioisotopes in industrial research" S. E. Eaton	15
<u>19C.2</u>	<u>Production of Radioactive Isotopes</u>		
P/314	(USA)	"Large-scale production of radioisotopes" A. F. Rupp	20
P/461	(UK)	"The production of beta-ray sources for industrial and clinical uses" P. E. Carter and L. C. Myerscough	20
P/886	(Norway)	"Separation of carrier-free isotopes by diffusion methods" K. Samsahl and K. Taugbol	20
	DISCUSSION		15

<u>19C.3</u>		<u>Handling of Radioactive Isotopes</u>	
P/13	(Canada)	"Current techniques of handling and distributing cobalt-60 radiation sources"	
		A. B. Lillie	20
P/69	(USA)	"Mechanical arms incorporating a sense of feel for conducting experiments with radioactive materials"	
		J. R. Burnett et al	20
		DISCUSSION	15

Session 20C, Thursday, 18 August: Afternoon

DOSIMETRY

			<u>Time in minutes</u>
		Chairman	5
<u>20C.1</u>		<u>General Aspects</u>	
P/150	(USA)	"Low-level counting and the future of isotopic tracers"	
		W. H. Johnston	15
		DISCUSSION	
<u>20C.2</u>		<u>Dosimetry of Gamma-rays</u>	
P/386	(France)	"Dosimetry of cobalt-60 gamma-rays and thermal neutrons in heavy water piles"	
		J. Sutton et al	10
P/70	(USA)	"Absolute dosimetry of cobalt-60 gamma-rays"	
		J. S. Laughlin et al	10
		DISCUSSION	10

20C.3Neutron Dosimetry

P/154	(USA)	"Dosimetry of reactor radiations by calorimetric measurements" D. M. Richardson et al	10
P/63	(USA)	"Methods of measurements of neutron flux at low levels" F. P. Cowan and J. O'Brien	20
P/60	(USA)	"A gamma insensitive semi-conductor fast neutron dosimeter using single crystal germanium" B. Cassen	10
		DISCUSSION	10

20C.4Counting and Electronics

P/71	(USA)	"Dosimetry of ionizing particles" G. Failla	10
P/61	(USA)	"Recent developments in the scintillation counter field" G. A. Morton	10
P/66	(USA)	"Methods of pulse analysis" G. G. Kelley and P. R. Bell	10
P/159	(USA)	"High resolution radiation detectors in research" H. J. Gomberg and M. J. Schlesinger Jr.	10
P/930	(Nether- lands)	"New geiger tube design - hollow anode and parallel plate counters" J. Hersen et al	10
		DISCUSSION	20

Session 21C, Friday, 19 August: Morning

RADIOACTIVE ISOTOPES IN RESEARCH

Time in
minutes

Chairman

5

551

1035907

<u>21C.1</u>		<u>Reaction Mechanisms</u>	
P/708	(USSR)	"Application of tracer atoms in the study of the mechanism of chemical reactions" V. N. Kondratyev	20
P/163	(USA)	"Stable and unstable isotopes in heterogeneous catalytic reactions" J. Turkevich	20
P/149	(USA)	"Tritium as a research tool in chemistry and industry" W. G. Brown et al	15
		DISCUSSION	15
<u>21C.2</u>		<u>Activation Analysis</u>	
P/632	(USSR)	"Quantitative determination of impurities in high purity metals by radioactivation analysis" V. V. Jakovlev	15
P/706	(USSR)	"Application of radioactive isotopes in chemical analysis" I. P. Alimarin	15
P/770	(UK)	"Recent advances in radioactivation analysis" A. A. Smales	15
		DISCUSSION	15
<u>21C.3</u>		<u>Research in Metallurgy</u>	
P/702	(USSR)	"Investigation of diffusion and atomic interaction in alloys with the aid of radioactive isotopes" G. V. Kurdyumov	25
		DISCUSSION	15

Session 22C, Friday, 19 August: Afternoon

RADIOACTIVE ISOTOPES IN CONTROL AND TECHNOLOGY

			<u>Time in minutes</u>
		Chairman	5
P/463	(UK)	"Development in thickness gauges and allied instruments" J.L. Putman	15
P/164	(USA)	"Versatility of radiation applications involving penetration or reflection" C.E. Crompton	15
P/704	(USSR)	"Application of radioactive isotopes in technological process control instruments" G.G. Jordan et al	15
		DISCUSSION	15
P/383	(France)	"Studies and industrial applications of Bremsstrahlung from the beta rays of yttrium 90" P. Leveque et al	15
P/ 462	(UK)	"Application of radioisotopes to leakage and hydraulic problems" J.L. Putman and S. Jefferson	15
P/707	(USSR)	"Use of radioactive isotopes in the study of the process of steel and pig iron production" A.M. Samarin	15
P/713	(Ukr.SSR)	"Use of radioactive isotopes for the study of the wear of machine parts" D.B. Grozin	15
		DISCUSSION	15

P/1054	(Japan)	"Brief review of applications of isotopes on process and quality control"	M. Kato	15
P/882	(Norway)	"Some industrial uses of radioactive isotopes in Norway"	U. Been and E. Saeland	15
		DISCUSSION		10

Session 23C, Saturday, 20 August: Morning

FISSION PRODUCTS AND THEIR APPLICATIONS

				<u>Time in minutes</u>
		Chairman		15
<u>23C.1</u>		<u>Polymerisation Induced by Radiation</u>		
P/168	(USA)	"The effect of gamma radiation on some chemical reactions of possible industrial importance"	B.G. Bray et al	20
P/465	(UK)	"Recent developments in the irradiation of long-chain polymers"	A. Charlesby	15
		DISCUSSION		15
<u>23C.2</u>		<u>Food Sterilization</u>		
P/172	(USA)	"Progress and problems in the development of cold sterilization of foods"	B.E. Proctor and S.A. Goldblith	15
P/225	(USA)	"Health protection against food-borne parasitic diseases with particular reference to control of trichinosis"	H.J. Gomberg and S.E. Gould	15

P/175	(USA)	"Sterilization of medical supplies with gamma radiations" L.E. Brownell and J.J. Blumer	15
		DISCUSSION	15
<u>23C.3</u>		<u>Conversion of Radiation into Electricity</u>	
P/974	(Sweden)	"Study on the properties of an electrolytic cell consisting of an electrode system in a chloroform alcohol solution under γ-irradiation" C.G. Osterlundh and E. Haeffner	15
P/169	(USA)	"The direct conversion of radiation into electricity" E.G. Linder et al	20
		DISCUSSION	20

ALLOCATION OF ABSTRACTS TO SESSIONS

GENERAL SESSIONS

(Sessions 1 - 7, Session 24)

SESSION 2, WORLD ENERGY NEEDS

P/3, 125, 324, 325, 326, 388, 467, 469, 757,
772, 781, 799, 802, 864, 868, 877, 892, 902,
909, 919, 949, 955, 962, 981, 987, 998, 1060,
1074, 1082, 1083, 1085, 1086, 1092, 1102, 1108,
1113, 1115, 1116, 1117.

SESSION 3, THE BUILDING OF A NUCLEAR ENERGY ENTERPRISE

P/391, 477, 615, 851.

SESSION 4, FACTORS IN THE USE OF NUCLEAR ENERGY

P/319, 320, 321, 322, 323, 329, 390, 400, 476,
778, 783, 798, 854, 855, 856, 857, 867, 907,
984, 1063, 1072.

SESSION 5, THE ROLE OF NUCLEAR POWER IN THE NEXT 50 YEARS

P/11, 145, 327, 389, 468, 475, 758, 810, 849,
863, 893, 1002, 1078, 1087.

SESSION 6, HEALTH AND SAFETY ASPECTS OF NUCLEAR ENERGY

P/392, 394, 478, 479, 481, 482, 483, 572, 616,
617, 797, 803, 852, 853.

SESSION 7, THE USE OF RADIOACTIVE ISOTOPES

P/308, 309, 310, 311, 312, 330, 331, 332, 395,
396, 397, 398, 618, 780, 848, 912, 914, 969,
1039, 1062.

SESSION 24, CLOSING GENERAL SESSION

P/466, 619, 755, 779, 800, 805, 983, 1080,
1093.

PHYSICS AND REACTOR SESSIONS

(Sessions 6A - 23A)

SESSION 6A, SPECIAL TOPICS IN NUCLEAR PHYSICS

P/579, 581, 588, 643, 650, 651, 654, 714, 807,
830, 870, 941, 945, 950, 951, 1033, 1076, 1091,
1094.

SESSION 7A, FISSION PHYSICS

P/592, 593, 652, 653, 836, 884, 891, 897, 911,
913, 993, 1089.

SESSION 8A, RESEARCH REACTORS

P/401, 484, 485, 486, 487, 762, 804, 859, 888,
946.

SESSION 9A, RESEARCH REACTORS AND DESCRIPTIONS

P/387, 488, 489, 490, 621, 622, 623, 860, 915.

SESSION 10A, RESEARCH REACTORS, DESCRIPTIONS: (concluded) FUEL CYCLES

P/4, 402, 403, 620, 861, 862.

SESSION 11A, DESIGN OF REACTORS FOR POWER PRODUCTION

P/333, 336, 337, 492, 493, 494, 936, 938.

SESSION 12A, DESIGN OF REACTORS FOR POWER PRODUCTION (concluded)

P/335, 405, 491, 495 496, 624, 814.

SESSION 13A, POWER REACTORS, PROTOTYPES

P/497, 498, 500, 815, 816, 879.

SESSION 14A, POWER REACTORS, PROTOTYPES (concluded)

P/406, 499, 501, 813.

SESSION 15A, EQUIPMENT AND TECHNIQUES USED IN MEASURING CROSS-SECTIONS
IMPORTANT TO REACTOR DESIGN

P/421, 426, 573, 574, 576, 577, 580, 582, 584,
640, 641, 767, 806.

SESSION 16A, EQUIPMENT AND TECHNIQUES: (concluded) CROSS-SECTIONS
OF NON-FISSIONABLE MATERIALS: DELAYED NEUTRONS

P/356, 578, 591, 596, 642, 648, 831, 832.

SESSION 17A, CROSS-SECTIONS OF FISSIONABLE MATERIALS

P/354, 355, 422, 423, 424, 586, 589, 594, 641,
644, 645, 646.

SESSION 18A, PROPERTIES OF FISSIONABLE MATERIALS; RESONANCE ANALYSIS

P/425, 583, 585, 587, 590, 595, 657, 658, 660.

SESSION 19A, INTEGRAL MEASUREMENTS

P/357, 358, 359, 360, 597, 661, 662, 789, 872,
928, 933.

SESSION 20A, RESONANCE INTEGRALS; FISSION PRODUCT POISONING; CRITICALITY
OF SOLUTIONS

P/5, 6, 427, 428, 432, 659, 833, 834, 835, 883,
948.

SESSION 21A, ZERO ENERGY AND EXPONENTIAL EXPERIMENTS

P/361, 429, 599, 600, 601, 602, 603, 604, 605,
606, 607, 623, 790, 791, 920.

SESSION 22A, ZERO ENERGY EXPERIMENTS ON FAST REACTORS AND REACTOR KINETICS

P/334, 404, 434, 598, 609, 610, 612, 775, 934.

SESSION 23A, REACTOR THEORY

P/430, 431, 433, 608, 611, 613, 647, 649, 655, 656,
663, 664, 665, 666, 667, 668, 669, 796, 916, 937,
1003.

CHEMISTRY, METALLURGY AND
TECHNOLOGY SESSIONS

(Sessions 6B - 23B)

SESSION 6B OCCURRENCE OF URANIUM AND THORIUM

P/14 to 25, 27 to 30, 32 to 57, 126, 127, 130,
131, 285 to 307, 328, 470 to 474, 759 to 761,
782, 865, 875, 887, 918, 956, 963, 968, 980,
999, 1000, 1001, 1035, 1036, 1071, 1073, 1101,
1105, 1106, 1114, 1118.

SESSION 7B PROSPECTING FOR URANIUM AND THORIUM

P/1, 132, 338, 502, 503, 504, 505, 506, 507,
508, 509, 510, 511, 512, 513, 514, 515, 516,
517, 518, 625, 626, 763, 764, 773, 869, 994.

SESSION 8B THE FISSION PROCESS: FACILITIES FOR HANDLING HIGHLY
RADIOACTIVE MATERIALS

P/438, 614, 672, 673, 718, 721, 722, 723, 725,
881.

SESSION 9B CHEMISTRY OF FISSION PRODUCTS

P/435, 436, 437, 670, 671, 719, 724, 837, 979,
1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025,
1026, 1027, 1058, 1059.

SESSION 10B HEAVY ELEMENT CHEMISTRY

P/439, 440, 441, 674, 675, 676, 677, 678, 726,
728, 729, 730, 731, 732, 733, 734, 735, 736,
737, 809, 838, 929, 991, 1028, 1090, 1096,
1110.

SESSION 11B EFFECTS OF RADIATION ON REACTOR MATERIALS

P/442, 443, 680, 681, 743, 744, 745, 746, 747.

SESSION 12B EFFECTS OF RADIATION ON LIQUIDS

P/7, 363, 445, 679, 682, 683, 738, 739, 740,
741, 742, 839.

SESSION 13B EFFECTS OF RADIATION ON SOLIDS

P/362, 444, 748, 749, 750, 751, 753.

SESSION 14B TREATMENT OF URANIUM AND THORIUM ORES AND ORE CONCENTRATES

P/2, 133, 134, 339, 340, 519, 520, 521, 522,
523, 524, 525, 526, 527, 528, 529, 784, 850,
871, 873, 957, 965, 977, 986, 996, 997.

SESSION 15B PRODUCTION OF METALLIC URANIUM AND THORIUM:
ANALYTICAL METHODS IN RAW MATERIAL PRODUCTION

P/116, 117, 136, 341, 407, 531, 532, 627, 628,
629, 630, 635, 636, 817, 818, 942, 952, 959,
964, 966, 976, 978, 989, 990, 1004, 1005, 1006,
1007, 1008, 1009, 1011, 1012, 1013, 1014, 1095
1104, 1107.

SESSION 16B PRODUCTION TECHNOLOGY OF SPECIAL MATERIALS

P/343, 344, 410, 534, 631, 774, 819, 923, 927,
943, 958, 960, 988, 992, 1010.

SESSION 17B PRODUCTION TECHNOLOGY OF SPECIAL MATERIALS (concluded)

P/345, 346, 347, 409, 533, 633, 634, 709, 820,
876, 1015, 1016, 1017, 1075.

SESSION 18B METALLURGY OF THORIUM, URANIUM AND THEIR ALLOYS:
FABRICATION OF FUEL ELEMENTS

P/351, 352, 416, 555, 556, 557, 558, 559, 561,
562, 786, 825, 826, 827, 828, 885, 947, 953,
961.

SESSION 19B LIQUID METAL TECHNOLOGY

P/118, 119, 120, 121, 122, 123, 124, 417, 637,
638, 639, 766, 787, 812, 829, 866, 1103.

SESSION 20B CHEMICAL ASPECTS OF NUCLEAR REACTORS

P/348, 411, 412, 535, 536, 537, 811, 821, 880,
900.

SESSION 21B CHEMICAL PROCESSING OF IRRADIATED FUEL ELEMENTS

P/349, 413, 414, 539, 540, 541, 543, 547, 548,
549, 551, 765, 785, 822, 824.

SESSION 22B CHEMICAL PROCESSING OF IRRADIATED FUEL ELEMENTS: (concluded):
SEPARATION AND STORAGE OF FISSION PRODUCTS

P/350, 415, 542, 544, 545, 546, 550, 552, 553,
823.

SESSION 23B WASTE TREATMENT AND DISPOSAL

P/12, 353, 418, 419, 420, 554, 564, 565, 567,
569, 571, 788, 975, 995, 1051, 1056.

BIOLOGICAL AND MEDICAL SESSIONS

(Sessions 8C - 18C)

SESSION 8C RADIOACTIVE ISOTOPES AND NUCLEAR RADIATIONS
IN MEDICINE - Therapy

P/144, 177, 179, 183, 184, 185, 194, 197, 200,
201, 202, 203, 206, 208, 209, 210, 211, 212,
213, 366, 367, 446, 685, 910, 925, 970, 973.

SESSION 9C RADIOACTIVE ISOTOPES AND NUCLEAR RADIATIONS IN MEDICINE
(continued) - Diagnosis and Studies of Disease

P/9, 141, 181, 187, 189, 190, 191, 193, 196,
198, 199, 207, 216, 227, 365, 368, 376, 378,
684, 754, 768, 769, 777, 841, 917, 924, 971,
972, 1029, 1065, 1097, 1098, 1099.

SESSION 10C RADIOACTIVE ISOTOPES AND NUCLEAR RADIATIONS IN MEDICINE
(concluded) - Diagnosis and Studies of Disease

P/140, 142, 178, 180, 188, 192, 214, 215, 217,
219, 220, 224, 228, 229, 374, 447, 711, 840,
844, 921, 1034.

SESSION 11C BIOLOGICAL EFFECTS OF RADIATION - Modes of Radiation
Injury and Radiation Hazards

P/72, 75, 77, 80, 81, 82, 88, 236, 242, 243,
244, 251, 254, 256, 257, 375, 448, 450, 692,
693, 847, 926, 1045, 1070.

SESSION 12C BIOLOGICAL EFFECTS OF RADIATION (continued) -
Mechanisms of Radiation Injury: Protection and Recovery

P/78, 83, 84, 87, 94, 97, 239, 249, 252, 253,
255, 371, 372, 455, 690, 691, 878, 898, 899,
904, 905, 906, 932, 939, 940, 1042, 1109.

- SESSION 13C BIOLOGICAL EFFECTS OF RADIATION (concluded) - Genetic Effects;
Human Implications
RADIOACTIVE ISOTOPES AND IONIZING RADIATIONS IN AGRICULTURE -
Radiation-induced Genetic Changes and Crop Improvement

P/101, 103, 107, 110, 234, 235, 238, 266, 449,
793, 890, 1042.
- SESSION 14C RADIOACTIVE ISOTOPES AND IONIZING RADIATIONS IN AGRICULTURE
(concluded) - Tracer Studies in Agriculture

P/10, 100, 104, 105, 106, 108, 109, 111, 112,
113, 114, 115, 380, 381, 382, 460, 694, 695,
696, 698, 699, 701, 716, 889, 1040, 1049.
- SESSION 15C RADIOACTIVE ISOTOPES IN PHYSIOLOGY AND BIOCHEMISTRY

P/90, 91, 92, 93, 95, 96, 99, 259, 269, 271,
274, 275, 373, 379, 459, 688, 697, 700, 715,
874, 908, 1046, 1047, 1048, 1067, 1100.
- SESSION 16C RADIOACTIVE ISOTOPES IN PHYSIOLOGY AND BIOCHEMISTRY (concluded) -
General Biochemistry

P/98, 182, 221, 222, 260, 261, 262, 263, 264,
265, 267, 268, 270, 272, 273, 377, 456, 457,
686, 687, 710, 776, 842, 843, 846, 922, 967, 1030,
1031, 1032.
- SESSION 17C SAFETY STANDARDS AND HEALTH ASPECTS OF LARGE-SCALE
USE OF ATOMIC ENERGY

P/73, 74, 76, 79, 85, 89, 230, 241, 245, 247,
250, 258, 370, 451, 689, 792, 944, 1041.
- SESSION 18C SAFETY STANDARDS AND HEALTH ASPECTS OF LARGE-SCALE USE
OF ATOMIC ENERGY (concluded)

P/8, 240, 248, 276, 277, 278, 279, 280, 281,
283, 369, 393, 452, 453, 454, 480, 771, 845,
1052, 1055, 1057, 1066.

RADIOACTIVE ISOTOPES SESSIONS

(Sessions 19C - 23C)

SESSION 19C GENERAL USES, PRODUCTION AND HANDLING OF RADIOACTIVE ISOTOPES

P/13, 69, 86, 146, 313, 314, 315, 316, 317, 318,
399, 461, 801, 886, 985, 1088.

SESSION 20C DOSIMETRY

P/58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68,
70, 71, 150, 151, 152, 153, 154, 155, 157, 158,
159, 386, 795, 930, 974, 1069, 1077.

SESSION 21C RADIOACTIVE ISOTOPES IN RESEARCH

P/147, 149, 160, 161, 163, 226, 231, 232, 233,
342, 632, 702, 703, 706, 708, 712, 770.

SESSION 22C RADIOACTIVE ISOTOPES IN CONTROL AND TECHNOLOGY

P/148, 162, 164, 165, 166, 383, 462, 463, 464,
704, 705, 707, 713, 882, 1053, 1054, 1061,
1081.

SESSION 23C FISSION PRODUCTS AND THEIR APPLICATIONS

P/156, 167, 168, 169, 170, 171, 172, 173, 174,
175, 176, 225, 465, 794, 1068.

APPENDIX XVI -- UNITED NATIONS LIST OF DELEGATIONS

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President: Dr. Homi Bhabha (India)

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Sir John Cockcroft (UK), Dr. I. I. Rabi (USA).

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Deputy Conference Secretary General: Dr. Viktor S. Vavilov

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Engineer D. Otto O. M. GAMBA

Dr. D. GERMAN MENDIVELZUA

Dr. D. Fidel ALSINA FUERTES

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Counsellor of Embassy

Dr. Eduardo de ANTUENO,
Secretary of Embassy

Dr. Americo RONCAROLO,
Assistant

Dr. D. Constantino NUNEZ

Engineer D. Victorio ANGELELLI

Dr. D. Mauricio BUHLER

Dr. D. Kurt FRAENZ
Engineer D. Juan U. KOPPEL
Dr. D. Walter SEELMAN-EGGEBERT
Dra. Dna. Ilse G. de FRAENZ
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Australian National University
Mr. R. L. HARRY,
Department of External Affairs
Dr. C. E. EDDY,
Department of Health
Mr. S. E. HUDDLESTON,
Electricity Trust of South Australia

Dr. C. N. WATSON-MUNRO,
Australian Atomic Energy Commission
Dr. G. L. MILES,
Australian Atomic Energy Commission
Dr. K. F. ALDER,
Australian Atomic Energy Commission
Dr. G. C. J. DALTON,
Australian Atomic Energy Commission
Mr. R. G. THOMAS,
Commonwealth Scientific Industrial Research Organization
Mr. D. L. ANDERSON,
Department of National Development
Mr. V. J. F. BRAIN,
Electricity Commission of New South Wales

Mr. D. R. GRIFFITHS,
Electricity Trust of South Australia

Mr. F. SYKES,
Electricity Commission of New South Wales

Austria

Dr. Franz MATSCH,
Envoy Extraordinary and Minister Plenipotentiary,
Chairman of the Austrian Atomic Energy Commission.

Professor Dr. Berta KARLIK,
Director of the Institute of Radio-Research

Dr. Wilhelm KOVATS,
Ministerial Councillor

Ing. Franz GRILL,
Ministerial Councillor

Dr. Josef NAGLER,
Director of the Technical Museum

Dr. Herbert VETTER

Dipl. Ing. Richard POLACZEK,
Councillor of Section

Dr. Adalbert ORLICEK,
Councillor of Section

Professor Dr. Maximilian LEDINEGG,
Director of the Federal Experimental Establishment Arsenal

Dr. Ferdinand CAP,
Professor of the University of Innsbruck

Dr. Karl LINTNER,
Institute of Radioresearch

Dr. Heinrich GLEISSNER,
Secretary of Legation

Dr. Gustav ORTNER,
Professor of Nuclear Science

Dr. Heimo HARDUNG-HARDUNG

Dr. Richard KIEFER,
Director of the Metallic Plant Plansee

Mr. Eugen VUCINIC,
Director of the Electric Firm Elin

Dipl. Ing. Dr. Roland KEMETSMULLER,
Director of the Establishment Waagner-Biro

Dipl. Ing. Franz HINTERMAYER

Dipl. Ing. Wolfgang HAHN

Dipl. Ing. Dr. Leopold BAUER

Dipl. Ing. Dr. Heinz SCHMIDL

Dr. Friedrich OSZUSZKY

Prof. Dr. Ludwig MUSIL,
Director of the Styrian Hydroelectric Company

Senatsrat Dr. Ing. MOKESCH,
Electricity Plants of Vienna

Dipl. Ing. Dr. KAINDL

Dr. Otto SMETANA,
Chief-chemist of Treibacher chemical plants

Dipl. Ing. Friedrich JANICEK,
Austrian Drau Werke A. G.

Dr. Ing. Karl SEDLATSCHKE,
Metallwerk Plansee Ges.m.b.H
Reutte/Tirol

Dr. RIGELLE,
Vereinigte Osterreichische Eisen - und
Stahlwerke, Linz

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Commissaire a l'Energie atomique

Paul de GROOTE,
President du Conseil d'Administration de l'Universite
Libre de Bruxelles,
Membre du Conseil d'Administration du Centre d'Etudes
pour les Applications de l'Energie Nucleaire

Louie DE HEEM,
Directeur General du Centre d'Etudes pour les
Applications de l'Energie Nucleaire

Jacques ERRERA,
Professor a l'Universite de Bruxelles,
Conseiller de la Delegation permanente de la
Belgique aupres des Nations Unies

Jean WILLEMS,
President du Conseil de l'Institut Interuniversitaire
des Sciences Nucleaires

MM. Gaston ANDRE,
Directeur du Department Radium de l'Union Miniere
du Haut Katanga

Zenon BACQ,
Professor a l'Universite de Liege,
Membre de la Commission scientifique de Conseil
superieur de la Securite civile

Paul CAPRON,
Professor a l'Universite de Louvain

Albert CLAUDE,
Professeur a l'Universite Libre de Bruxelles,
Membre de la Commission scientifique de L'Institut
Interuniversitaire des Sciences Nucleaires

MM. Marcel de MERRE,
Administrateur Directeur General de la Societe
Metallurgique de Hoboken

Maurice D'HONT,
Attache au Centre d'Etudes pour les Applications
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Pierre ERKES,
Attache au Syndicat d'Etudes de l'Energie Nucleaire

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Secrétaire de l'Institut Interuniversitaire des
Sciences Nucleaires

Edgard GILLON,
Professor a l'Universite de Louvain

Julien GOENS,
Directeur au Centre d'Etudes pour les Applications
de l'Energie Nucleaire

Georges GOFFIN,
Ingenieur en chef,
Directeur du Service de l'Energie electrique au
Ministere des Affaires economiques

Pierre GOSSELIN,
Administrateur-Delegue au Syndicat d'Etudes des
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Commission federale de l'energie nucleaire

Mr. Vojko PAVICIC,
Directeur de l'Institut des sciences nucleaire
"Boris Kidric" et membre de la Commission
federale del'energie nucleaire

Mr. Cedo MILICEVIC,
Directeur de la Commission de l'economie
electrique yougoslave et member de la Commission
federale de l'energie nucleaire

Dr. Dragoslav POPOVIC,
Collaborateur de l'Institut des sciences
nucleaires "Boris Kidric"

Mr. Vjekoslav MIKINCIC,
Geologue,
President du Conceil d'administration de l'ins
federal de geologie

Mr. Milorad RISTIC,
Ing., member de la Commission federale de
l'energie nucleaire

Dr. Bozo TEZAK,
Professeur d'Universite

Mr. Lado KOSTA,
Ing., collaborateur de l'Institut "Jozef Stefan"

Dr. Drago GRDENIC,
Membre de la Commission federal de l'energie
nucleaire

Mr. James DEKLEVA,
Ing., collaborateur de l'Institut "Josef Stefan"

Mr. Tomo BOSANAC,
Ing., collaborateur de l'Institut "Rudjer
Boskovic", ingenieur en chef de "Rade Koncar"

Dr. Dina KEGLEVI,
Collaborateur de l'Institut "Rudjer Boskovic"

Mr. Bella BUNJI,
Ing., directeur de l'Institut federal de
technologie

Dr. Borivoje DAMJANOVIC,
Collaborateur de l'Institut des sciences
nucleaires "Boris Kidric"

Mr. Miodrag PETROVIC,
Ing., d'electricite, collaborateur de l'Institut
des sciences nucleaires "Boris Kidric"

Mr. Slobodan RIBNIKAR,
Chimiste, collaborateur de l'Institut des
sciences nucleaires "Boris Kidric"

Mr. Bogoljub JOVANOVIC,
Secetaire au Secretariat d'Etat des Affaires
Etrangeres

Mr. Milenko SUSIC,
Chimiste, collaborateur de l'Institut des
sciences nucleaires "Boris Kidric"

DELEGATIONS OF SPECIALIZED UN AGENCIES

International Labour Office

Mr. David A. MORSE,
Director-General

Mr. C. W. JENKS,
Assistant Director-General

Mr. J. L. MOWAT,
Chief Special Research and Reports Division

Mr. M. ROBERT,
Chief Occupational Safety and Health Division

Mr. K. L. GOODALL,
H. M. Inspector of Factories,
Factory Department,
Ministry of Labour and National Service,
London

Food and Agriculture Organization of the United Nations

Dr. F. T. WAHLEN,
Director of the Agriculture Division

Dr. R. A. SILOW,
Agriculture Division

United Nations Education Scientific and Cultural Organization

Professor P. AUGER,
Director, Department of Natural Sciences

Professor N. B. CACCIAPUOTI,
Deputy Director,
Department of Natural Sciences

Dr. L. KOWARSKI

World Health Organization

- Dr. Pierre DOROLLE,
Deputy Director-General
- Dr. V. A. SUTTER,
Assistant Director-General
Department of Advisory Services
- Dr. A. L. BRAVO,
Chief, Section of Social and Occupational Health
- Dr. G. LOFSTROM,
Chief, Section of Health Laboratory Methods
- Dr. I. S. EVE,
Medical Officer in charge of questions
dealing with atomic energy and health

International Civil Aviation Organization

- Mr. E. R. MARLIN,
Director of Technical Assistance
and External Relations Officer
- Mr. A. MUNCH,
Technical Officer,
Bureau of Air Navigation

International Telecommunication Union

- Dr. Marco Aurelio ANDRADA,
Secretary-General
- Mr. Alfonso CATA,
Vice-Chairman of the International
Frequency Registration Board
- Mr. Georges VALENSI,
Director, International Telephone
Consultative Committee
- Professor Dr. Balth. van der POL,
Director, International Radio
Consultative Committee

International Bank for Reconstruction and Development

Mr. Brian H. COLQUHOUN,
The International Bank's Chief Engineering Advisor

Dr. Wayne REMBERT

Mr. Corbin ALLARDICE,
Adviser on Atomic Energy

World Meteorological Organization

Mr. D. A. DAVIES,
Secretary-General

Dr. G. SWOBODA,
Acting Secretary-General

Mr. G. R. RIVET,
Assisting Secretary-General

Dr. K. LANGLO,
Chief of Technical Division

ATTACHMENT 1 - COMPLETE U.S. LIST OF SECRETARIAT AND STAFF OF U.S. DELEGATION

Conference Office

Assistants to US Representatives

Charles Bates
Everett R. Holles
William C. Wampler

Ad Hoc Policy Committee

Gerard C. Smith (State), Chairman

Executive Office

Harry S. Traynor, Executive Officer (AEC)
George M. Fennemore, Deputy Executive Officer (State Department)
Christopher L. Henderson

Reactor Inspection

Marvin M. Mann

Office of Technical Programs and Exhibits

George L. Weil, Director (AEC)
Thoms O. Jones

Laura Fermi
Norvell W. Page
Roland Sawyer
Stephen White

Technical Papers Unit

Paul W. McDaniel, Chief (AEC)
Stephen P. Cobb, Jr.
Paul G. LeFevre
Andrew W. McReynolds

Scientific Secretaries: Walter D. Claus, R. Carson Dalzell,
Edward Epremian, L. E. Glendenin, George A. Kolstad, Karl M.
Mayer, Robert D. Nininger, Paul B. Pearson, Alvin Radkowsky,
Ulysses M. Staebler.

Reactor Unit

George G. Manov, Chief (AEC)
D. F. Cope

D. S. Billington
Everett P. Blizzard
A. L. Boch
C. D. Cagle
R. L. Clark
T. E. Cole

D. D. Cowen
J. E. Cunningham
J. T. DeLorenzo

E. P. Epler
S. H. Hanauer
J. W. Hill, Jr.
L. B. Holland
Francois Kertesz
Manzell E. Ramsey
C. W. Richer
A. F. Rupp
Albert C. Stewart
Charles E. Winters

Exhibits Unit

Alberto F. Thompson, Chief (AEC)
R. L. Brecker
Bernard M. Fry

R. L. Butenhoff
J. William Young

Information Office

John P. McKnight, Director (USIA)
Morse Salisbury (AEC), Joseph O. Hanson (USIA), and Richard
Friedman (State Department), Deputy Directors.

Gordon Dunning
Charter Heslep
John F. Hogerton
Albin E. Johnson
Robert C. Tumbleson

Office of Liaison and Protocol

John A. Hall, Director (AEC)

Classification Office

Charles D. Luke, Director (AEC)
Charles L. Marshall

Special Services Office

Daniel H. Clare, Jr., Co-Director (State Department)
Bryan F. LaPlante, Co-Director (AEC)

Richard G. Cavanaugh
Keith O. Lynch

Administrative Office

Albert J. Ciaffone, Director (State Department)
Harold D. Anamosa (AEC), and George R. Koontz (State), Deputy
Directors

Elizabeth C. Driscoll
Hallye A. Heiland
Roderick L. Jones
Charles A. Shinkwin
William Thomas

Health and Safety Trailer Exhibit

Merril Eisenbud, Director (AEC)

Hanson Elatz
Edward P. Hardy
John H. Harley
William B. Harris
Harris D. Levine
Alfred Y. Yoli

Staff

Amelia Allen
Theodore Arehart
Lewis T. Arnett
Don R. Armstrong
Thorold Avery
Henry J. Badini
John L. Balderston
Katherine Barrett
William P. Bigler
Lewis Branscomb
Mary S. Buckley
Elroy W. Bungart
Esther M. Call
Mildred P. Cecil
Isaac E. Cody
Louis Costrell
Albert L. Cox
Dorothy D. Davis
Howard L. Davis
Mary Demona

Teresa H. Dent
Charles M. dePaoli
H. L. Dykes
Warren K. Eister
Rose Mary Elmo
Thelma V. Fleming
Hillman S. Ford
George E. Foster
Donald S. Gaither
W. B. Gates
Alfonso G. Gerardi
Dorothy H. Gilchrist
Robert J. Glass
Ellen J. Hanes
Lenora B. Hoover
Eugene C. Howland
Wayne C. Huddleston
Thomas J. Ince
Frances E. Jackson
Charles W. Johnstone

Yvonne Julihn
 John H. Kane
 William H. Kellenberger
 Myron T. Kelley
 Finis G. Lacy
 John M. Leahy
 Rita Leipina
 Gloria H. Lettre
 Martha Litz
 Edward J. Manning
 John H. Martens
 Rita Martinez
 Earl M. Mason
 Jean B. May
 Elizabeth McAllister
 Robert L. McGregor
 Shirley M. McMillan
 Jo Ann Mintz
 Victor S. Mitchell
 Harry P. Morr
 Harrison S. Nelson
 Lillie W. Nelson
 Roger T. Nix
 Frank L. Norris
 D. L. O'Connell
 Frank Owings
 Wellington Patrick
 Edwin S. Prigmore
 Ralph C. Pryde

Joseph N. Kendall
 Virginia Knapik
 Everett J. Knowles
 Amanda M. Kramer
 Joseph R. Quinn
 Nellie C. Reighter
 Priscilla S. Reuter
 John Rico
 James P. Roach
 Joseph R. Schneider
 Marie C. Schock
 Ellen L. Schrodtt
 Simone Schwind
 Curtis Sessoms, Jr.
 Seymour Shapiro
 Joseph R. Schneider
 Alexander W. Sheen
 Meade K. Shick
 John W. Stephens
 Bennie May Stevens
 William H. Sweat
 Harold Z. Tanquary
 Sara Elizabeth Tingle
 Violet Voce
 Virginia H. Walker
 Charles H. Wellington
 M. Claire Wertenbruch
 Joseph J. Zarzachi

Receptionists, Interpreters and Technical Assistants

Sandi Abramovici
 Jeannine De Bay
 Monique Ducroux
 Rosemary Gallay
 Claire Harbury
 Charles Herschmann
 Marielle Hoechstetter
 Doris Johner
 Ivan Edmund Kubala
 Notkor Kung
 Guge Langmeier
 Marlyse Lowenback
 Loni Moos
 Andre Peltzer
 Marisa Pongracz
 Joan A. Ritzenthaler
 Selina Rommel
 Aaron Ruhaltor
 G. A. J. Voetelink
 Louise Wheelock
 Charles Wilson

APPENDIX XVII - PRESS RELEASES BEFORE AND DURING CONFERENCE

Joint Department of State - AEC Releases

No. 599

FOR RELEASE AT 12:00 NOON (EST)
WEDNESDAY, FEBRUARY 23, 1955

PLANS ANNOUNCED FOR UNITED STATES PARTICIPATION
IN GENEVA CONFERENCE ON ATOMIC ENERGY

Preliminary plans for participation by the United States in the International Conference on the Peaceful Uses of Atomic Energy at Geneva, Switzerland, August 8-20, 1955, were announced today.

The United States Government has accepted the invitation to participate in the Conference, which was extended by the United Nations to 84 nations, including 10 from the Soviet bloc. Enclosed with the invitations were several documents, including the Topical Agenda for the Conference and the Conference Rules of Procedure.

Primary responsibility for the technical planning and preparation for the United States participation has been assigned to the United States Atomic Energy Commission. The Commission has named Dr. George L. Weil, former Assistant Director of its Reactor Development Division and now a consultant to the Commission, as Technical Director for United States Participation in the International Conference.

President Eisenhower's proposal for a world-wide conference to promote the dissemination of new information on peaceful uses of atomic energy was first announced by Chairman Lewis L. Strauss of the United States Atomic Energy Commission on April 19, 1954. It will be held under the auspices of the United Nations, which authorized the meeting by formal resolution of the United Nations General Assembly on December 4, 1954.

The Conference is an outgrowth of the atoms-for-peace proposals laid before the United Nations on December 8, 1953 by President Eisenhower when he urged that the atomic resources of the world be mobilized to apply the benefits of atomic energy to the cause of peace.

The Conference will be devoted to the presentation of information on reactor technology, atomic power, radiation protection, applications of atomic energy to biology, medicine, and agriculture and the industrial uses of radioisotopes.

The Atomic Energy Commission is assembling through key United States educational institutions, industrial establishments and research centers (government and private) technical information in the fields appropriate to the Conference Agenda. It is believed that papers presented by United States scientists and engineers will make substantial contributions to all segments of the Topical Agenda.

The Commission also is planning a technical exhibit at the Conference site at Geneva. More than 60 institutions and firms already have signified interest in participating in this United States Government exhibit.

In addition to heading the Commission's staff assigned to the planning and preparation of the Conference, Dr. Weil will undertake to coordinate the technical participation in the meeting of other interested agencies.

Invitations are being issued requesting that abstracts of papers be submitted prior to March 11 for consideration for the United States program which will be submitted to the United Nations Secretary General. Interested individuals should contact their organizations for copies of the Conference Topical Agenda and Rules of Procedure.

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GEORGE L. WEIL

Dr. George L. Weil, who on Feb. 11, 1955, was appointed by AEC General Manager K. D. Nichols as a special assistant to the general manager and technical director for the planning of the U. S. participation in the Geneva international atomic energy conference, is a physicist with specialized experience in the development of nuclear reactors dating back to 1940.

In that year, he joined the group working under the late Dr. Enrico Fermi at Columbia University. This group became part of the Metallurgical Laboratory of the war-time Manhattan Engineer District at the University of Chicago. Dr. Weil participated in the event on Dec. 2, 1942 when the world's first sustained chain reaction was produced in the nuclear reactor built in the old squash court under the Stagg Field stands at the University of Chicago.

Following this pioneer work, he joined the duPont Company to assist in the start-up and operation of the plutonium production reactors at Hanford, Washington. In April, 1945, he was assigned to the group at Los Alamos, New Mexico working on the first test of an atomic bomb.

In October, 1945, he was appointed U. S. Scientific Representative to the Joint Canadian-United Kingdom project at Chalk River, Ontario, Canada. Following this, in 1947, he became a research associate with the SEC's Knolls Atomic Power Laboratory operated by the General Electric Company at Schenectady, New York.

When the AEC Research Division was formed in 1947, Dr Weil was appointed to its staff and later joined the Reactor Development Division when it was organized in 1949. He was Assistant Division Director when he resigned in June, 1952 to engage in private consulting practice in Washington, D. C.

Dr. Weil is currently an atomic energy consultant to a number of private concerns as well as the AEC, and holds an appointment as lecturer on reactor engineering at Johns Hopkins University, Baltimore, Maryland.

He is a native of New York, received his B.A. Degree from Harvard, and his M.A. and Ph.D degrees from Columbia University.

Dr. Weil lives in Cabin John, Maryland with his wife, the former Veniette F. Caswell. They have one son, Stephen George.

No. 646

FOR IMMEDIATE RELEASE
FRIDAY, JUNE 10, 1955

SWITZERLAND AND UNITED STATES INITIAL AGREEMENT ON SALE OF "ATOMS FOR PEACE" REACTOR

Representatives of the Governments of Switzerland and the United States today initialed an agreement for cooperation covering the sale and purchase of the research reactor that is to be a central feature of the official U. S. exhibit at the United Nations' International Conference on Peaceful Uses of Atomic Energy at Geneva next August.

The agreement covers the sale and purchase of the research reactor, the exchange of information relating to the reactor and the lease of special nuclear material to be utilized in the reactor.

The reactor, which is to be assembled from components shipped to Geneva from Oak Ridge, will be in operation as a part of the official U. S. exhibit while the conference is in session August 8-20. At the conclusion of the conference, the U. S. Government, through the Atomic Energy Commission, will sell the reactor to Switzerland.

The price of the reactor, building, associated machinery and exhibits is to be \$180,000. The U. S. will lease to Switzerland sufficient uranium enriched in the isotope U-235 for initial and replacement fuel for the reactor. The quantity of uranium under such lease shall not contain more than six kilograms of U-235 (maximum enrichment - 20 per cent), plus such additional quantity as the AEC may determine is necessary to permit the efficient and continuous operation of the reactor while replaced fuel elements are radioactively cooling in Switzerland or while fuel elements are in transit.

Representing Switzerland at the initialing of the agreement, which took place at the State Department, was Mr. Henry de Torrente, Minister of Switzerland. The United States was represented by the Chairman of the Atomic Energy Commission, Mr. Lewis L. Strauss, and by the Assistant Secretary of State for European Affairs, Mr. Livingston T. Merchant.

The relocation of the reactor at another site and the restoration of the Geneva site to its original condition are to be undertaken at the expense of the Government of Switzerland.

Other provisions of the agreement included the following:

- The reactor shall be used solely for research purposes related to the development of the peaceful, beneficial and humanitarian uses of atomic energy.

- No material transferred to Switzerland under the agreement will be used for atomic weapons or for research on or development of atomic weapons or for any other military purposes, and none will be transferred to unauthorized persons or beyond the jurisdiction of the Government of Switzerland.

- Restricted Data shall not be communicated under the agreement.

- The AEC will exchange with Switzerland information relating to (a) design, construction and operation of the reactor and its use as a research tool; (b) health and safety problems in the operation and use of the reactor; (c) the use of radioactive isotopes produced in the reactor and (d) power levels of the reactor's operation and burn-up of reactor fuels.

— Subject to availability of supply, the AEC will sell or lease to Switzerland such reactor materials, other than special nuclear materials, as are not obtainable on the commercial market and which are required in operation of the reactor.

The agreement is for a five-year period and shall be renewed automatically for another five years unless terminated with due notice by either party. At the expiration of the agreement, the Government of Switzerland is to deliver to the U. S. all fuel elements or other fuel material leased from the AEC.

Under the provisions of the U. S. Atomic Energy Act of 1954, certain procedural steps must be taken by the Executive and Legislative branches of the United States of America before the agreement initialed today may be signed and entered into force.

AEC RELEASES

No. 613

FOR IMMEDIATE RELEASE
March 23, 1955

U. S. TO BUILD ATOMIC REACTOR
FOR WORLD CONFERENCE AT GENEVA

Lewis L. Strauss, Chairman of the Atomic Energy Commission, announced today that the United States will build an operating research reactor at Geneva, Switzerland, for demonstration at the United Nations International Conference on August 8 - 20, 1955.

The project, expected to be a major exhibit feature of the Conference, has been made possible through the cooperation of the Government of Switzerland and the Secretary General of the United Nations.

"We are confident that the operation of a large research reactor at Geneva during the Conference will add immeasurably to the interest and usefulness of this important meeting," Mr. Strauss said. "This instrument will use the type of fuel that other nations can draw from the 100 kilograms of Uranium-235 the United States has made available for research reactors in other countries as a major step in President Eisenhower's atoms-for-peace program."

The exhibit would enable visiting scientists and technicians to observe a reactor which provides excellent facilities for a variety of cross section measurements, experiments with neutrons and gamma rays, including shielding studies, and production of radioisotopes.

Qualified scientists and technicians will be allowed to operate the machine, using the controls to start, maintain and stop a nuclear chain reaction within the reactor. During these experiments, known as criticality tests, the familiar blue glow of the irradiated fuel elements will be visible in the water.

The reactor will be of the "swimming pool" type successfully operated at the AEC's Oak Ridge National Laboratory for several years. Research reactors of this type are now being constructed at the Pennsylvania State and Michigan Universities. The name comes from the fact that the reactor is immersed in a pool of water which affords an effective safety shield against radiations.

The project for the Geneva Conference will be carried out by Oak Ridge National Laboratory, which is operated for the AEC by the Carbide & Carbon Chemicals Company, and will be under the general supervision of Dr. George L. Weil, Technical Director of the U. S. participation in the Geneva Conference.

The fuel will be fuel grade uranium enriched in isotope 235 to about 20 percent. About 5 kilograms of U-235 will be required.

The reactor will be tested at Oak Ridge and then dismantled and shipped to Geneva. The reactor and its fuel would be at all times under the control and custody of the AEC.

It will be housed in a temporary prefabricated metal building designed especially to enable the delegates and visitors at Geneva to see the reactor in operation.

The "swimming pool" feature will be a tank 10 feet in diameter and 20 feet deep, in which the entire reactor is immersed. Specially purified water is used for the shielding. Health and safety control will be built into the reactor.

A small platform will be built on top of the reactor, from which a lecturer can direct demonstrations and explain the operation of the machine. The housing structure will be designed to accommodate a constant flow of visitors observing the operation of the reactor.

The swimming pool reactor, which is estimated to cost about \$350,000, will be part of the technical exhibit being planned by the U. S. at Geneva.

NOTE TO DESKS: Four pictures of the present Swimming Pool Reactor at the Oak Ridge National Laboratory are available at 30 East 42nd Street (Union Carbide and Carbon Corporation): Telephone Murray Hill 7-8042.

No. 633

FOR RELEASE AT NOON, EDT
FRIDAY, May 6, 1955

1,100 U. S. SCIENTISTS AND ENGINEERS SUBMIT IDEAS FOR PAPERS AT UN CONFERENCE AT GENEVA

Nearly 1,100 U. S. scientists and engineers want to present papers at the United Nations international conference on peaceful uses of atomic energy at Geneva next August. In response to invitations issued by the U. S. Atomic Energy Commission, that many have submitted summaries of their ideas for consideration.

In announcing that the first group of 189 abstracts of papers tentatively accepted had been forwarded to the United Nations, Acting Chairman Willard F. Libby of the AEC, expressed gratification at the widespread interest shown throughout the scientific community of this country for participation in the forthcoming world-wide conference.

"This overwhelming response is heartening for two reasons," Dr. Libby said. "It demonstrates our desire to share with the world the results of our researches and applications of atomic energy for peaceful purposes. Also, it gives evidence of the substantial contributions the United States has to make to all sections of the comprehensive agenda adopted for the Conference."

Dr. George L. Weil, technical director of the U. S. participation in the Conference, explained that this was only the first group of abstracts of U. S. papers to be submitted to the United Nations Conference Secretary General. These technical summaries cover some of the papers proposed for several important parts of the Conference program. Dr. Weil also pointed out that, within the time allotted to the U. S. at the Conference, only a relatively small number of all the papers eventually accepted can be presented in person by the authors. Other papers will be published in the Conference Proceedings.

This group of 189 includes papers proposed in the broad fields of applications of atomic energy to medical research, agriculture and industry; applications of radioisotopes in process and quality control, industrial uses of fission products, developments in instrumentation, and remote controls necessary in handling radioactive materials, and natural occurrence of uranium in this country and extracting and refining uranium ores.

In this first group of abstracts, the largest number -- 60 -- came from colleges and universities. The laboratories operated for the AEC by academic and industrial contractors accounted for 47. Government agencies other than the AEC contributed another 46, of which 34 covering various aspects of the raw materials field are from the U. S. Geological Survey. Hospitals, research institutions and industrial groups accounted for the remainder of the 189 abstracts submitted.

A list of the institutions represented in the 189 titles follows:

EDUCATIONAL INSTITUTIONS: University of California, University of California at Los Angeles, University of Chicago, Columbia University, University of Florida, George Washington University, Harvard University, Illinois Institute of Technology, Kansas University, Massachusetts Institute of Technology, Meharry University, Michigan State College, University of Michigan, University of Minnesota, New Mexico University, North Carolina State College,

University of North Carolina, Ohio State University, University of Pittsburgh, Princeton University, Purdue University, Rensselaer Polytechnic Institute, Rutgers University, University of Southern California, Tulane University, Washington University (St. Louis), University of Washington, and the University of Wisconsin.

HOSPITALS AND MEDICAL RESEARCH CENTERS: Beth Israel Hospital, New York City; Frances Delafield Hospital, New York City; Lovelace Foundation, Albuquerque, N. Mex.; Massachusetts General Hospital, Boston; Montefiore Hospital, New York City; National Heart Institute; the Veterans Administration hospitals at Boston, Mass., and Long Beach, Calif.; and the Walter Reed Army Medical Center, Washington, D. C.

RESEARCH GROUPS AND INDUSTRIAL ORGANIZATIONS: American Meat Institute, Chicago, Ill.; Anton Electronics Laboratory, Brooklyn, N.Y.; Boyce Thompson Institute for Plant Research, Yonkers, N. Y.; California Research Corporation, Richmond, Calif.; Hawaiian Sugar Planters Association, Honolulu; Arthur D. Little Co., Cambridge, Mass.; National Lead Co., New York City; Radio Corporation of America Laboratories, Camden, N.J.; Southern Research Institute, Birmingham, Ala.; Technical Operations Inc., Arlington, Mass.; Textile Research Institute, Princeton, N. J.; U. S. Radium Corporation, Bloomsberg, Pa.; and the Worcester (Mass.) Foundation for Experimental Biology.

AEC LABORATORIES AND CONTRACTORS: Argonne National Laboratory, Lemont, Ill.; Brookhaven National Laboratory, Long Island, N.Y.; Hanford (Washington) Atomic Products Operation; Knolls Atomic Power Laboratories, Schenectady, N.Y.; Mound Laboratory, Miamisburg, O.; Los Alamos (New Mexico) Scientific Laboratory; Oak Ridge (Tenn.) Institute of Nuclear Studies; University of California, at Los Angeles; University of Rochester (N.Y.) and Western Reserve University, Cleveland, O.

(NOTE TO CORRESPONDENTS: The United Nations is releasing simultaneously in New York the titles of all papers submitted so far for the Conference including the 189 U. S. abstracts.)

FOR RELEASE AT 12:30 P. M.,
EDT, FRIDAY, JUNE 24, 1955

Remarks Prepared by Lewis L. Strauss
Chairman, U. S. Atomic Energy Commission
For Delivery at the Overseas Press Club Luncheon
New York, N. Y. - June 24, 1955

It is a pleasure to meet with you and to have this opportunity to discuss some of the activities underway in our atomic energy program.

As you know, the Government's atomic energy program is a scientific and industrial complex created over the past 12 years. The adjective which most properly describes it is "enormous." It represents an investment of some 12 to 14 billion dollars, and to operate it, we spend about 2 billion dollars a year, of your tax money and mine. That figures out to something like a quarter of a million dollars every hour, around the clock, everyday.

In spite of the stake which, as taxpayers, we all have in the enterprise, many people think of it only as a mysterious, super-secret operation carried on behind windowless walls and barbed wire barricades -- manufacturing bombs, and with little else to show for its gigantic outpouring of money and effort.

It is true that weapons to defend our freedom if defense be needed, are our first and paramount concern. That is the primary obligation laid upon us by the law -- both the original Atomic Energy Act of 1946 and the new revised law of 1954. The law unequivocally states that whatever we do must be "subject at all times to the paramount objective of making the maximum contribution to the common defense and security."

Nevertheless our weapons program, of necessity a secret function lest we compromise the advantages we possess, is only part of the story. Our current budget includes the development, manufacture, testing and stock-piling of weapons on the one hand, and the peaceful development and applications of atomic energy on the other.

As we learn more about these peaceful applications we are able to move more and more of our activities out from behind the walls of security restrictions. We are publishing large amounts of information hitherto classified. For instance, during this fiscal year, which is just about to close, the Commission has declassified and brought into the public domain a little over twice as many documents of scientific and technical information as in the preceding year, and one and one-half times the number of the year before that. Our publications of such declassified information also have shown a substantial increase. We are handing over to industry more of the Government-developed formulae and processes, and we are encouraging wider development of this new art within the framework of our free enterprise system.

As for instance I might cite that, in the near future, the Atomic Energy Commission will be taking action on the proposals recently submitted by groups of American companies to build commercial power reactors, under our Power Demonstration Program.

These proposals, together with a project of the Consolidated Edison Company of this city, aggregate 700,000 kilowatts of electrical energy at a total cost of well over \$200 million.

This response to our Power Demonstration Program, which was undertaken only last January under the licensing provisions of the new Atomic Energy Act, has been heartening beyond our expectations. But still more encouraging is the fact that — even though atomic power plants are not a paying proposition at this time, that is to say, they are not yet economically competitive with conventional plants — nevertheless those groups I have mentioned are prepared to put up about 90% of the costs of the program out of their own pockets. Others are asking only for research and development assistance from our laboratories. And companies like Consolidated Edison and Commonwealth Edison of Chicago are prepared to pay the entire cost of atomic power plants — running into many millions of dollars — without any financial help from the Federal Government.

American industry, large and small, is in the picture in an impressive way, and its role will grow and grow.

As industry's role expands, it will need an increasing number of trained reactor technicians. The Commission has anticipated the demand for such skills with the result that for the last nine years it has been training students at schools, operated at its laboratories at Oak Ridge and Argonne. Nearly 500 young Americans scientists and engineers have already been graduated from these schools, and new classes will begin in September.

At home and abroad — except in the field of weapons — we are cutting down on our Government monopoly as rapidly (with safety) as we know how. The pace in this direction will be accelerated — or at least, that is my belief.

We are sharing the technology of the peaceful uses of atomic energy with other nations, to provide them with new tools for basic research, and for use in medicine, agriculture and industry — witness the 22 bilateral agreements we have completed negotiating with other countries; witness, too, the students from 19 foreign nations who are presently with us learning the technology of reactors, and other students from 32 countries who have come here to study the production and use of radioactive isotopes. Witness also our offer, as announced by the President two weeks ago, to pay up to half the cost for the construction of research reactors in friendly countries. This sharing of our knowledge of the atomic art is a translation into action — a positive translation — of the President's stirring proposal which he made to the United Nations on December 8, 1953 — a proposal which fired the hopes of peoples the world over. Someone has called it "Atoms for Peace," and the name is a natural.

Also, as a result of our initiative there will be convened in Geneva, Switzerland, early in August, a United Nations Conference

involving upwards of 60 nations. Its purpose is to exchange scientific and engineering information on the peaceful uses of atomic energy. The United States will make substantial contributions to this important implementation of "Atoms for Peace."

All of us in the Atomic Energy Commission hope and pray for the day when the words "atomic energy" will arouse no image of weapons, but only of daily, benign wonders to make man's life healthier, happier and more abundant.

However, the uncertain climate of world affairs, and the menaces from those who have destroyed freedom in the expansion of their own ruthless philosophy, compel us in simple self-defense to develop, test and stockpile nuclear weapons. We have no other prudent course until adequate safeguards are otherwise assured. Our security and our hopes of avoiding war are measured by our capability to defend ourselves.

But we have long realized that atomic weapons and means of their delivery alone cannot banish the fears of war, nor bring to the peoples of the free world the bounties of peace so fervently sought.

Therefore, "Atoms for Peace" has shown itself to be both a symbol of hope to free but apprehensive peoples, and a vigorous answer to hostile efforts to picture us as a nation whose nuclear energies are devoted entirely to producing weapons for an "imperialist" war.

Only recently I returned from a trip through part of Western Europe where I witnessed the degree to which "Atoms for Peace" has stimulated the hopes and dreams of men. The positive steps we have taken to share the peaceful uses of the atom have had a profound impact on the hearts of peoples with whom I talked, in high places and low.

You know what those steps have been.

We have allocated 100 kilograms of costly fissionable materials for research reactors in friendly countries. We have agreed to provide some of those countries with heavy water, a material used in certain types of atomic reactors. We have brought their students to this country to learn how to use the peaceful atom. And, as I have mentioned, we are helping those countries to build and operate reactors. These affirmative acts have had a tangible effect on the public confidence.

There has also been an improvement in the economic condition of the peoples of Western Europe, -- an improvement so marked

and discernible that no recourse to statistics is needed to substantiate the proposition that prosperity is associated with peace and not with war.

Apart from the economic assistance which under both Administrations since the war we have been in the fortunate position to render, our defense potential has provided the free countries of Western Europe with a barricade against aggression. It has furnished them with a sense of security and a breathing space in which to rebuild their economies. They have made good use of this period.

This, however, is at best an armed peace.

We have been striving and, I feel sure, will continue to strive for an agreement with proper and effective provisions that will make for real peace in this nuclear age.

When that day comes it will be a simple matter to "strip the atom of its military casing and convert it to the arts of peace."

Our weapons stockpile represents an investment of billions, but this value lies not alone in these contrivances as devices of destruction. They have another and happier potential.

Conventional weapons — shells, guns, battleships and planes — become obsolete with time and are salvageable only for their scrap value, a small fraction of their cost.

But when the day comes that our atomic armament is no longer required to deter aggression, the nuclear material which it contains can be easily converted into energy sources to provide very great amounts of power to turn the wheels of industry, furnish us with light, heat, transportation, and the many other conveniences and blessings of peace.

We who work in the Atomic Energy Commission work with the vision of that day before use.

OFFICE FOR INTERNATIONAL CONFERENCE RELEASES

No. 1

FOR RELEASE IN AFTERNOON PAPERS
WEDNESDAY, JUNE 29, 1955

150 U.S. FIRMS AND ORGANIZATIONS
TO BE REPRESENTED IN EXHIBITS AT GENEVA CONFERENCE

Some 100 U. S. industrial and commercial firms, along with 50 academic, professional and private educational and research organizations, will be represented in exhibits at the International "atoms-for-peace" Conference at Geneva, Aug. 8-20. Several commercial concerns will have displays in more than one of the exhibits.

So announcing today, Lewis L. Strauss, Chairman of the U. S. Atomic Energy Commission, said that this constituted "vivid evidence of the partnership of government and private enterprise in developing peaceful uses of atomic energy."

Eighty-three firms and organizations have contributed to the official U. S. technical exhibit at the Palais des Nations, site of the United Nations sponsored conference. Another 19 have furnished parts of a United States Information Agency "teaching" exhibit at Geneva's exposition hall. At least 22 industrial and commercial firms will show independently or under private auspices at an atomic "trade fair," also to be located at the downtown exposition hall.

Fourteen commercial publishers and approximately 30 scientific, engineering and other professional organizations will be represented in a display of more than 100 U. S. periodicals in the nuclear energy field.

A 10-kilowatt operating research reactor of the "pool" type will highlight the U. S. official exhibit. In addition, there will be 10 scale models of power and research reactors operating or planned in the United States.

Other displays in the technical exhibit will show medical, biological, agricultural and industrial applications of atomic energy, including uses of radioisotopes; a simulated reactor control panel; examples of reactor fuel elements and reactor components; a demonstration of chemical separation techniques for atomic waste products; and radiation-measuring and other instruments. The displays are being assembled by Design and Production, Inc., Alexandria, Va.

The exhibit will be supplemented by a technical reference library, containing several thousand AEC unclassified reports, a collection of technical books being contributed by American publishers, and the display of American scientific and technical journals.

Limitations on space at the Palais building at the Conference site resulted in a United Nations requirement that all exhibits there be sponsored by participating governments, be non-commercial in character, and be designed primarily for the delegates and technical experts attending the Conference.

However, UN authorities are encouraging national and commercial exhibits at the more spacious Exposition Palace in mid-city. Some exhibits provided by the Atomic Energy Commission will be placed there. So will the USIA popular "Atoms for Peace" exhibit, covering 15,000 square feet of floor space, which was recently shown in Germany and Austria.

The atomic energy trade show at the downtown exposition hall is being sponsored by the Organizing Committee, First International Exhibition of the Peaceful Uses of Atomic Energy (1 Place du lac, Geneva, Switzerland).

Organizations contributing to the technical exhibit are:

American Machine and Foundry Company, New York, N.Y.
Anton Electronic Laboratory, Brooklyn, N.Y.
Argonne Memorial Cancer Research Hospital, University
of Chicago, Chicago, Ill.
Argonne National Laboratory, Chicago, Ill.
Atomic Instrument Company, Cambridge, Mass.
Atomic Research Corporation, Colorado Springs, Colorado
The Babcock and Wilcox Company, New York, N.Y.
A. O. Beckman, Inc., South Pasadena, Calif.
Beckman Instruments, Inc., Fullerton, Calif.
Bendix Aviation Corporation, Cincinnati, Ohio
Brookhaven National Laboratory, Upton, N.Y.
The Brush Beryllium Company, Cleveland, Ohio
Cambridge Instrument Company, Inc., New York, N.Y.
Chapman Valve Manufacturing Company, Indian Orchard, Mass.
Commonwealth Edison Company, Chicago, Ill.
Consolidated Edison Company, New York, N.Y.
Consolidated Engineering Corporation, Pasadena, Calif.
Consumers Public Power District of Nebraska, Columbus, Neb.
Crane Company, Chicago, Ill.
The Detectron Corporation, North Hollywood, Calif.
Detroit Edison Company, Detroit, Mich.
Allen B. DuMont Laboratories, Inc., Clifton, N.J.
El-tronics Inc., Philadelphia, Pa.

Engineers Syndicate Ltd., Hollywood, Calif.
 General Dynamics Corporation, Groton, Conn.
 General Electric Company, Schenectady, N.Y.
 The Harshaw Chemical Company, Cleveland, Ohio
 Iowa State College, Ames Laboratory, Ames, Iowa
 Johns Hopkins University, Baltimore, Md.
 Keteket X-Ray Corporation, Covington, Kentucky
 Landsverk Electrometer Company, Glendale, Calif.
 LaRoe Instruments, Inc., Bethesda, Md.
 H. W. Leighton Laboratories, Hatboro, Pa.
 Lindsay Chemical Company, West Chicago, Ill.
 Litton Industries, Beverly Hills, Calif.
 Los Alamos Scientific Laboratory, Los Alamos, New Mexico
 Massachusetts Institute of Technology, Cambridge, Mass.
 Michigan State College, East Lansing, Mich.
 Minneapolis-Honeywell Regulator Company, Philadelphia, Pa.
 National Bureau of Standards, Washington, D. C.
 National Radiac, Inc., Newark, New Jersey
 New England Deaconess Hospital, Boston, Mass.
 New York University, New York, N.Y.
 Norden-Ketay Corporation, New York, N.Y.
 North American Aviation, Inc., Downey, Calif.
 Nuclear Instrument and Chemical Corporation, Chicago, Ill.
 Nuclear Metals, Inc., Cambridge, Mass.
 Nuclear Research Corporation, Philadelphia, Pa.
 Nuclear Research and Development, Inc., St. Louis, Mo.
 Nuclear Science and Engineering, Inc., Pittsburgh, Pa.
 Nucleonic Company of America, Brooklyn, N.Y.
 Oak Ridge Institute of Nuclear Studies, Oak Ridge, Tenn.
 Oak Ridge National Laboratory, Oak Ridge, Tenn.
 Ohio State University, Department of Medicine, Columbus, Ohio
 The Ohmart Corporation, Cincinnati, Ohio
 Packard Instrument Company, LaGrange, Ill.
 Phillips Petroleum Company, Idaho Falls, Idaho
 Pratt and Whitney, Division Niles-Bement-Bond Company,
 Hartford, Conn.
 Precision Radiation Instruments, Los Angeles, Calif.
 Radiation Counter Laboratories, Skokie, Ill.
 Radiation Industries Company, Brookhaven, New York
 Radiation Instrument Development Laboratory, Chicago, Ill.
 Radiation Research Corporation, West Palm Beach, Fla.
 Radio Corporation of America, Princeton, N.J.
 Radioactive Products, Inc., Detroit, Mich.
 Raytheon Manufacturing Company, Waltham, Mass.
 R-C Scientific Instruments Company, Inc., Playa Del Rey,
 Calif.
 Sherwin Instrument Company, New York, N.Y.
 Sloan-Kettering Institute for Cancer Research, New York,
 N. Y.

Sylvania Electric Products, Inc., Bayside, Long Island, N.Y.
 Technical Associates, Burbank, Calif.
 Tracerlab, Inc., Boston, Mass.
 Union Carbide and Carbon Corporation, New York, N.Y.
 United States Atomic Energy Commission, Washington, D. C.
 United States Bureau of Mines
 United States Geological Survey
 United States Radium Corporation, New York, N.Y.
 United States Weather Bureau
 University of California, Radiation Laboratory, Berkeley,
 Calif.
 University of Michigan, Ann Arbor, Mich.
 Victoreen Instrument Company, Cleveland, Ohio
 Westinghouse Electric Corporation, Pittsburgh, Pa.
 N. Wood Counter Laboratory, Chicago, Ill.

Organizations contributing to the USIA exhibit:

Alco Products, Inc., Schenectady, N.Y.
 American Machine and Foundry Co., New York City
 Anton Electronic Laboratories, Inc., Brooklyn, N.Y.
 S. Blickman, Inc., Weehawken, N.J.
 Boston Museum of Science, Boston, Mass.
 Central Research Laboratories, Redwing, Minn.
 Corning Glass Works, Corning, N.Y.
 El-Tronics, Inc., Philadelphia, Pa.
 General Electric Co., Schenectady, N.Y.
 P. M. Lennard Co., Inc., Harrison, N.J.
 Lovelace Foundation for Medical Education and Research,
 Albuquerque, New Mexico
 Newport News (Va.) Shipbuilding and Drydock Co.
 Nuclear Instrument and Chemical Corp., Chicago, Ill.
 Penberthy Instrument Co., Seattle, Wash.
 Radiation Counter Laboratories, Skokie, Ill.
 Sylvania Electric Products, Inc., New York City
 Tracerlab, Inc., Boston, Mass.
 Westinghouse Air Brake Co., Pittsburgh, Pa.
 Westinghouse Electric Corp., Pittsburgh, Pa.

Firms that have so far taken space in the "trade fair" exhibit:

American Machine and Foundry Company, New York City
 Anton Electronic Laboratories, Brooklyn, N.Y.
 Atomic Development Mutual Fund, Inc., Washington, D. C.
 AVCO Manufacturing Corporation (Lycoming Division) Strat-
 ford, Connecticut
 Babcock & Wilcox Co., New York City
 Bendix Aviation Corporation, Detroit, Michigan
 Daystrom, Inc., Archbald, Pa.

Foster Wheeler Corporation, New York City
 General Dynamics Corporation, New York City
 General Electric Company, Schenectady, N.Y.
 High Voltage Engineering Corporation, Cambridge, Mass.
 Walter Kidde Nuclear Laboratory, Garden City, L.I., N.Y.
 Glenn L. Martin Co., Baltimore, Md.
 Micro-Metallic Corporation, Glen Cove, Long Island, N.Y.
 National Research Corporation, Cambridge, Mass.
 Nuclear Development Associates, Inc., White Plains, N.Y.
 Nuclear Instrument Corporation, Venice, California
 Tracerlab, Inc., Boston, Massachusetts
 Union Carbide and Carbon Corporation, New York City
 Vitro Corporation of America, New York City
 Westinghouse Electric Corporation, Pittsburgh, Pa.
 Weston Electrical Instrument Corp., Newark, N.J.

Periodicals which will be included in the display of technical literature:

<u>Publication</u>	<u>Contributor</u>
Cancer	American Cancer Society
American Journal of Roentgenology, Radium Therapy, and Nuclear Medicine	The American Roentgen Ray Society and The American Radium Society
A. M. A. Archives of Ophthalmology	American Medical Association
Endocrinology The Journal of Clinical Endocrinology and Metabolism.	The Endocrine Society
The Journal of General Physiology The Journal of Experimental Medicine	The Rockefeller Institute for Medical Research
Journal of Cellular and Comparative Physiology	Wistar Institute of Anatomy and Biology
Federation Proceedings	Federation of American Socie- ties for Experimental Biology
Journal of Applied Physiology; American Journal of Physiology	The American Physiological Society
The Journal of Laboratory and Clinical Medicine	Central Society for Clinical Research
Radiation Research	Radiation Research Society

<u>Publication</u>	<u>Contributor</u>
Corrosion	National Association of Corrosion Engineers
Mechanical Engineering A Glossary of Terms in Nuclear Science and Technology	American Society of Mechanical Engineers
Chemical Engineering Progress, plus several Chemical Engineering Progress Symposium Series	American Institute of Chemical Engineers
A Forum Survey, and three Forum Reports	Atomic Industrial Forum
Modern Medicine	Modern Medicine Publications, Inc.
Qualified Contractor	National Electrical Contractors Association
Electrical Manufacturing	The Gage Publishing Company
Dun's Review and Modern Industry	Dun and Bradstreet Publication Corporation
Seventeen publications	National Academy of Sciences and the National Research Council
Twelve publications	U. S. Geological Survey
Twenty-five publications	National Bureau of Standards
Journal of the National Cancer Institute	Department of Health, Education and Welfare
Proceedings of the Society for Experimental Biology and Medicine	Society for Experimental Biology and Medicine
Other publishing houses represented:	
Breskin Publications, Inc.	
Case-Sheppard-Mann Publishing Corp.	
Diesel Publications, Inc.	
F. W. Dodge Corp. Publisher	
Fairchild Publications, Inc.	
Gulf Publishing Co.	
Keeney Publishing Co.	
Miller Freeman Publications	
George F. Taubeneck	

FOR RELEASE IN MORNING PAPERS
THURSDAY, JUNE 30, 1955

No.2

U.S. REACTOR FOR UN CONFERENCE
BEING FLOWN FROM U.S. TO GENEVA

The research reactor the U. S. Atomic Energy Commission will exhibit at the International Conference on Peaceful Uses of Atomic Energy will be air-lifted to Geneva starting from Knoxville, Tenn., June 30, Lewis L. Strauss, Chairman, announced today.

The reactor will be flown over in two U. S. Government aircraft and re-assembled on the grounds of the Palais des Nations, where the Conference will be held.

Built in record time in the past three months at the Commission's Oak Ridge National Laboratory, near Knoxville, the reactor was successfully tested, passing all safety requirements, before it was dismantled and crated for trans-Atlantic airlift.

The Oak Ridge National Laboratory is operated under contract for the A. E. C. by Union Carbide & Carbon Chemicals Corp. The reactor project has been under the direction of Dr. Charles E. Winters.

About 15 tons of reactor components are being airlifted from the McGhee-Tyson Air Force Base in a C-124 and a C-54 supplied by the Military Air Transport Service. The framework for the reactor was dispatched earlier by ship. The aircraft are expected to reach Geneva July 1.

The reactor will be re-assembled in a new building at Geneva especially built for it. After installation adjustments and test operations are completed, the reactor will be given a final check-out. It will be ready for display when the 12-day Conference opens August 8.

Delegates will be invited to watch demonstrations and experiments of the reactor. It is expected there will be special hours when the public also will be invited to attend. This will be the first United States reactor to be exhibited in Europe. It is one prototype of research reactors which will become available to more than 20 nations under the bilateral agreements which the United States has been signing in recent weeks with individual nations. After the Geneva Conference, the reactor will be sold to the Swiss government.

This is a pool-type reactor. At Geneva it will operate in a cylinder of purified water 10 feet in diameter and 21 feet deep. The reactor operates with approximately 18 kilograms of uranium containing 3.6 kilograms of the U 235 isotope. This represents a 20 per cent enrichment of the fuel, insufficient to make it of weapons grade.

The reactor underwent a variety of operational and safety tests at Oak Ridge, each of which was satisfactory. The reactor's power rose to a maximum level of 100 kilowatts of heat. It operated at full power for a total of 25 minutes during the several hours of tests.

As a result of advances in instrumentation, it is possible for this reactor to be operated automatically from start to full power. Laboratory engineers point out that adaptation of this design will add more safety factors for reactors of this type now under construction both in the United States and abroad.

The major vendors and contractors for the United States research reactor exhibit in Geneva and their contributions are as follows:

American Machine and Foundry Company: Brooklyn, N. Y.	control drive motors, electromagnets, grid plate control rods, and guide tubes.
Atomic Instrument Company: Cambridge, Mass.	scaler
Brown Instrument Division of Minneapolis-Honeywell Company: Philadelphia, Pa.	display recorders.
Burton-Rogers Company: Cincinnati, Ohio	reactor tank cover.
Cincinnati Ventilating Company: Covington, Ky.	grid plate support stand and fuel storage rack.
Craftweld Equipment Company: Long Island, N. Y.	diving lights.
Daystrom Instrument Company: Archbald, Pa.	reactor control instruments.
Electric Machinery Company: Minneapolis, Minn.	frequency converter controls.

Fisher and Porter Manufacturing Company: Hatboro, Pa.	flow rate meters.
Harig Manufacturing Company: Chicago, Ill.	grid plate.
Illinois Water Treatment Company: Rockford, Ill.	water demineralizer equipment.
International Instrument, Inc.: New Haven, Conn.	control rod position indicator.
Labour Company: Elkhart, Ind.	water pumps.
Leeds and Northrup Company: Philadelphia, Pa.	reactor simulator recorders and flux amplifier.
Master Electric Company: Dayton, Ohio	motor generator frequency con- verter.
Oak Ridge National Laboratory: Oak Ridge, Tenn.	design and engineering of fuel element fabrication.
Panellit, Inc.: Skokie, Ill.	reactor control panel.
Radiation Counter Laboratories: Skokie, Ill.	ionization chambers.
Radio Corporation of America: Camden, N. J.	intercommunication and public address equipment.
L. Schreiber and Sons, Company: Covington, Ky.	control drive platform and railing.
Structural Display Company, Inc.: Long Island, N. Y.	exhibits
Westinghouse Electric, Elec- tronic Tube Division: Elmira, N. Y.	fission chambers.

The Major Foreign Contractors in Geneva are as follows:

Ateliers de Carouge:	Tank Manufacturer.
Conrad Zschokke:	Construction Contractor.
Union Carbide Europa.	

No. 3

FOR RELEASE IN AFTERNOON PAPERS
MONDAY, JULY 25, 1955

183 U.S. SCIENTISTS AND ENGINEERS APPOINTED
U.S. TECHNICAL ADVISORS FOR GENEVA CONFERENCE

Included in today's State Department announcement of the roster of the United States Delegation at the International Conference on Peaceful Uses of Atomic Energy at Geneva, Switzerland, August 8 - 20, 1955 are 183 technical advisors.

These advisors include many prominent U.S. nuclear scientists and engineers representing a cross section of both public and private aspects of this country's atomic energy programs.

They have been drawn from more than 50 different laboratories, educational institutions, industrial organizations and research groups in addition to seven government agencies, and will make contributions to every segment of the comprehensive agenda prepared for the Conference. The majority of the 183 persons listed will present papers at Conference sessions. Several have been nominated to the United Nations to preside at some of the approximately 60 separate Conference sessions or carry out other Conference assignments.

The technical advisors are:

Paul C. Aebersold
AEC Oak Ridge Operations Office

Seymour Bernstein
Oak Ridge National Laboratory

Augustine Oliver Allen
Brookhaven National Laboratory

Hans A. Bethe
Cornell University

William Freer Bale
University of Rochester

Douglas Sheldon Billington
Oak Ridge National Laboratory

Clifford Keith Beck
North Carolina State College

Clifton R. Blincoe
University of Missouri

Manson Benedict
Massachusetts Institute of
Technology

Lowell Moyer Bollinger
Argonne National Laboratory

Harvey Brooks
Harvard University

George Bosworth Brown
Sloan-Kettering Institute for
Cancer Research

Harrison Scott Brown
California Institute of
Technology

Weldon Grant Brown
Argonne National Laboratory

Lloyd Earl Brownell
University of Michigan

Francis Robert Bruce
Oak Ridge National Laboratory

Marshall Herbert Brucer
Oak Ridge Institute of Nuclear
Studies

Austin Moore Brues
Argonne National Laboratory

John C. Bugher
U. S. Atomic Energy Commission

George O. Burr
Experiment Station of Hawaiian
Sugar Plantation

Richard S. Caldecott
University of Minnesota

Alfred Dixon Callihan
Oak Ridge National Laboratory

Melvin Calvin
University of California Radiation
Laboratory

George W. Casarett
University of Rochester

Benedict Cassen
University of California

Walker L. Cisler
Detroit Edison Company

Dwight Edwin Clark
University of Chicago

Walter D. Claus
U. S. Atomic Energy Commission

Emanuel Richard Cohen
North American Aviation

Karl Paley Cohen
Walter Kidde Nuclear
Laboratories

Cyril Lewis Comar
Oak Ridge Institute of Nuclear
Studies

Frederick P. Cowan
Brookhaven National Laboratory

Lawrence Cranberg
Los Alamos Scientific
Laboratory

James Homer Crawford, Jr.
Oak Ridge National
Laboratory

Floyd Leroy Culler, Jr.
Oak Ridge National
Laboratory

Burris Bell Cunningham
University of California
Radiation Laboratory

John Edward Cunningham
Oak Ridge National
Laboratory

Laughlin MacLaurin Currie
National Carbon Company

Farrington Daniels
University of Wisconsin

W. Kenneth Davis
U. S. Atomic Energy Commission

Robert Briggs Day
Los Alamos Scientific
Laboratory

George Julian Dienes
Brookhaven National Laboratory

Joseph Robert Dietrich
Argonne National Laboratory

Benjamin Clinton Diven
Los Alamos Scientific Laboratory

Frank J. Dixon
University of Pittsburgh

Richard Lloyd Doan
Phillips Petroleum Company

Richard Wolford Dodson
Brookhaven National Laboratory

Joseph Edward Draley
Argonne National Laboratory

Samuel Edward Eaton
Arthur D. Little, Inc.

Merril Eisenbud
AEC New York Operations Office

Emanuel Hendricks Epstein
Department of Agriculture

Leo Francis Epstein
Knolls Atomic Power Laboratory

Gioacchino Failla
Columbia University

Lee Edward Farr
Brookhaven National Laboratory

Harold Morton Feder
Argonne National Laboratory

Don Ernest Ferguson
Oak Ridge National Laboratory

Frank Gale Foote
Argonne National Laboratory

Richard F. Foster
Hanford Atomic Products
Operation

Marvin Fox
Brookhaven National Laboratory

Paul F. Gast
Hanford Atomic Products
Operation

Albert Ghiorso
University of California
Radiation Laboratory

Lawrence Elgin Glendenin
Argonne National Laboratory

Raymond C. Goertz
Argonne National Laboratory

Henry Jacob Gomberg
University of Michigan
Phoenix Project

David Harris Gurinsky
Brookhaven National Laboratory

R. Philip Hammond
Los Alamos Scientific
Laboratory

Joseph M. Harrer
Argonne National Laboratory

John Arthur Harvey
Brookhaven National Laboratory

Menelaus D. Hassialis
Columbia University

Robert J. Hasterlik
Argonne Cancer Research Hospital

Albert Baird Hastings
Harvard Medical School

William W. Havens, Jr.
Columbia University

Leland J. Haworth
Brookhaven National Laboratory

Gerhart Richard Hennig
Argonne National Laboratory

William A. Higginbotham
Brookhaven National Laboratory

James Clark Hindman
Argonne National Laboratory

Clarence J. Hochanadel
Oak Ridge National Laboratory

Frank Edward Hoecker
University of Kansas

Alexander Hollaender
Oak Ridge National Laboratory

John P. Howe
North American Aviation, Inc.

John Randolph Huffman
Research and Development,
Phillips Petroleum
Company

Donald James Hughes
Brookhaven National Laboratory

Henry Hurwitz, Jr.
Knolls Atomic Power
Laboratory

Earle Kenneth Hyde
University of California
Radiation Laboratory

Mark Gordon Inghram
Argonne National Laboratory

Dale W. Jenkins
Army Chemical Corps

Jesse C. Johnson
U. S. Atomic Energy
Commission

Thomas Hope Johnson
U. S. Atomic Energy
Commission

Warren C. Johnson
University of Chicago

William Harper Johnston
Purdue University

William Rudolph Kanne
Knolls Atomic Power Laboratory

Irving Kaplan
Brookhaven National Laboratory

Joseph J. Katz
Argonne National Laboratory

Albert Rudolph Kaufmann
Nuclear Metals, Inc.

George Robert Keepin, Jr.
Los Alamos Scientific
Laboratory

L. D. Percival King
Los Alamos Scientific
Laboratory

Leonard John Koch
Argonne National Laboratory

Daniel Edward Koshland, Jr.
Brookhaven National Laboratory

Sidney Karsik
Westinghouse Atomic Power
Division

Kurt A. Kraus
Oak Ridge National Laboratory

James Arthur Lane
Oak Ridge National Laboratory

Clarence Larson
Oak Ridge National Laboratory

John Seth Laughlin
Sloan-Kettering Institute for
Cancer Research

Ernest O. Lawrence
University of California
Radiation Laboratory

John Hundale Lawrence
University of California
Donner Laboratory

Stephen Lawroski
Argonne National Laboratory

Robert Briggs Leachman
Los Alamos Scientific Laboratory

Harold V. Lichtenberger
Argonne National Laboratory

Ernest Gustaf Linder
Radio Corporation of America
Laboratories

Blake Marshall Loring
University of Maryland

Richard Norton Lyon
Oak Ridge National Laboratory

Winston Marvel Manning
Argonne National Laboratory

Bernard Manowitz
Brookhaven National Laboratory

Joseph J. Martin
University of Michigan

George G. Marvin
U. S. Atomic Energy Commission

Edward S. Mason
Harvard University School of
Public Administration

Karl M. Mayer
U. S. Atomic Energy Commission

C. Rogers McCullough
Monsanto Chemical Company

William Mitchell
U. S. Atomic Energy Commission

Karl Ziegler Morgan
Oak Ridge National Laboratory

Samuel Brooks Morris
Los Angeles Department of Water
and Power

George Ashmun Morton
RCA Laboratories

William Frederick Neuman
University of Rochester

Robert D. Nininger
U.S. Atomic Energy Commission

Eugene Pleasants Odum
University of Georgia

David Okrent
Argonne National Laboratory

Lincoln Ridler Page
Department of the Interior
Geological Survey

Harry Palevsky
Brookhaven National Laboratory

Herbert Myers Parker
Hanford Atomic Products Operation

William Edward Parkins
North American Aviation, Inc.

Robert Allen Penneman
Los Alamos Scientific Laboratory

Bernard Emerson Proctor
Massachusetts Institute of
Technology

Roger R. D. Revelle
Scripps Institute of Oceanography

Albert J. Riker
University of Wisconsin

Clement James Rodden
AEC New Brunswick Area Office

Joseph Foster Ross
University of California Medical
Center

Arthur Frederick Rupp
Oak Ridge National Laboratory

Liane Brauch Russell
Oak Ridge National Laboratory

William Lawson Russell
Oak Ridge National Laboratory

Vance Lewis Sailor
Brookhaven National Laboratory

Jack Schubert
Argonne National Laboratory

Glenn Theodore Seaborg
University of California Radiation
Laboratory

Charles Harold Secoy
Oak Ridge National Laboratory

Frederick Seitz
University of Illinois

Stephen Matheson Shelton
Department of the Interior
Bureau of Mines

Sidney Siegel
North American Aviation, Inc.

Leslie Silverman
Harvard University School of
Public Health

John Wistar Simpson
Westinghouse Atomic Power
Division

Oliver Cecil Simpson
Argonne National Laboratory

Willard Ralph Singleton
Brookhaven National Laboratory

Cyril Stanley Smith
University of Chicago

Arthur Hawley Snell
Oak Ridge National Laboratory

Thoma M. Snyder
Knolls Atomic Power Laboratory

Frank Harold Spedding
Iowa State College
Ames Laboratory

Bernard Israel Spinrad
Argonne National Laboratory

Philip Sporn
American Gas and Electric
Service Corporation

Chauncey Starr
North American Aviation, Inc.

Ellis Philip Steinberg
Argonne National Laboratory

Robert Spencer Stone
University of California
Medical Center

John Arthur Swartout
Oak Ridge National Laboratory

William Herbert Sweet
Massachusetts General Hospital

Richard Ferdinand Taschek
Los Alamos Scientific Laboratory

Lauriston S. Taylor
National Bureau of Standards

Donald Earl Thomas
Westinghouse Atomic Power Division

Ray Elliott Tomlinson
Hanford Atomic Products Operation

Thomas Trocki
Knolls Atomic Power Laboratory

Harold Bradford Tukey
Michigan State University

John Turkevich
Princeton University

Bruce Wallace
Long Island Biological Laboratory

Martin Walt, IV
Los Alamos Scientific Laboratory

Clifford Edward Weber
Knolls Atomic Power Laboratory

Alvin M. Weinberg
Oak Ridge National Laboratory

Victor F. Weisskopf
Massachusetts Institute of Technology

Theodore Allen Welton
Oak Ridge National Laboratory

Harry Wexler
Weather Bureau

John Archibald Wheeler
Princeton University

Eugene Paul Wigner
Princeton University

Harley Almey Wilhelm
Iowa State College of Agriculture
and Mechanical Arts

J. Ernest Wilkins, Jr.
Nuclear Development Associates,
Inc.

Clarke Williams
Brookhaven National Laboratory

Abel Wolman
Johns Hopkins University

Wallace Kelly Woods
Hanford Atomic Products Operations

Walter Henry Zinn
Argonne National Laboratory

UNITED STATES PARTICIPATION
IN ATOMS-FOR-PEACE CONFERENCE

Geneva, Switzerland: To the International Conference on Peaceful Uses of Atomic Energy held here August 8-20, the United States is sending the largest and most representative group of its specialists in atomic energy ever assembled — leading scientists, members of Congress, and other United States Government officials.

Perhaps never before in history has the United States participated on so broad a scale in an international scientific conference. The American contribution is commensurate with the role that the United States plays in matters atomic.

While the Conference is under the auspices of the United Nations, it was President Eisenhower who furnished its inspiration by his speech before the United Nations General Assembly on December 8, 1953. In December 1954, the United Nations General Assembly endorsed the President's proposals for both an International Atomic Energy Agency and a scientific conference on the peaceful applications of atomic energy.

Groundwork for the Conference was laid in eight months of intensive effort by a United Nations advisory committee consisting of representatives of the United States and six other nations named by Secretary-General Dag Hammarskjöld. Professor Walter G. Whitman of the Massachusetts Institute of Technology is Secretary General of the Conference.

Each of the 70-odd nations participating is permitted to send up to five official delegates and any number of technical advisers. The Chairman of the United States Delegation is Mr. Lewis L. Strauss, Chairman of the United States Atomic Energy Commission. Other members are: Vice Chairman, Dr. Willard F. Libby of the U. S. Atomic Energy Commission; Dr. I. I. Rabi, Professor of Physics at Columbia University and Chairman of the General Advisory Committee to the Atomic Energy Commission; Dr. Detlev W. Bronk, President of the National Academy of Sciences and President of the Rockefeller Institute for Medical Research; and Dr. Shields Warren, Scientific Director of the Cancer Research Institute, New England Deaconess Hospital, Boston, Mass.

Attending in the capacity of Technical Advisers to the United States Delegation will be 183 prominent scientists and engineers and recognized experts in various phases of atomic energy. The majority of these will present papers at the Conference sessions.

They represent a wide cross section of all segments of the public and private nuclear research and application programs of the United States.

Although the Geneva Conference will be in session officially only twelve working days, a great expanse of technical ground will be covered. Altogether, excluding the three hours devoted to the opening session, there will be 162 hours of sessions, during which 474 papers, contributed from 23 different countries, will be presented and discussed.

The United States Delegation is assigned a total of 178 papers on the Conference agenda. These were chosen from 535 papers originally submitted to the United Nations Advisory Committee for consideration, all of which will be published in the official proceedings of the Conference. The United States session papers will be read -- in whole or in part -- by their authors, or by a representative of the writer if he is unable to be present.

The subject matter of the United States papers covers every segment of the Conference agenda, making this country the only one participating to cover the complete range of topics designated for discussion. When the call went out to scientists and engineers in industry, institutes of learning and other areas of atomic research early this year for suggestions as to United States contributions to the Geneva Conference, more than 1,100 technical abstracts were received by the Atomic Energy Commission's Office for International Conference. From this collection of material, refined down by careful evaluation and combination, emerged the 535 papers which will be included in the Conference's permanent records.

The contributions of the United States are not confined to the presentation of papers and participation in the scientific discussions. As educational and demonstration resources, the delegation is providing a full-scale operating research reactor, technical and popular exhibits, a reference library, and a film program.

The research reactor, constructed in record time at the Atomic Energy Commission's Oak Ridge National Laboratory and sent to Geneva by plane, will be in operation daily. Delegates and the general public will be able to watch experiments and demonstrations of the "pool" reactor, one type of research reactor which will become available to 24 nations under bilateral agreements for atomic co-operation with the United States initialed or signed in the past 3 months. After the Conference the reactor will become the property of the Swiss Government which has agreed to purchase it under one of the 24 bilateral agreements. During the recent four-power conference in Geneva, President Eisenhower visited the reactor and operated the controls.

Participating also in the International Conference on the Peaceful Uses of Atomic Energy, through the exhibits, are some 100 American industrial and commercial firms, along with 50 academic, professional and private educational and research organizations. Eighty-three of these firms have contributed to the official United States Technical Exhibit at the Palais des Nations, which is the scene of the conference. Another score have furnished parts of the United States Information Agency's teaching exhibit which is located in a downtown exposition hall. This exhibit, which has been showing to record crowds in West Germany, occupies some 15,000 square feet of floor space, while the official technical exhibits of the United States at the Palais des Nations will take some 4,000 square feet.

The official technical exhibit provides an integrated story of peacetime atomic energy development on its technical side, from raw materials through fuel elements, models of reactors, reactor components, chemical processing, instrumentation, the uses of isotopes in biology and medicine and industry, and basic research.

For the use of the delegations at the Conference and as a display of certain atomic energy technical information resources available from the United States for world-wide use, the Delegation has installed a technical reference library room alongside the technical exhibits. This library is a replica of the ones that have been presented by the Atomic Energy Commission to 23 nations on request. It contains all the unclassified atomic energy publications of the Commission, comprising more than 6,500 research and development reports, 34 case-bound books and 22 miscellaneous pamphlets, eleven volumes of the Commission's "Abstracts of Nuclear Science" and 55,000 catalogue cards. American scientific and technical societies, commercial publishers and others have contributed more than 300 books, publications and journals dealing with atomic energy to the library. After the Conference, the library will become a permanent part of the collection of the United Nations center at the Palais des Nations.

Provided by the United States, but shown under the auspices of the United Nations management of the Conference, will be a collection of technical films portraying atomic science and technology. These films will have sound tracks in the four official languages used in United Nations conferences -- English, French, Russian and Spanish.

Commenting on the Conference in its current semi-annual Report to Congress, the Atomic Energy Commission stated: "The Conference will be, it is now apparent, the outstanding scientific and technical event up to this time in the years following World War II. It will gather together the largest and most representative group of the world's specialists in nuclear science and the arts of applying atomic energy to human welfare that has ever been assembled.

Old lines of scientific communication will be renewed and new ones formed. The collective knowledge of mankind on how to put the atom to work for material progress in all lines will be shared among the technical representatives of the great majority of the people of the world."

No. 5

FOR RELEASE: 4:00 P.M., Geneva Time,
Saturday, August 6, 1955.

Statement by Lewis L. Strauss, Chairman
United States Atomic Energy Commission
and
Chairman, U. S. Delegation, International Conference
on the Peaceful Uses of Atomic Energy
Geneva, Aug. 8-20, 1955

This historic and hospitable city has provided the setting for many international conferences, but the one which convenes here on Monday is unique.

The scientists and engineers of the 70-odd nations who are gathering here to exchange their accumulated knowledge and their ideas on the peaceful uses of atomic energy will be filling in the blueprints for the foundations upon which can be built healthier, happier and more abundant lives for people all over the world.

Speaking for my Government, I should say that we have a more than ordinary interest in this Conference and its success, beyond the fact that a controlled nuclear chain-reaction was first brought about in the United States by the late Dr. Enrico Fermi and his co-workers in 1942, and that we have a large and diverse program involving all phases of the peaceful use of atomic energy.

This Conference is a direct outgrowth of President Eisenhower's great speech before the United Nations in December of 1953 when he made his stirring proposal.

In April following that speech, we stated that we would attempt to convene such a conference as this. A specific proposal to that end was made to the United Nations last December and unanimously adopted.

It is in this same spirit that we have already negotiated agreements of cooperation with 27 countries and will help them to acquire research reactors and otherwise develop the peaceful atom.

To give reality to this international program we have allocated 200 kilograms of fissionable materials, to serve as fuel for such reactors and are prepared to facilitate their construction by paying up to half the cost.

We of the United States have come to Geneva prepared to make significant contributions to each segment of the Conference agenda.

We know that the contributions from other countries will also be important.

We hope that our papers, and the exhibits which we have prepared -- including the research reactor at the Palais des Nations-- will be interesting to all participants.

United States Delegation Releases

No. 6

FOR RELEASE AFTER 11:00 AM GENEVA TIME,
MONDAY, AUGUST 8, 1955

MESSAGE FROM THE PRESIDENT OF THE UNITED STATES
TO
THE INTERNATIONAL CONFERENCE ON PEACEFUL USES OF ATOMIC ENERGY

NOTE TO CORRESPONDENTS: The following message from President Dwight D. Eisenhower of the United States was read to the Conference by the Chairman of the United States Delegation, Mr. Lewis L. Strauss.

Members of the Conference:

Please accept my warmest greetings and sincere good wishes — on behalf of the people of the United States — for the success of this first International Conference on the Peaceful Uses of Atomic Energy, held under the auspices of the United Nations.

You — the world's foremost nuclear scientists and engineers, who are penetrating the mysteries of atomic energy — most surely know how the atom stands ready to become man's obedient and tireless servant, if man will only allow it.

The knowledge and vision which you possess carries with it a great opportunity — and a great challenge. Your lives are dedicated to the search for knowledge and truth. You hold the respect of your peoples because they look to you for words of calm, unadorned scientific fact.

You can best unfold to the peoples of the world the bright promise of the benign atom.

You meet in Geneva under conditions favorable to this great purpose.

No other scientific gathering of such scope and importance, or of such widespread interest, has ever taken place. The peoples of the world are represented. At hand is a rich opportunity to restore old lines of free scientific communication which have been disrupted for so many years. The knowledge and skills which each of

you has acquired in his own country to put the atom to work for peaceful purposes will be circulated and shared in the friendly atmosphere of hospitable Switzerland with its age-old tradition of freedom.

This atmosphere is encouraged also by the fact that the United Nations Resolution of last December 4th, which created your Conference, limited its concern to scientific and technical matters. It is expressly non-political.

You meet, therefore, as free men of science, interested only in enriching man's store of knowledge about this wonderful discovery.

Science speaks in many tongues. The advancement of the nuclear arts has been the work of men of many nations. That is so because the atom itself is non-political. It wears no nationality and recognizes no frontiers. It is neither moral nor immoral. Only man's choice can make it good or evil. The phenomenon of nuclear fission having been revealed to man, it is still left to him to determine the use to which it shall be put.

On December 8, 1953, I had the privilege of addressing the General Assembly of the United Nations on the subject which occupies this Conference — world cooperation for the peaceful uses of atomic energy.

I stated then, and I reaffirm now, that the United States pledges its determination to help find ways by which the miraculous inventiveness of man shall not be dedicated to his death, but consecrated to his life.

This pledge which we gave 20 months ago has become the law of our land, written into our statutes by the American Congress in the new Atomic Energy Act of 1954. The new act states in forthright language that we recognize our responsibilities to share with others, in a spirit of cooperation, what we know of the peaceful atomic art. To further encourage such cooperation with other nations, the new act relaxed the previously existing restrictions on independent atomic research and development by private industry, thereby further clearing the way for cooperation with others.

Since our new Atomic Energy Act became law a year ago, we have striven in many ways and ever in a spirit of good will to translate its words and its purpose into concrete action.

That is the way we interpret our responsibility and the responsibility of all nations of good will.

We appeal not alone to Governments to join with us in this cooperative endeavor. We are hopeful also that business and professional groups throughout the world will become interested and will provide incentives in finding new ways that this science can be used.

All of the enlightened nations of the world are spending large sums every year on programs of health, education and economic development. They do so because they know that disease, ignorance, and the lack of economic opportunity are the dark breeding places of disorders and wars.

Every scientific tool available has been brought to bear in this effort.

Atomic science is the newest and the most promising tool of all.

In your capable hands, I am confident it can be made to perform greatly for the betterment of human living.

No. 7

FOR RELEASE: 3:00 PM, Geneva Time,
Monday, August 8, 1955.

**\$1,000,000 INTERNATIONAL "ATOMS FOR PEACE"
AWARDS FUND ANNOUNCED**

Chairman Lewis L. Strauss of the U. S. Delegation to the International Conference on the Peaceful Uses of Atomic Energy today stated that he has been requested by Mr. Henry Ford II to announce the establishment of a one-million-dollar fund to provide annual, worldwide "ATOMS FOR PEACE AWARDS."

Creation of the fund and the annual awards were proposed by Mr. Ford and his brothers, Benson Ford and William Clay Ford, as memorial to their father and grandfather, the late Edsel B. Ford and Henry Ford. The memorial, to be known as "ATOMS FOR PEACE AWARDS", has been formally authorized by the Board of Trustees of the Ford Motor Company Fund, a non-profit institution.

Each year an International Jury of Awards will be appointed and will select the individual or groups of individuals to receive a \$75,000 award. The recipients will be selected from among the world's scientists, inventors and engineers "without regard for nationality or political belief."

In a letter to Chairman Strauss, Henry Ford II said the decision to establish the awards was inspired by President Eisenhower's expression of hope that "private business and professional men throughout the world will ... provide an incentive in finding new ways that this (atomic) science can be used ... for the benefit of mankind and not for destruction."

Mr. Strauss and Mr. Ford agreed, in an exchange of letters, that announcement of the awards in Geneva, during the first International Conference on the Peaceful Uses of Atomic Energy, would be particularly fitting, and in keeping with the purposes of the Conference.

Mr. Strauss also pointed out that the announcement would be of interest to the large number of scientists and engineers now convened in Geneva.

Mr. Henry Ford II, after referring in his letter to the President's statement, went on to say:

"In response to the challenge of this statement, and upon the suggestion of my brothers, Benson Ford and William Clay Ford, and me, the Board of Trustees of the Ford Motor Company Fund have agreed to authorize as a memorial to our grandfather and father, Henry Ford and Edsel B. Ford, a contribution by the Ford Motor Company Fund of \$1,000,000 (\$100,000 annually for ten years) to be spent in helping to provide such worldwide incentives.

"This sum would be received and administered by a newly-created institution to be chartered as a non-profit corporation, and to be given the name of:

ATOMS FOR PEACE AWARDS
A Memorial to Henry Ford and Edsel Ford

"We would want to ask a small group of public-spirited American citizens to serve as an Organization Committee to suggest the policies and administrative pattern for ATOMS FOR PEACE AWARDS that would best assure the use of its funds during the next ten years toward the application of 'atomic energy for the benefit of mankind'.

"We would propose that when the new organization of this new memorial fund is completed, the Board of Trustees of ATOMS FOR PEACE AWARDS appoint each year a competent International Jury of Awards for the purpose of selecting from among the world's scientists, inventors and engineers -- without regard for nationality or political belief -- the individual or group of individuals who, in the Jury's judgment, has made the greatest contribution during the year to peaceful uses of atomic energy; that the individual or group so selected be granted with appropriate ceremony the ATOMS FOR PEACE AWARD for that year; that the annual Award carry, in addition to a suitable medal to be designed and cast for the purpose, an honorarium of \$75,000; that, if during any year the International Jury of Awards or the Board of Trustees finds no candidates pre-eminently meriting the ATOMS FOR PEACE AWARD, the sum at the disposal of the memorial fund be used that year for scholarships and fellowships most likely to contribute to the advancement of the new science of peaceful application of atomic energy."

Chairman Strauss, in his letter of response to Mr. Henry Ford II, said:

"I think this is a very fine thing for you and your brothers to do.

"Your action should aid importantly in achieving the goals that President Eisenhower had before him in Geneva when he expressed the hope that private business and professional men throughout the world would provide an incentive in finding new ways that atomic energy may be used for the welfare of mankind. I am confident that the President will appreciate the prompt and public-spirited response which you and your brothers have made."

No. 8

FOR RELEASE AFTER 12:30 P.M.
GENEVA TIME, TUESDAY, AUGUST 9,
1955 (11:30 GMT)

UNITED STATES DELEGATION PRESENTS
REFERENCE COLLECTION TO OTHER DELEGATIONS

Lewis L. Strauss, Chairman of the United States Delegation to the International Conference on the Peaceful Uses of Atomic Energy, today presented to the President, the Secretary General, and the six Vice Presidents of the Conference and the senior officers of the United Nations present in Geneva, an eight-volume set of technical data titled "Reference Material on Atomic Energy."

The set was compiled by the United States Atomic Energy Commission especially for the official Representatives of the 72 nations sending delegations to the Conference (each nation is entitled to five Representatives) and for Conference officials.

Receiving the presentation volume and the eight-volume set today were: Dr. Homi Bhabha of India, President of the Conference; the following Vice Presidents; Gen. Bernardino C. de Mattos of Brazil; Dr. W. B. Lewis of Canada; Prof. Francis Perrin of France; Prof. D. V. Skobel'tzin of the USSR; Sir John Cockcroft of the United Kingdom; Dr. I. I. Rabi of the United States; and the Secretary General, Prof. Walter G. Whitman of the United States. Presentations were also made to Secretary General Dag Hammarskjöld of the United Nations, and to the two Under-Secretaries of the United Nations now in Geneva, Mr. Ralph Bunche and Mr. Ilya Tchernychev.

The reference materials on atomic energy were compiled to supplement the comprehensive progress report on research and development going on in the United States in peaceful uses of atomic energy

which is conveyed by more than 500 scientific and technical papers submitted for the Conference by the United States Government.

The sets are designed to furnish a practical basic source of technical information on nuclear energy and its application. The material is made up into the following eight volumes:

Volume 1, Research Reactors — Detailed descriptions, complete with selected design drawings, of six types of United States research reactors now in use.

Volume 2, Reactor Handbook: Physics — A compilation of reactor physics and nuclear design data, including shielding theory and calculating techniques.

Volume 3, Reactor Handbook: Engineering — A compilation of reactor technology, comprising basic reactor systems applicable to power development and a summary of experimental reactor designs.

Volume 4, Reactor Handbook: Materials — A compilation of data and background information on reactor materials; fuels and moderators and shielding, structural and miscellaneous materials.

Volume 5, Neutron Cross Sections — Recent compilations of neutron cross section data affecting reactor design.

Volume 6, Chemical Processing and Equipment — Process and engineering description of a chemical separation system, together with a catalogue of special laboratory equipment for the handling of radioactive materials.

Volume 7, Eight-year Isotope Summary — Case examples of isotope applications in research and industry, together with a bibliography of nearly 7000 published papers on isotope utilization in various fields.

Volume 8, Information Sources — Bibliographic index material, including (1) a list of all United States papers provided at this Conference, (2) a guide to the United States Depository Library program, (3) a complete list of all available United States technical reports, and (4) a selective bibliography of United States publications.

Besides the above eight volumes, the reference material includes an introductory illustrated book printed in the 4 languages of the Conference. The dedication of this book is by President Dwight D. Eisenhower and reads as follows:

The atom cannot be limited by national boundaries.

Men of science from many countries, often working together, help to harness its great energy for the good of mankind. The Geneva Conference on Peaceful Uses of Atomic Energy is a tribute to the inventive genius of these men. At the same time, it demonstrates to people everywhere that continued international cooperation is essential if we are to realize man's capacity to create for himself an increasingly productive world, living at peace.

The great strides already made in putting atomic energy to work in industry, agriculture, medicine and research, will become evident during the course of this Conference. We hope that the free exchange of technical information and ideas among leading scientists and engineers of many nations will stimulate even greater progress in the months and years ahead.

In this cause, the United States is firmly dedicated to promote international cooperation and to contribute its share of scientific knowledge and resources.

The introductory volume also carries a preface by Chairman Strauss concluding with the statement that "It is our sincere hope that this material will be of practical value to the men and women of science and engineering in whose hands the great power of the atom is becoming a benign force for world peace."

No. 9

FOR RELEASE: 2:00 PM, Geneva Time,
Monday, August 8, 1955

USAEC ANNOUNCES PRICES FOR NATURAL URANIUM,
HEAVY WATER; LEASE VALUE FOR ENRICHED
URANIUM

The United States Atomic Energy Commission is announcing in Washington today a value for enriched uranium leased for research reactors and sale prices for normal uranium and heavy water.

Chairman Lewis L. Strauss of the Commission said: "This price and lease charge schedule should be of assistance to those nations planning to use research reactors as part of their program for benign uses of the atom."

The value established for lease of uranium enriched to 20 per cent in U 235, for use in research reactors under the bilateral

agreements between the United States and friendly nations for cooperation in the civil uses of atomic energy is twenty-five dollars (\$25) per gram of contained ²³⁵U.

The sale prices announced were:

For heavy water -- twenty-eight (\$28) per pound. Heavy water is used as a moderator and coolant in certain types of research reactors because it enables the reactor system to make efficient use of neutrons.

For normal uranium metal -- forty dollars (\$40) per kilogram.

No. 10 - See Appendix XVIII - August 8, 1955, Press Conference

No. 11

August 10, 1955

BACKGROUND INFORMATION ON ATOMIC POWER DEVELOPMENT IN THE UNITED STATES

Note to Correspondents: The information contained herein is given you not as spot news but as background information. However, it is available for use by correspondents as of the above date of distribution, and may be attributed to the Information Office of the United States Delegation to the International Conference on Peaceful Uses of Atomic Energy.

Atomic power development in the United States is moving into the stage of large prototype plants and planning for full-scale central station power plants drawing their heat from atomic reactors.

Leading up to the many present moves by Government and industry on a broad front in the atomic power field has been six years of experimentation in the technology of atomic power. Along the way, power has been generated by prototypes of military propulsion reactors and experimental reactors testing out various theories in this field.

In December 1951, power was first generated on a small scale by an experimental fast breeder reactor at the National Reactor Testing Station in Idaho. Later the homogeneous reactor experiment at the Oak Ridge National Laboratory did the same. The submarine prototype reactors came into operation in the following years.

Steam from one of these prototypes, at West Milton, New York, is now being intermittently employed to turn a generator of 10,000 kilowatts capacity and the power produced is being fed into the power grid of the locality.

The procession of development has been similar to that in all new fields of technology -- formulation of theories; experimentation with elements of machines and model machines; later with small-scale machines; continuous research into the many problems of theory and practice. Now the United States Government and industrial program is reaching the stage of trying out and learning further from the operation of full-scale atomic power plants.

Economic Nuclear Power is Goal

The problem of making atomic power plants competitive economically with conventional plants is more difficult in most parts of the United States than in many other places because of the low costs of abundant fuels or hydro power.

Nevertheless Government and industry are pushing ahead toward the goal of economically competitive power from nuclear plants for these reasons:

1. Fuel consumption is increasing so rapidly in the United States and throughout the world that the time is approaching when it will become desirable to tap the nuclear fuel supply.
2. Atomic development will contribute to general technical progress.
3. There is opportunity to work with and assist other countries where conventional fuels are scarce and costly. Nuclear power may become economic in such nations before it reaches that stage in the United States.

Progress toward the generation of electricity from nuclear fuel economically and on a large scale is being made along several fronts in the United States.

For example, the Government through its Atomic Energy Commission, designated "AEC" for short, has under construction four experimental power reactors of as many different types. They are a part of a program extending over several years which includes at least one other reactor experiment not yet in the construction stage. These five experimental plants will have a total capacity of over 80,000 kilowatts of electricity.

Preceding these, four types of power reactors were built and operated successfully in the United States — two as very small plants, and two as military plants. Thus the technical feasibility of these types was demonstrated.

Power From Reactor Being Sold

One of the military prototype reactors has provided the first commercial sale of atomic electric power in the United States. The submarine reactor prototype known in the atomic energy program as SIR-Mark I is now turning surplus steam into a 10,000 kilowatt turbine generator and the power thus manufactured is being distributed over the system of the Niagara-Mohawk Power Company in northern and central New York. The turbine generator was installed at no cost to the Government by the contractor for the reactor, the General Electric Company. Current is generated only when the reactor is being used for test and experimental purposes.

The first delivery of power to the Niagara-Mohawk Company was on July 18, 1955, and the occasion was signalized by a ceremony at West Milton, New York, the site of the reactor. The arrangement with the Niagara-Mohawk Company is temporary, pending determination of power transport arrangements by three public power organizations or cooperatives within a 100-mile radius of West Milton which have expressed a desire to purchase the power.

The plants of the current government power development program are being built for the AEC by private industry under contract, and they will be Government-owned. Their purpose is to provide sufficient technical information to help industry as it enters broadly into the development and construction of power reactors.

Industry has already spent about \$8 million of its own money on research, development, and study. In recent months industry and public power units have proposed the construction of six nuclear plants with a total capacity of over 700,000 kilowatts of electricity. The proposals, which call for much of the financing by industry, with only a part by Government, are being considered. Two proposals do not ask for any Government financial assistance.

Data Being Made Available

Meanwhile, the Atomic Energy Commission is taking steps to make classified as well as unclassified information concerning civilian applications of nuclear power available to any American organization or individual possessing a legitimate interest, and meeting certain qualifications. Permits providing access to classified information

have been issued to 220 organizations and firms by the AEC since the new program went into effect in April 1955, and some 50 other organizations received such information under earlier study group agreements.

The AEC has revised the classification of much power reactor information so that now nearly all data about many types of power reactors is either unclassified or is in the Confidential Restricted Data category where it can be furnished and handled readily. Compilations are being prepared for the convenience of the qualified users.

For certain types of research reactors enough unclassified information is available to make possible design and construction. Such unclassified information is being furnished other nations under the bilateral agreements concluded with 24 nations by the United States.

On Monday, August 8, 1955, the AEC announced the value it had established for the lease of uranium enriched to 20 percent in U 235 for use in research reactors under the bilateral agreements between the United States and friendly nations. This value is \$25 per gram of contained U 235. The AEC also announced prices for the sale of natural uranium — \$40 per kilogram — and of heavy water — \$28 per pound.

The AEC has also established prices it will pay domestically for the fissionable materials which are produced in reactors. The bases for the charges to be made for the chemical processing of fuel elements at Government plants are being determined. This price information of payments by Government for fissionable materials and to Government for processing remains classified, but available to those in industry and other units which qualify under access permits or otherwise.

Paralleling these Government steps, a number of industrial groups are continuing studies of power reactor technology and economics. These study groups frequently prepare reports, some of which are made available in both classified and unclassified form. Studies in progress include application of nuclear power to merchant ships and locomotives as well as to large and small stationary plants for generating electricity.

A number of manufacturing firms have organized and are operating atomic power equipment divisions. Babcock and Wilcox is building, with its own money, a fuel element fabrication plant. Westinghouse Electric Corporation has announced that it will build a \$6 million test reactor to furnish testing service for its own projects and for other firms. Other industrial reactors are planned as research and testing tools.

PROJECTS OF GOVERNMENT PROGRAM

Pressurized Water Reactor

The first full-scale civilian nuclear power plant in the United States is the Pressurized Water Reactor being built at Shippingport, Pennsylvania. It is designed to produce a minimum of 60,000 kilowatts of electricity. Completion is scheduled for 1957. As the name indicates, this plant is of the pressurized water type, which has operated in the submarine "Nautilus". Like other plants of this program, this reactor is experimental and will not be economic. However, its operating expenses are expected to be lowered by experience. The total cost is estimated at \$95 million, which includes \$47 million for research and development and \$48 million for construction.

Duquesne Light Company of Pittsburgh is furnishing the turbo-generator portion of the plant and an additional \$5 million toward construction of the nuclear portion. Duquesne will also operate the entire plant, buy steam from the AEC, and feed the electricity generated into its transmission system. Westinghouse Electric Corporation, developer and builder of the reactor for the AEC, is contributing \$500,000.

In the Shippingport reactor, water under high pressure -- about 2,000 pounds per square inch -- will carry heat from the reactor to heat exchangers where the heat will convert other water of the power cycle into steam for the turbo-generator.

Experimental Boiling Water Reactor

In an effort to avoid this high pressure and the expensive equipment required and do away with intermediate heat exchangers, Argonne National Laboratory, operated for the Commission by the University of Chicago, has conducted experiments with a small reactor in which water in contact with fuel elements actually boils. Indications are that a boiling reactor will operate in a stable manner.

A demonstration reactor, known as the Experimental Boiling Water Reactor, is being built to explore this concept. With a capacity for 5,000 kilowatts of electricity, the plant, located at Argonne National Laboratory near Chicago, is scheduled for completion late in 1956. The cost of the project for both research and development and construction is estimated at about \$17 million.

As a part of this project, a small turbogenerator has been connected to a boiling reactor experimental installation at the National Reactor Testing Station in Idaho. It is being operated to get information for the 5,000 kilowatt plant at Argonne.

Sodium Reactor Experiment

At Santa Susana, California, near Los Angeles, construction is in progress on the Sodium Reactor Experiment, a reactor that will be cooled by the liquid metal, sodium. It is desired to raise steam at high temperature and pressure without pressurization of the coolant that removes the heat from the reactor. Sodium remains a liquid at these temperatures. Disadvantages include the facts that sodium becomes highly radioactive and that it will enter a violent chemical reaction with water.

North American Aviation, Inc., the development contractor, is contributing \$2.5 million of a \$10 million research, development, and construction program. The reactor will have a heat output of 20,000 kilowatts and completion is scheduled for late 1956. Installation of a turbogenerator has not been planned, but Southern California Edison Company has offered to install one at its own expense. Other proposals have been solicited. No decision has been made.

The two reactors just described will be fueled with uranium only slightly enriched in the 235 isotope, while the Shippingport reactor will contain some highly enriched elements with a natural uranium blanket. Hence all three will contain a large proportion of the 238 isotope. A small part of this uranium 238 fertile material will be transmuted into the fissionable material, plutonium. Thus these reactors will produce some new fissionable material but not as much as they consume.

These are known as slow, or thermal, reactors since most of the fissioning in them will be caused by neutrons slowed down to thermal speed of a few miles (or kilometers) per second. This corresponds to the speed of thermal agitation of atoms or molecules at the temperature of materials in the reactor.

Neutrons are released from the fission process at more than 10,000 miles (16,000 kilometers) per second. The slowing down is accomplished by a moderator, which is the cooling water in the core of the Pressurized Water Reactor and the Experimental Boiling Water Reactor, and graphite for the Sodium Reactor Experiment. Fast reactors whose neutrons are not slowed down appreciably before they cause fission can also be built.

Experimental Breeder Reactor No. 2.

The nuclear constants of the materials involved favor such fast reactors for the maximum production of plutonium from uranium 238. In fact, such a reactor, the Experimental Breeder Reactor No. 1,

has demonstrated on a very small scale that at least as much new fissionable material can be produced as is consumed. This is called breeding. This reactor plant was also the first to produce electricity in December 1951, as noted previously.

A much larger reactor of this type, known as Experimental Breeder Reactor No. 2, is being developed by the Argonne National Laboratory. Its coolant will be liquid sodium. There will be no moderator. With a capacity of 16,000 kilowatts of electricity, EBR No. 2 is scheduled to be completed in 1958. The use of plutonium as fuel in fast neutron reactors will be explored in both of these experimental units.

Homogeneous Reactor Experiment No. 2.

The last major technical approach of the Government's power reactor program is represented by the homogeneous type reactor; so-called in contrast to the heterogeneous reactors already described. In the homogeneous reactor being developed the fuel is highly enriched uranium uniformly distributed as uranyl sulfate in a water solution. This solution also serves as moderator and heat transfer fluid. Potential advantages include simplicity of construction, ease of chemical processing (since the fuel is already a liquid) and elimination of fuel fabrication.

The small Homogeneous Reactor Experiment No. 1 demonstrated at Oak Ridge National Laboratory that a power reactor of this type will operate in a stable manner. (Very small homogeneous research reactors, known as "water boilers," were already in use operating at much lower temperatures.)

Now the Oak Ridge National Laboratory, operated for the Commission by Union Carbide and Carbon Corporation, is building a much larger HRE No. 2 which will have a heat output of 5,000 to 10,000 kilowatts as compared with 1,000 kilowatts for HRE No. 1. Completion is scheduled for early 1956.

The Government program originally included an HRE No. 2 of about 3,000 kilowatts heat output, to be followed by a Homogeneous Thorium Reactor of about 65,000 kilowatts of heat, of which about 16,000 kilowatts would be converted into electricity. The present design of HRE No. 2 for 5,000 to 10,000 kilowatts, and its anticipated modifications to the range of 10,000 to 20,000 kilowatts for thorium oxide slurry runs, will make it unnecessary to build at Government expense an HTR of 65,000 kilowatts.

The nuclear properties of the uranium isotopes and of thorium and plutonium make the generation of uranium 233 from thorium attractive for thermal reactors in which fission is primarily by slow, or

thermal, neutrons, whereas the breeding of plutonium from uranium 238 can be accomplished most readily in a fast reactor.

Liquid Metal Fueled Reactor

In addition to these major projects using five different technical approaches, the Government program includes investigations at an earlier stage of other possible reactor types. One type, being developed at the Brookhaven National Laboratory, operated for the Commission by Associated Universities, Inc., is called the Liquid Metal Fueled Reactor because it would use a solution of uranium in bismuth as fuel. Graphite would be the moderator.

Potential advantages include simplified fuel processing and the high-temperature-at-low-pressure characteristic of liquid metal cooling. The Brookhaven data and calculations are being studied by a highly trained team of men from several organizations. Their report will influence the further development of this technology.

Organic-Moderated Reactor Experiment

Investigations of organic compounds as possible reactor moderator coolants indicate advantages of low induced radioactivity and high boiling point of coolant and little corrosion of the fuel elements. The moderator characteristics are such that compact reactor cores may be designed with materials making them particularly attractive for smaller sized plants. Serious consideration is being given to initiation of an experimental reactor project of this type.

LARGE CENTRAL STATION POWER REACTOR PLANTS PROPOSED BY INDUSTRY

The projects proposed by industry range in power from 75,000 to 236,000 kilowatts of electricity and represent scaling-up from the smaller Government-built experimental plants even though none of the latter has actually been completed. Two utilize pressurized water designs, one a boiling water, one a sodium graphite, and one a fast breeder design.

Consolidated Edison Pressurized Water Reactor

The largest plant would be a pressurized water reactor which the Consolidated Edison Company of New York City, proposes to build at Indian Point on the Hudson River near Peekskill, New York. Of the total of 236,000 kilowatts of electricity, 140,000 would come from the reactor and 96,000 from an oil-fired superheater.

The plant is designed to be fueled with highly enriched uranium and thorium and have an over-all thermal efficiency of 32 percent. The Babcock and Wilcox Company of New York is the contractor for the design, fabrication, and construction of the plant. The cost is estimated at \$55 million and 1960 is the scheduled operating date. No Government financial assistance is asked.

Yankee Atomic Electric Company Pressurized Water Reactor

The other pressurized water plant is a 100,000 kilowatt unit proposed by the Yankee Atomic Electric Company of Boston, Massachusetts, to be built in the northwestern part of the state. The Yankee Company, made up of 12 utilities of New England, proposed to employ Fluor Corporation of Los Angeles as the contractor for plant construction, and Monsanto Chemical Company of St. Louis, Missouri, to design and fabricate the reactor core.

The design calls for slightly enriched fuel elements clad in aluminum jackets. Thermal efficiency is expected to be 20 percent and over-all cost of plant about \$25,000,000. It is estimated that initial operation could take place approximately 2-1/2 years after start of construction. The company requested research and development cooperation and assistance from the AEC in this venture.

On Monday, August 8, the Commission announced that the original proposal submitted by the Yankee Atomic Electric Company was not an acceptable basis for negotiation, but that the Commission was undertaking discussions to see whether the proposals could be modified so that negotiations could be set underway.

Nuclear Power Group Dual-Cycle Boiling Reactor

A dual-cycle boiling reactor plant is proposed by the Nuclear Power Group, which consists of six electric utilities and a construction firm. The plant would be built near Chicago and operated as a part of the system of the Commonwealth Edison Company. This nuclear power plant, designed for a capacity of 180,000 kilowatts of electricity, is estimated to cost about \$45 million. It would be fueled with slightly enriched uranium, have an over-all thermal efficiency of 25 percent, and, if started promptly, be completed in 1960.

The dual-cycle feature is a concept developed by the contractor, the General Electric Company. It refers to a boiling and "flashing" cycle, as distinguished from a simple boiling cycle, designed to reduce the formation of bubbles of steam around the fuel elements, resulting in higher heat transfer rates and improved power-demand control.

By the arrangement proposed, only a part of the steam required would be generated in the core. The other part would be generated in an external "flash drum" operating at a lower pressure than the reactor. The dual cycle is expected to make possible production of more power from a given reactor core with the same amount of bubble formation.

No Government financial assistance is asked. The General Electric Company would build a pilot reactor as a part of the development program.

Consumers Public Power District Sodium Graphite Reactor

A 75,000 kilowatt sodium graphite reactor is proposed by the Consumers Public Power District of Nebraska to be built near Lincoln, Nebraska, at a cost of about \$24 million. Slightly enriched uranium would be used and the plant would have an over-all thermal efficiency of about 35 percent. North American Aviation, Inc., is working on the design.

On Monday, August 8, 1955, the Commission announced that this proposal, like that of the Yankee Electric Company, did not constitute an acceptable basis for negotiations, but that discussions were under way to determine whether the proposal could be modified to become a basis for negotiations.

Detroit Edison Company and Associates Fast Breeder Reactor

Detroit Edison Company and Associates, including utilities, manufacturers, and engineering firms, seeks to build a fast breeder power plant of about 100,000 kilowatts capacity near Detroit on the lines of the Detroit Edison Company. This group has already spent several million dollars on research and development. The cost of the project has been estimated at \$54 million, including additional research and development effort by the companies. The operating date has been set as late as 1959.

This reactor is designed to be fueled with enriched uranium and have a blanket of depleted uranium for use in the breeding operation. An over-all thermal efficiency of 33 percent is calculated.

Proposal by the Rural Cooperative Power Association of Elk River, Minn.

On August 8, 1955, the Commission announced that it had under consideration a proposal from the Rural Cooperative Power Association

of Elk River, Minnesota, the first proposal received from a rural electric cooperative. The Elk River plan is for a reactor plant of 22,000 kilowatts capacity. No further details were made available by the Commission in this announcement, save that the Elk River plan called

For the heat-producing portion of plants, excluding the turbo-generator, industrial groups during recent months have estimated costs as low as \$80 to \$100 per kilowatt for plants of 75,000 to 150,000 kilowatts capacity. While this is still substantially more than the \$40 to \$70 per kilowatt for conventional boilers of the same size, it is definitely encouraging. The "reactor boiler" cost of the Shippingport plant is more than \$600 per kilowatt.

For conventional power plants in the United States, fuel costs generally determine whether an area has high-cost electricity or low-cost electricity. The high-cost and low-cost power areas roughly match the high-cost and low-cost fuel areas. Fuel costs vary from about 7 to 15 cents per million BTU's (heat units) in natural gas fields to 30 to 40 cents from oil or at a considerable distance from coal and gas.

A study by the Federal Power Commission showed that the average cost of generating electricity in the United States during 1951 was 7.4 mills per kilowatt-hour. This figure covers large and small plants, inefficient old plants, and efficient new plants. The study, which included Class A and B utility systems (95 percent of the country's generating capacity, excluding very small systems, rural electric cooperatives and "captive" industrial plants) found that the generating costs ranged from 3.9 mills to 9 mills per kilowatt-hour.

One-fifth of the power produced cost more than 6.9 mills and one-half more than 5.9 mills per kilowatt-hour. This data indicates that to become competitive in 20 percent of the market, electricity must be generated from nuclear fuel at 6.9 mills and to become competitive in 50 percent of the market, the cost must be brought down to 5.9 mills per kilowatt-hour.

The constant improvement in the efficiency of conventional plants should not be forgotten. As old plants are retired and new ones built, these per-kilowatt-hour costs may be reduced to some extent.

Atomic energy offers the possibility of lowering fuel costs. Yet, it should be realized that if fuel — conventional or atomic — were free, the possible reduction in the cost of electricity to the small consumer on a distribution system would be only about 15 to 20 percent.

THE FUEL ELEMENT PROBLEM

Reactor operation is expensive because of the manner in which the fuel has to be prepared and because it has to be removed from reactors for chemical processing when only a small part has fissioned.

The fissionable and fertile materials must be "clad" (covered, enclosed to avoid corrosion by the cooling water or liquid metal and to keep the highly radioactive fission products, into which the fissionable material disintegrates when it fissions, from contaminating the coolant).

Cladding material must withstand corrosion and maintain its strength when exposed to the hot coolant under intense radioactivity. The radioactivity of a large reactor is equivalent to that which would be produced by hundreds of tons of radium. The cladding metal must also absorb few neutrons to avoid dampening the chain reaction.

Aluminum is used in research reactors since they do not have to operate at high temperatures. The processing of zirconium was developed to make available this hitherto little used metal for cladding fuel elements. It meets the requirements well but is expensive, costing about \$15 a pound in ingot form.

Fuel elements for some reactors have been made in the shape of plates consisting of a layer of uranium bonded between layers of aluminum or zirconium.

In order to maintain the critical mass required for the chain reaction, a reactor must contain a very large amount of uranium compared with that which is consumed. It is as if a conventional power plant had to keep on hand a supply of coal to last one to two years instead of several months.

All the nuclear fuel must be removed from a reactor when only a very small percentage has fissioned, or "burned", for one of two reasons:

1. Enough fission products may have accumulated to quench the chain reaction. Fission products are avid absorbers of neutrons;
2. The fuel elements may be damaged structurally by corrosion, radiation, or the weakening effect of fission products.

Fresh fuel elements are so slightly radioactive that they can be handled by hand without shielding. Used fuel elements are so radioactive that they must be removed under about 15 feet of shielding water or in thick lead "coffins". They are stored under water for several months until they lose a part of this radioactivity.

Then the fuel elements are ready for chemical processing to recover the uranium, plutonium, or thorium so that it can be used again. The element is dissolved and the fuel separated from the

cladding material and fission products. Because of the radioactivity involved, all this processing has to be done by remote control in thick-walled concrete cells. The useful materials are returned to the solid state and again fabricated into fuel elements.

The large investment in fuel, the elaborate remote processing, and the loss of uranium multiplied from a very small percentage by repeated processing of the same material account for most of the high fuel costs.

A major effort is being made by the Government and industry to develop fuel elements that will last longer and reactor designs that will not require frequent removal of elements because of fission product accumulation. Possible methods by which some of these difficulties might be circumvented were brought out in the descriptions of the various experimental reactors.

In the general area of professional education, societies of scientists and engineers working in the nuclear field have organized the American Nuclear Society. A number of technical papers were presented and discussed at its first meeting in June. Meanwhile, some of the long established engineering societies are organizing branches in nuclear engineering as they did in aeronautical engineering. Numerous technical symposia have already been held during the past several years under the sponsorship of various groups, and meetings of this kind continue.

EDUCATION

Several engineering colleges now offer degrees in nuclear engineering and most of them make available to engineering students optional courses in nuclear physics and reactor engineering. Textbooks on reactor theory and engineering have been published and more are planned.

The Atomic Energy Commission is conducting at its Argonne National Laboratory a 7-month course in reactor technology for 31 students from 19 foreign countries and 9 from the United States. An additional 7-month course will begin next November. The Government anticipates that similar courses will eventually be given by American colleges and universities. In addition, the AEC-sponsored one-year course of the Oak Ridge School of Reactor Technology, containing classified information, continues.

Since 1954 North Carolina State College has been operating a small "water boiler" type reactor as a teaching and research reactor. The second college reactor, of the "swimming pool" type, the kind built for the International Conference on the Peaceful Uses of Atomic Energy, is being completed by Pennsylvania State University during this summer.

Other research reactors are being built by the University of Michigan, the University of California at Los Angeles, the Naval Research Laboratory, Armour Research Foundation, and Battelle Memorial Institute.

No. 12

August 11, 1955

BACKGROUND INFORMATION
ON THE UNITED STATES PROGRAM OF RADIATION PROTECTION

Note to Correspondents: The information contained herein is given you not as spot news but as background information. However, it is available for use by correspondents as of the above date of distribution, and may be attributed to the Information Office of the United States Delegation to the International Conference on Peaceful Uses of Atomic Energy.

The atomic energy industry is one of the safest industries in the United States, according to records of the National Safety Council (U.S.A.). The Safety Council's award of honor was presented to the Atomic Energy Commission in 1953.

The rate at which disabling or fatal injuries are suffered in atomic energy activities is lower than in all except one of the 40 industries listed in the latest compilation of statistics by the Safety Council.

Less than 2 percent of the injuries experienced to date in the atomic energy field have involved radiation as a factor.

Many reasons for the exceptional safety record in the new industry, potentially hazardous because of the amounts of radio-activity with which thousands of people work daily, are set forth in exhibits of the United States Delegation at the International Conference on Peaceful Uses of Atomic Energy in Geneva August 8-20. In assisting other nations to enter atomic energy activities, the Atomic Energy Commission and contractors stand ready to share the results.

Basic Safety Practices

An exhibit illustrating basic safety practices was furnished by the Union Carbide and Carbon Corporation in the temporary building which houses the United States pool-type research reactor on the United Nations grounds in Geneva.

It depicts, on the one hand, detection of radiation with various types of instruments and, on the other hand, protection against high level radioactivity by means of shielding and against prolonged contact with particles of low-level activity by the wearing of masks, protective clothing and gloves and by thoroughly washing the hands and body. The mask prevents the breathing of small radioactive particles into the lungs. The radioactivity of ventilating air consists primarily of the radioactivity of small particles of different elements it contains.

Detection and Monitoring Instruments

A large assortment of detection, or monitoring, instruments that are worn on the person by workers or visitors at atomic energy installations are displayed as a part of the United States Delegation's exhibit in the Palais des Nations building. They include film badges and small dosimeters. When developed, the film on the badge reveals any exposure to radioactivity. From the dosimeter the worker at any time can observe a reading of the amount of the dose of radiation that has accumulated since the instrument was last set.

When workers are dealing with radioactive objects from which they must maintain a safe distance, a health-physics specialist accompanies them, employing an appropriate monitoring instrument for indicating the instantaneous level of radiation. More than a dozen different types of such instruments are on display for measuring four kinds of radiation — alpha, beta, and gamma radiation and neutrons. They include ionization chambers and geiger, proportional and scintillation counters.

The monitoring instruments section also includes a device for constantly measuring the level of radioactivity in a plant or laboratory. As a part of this device, a vacuum pump draws air through a moving strip of filter paper. Then the paper, containing particles removed from the air, passes before a detector. If the particles picked up by the paper are sufficiently radioactive, an alarm circuit is actuated to sound a warning bell.

An instrument with which visitors can test themselves is a hand-and-foot contamination monitor commonly used in laboratories and plants by all persons leaving areas in which their hands and feet may have picked up radioactive particles. It is as high as a man is tall. When a person puts his feet on designated spots and places his hands in two holes, 12 geiger counter tubes go to work detecting any radiation from them. Readings for each hand and foot are given by four meters and the final result is reported by either an "OK" signal or an "Above Permissible Level" signal. In the latter case the person is warned to rid himself of the radioactive dirt he has acquired.

Detection and monitoring instruments are one product of the new radiation instruments industry that has grown up in the United States since World War II. More than 100 firms are producing an annual output worth \$25 million. The Government and private atomic power plant builders, radioisotope users and others depend on these firms to meet their instrument needs.

Supplementing the use of detection instruments, workers commonly wear smocks and cover-alls, which are kept in the working areas, examined for accumulated radioactivity and washed in special laundries. Disposable plastic overshoes are worn in some areas.

Protection of Environment

In addition to safeguarding workers, the United States Government and industrial firms try to make sure that there will be no hazardous amounts of radioactivity beyond the limits of the plants and laboratories. Some of these activities are illustrated by an exhibit titled "Protection of Environment from Radioactivity."

For example, this exhibit contains samples of air filters developed especially for atomic energy applications to provide the required very high efficiency for removing extremely small particles. One is a glass fiber filter through which corrosive chemical plant fumes are passed prior to controlled release to the atmosphere. Another is an asbestos fiber filter with which ventilating air is cleaned before it is circulated where workers handle radioactive materials and again before being released to the atmosphere. United States firms have been furnishing this type of filter to some European laboratories.

Also displayed is a one-fourth scale model of an incinerator developed by the United States Bureau of Mines for concentrating low-level combustible wastes to simplify their final disposition. The incinerator so burns the waste and filters the gases of combustion that the smoke is free of radioactivity-bearing particles and can be released without hazard.

A portion of this exhibit illustrates some of the activities of the United States Weather Bureau in atomic energy. For example, weather studies aid evaluation of proposed sites for reactors and chemical processing plants and the design of the plants to make sure that any slightly radioactive gases released will be quickly and safely dispersed and will not become concentrated at ground level.

The Weather Bureau exhibit is supplemented by a photograph of a low speed smoke tunnel at New York University for scale model experiments with discharge of gases from proposed plants into the surrounding terrain.

Investigations at the Brookhaven National Laboratory of the possibility of fixing the radioactivity of highly radioactive liquid wastes on montmorillonite clay for permanent disposition are illustrated. It has been found that this clay, a common type, will adsorb radioactivity from liquids and that after the clay is baked the radioactivity cannot be removed.

The exhibit includes a transparent tube of extruded, spaghetti-like clay, a sample of that through which wastes are passed at the Laboratory, and samples of the clay after it has been baked. The pilot plant is pictured and there is a drawing of one type of a proposed full-scale installation in which clay would adsorb radioactivity, be heated and then covered with earth. The fixing is necessary to prevent the leaching of radioactivity from the clay into ground water.

Studies at Massachusetts Institute of Technology on the effectiveness of different methods of treating domestic water supplies in removing any radioactivity with which the water might become contaminated are depicted. Representative data are given.

The exhibit pictures equipment used by Johns Hopkins University to study the effectiveness of employing biological slimes to remove radioactivity from low level liquid wastes such as sewage. There is also an illustration of a pilot plant at New York University for the use of slimes in the trickling filter process and of the first full-scale installation of a trickling filter plant for treating radioactive wastes. This plant, at the National Reactor Testing Station in Idaho, processes the waste from a laundry in which the coveralls and smocks of laboratory and plant employees are washed.

The program of general safety to guard against hazards other than radiation is administered through the safety branch of the Division of Organization and Personnel of the AEC, which gives support to the safety divisions of the contractors operating the plants and laboratories. These contractors, of course, are responsible for the outstanding record of general and radiation safety attained in the total atomic energy industry of the United States.

Formulation of the radiation protection program and advice to contractors on putting it into effect is the responsibility of the Division of Biology and Medicine (AEC). The devices and procedures illustrated in the technical exhibits and described above have resulted in part from the work of this Division and in larger part from the ingenuity and management of the contractors operating plants and laboratories. The following outline explanation of radiation safety standards and statement of results in the radiation protection program was prepared by that Division.

Possible Radiation Hazards from Atomic Energy Plants

A. Kinds of radiations:

1. External

- a. Whole body irradiation by gamma rays and/or neutrons;
- b. Skin doses from beta and soft gamma rays.

2. Internal

- a. Irradiation of various organs by alpha, beta, and gamma rays after internal deposition of radioisotopes.

B. Sources of causes

1. Nuclear reactors

- a. Direct escape of gamma rays and/or neutrons through shielding, and leakage of radioactive gases;
- b. Reactor cooling and plant ventilating air and process gases and cooling waters;
- c. Handling of radioisotopes in production and processing, as well as in research, medicine and industry.

2. Chemical processing plants

- a. Separation and disposal of waste materials.

3. Other operations related to reactors

- a. Fabrication and processing of fuel elements;
- b. Isotope production and distribution.

4. High energy machines, i.e., X-ray, cyclotrons, betatron, van de Graaff, etc.

- a. Escape of whatever high energy radiation involved (electrons, protons) and radiations resulting from impacts of these on parts of the machine and shielding.

5. Teletherapy (such as Cobalt 60) and applicators (such as strontium 90)

C. Controls Developed for Radiation Hazards

1. Adequate shielding for reactors, machines, and radioisotopes.
2. Careful planning of methods and procedures during operations to reduce radiation exposure.
3. Use of remote control equipment for handling; adequate supply of fresh air for working spaces; filters for stack gases.
4. Dilution of waste products for disposal, or concentration for safe storage.
5. Protective clothing for specific work.
6. Decontamination procedures for personnel and material, when indicated.
7. Monitoring of
 - a. Personnel
 - i. use of film badges and dosimeters, fixed instruments with recorders and alarms;
 - ii. use of radiac instruments for monitoring personnel contamination.
 - b. Automatic radiac instruments
 - i. for automatic monitoring of air and water contamination for gross activity.
 - c. Procedures
 - i. routine and emergency procedures have been developed using a wide variety of radiac instruments to monitor for different kinds of radiation, measuring any radiation directly from the reactor or high-energy machines as well as contamination of personnel and material;
 - ii. each installation has developed procedures that are most applicable to its special problems and in conformity with generally accepted principles of health physics.

Principles Followed in Limiting Exposure

Criteria for Maximum Permissible Radiation Exposure — The International Commission on Radiation Protection in 1951 and the National (United States) Committee on Radiation Protection have recommended criteria for maximum exposure to radiation. The United States Atomic Energy Commission has adopted practices consistent with these criteria. The essence of these criteria is contained in National Bureau of Standards handbook #52, "Maximum Permissible Amounts of Radioisotopes in the Human Body and Maximum Permissible Concentrations in Air and Water" and #59, "Permissible Dose from External Sources of Ionizing Radiation."

One of the basic criteria used by the Commission and contractors is the recommended maximum permissible exposure of 0.3 roentgens per week of whole body irradiation from penetrating (gamma and X-rays) irradiation. Higher exposures of three times this amount are permitted for any one week providing the three months' exposure does not exceed three roentgens. There are many additional criteria dealing with exposure to low energy radiation, temporary, occasional and long-term exposure and others.

Administration of Program

The Atomic Energy Commission, acting through its Division of Biology and Medicine, has primary responsibility for fixing standards of protection, for guiding and coordinating research, and for watching over radiation safety throughout the enterprise. Specifications and methods for safe handling of wastes are developed by the sanitary engineering groups in the Reactor Development Division. Direct control of radiation safety is in the hands of the AEC's operating contractors. Records of personnel exposure are maintained at each installation.

The Record of Radiation Exposure or Injury in Plant and Laboratory Operations

1. Considerably more than one-half of the workers in atomic energy plants or laboratories have experienced radiation exposures only a small fraction of the 0.3 roentgens per week; rarely is the 0.3 roentgens per week exceeded. For example, in 1954 at Hanford of the 609 persons who spent the major portion of their working time around reactors, only 5.7 percent received dosages over 3 roentgens for the year; the highest exposure for the year of any individual was about 5 roentgens and the average about one roentgen for the year.

2. Two deaths (1945 and 1946), both at Los Alamos Scientific Laboratory while performing criticality experiments. Eight others exposed during these accidents, all are living today.

3. Four cases of whole-body gamma exposures of significant amounts at Argonne June 2, 1952 while performing experiments with a test reactor. All are living today.

4. Twenty-eight cases of internal exposure to plutonium in 1945 at Los Alamos. Amounts were minimal, i.e., at or slightly above maximum permissible amount. No changes observable in personnel to date.

The Cost of Radiation Protection

1. Direct cost of radiation protection — about \$3 to \$4 for every \$100 spent for the operations program.

2. Significant increased costs in construction to provide shielding (with attendant floor loading) and special facilities to handle radioactive materials and equipment — may run as high as several times the cost for similar plants handling non-radioactive materials.

3. Increased costs in additional time consumed to perform work in conformity with radiological procedures — nearly two-thirds of the operating expenses for such a plant, including depreciation, might be incurred solely because radiation was present.

The Benefits of Radiation Protection

1. Confidence of employees in the protective system and thus more efficient work and greater ease in recruitment.

2. Extra hazard pay not required.

3. Life insurance available to workers at rates comparable to those in other industries.

No. 13

FOR RELEASE: 3:00 PM, Geneva Time,
Friday, August 12, 1955

ELECTRICITY FROM NUCLEAR ENERGY LIGHTS U.S. TOWN

Electricity produced from nuclear energy, has been used to light and power a town in the United States.

Arco, Idaho, population 1,200, became the first American community to receive its entire supply of power from a nuclear source when, on July 17, 1955, electricity produced in an experimental nuclear power plant operated by Argonne National Laboratory at the U. S. Atomic Energy Commission's National Reactor Testing Station 20 miles away was fed into transmission lines supplying the small town.

When the reactor power was cut in, utility lines supplying conventional power to Arco from the Utah Power and Light Company were disconnected. The entire community then depended solely on nuclear power for more than one hour.

Although the transmission of electricity from the nuclear power plant to Arco was, by prior arrangement, discontinued after the demonstration had been completed, the generation of electricity at the testing station site is being continued.

A motion picture record of the demonstration was presented to the United Nations today at the International Conference on Peaceful Uses of Atomic Energy. The U. S. delegation plans to make the film available during the Conference to representatives of 72 nations in attendance.

The experimental nuclear power plant, known as "BORAX", short for "boiling reactor experiment", was the subject of a major technical paper presented to the Conference on August 9 by Dr. Walter H. Zinn, Director, Argonne National Laboratory. The plant, which generates more than 2,000 kilowatts of electricity, was designed and constructed by the Laboratory. Harold V. Lichtenberger, who is a Technical Adviser to the United States Delegation at Geneva, is director of the Laboratory's activities at the testing station.

The reactor has been under development by the Laboratory since 1953. An experimental facility for conducting studies of a reactor of this type was constructed at the testing station site in the summer of 1953 and tests on safety and steady state operating characteristics were conducted. The tests were sufficiently encouraging so that additional studies were made in the summer of 1954.

Experience gained during the operation of this reactor warranted the addition of a turbo-generator so that the steam being produced could be converted into a more usable form of energy. This generation plant was placed into operation on June 28, 1955, and the production of electricity is continuing on a routine basis.

The reactor consists of a pressure vessel containing an assemblage of enriched uranium-bearing plates submerged in water,

plus a number of neutron-absorbing control rods. The water circulates through the reactor core by natural convection, and steam, produced by the heat created by the fissioning of uranium atoms, is conducted to the 3,500 kilowatt turbo-generator, located in a nearby building.

The simplicity of construction, ease of operation, low cost, and high degree of safety suggest that this type of small power plant is suitable for use in remote areas or in conjunction with mining or manufacturing operations.

No. 14 - See Appendix XVIII-August 11, 1955, Press Conference

No. 15

FOR IMMEDIATE RELEASE

Nuclear scientists of four nations — on their own and not as a part of the scheduled program for the International Conference on Peaceful Uses of Atomic Energy — have taken an important step to make use immediately of some of the hitherto classified technical data that has been exchanged in the Conference sessions.

It came about as a result of the August 17 session on "Cross Sections of Fissionable Materials" presided over by Dr. Donald J. Hughes of the United States' Brookhaven National Laboratory. Although a highly technical subject, accurate measurements of neutron cross sections are vital to the design and operation of nuclear power reactors. These are calculations that help determine the efficiency of the use of fissionable material. The large number of Conference papers read in this field is evidence of the importance of the subject.

After the session last Thursday morning, Chairman Hughes and Assistant Chairman D. Popovic of Yugoslavia gave a luncheon for the scientists who had participated in the program. They were quite excited over the fact that the paper just read had shown that there was substantial agreement, reached independently, on certain important cross section measurements in the papers from France, Great Britain, the Soviet Union, and the United States.

On Friday, August 19, at an informal two-hour session, the scientists did some further checking on their data. As a result, they have announced the "International Values For Thermal Cross Sections of Fissionable Isotopes." It was explained that this was equivalent to determining a rough standard measurement. However, there is still too much margin of error for it to be compared in exactitude to the accepted standard inch or standard centimeter.

But the figures for Uranium 233, Uranium 235, and Plutonium--- the sources of fissionable materials for reactor fuel -- were agreed upon for neutron absorption and neutron fission of these isotopes at the thermal level of energy -- 2200 m/s.

Those participating in the Conference included: from France - Bernard Jacrot, Francis Netter and Georges Vendryes; from Great Britain - J. E. Sanders and P. A. Egglestaff, both of Harwell; from the Soviet Union - V. V. Vladimirovsky, V. I. Mostovoy and Eng. S. I. Sukhorutchkin; and from the United States - Donald J. Hughes, John Arthur Harvey and Harry Palevsky, all of Brookhaven National Laboratory.

The technical statement released on behalf of the group by Dr. Hughes follows:

At Session 17 of the International Conference on the Peaceful Uses of Atomic Energy, a large amount of recently declassified information was presented on the cross sections of the fissionable isotopes U233, U235 and Pu 239.

In the low energy region, where extensive measurements were reported, excellent agreement was obtained for these isotopes, which are important in reactor design.

At the suggestion of the Chairman, the French, United Kingdom, Union of Soviet Socialist Republics and United States scientists met after the formal session to consider the thermal (2200 m/s) absorption and fission cross sections of these isotopes.

It was decided to prepare a set of world average values for these cross sections, which could be used as a means of coordinating reactor calculation based on these cross sections.

The quoted errors of the world average values here given are based primarily on the spread in reported results and are sometimes larger than errors of specific quoted results.

	$\sigma_{\text{abs}}(\text{barns})$	$\sigma_{\text{F}}(\text{barns})$
U ²³³	593 ± 8	52 ± 8
U ²³⁵	698 ± 10	590 ± 15
Pu ²³⁹	1032 ± 15	729 ± 15

RELEASE: 12:00 Noon, Geneva Time
(11:00 GMT) Saturday,
August 20, 1955

U. S. CONFERENCE RESEARCH REACTOR
TURNED OVER TO SWISS GOVERNMENT

The research reactor which has been a feature of the United States exhibits at the International Conference on Peaceful Uses of Atomic Energy today becomes the property of the Government of Switzerland. Switzerland thus is the first nation to acquire a reactor under President Eisenhower's Atoms for Peace program.

In a formal ceremony at the building erected especially for display and operation of the reactor during the Conference, Chairman Lewis L. Strauss of the United States Atomic Energy Commission and Professor Paul Scherrer, Chairman of the Swiss Commission for Nuclear Research, signed the necessary papers transferring the ownership of the reactor and custody of its nuclear fuel to the Swiss Government.

Participating in the ceremony also were the U. S. Ambassador to Switzerland, Frances E. Willis and Chairman Walter Boveri of the Board of Directors of "Reacteur, S.A." a privately-owned, government aided stock company which will operate the reactor.

Two documents were signed. The first is a "Memorandum of Transfer." Under its terms, the reactor, the building in which it has been housed, the machinery related to the facility and the exhibits in the building are transferred to the Swiss Government for \$180,000.

The second is an "Agreement of Lease" by which the United States leases to the Swiss Government the six kilograms of Uranium 235 which are contained in the enriched uranium fuel being turned over to Switzerland. At present, 3.7 kilograms are contained in the fuel in the reactor. The remainder is a reserve supply and will be used when it becomes necessary to return the original fuel now in the reactor to the United States for reprocessing.

Under prices set forth in the U. S. Atomic Energy Commission's announcement of Aug. 8, 1955, the Swiss will pay an interest charge of four percent on the uranium 235 content of the fuel which is valued at \$25 per gram. The Swiss will pay this price for any U 235 consumed during the operation of the reactor. The amount of "burn up" will be determined accurately when the fuel is reprocessed.

The Swiss Government also assumes the obligation of removing the reactor from its temporary location on the property of the United Nations European Center, tearing down the building and restoring the grounds of the Palais des Nations to their original condition.

The transfer of the reactor and lease of the fuel is made possible under the bilateral agreement between the two countries which became effective on July 18, 1955. Switzerland is one of the 24 nations which have negotiated similar agreements for assistance in the design, construction and operation of research reactors.

The reactor, with enlarged facilities, will be reassembled at Wurenlingen, a village on the Aar river some 140 miles from Geneva, where it will be used both for research and training. However, some months must elapse before this can take place to allow time for the "hot" irradiated fuel elements in the reactor to cool off.

The reactor has been seen by more than 50,000 people during the Conference and will remain on public display until 7:00 PM Sunday night. About 100 scientists and other prominent figures from 48 nations, including President Petitpierre of Switzerland, have operated the machine during the two weeks of the United Nations Conference.

It was built in the United States in four months by the Oak Ridge National Laboratory operated for the U. S. Atomic Energy Commission by the Union Carbide Company. Following exhaustive tests which were completely successful, the reactor was dismantled, flown to Geneva and reassembled in a record time of 14 days. President Eisenhower operated the reactor when he paid a surprise 45-minute visit to the installation on July 20 while attending the "summit" meeting in Geneva.

No. 18

For Release After 10:30
A.M. Geneva Time (9:30 GMT)
Saturday, August 20, 1955

UNITED STATES DELEGATION PRESENTS
TECHNICAL LIBRARY TO UN GENEVA

Dr. Willard F. Libby, Vice-Chairman of the United States Delegation to the International Conference on the Peaceful Uses of Atomic Energy, today presented to the United Nations library in Geneva the technical library which has constituted part of the United States technical exhibit at the Conference. The gift of the library was received for the UN by Dr. A. C. Breycha-Vauthier, Chief Librarian.

The technical library will be kept up-to-date by the United States AEC which will provide as it is issued all new unclassified published material originating in the AEC program. The library is a depository collection similar to those which the AEC maintains at 42 points in the United States and has presented to 29 other nations and CERN as part of President Eisenhower's Atoms for Peace plan.

The library, which has been visited by thousands during the Conference, contains all the unclassified material published by the AEC, and volumes of abstracts of scientific and engineering reports related to atomic energy published in the open literature throughout the world.

- (1) 28 bound volumes of the National Nuclear Energy Series sponsored by the USAEC.
- (2) Nine complete volumes of Nuclear Science Abstracts, covering some 50,000 technical reports and journal articles published throughout the world.
- (3) A complete set of the AEC semiannual reports and such books sponsored by the AEC as "Elements of Nuclear Reactor Theory," "Sourcebook on Atomic Energy," "Energy in the Future," etc.
- (4) Over 6,500 unclassified technical reports covering many phases of nuclear science and engineering. Of these, 1,625 are full-size copies and 4,900 are on microcards.
- (5) Over 45,000 abstract cards which index and describe the USAEC unclassified report literature.
- (6) A set of library tools such as a filing manual, subject heading list, etc.

The library is the equivalent of about 250 feet of library shelving and contains the equivalent of 150,000 printed pages (By use of microcards, the actual size is less).

In making the presentation of the library, Dr. Libby said:

"During the Conference, the library served its first purpose of helping to spread knowledge among the hundreds of Delegates who have come here and used its facilities. Now we wish to make it serve a second purpose -- of continuing that spread of knowledge as a permanent part of the UN collection here, and of leaving with the United Nations a substantial and lasting reminder of our gratitude for the service of the UN to science through this Conference."

Accepting the collection, Dr. Breycha-Vauthier said:

"By handing over these collections and your promise to keep them up-to-date you have given us a new and important instrument to assist in the research in a science which has rapidly become a matter of international concern. We promise to make this material widely accessible on an international basis in that spirit of helpfulness which is and always will be the policy of this library."

No. 19

CAUTION: Embargoed until 1330 GMT
Saturday, August 20, 1955

NOTE TO CORRESPONDENTS: Dr. Libby made some revisions in his paper to take note of developments during the progress of the Conference. This is the text of United Nations Paper Number 805 for Session 24 which will be given by Dr. Libby.

INTERNATIONAL COOPERATION IN ATOMIC ENERGY DEVELOPMENTS

by

W. F. Libby, U.S. Atomic Energy Commission, Washington, D.C.

Mr. President, members of the Conference and distinguished guests and observers:

We have had a momentous and fruitful two weeks together here at this first International Conference on the Peaceful Uses of Atomic Energy.

The benefits of this meeting have been great. Scientists knowing the same things separately increase their total knowledge in conferring with one another. Though possibly unable to tell one another anything new, the fact that another scientist has discovered the same knowledge working independently constitutes the final necessary scientific proof of essential truth. In this way has our total knowledge been greatly increased by this Conference. Let us hope that we shall meet again, perhaps in three years, to describe the progress made in the interim.

President Eisenhower, in his memorable address to the United Nations General Assembly on December 8, 1953, proposed that an International Atomic Energy Agency be established under the aegis of the United Nations. He proposed such an agency as an instrumentality to spread throughout the world knowledge which had been acquired by those nations with advanced atomic energy programs. Last September

the United States and a number of other nations, believing the world-wide sharing of atomic knowledge to be imperative, agreed to press forward with the creation of an International Agency. Since that time, a draft statute has been prepared and discussed by those nations and it is my understanding that this draft statute will be ready for consideration in the immediate future. These preliminary discussions were held by Australia, Belgium, Canada, France, Portugal, the United Kingdom, the Union of South Africa, and the United States of America.

However, the United States has taken steps to spread atomic knowledge in advance of the formation of the International Agency. During the last six months it has been disclosing to the world a good deal of its fund of information gained through the American people's immense outlay of time and treasure and energies. We hope that the accomplishments of this Conference will increase the tempo of international cooperation in atomic energy. We are sure that this Conference has contributed in large measure to an improved understanding on the part of all nations of the present and future prospects for the peaceful uses of atomic energy. Such understanding is certain to be followed by constructive, cooperative action to develop these uses throughout the world.

Most of you here are aware of the effort which the United States is making to assist other peoples to develop their own atomic energy programs. However, the extent and variety of the measures which we are taking may not be fully known to all of you. I would like to review the present status and future possibilities for United States cooperation in training of technical personnel and exchange of technical data, materials, and equipment. By bringing this to your attention now, we hope that in the months to come there will be a marked increase in the opportunities for cooperative endeavors presented to the United States.

Forty-seven countries now receive shipments of radioisotopes from Oak Ridge. It is intended to facilitate this foreign distribution by an early substantial liberalization of the regulations applying. For some time, the Oak Ridge Institute of Nuclear Studies has been offering a course in the handling of radioisotopes. In May of this year a special four-week course began at Oak Ridge with 30 scientists and technicians from 21 nations in attendance. The training they received was identical with that given to American scientists at the same school. In the future, a substantial percentage of the total enrollment in the course on radioisotope techniques will be reserved for students from countries other than the United States. The next course for foreign scientists will be offered in October.

There are many training courses offered in the United States on the utilization of atomic energy in the fields of biology, medicine, and agriculture. These courses are open to students from

all over the world. For example, pre and post doctoral training of from one to two years will be provided at Brookhaven National Laboratory, Argonne National Laboratory, Argonne Cancer Research Hospital and the U. S. Atomic Energy Commission projects at the University of California, the University of California at Los Angeles and the University of Rochester School of Medicine and Dentistry. Courses in the medical application of atomic energy are available at the Harvard University Medical Physics Laboratory, the New England Deaconess Cancer Research Laboratory and the Western Reserve University School of Medicine. The training offered by these institutions provides six to eighteen months of active participation with a research group. During this time the students gain experience under the direction of outstanding scientists in using the new tools which atomic energy has provided for their professions. American universities also give instruction in industrial hygiene for industries dealing with atomic materials in industrial medicine, and in radiological physics.

In the majority of instances the students pay for their training; however, when funds for training are not available, it may be possible to arrange for financial assistance through a program administered by the Department of State.

Many countries at the present time badly need more people possessing the basic technical training necessary for participation in specialized nuclear energy programs. Arrangements accordingly have been made for outstanding foreign students with scientific aptitudes to receive one to two years of such basic training at American universities.

A few weeks ago in Washington I had the pleasure of welcoming 23 distinguished physicians and surgeons from eleven countries who were about to begin a five-week tour of American cancer hospitals and laboratories. During the tour these doctors became acquainted with the research and clinical uses of radioisotopes and other weapons of atomic medicine in the battle against cancer. Two similar tours are planned for this fall.

As a means of disseminating information resulting from the progress of nuclear science in the United States, the U. S. Atomic Energy Commission has assembled technical libraries for presentation to those nations which desire them. A library, which at present occupies the equivalent of 250 feet of shelf space, consists of about 6,500 AEC research and development reports, 28 bound volumes of the Commission's National Nuclear Energy Series and six other casebound books published by the Commission, 11 volumes of the Commission's journal, Abstracts of Nuclear Science, which contain over 50,000 abstracts of the open literature on nuclear energy published everywhere in the world, and 55,000 catalog cards indexing the entire collection. Periodic additions are made to these

libraries. The United States only asks that the countries receiving these libraries provide in return their collections of similar official unclassified papers. The collection now on display at the United States exhibit has been given to the United Nations Library here in Geneva. A collection of works on particular aspects of nuclear science has already been provided to the European Center for Nuclear Research (CERN).

Since an increasing level of power generation is one of the prime factors in improving living standards it is hardly surprising that the interest of people throughout the world is focused on the utilization of nuclear energy in the production of electric power.

Remembering that this use of the atom is new, we must caution that the development of conventional power sources should not be neglected. For the next few years the atom will not be a major source of power. It is in the future — perhaps ten years from now — that we see it taking its rightful place as a primary source of power.

It is the aim of the United States to help other countries proceed, as rapidly as possible, toward the economic production of electric power from the atom. Harnessing a nuclear chain reaction, however, is a highly complex undertaking. The design and operation of a reactor requires scientific and technical personnel who are familiar with this new and complicated technology.

In recognition of this need, the United States has established a School of Nuclear Science and Engineering at Argonne National Laboratory near Chicago. The purpose of the School is to provide advance instruction in reactor technology. The School opened in March of this year with thirty students from nineteen countries in addition to the American students in attendance. During the seven months course the students receive instruction in reactor physics, reactor engineering, metallurgy of reactor materials, chemistry of the lanthanide and actinide elements, principles of separation processes, instruments, remote control, experimental reactor physics, and analytical procedures. A second course will begin in November and a third next March. When these men return to their homes, they will form nuclei around which may develop indigenous groups of atomic specialists.

The Government of the United States has concluded Agreements for Cooperation in the Civil Uses of Atomic Energy with more than twenty-five nations and is prepared to conclude similar agreements with many more. The agreements call for exchanges of information in the application of atomic energy to biology, medicine and agriculture. In addition, under these agreements, the United States aids in the construction of research reactors, will contribute half the cost of the first reactor in each country, and furnishes the

necessary fuel for these reactors. Nearly a year ago the President authorized the Atomic Energy Commission to allocate 100 kilograms of enriched uranium for use in research reactors abroad and last June this amount was increased to 200 kilograms. Agreements for the sale of heavy water have been made with a number of countries at a price of \$28 per pound. The enriched uranium containing as much as 20 per cent U 235 is to be leased at 4 per cent per annum on the basis of \$25 per gram of contained U 235. A charge at this rate will be made for the U 235 consumed. Ordinary uranium metal will be sold at \$40 per kilogram. All of these prices and values are estimated so the United States Government neither gains nor loses financially.

Research reactors, as you know, have many uses in themselves. These include: production of radioisotopes; medical therapy; solid-state physics research; studies on nuclear properties of matter such as cross sections for capture or scattering of neutrons, gamma ray spectrum induced by neutron capture, and radiation attenuation; reactor physics measurements; and reactor engineering experiments. The "swimming pool" reactor at the United States exhibit, which has been sold and transferred today to the Swiss Government, is one of the types of research reactors which the United States will help to build.

I should like to emphasize that each of these bilateral agreements states that it is the hope and expectation of both parties that the initial Agreement for Cooperation will lead to consideration of further cooperation extending to the design, construction and operation of power reactors.

The United States has no wish that any nation be dependent on American technicians for the operation of a nuclear power program. Experience in the operation of research reactors will provide a reservoir of trained engineers and scientists in the countries where such specialists are now lacking.

President Eisenhower, in his notable speech of last June 11 said: "If the technical and material resources of a single nation should not appear adequate to make effective use of a research reactor, we would support a voluntary grouping of the resources of several nations within a single region to acquire and operate it together." These are regions throughout the world where governments well might consider the establishment of such cooperative ventures in the operation of research reactors.

The following countries have negotiated Agreements for Cooperation with the United States, received technical libraries or have had students participating in one or more of our training programs: Argentina, Australia, Austria, Belgium, Brazil, Burma, Canada, Chile, Republic of China, Colombia, Cuba, Denmark, Egypt, Finland, France, Germany, Greece, Guatemala, India, Indonesia, Israel, Italy, Japan, Republic of Korea, Lebanon, Mexico, the Netherlands,

Pakistan, Peru, the Philippines, Portugal, Spain, Sweden, Switzerland, Thailand, Turkey, Union of South Africa, United Kingdom, Uruguay and Venezuela.

Making the atom serve man is a long and laborious task. Atomic scientists and technicians must first be trained and given experience. Experimentation and development work must be carried on continuously. The job is not a short one, but with large measures of patience, faith, and imagination we can confidently anticipate the time when all men will realize the full potential of the atom.

No. 20

FOR IMMEDIATE RELEASE

STATEMENT BY LEWIS L. STRAUSS, CHAIRMAN,
UNITED STATES DELEGATION,
CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY
SATURDAY, August 20, 1955

The first world Conference on the Peaceful Uses of Atomic Energy has been one of the most successful projects in international cooperation ever undertaken.

Of course, it is too early to attempt assessment of the contributions made here during the past two weeks. It will be some time later — weeks and perhaps months — before it will be possible properly to evaluate the many hundreds of scientific contributions and organize them in proper perspective.

Even before this scientific evaluation has begun, however, it is accurate to say that what has occurred here in Geneva has been most gratifying, especially the friendly atmosphere among all the delegates of the more than 70 nations represented.

A great deal of invention will surely be stimulated by this Conference.

The cross-fertilization of ideas that has gone on in the conversations between men of science — in the more than 1,000 papers that have been discussed, and in informal meetings — will, I think, produce an impressive number of inventions to further exploit the peaceful atom.

One of the most encouraging of all the aspects of the Conference has been the manner in which old lines of communication have been reopened among men who have not been able to communicate with one another for many years. Their exchange of hopes and ideas will have a direct bearing on the health, comfort and progress of human living.

Nothing like this Conference has ever happened before. It has lived up to the expectations of the American delegation; in fact, it has exceeded them.

It has been what it was intended to be when — with the authority of President Eisenhower — I first proposed it, before the World Affairs Council in Los Angeles last year.

I have previously expressed the hope of President Eisenhower that a second world Conference on the Peaceful Uses of Atomic Energy will take place.

APPENDIX XVIII - PRESS CONFERENCES OF U.S. OFFICIALS BEFORE
AND DURING THE INTERNATIONAL CONFERENCE ON
THE PEACEFUL USES OF ATOMIC ENERGY

PRESS CONFERENCE, NEW YORK CITY, MAY 12, 1955

PRESENT:

I. I. Rabi, United States Representative on the U.N. Advisory Committee on the Peaceful Uses Conference; George L. Weil, Technical Director, Office for International Conference, United States Atomic Energy Commission

DR. RABI: (Dr. Rabi began the Conference by making a statement, which is issued as a separate release (No. 2157) by the U. S. Mission to the U.N. See Attachment 1.)

I will now introduce to you Dr. Weil, who will explain the technical aspects of our presentation.

Let me say a few words about Dr. Weil first. He is one of the pioneers in the whole effort of atomic energy. He joined with the late Enrico Fermi in 1940 in the construction of the first reactor. He moved on with Fermi to Chicago where the first reactor was made to work and stayed with the project until 1944, when he went to Hanford. After that he spent some time at Los Alamos and with the Canadian project at Chalk River. From 1947 to 1952 he was in the Reactor Division of the Atomic Energy Commission in Washington. After that, until he took on this tremendously difficult job of organizing our presentation, he has been a private consultant in the field of atomic energy. We called him back to undertake this job. Dr. Weil is a veteran of this field and I am sure will be able to answer all your technical questions. Dr. Weil.

DR. WEIL. I would like to discuss the preparations that are being made for the Conference in Geneva and present to you briefly the various areas of activity.

There are two major areas of activity: first, the preparation of the technical papers; second, the preparation of the exhibits and the material related to the exhibits.

As you have heard, we have received over a thousand abstracts which were submitted from organizations all over the country. Now (indicating chart), this is a breakdown of those abstracts by organizations -- atomic energy laboratories, personnel of other

government agencies, business firms, educational institutions, hospitals and foundations. A total of 1037 abstracts were contributed.

Now, these abstracts were reviewed and evaluated and consolidated by review groups who were pulled together in Washington, made up of representatives in the various areas of technology and representing all phases of the country's interests.

These abstracts were then consolidated to about 524, which we are now submitting to the United Nations and which will have to be in their hands by May 15.

This (indicating chart) shows a breakdown, according to sessions, of the agenda which Dr. Rabi briefly described. The first three days will be plenary sessions and the last day will also be a plenary session. The discussions of reactors will include all types of research reactors, and power reactors; the discussion of chemistry and metallurgy will cover the problems associated with fuel elements and in getting the fissionable products out; the biology and medicine discussion will cover the uses of isotopes produced by reactors, which are here and now providing the great benefits to research people as well as in medicine and therapeutics. The discussion of reactor physics will cover how reactors are designed and the basic measurements in reactor physics. Technology will cover from raw materials through waste disposal and, finally, again the use of radioisotopes.

Now, you can see that we have had a very good distribution of papers submitted to each of these sessions. This column (indicating) gives the number of hours by the Conference to each session.

I would like to read just a few titles that I have selected to indicate the types of papers, particularly in the plenary sessions, which will cover the broadest topics.

For example, Dr. Farrington Daniels of Wisconsin has submitted a paper on alternate energy sources. Mr. Jesse C. Johnson, who is Director of the Raw Materials Division of the Atomic Energy Commission, has submitted a paper on nuclear fuel for the world power program. Dr. J. A. Lane of Oak Ridge National Laboratory has submitted a paper on the economics of nuclear power. Dr. W. K. Davis, who is head of the Atomic Energy Commission's Reactor Development Division has a paper on the capital investment required for nuclear energy. And Dr. Zinn, Director of the Argonne National Laboratory, has a paper on the boiling water reactor for power. Mr. Walker Cisler of Detroit Edison has a paper on the role which nuclear energy can play during the next 25 or 50 years. Professor Mason of Harvard has a paper on the survey of estimated world power requirements from 1975 to 2000. Mr. Sporn of American Gas and Electric — the role of energy and nuclear energy in the United States. Mr. Morris of the American Public Power Association — need in the United States for small power reactors.

We have a list here of 524. I have only picked the first few. The majority, of course, of these papers are highly technical. However, we will have in Geneva -- both the United States Delegation and the United Nations, as well as other countries -- science writers and reporters who will be able to interpret and evaluate the significance of the papers, particularly the technical papers, to the correspondents who are there.

Now, I would like to turn to another part of our participation -- the exhibits. There was a piece in one of the morning papers in New York which indicated there was some confusion. I think maybe there is but I think it can be explained.

This (indicating) is a map of Geneva -- the artist went overboard on the blue. But here is the downtown section, the hotel section. The Palais des Nations, where the Conference will be held, is about two or three miles from the downtown section. Now, we discovered soon after we took on this job that we had a very limited amount of space for exhibits, about 4000 square feet. We quickly tried to tie this up. Prior to that we had been told there was unlimited amount of space.

When we discovered we had only a small amount, we quickly tied up about ten times as much at another exhibition hall, which is several miles from the Conference.

Now this space down here (indicating) will be used by the United States Information Agency to show their popular Atoms-for-Peace exhibit, which has been touring Europe.

The United Nations has specified that any exhibit, because of the limited space in the Conference area itself, be highly technical and designed to supplement the technical papers.

In addition to that, last week we were told by the United Nations that they would encourage a trade show as distinct from a popular atoms-for-peace show.

So in all there will be three exhibits in Geneva, and these have sort of come one upon another as conditions have developed. First, there will be a highly technical exhibit in the Palais des Nations. Second, there will be a popular atoms-for-peace exhibit sponsored by the United States Information Agency at the exhibition palace. And third, in addition, a trade show at the exhibition palace. The second and third exhibits are not officially part of the Conference but are being encouraged in order to attract people and to supplement the Conference.

Probably the principal item in our exhibit will be the research reactor, and we have distributed copies of a very recent photo which was flown over from Geneva of the status of construction of this reactor. This reactor is what we call a "swimming pool" type reactor and is the type that many companies and research organizations are building in this country. It is a very flexible type of research reactor since it contains water which acts both as a shield and as a coolant and is a moderator. Instruments can be placed into the water very close to the core. This eliminates the need of having to go through holes, through concrete shields, and so forth.

This reactor is the type that could be used by other nations with the fuel that the United States is making available to the United Nations. The reactor will be housed in a separate building which is now under construction and the photo, as I say, indicates the status.

This (indicating) is an artist's conception of the housing of the exhibit. It will be a frame building. This (indicating) is an artist's sketch of the reactor which will be an iron tank sunk into the ground, excavated about 20 feet deep and about 10 feet in diameter. This (indicating) is an artist's view of the room with the reactor, and this blue glow which you see represents the emanation from the reactor when it is in operation.

This (indicating) is a floor plan of the reactor building. It shows the reactor. We will have exhibits inside the building indicating how the fuel elements are made, how the control mechanisms are put together, and giving some technical information with regard to the reactor itself. There will be a control room and a limited number of qualified delegates to the Conference will be allowed to operate the reactor. Other exhibits will be lined along the walls.

Now, the rest of the technical exhibit which we are installing in this 4,000 square feet will be housed in a room in the library wing of the United Nations building. This room is about 40 by 100. This exhibit is being planned by us.

However, there are some 80 organizations involved, private and public, including the Atomic Energy Commission. I can read you a few names: Atomic Energy Instrument Company, Columbus-Beekman Instruments in California, General Dynamics, General Electric, Massachusetts Institute of Technology, Minneapolis-Honeywell, Radiation Counter, Radio Corporation of America, Sloan-Kettering Institute for Cancer Research, Union Carbide and Carbon, United States Bureau of Standards, United States Geological Survey, United States Weather Bureau, Westinghouse, and so forth. Some 80 companies are contributing pieces of equipment which will go into this exhibit.

This exhibit is planned to tell a story from raw materials and feed materials through fuel elements, models of reactors, including the Atomic Energy Commission's five-year program, models of research reactors. There will be a reactor simulator. There will be an operating chemical separation unit here, with uranium and fissionable products actually being separated with a master slave safe manipulator, with an operator indicating how this is all worked. There will be examples of materials, components, fuel pumps, instrument section covering all of the uses of instruments, plus medical, industrial and agricultural uses of isotopes. Finally, it winds up with basic research -- including recently discovered elements -- which will be shown at the exhibit.

This (indicating) is a photograph of a model which has been constructed for the use of the people who were designing the exhibit. It indicates, first, the rather small amount of space that is available to show this material, and gives some conception of the distribution and how it will look.

I want to emphasize that what is in this exhibit will also be discussed in the technical papers -- all the instruments will be operating instruments. They will be "live" shows.

Now, as a further supplement to the technical papers, we are planning a film program in Geneva, which again will supplement the papers which are being discussed and will be presented at the Conference. There will be an hour and a half of films on reactors. "Nuclear Reactor for Research" has been prepared by the North American Aviation Company. "Developing Homogeneous Reactors", a film by Oak Ridge National Laboratory. "Progress Report on Sodium Graphite Reactors", a film by North American Aviation. And "Safety Experiments on a Boiling Water Reactor", which is the basis for the great hope that we have, that boiling water reactors would prove to be economical, is an Argonne National Laboratory film. In addition, there will be two films on the uses of radioisotopes; one in connection with general science, will show the uses of chemistry, biology, and metallurgy; the second, the application of tracer studies in therapeutics, treatment, and diagnostics of medical applications.

This is a brief review of what we are planning for the Conference. We have a lot to say and we are not doing it with any intention to outshine anybody. We feel that it is important for us to do our best to implement the general program of the President, and we feel that by presenting this information we will have done our share.

DR. RABI: Are there any questions?

Q. I have two questions, sir. The first concerns arrangements between the United States and Switzerland about the reactor. From what

side came the initiative for this, from Switzerland or the United States?

DR. RABI: I am not familiar with the diplomatic history. It is a very natural thing to do, and we will be very glad to come to an arrangement.

Q. What about the exhibits of other nations? Where will they be located?

DR. WEIL: They will be located in the same building. There are other rooms in the same building which are available.

Q. Also in the Palace?

DR. WEIL: That's right. There will also be other popular types of exhibitions downtown at the Exhibition Palace.

Q. Dr. Rabi, what would be the total cost of this whole program we are putting on?

DR. RABI: For the United States? I don't know. I haven't totalled it up. The whole delegation hasn't been selected.

Q. I mean the show itself.

DR. RABI: The exhibit?

Q. The exhibit, yes.

DR. RABI: Dr. Weil can answer that.

DR. WEIL: Well, it is not completed as yet. It will probably be more than \$300,000.

Q. How about the reactor?

DR. WEIL: That doesn't include the reactor. The reactor is about \$350,000.

Q. Dr. Weil, are you planning now that a nation can buy a reactor for something like a reasonable profit over and above \$350,000?

DR. WEIL: Well, this reactor, of course, may be a slightly smaller one than one would want in a research institution. It is to demonstrate the core. Now, however, one could buy this for something more than \$350,000 probably. I don't know what the negotiated price is.

Q. Well, I would take it from that — could you reasonably conclude from that that if they got one in a size that was practicable to them for actual use that a nation could practically buy one like that for about a million dollars?

DR. RABI: I think the way it would work out if a country wanted to do it is they would first have to negotiate a bilateral agreement according to our law. Then they would probably get permission to buy one from one of the companies. And what the price would be is hard to tell, but I think that when you talk about a million dollars you are in the ball park.

Q. That's getting this thing down to a bargain basement operation.

DR. RABI: That's right. That's progress.

Q. Dr. Rabi, the first country to sign such a bilateral agreement was Turkey. Could you tell us something more? Which Middle Eastern nation is next in line to sign such an agreement, and what Middle Eastern countries will be represented at the Conference in Geneva?

DR. RABI: As to the first question, that's a diplomatic matter which I haven't followed. There is no secret about it but I just haven't followed it and I can't tell you.

Q. Can you tell us what the power level of the reactor will be and what type of fuel it will use?

DR. WEIL: The power level will be 10 kilowatts. It will use uranium which has been enriched to 20 per cent in the U 235 isotope, clad with aluminum.

Q. You don't mean it would be 20 per cent uranium?

DR. WEIL: It would be enriched uranium. It would be uranium containing 20 per cent U 235 isotopes.

Q. The rest is 238?

DR. WEIL: There will be no radiation danger in connection with this reactor.

DR. RABI: Only because it will be thoroughly shielded. If anybody wanted to go swimming in this thing he would be exposed to the most serious radiation danger.

Q. The moderator used is ordinary water, is that right?

DR. WEIL: That is correct.

Q. Dr. Rabi, can you tell us if Dr. Einstein was consulted? Was he familiar with the plans, since you were working on it for some months, on the preparation of the Conference. It would be interesting to know.

DR. RABI: I didn't speak to him myself because I hadn't been down to Princeton now for sometime. But I have no doubt that he knew about it, because it has been discussed a great deal among scientists.

Q. Could I ask you, Dr. Rabi, to explain exactly what you mean by atomic trade exhibition? I think that was the words used. Or rather, Dr. Weil, does that mean that any of this material is possibly for sale to governments, or for sale later? What type of material is it?

DR. WEIL: It is primarily instruments. Whether the instruments themselves can be sold at the trade show or not, I wouldn't know. But in some cases there are governmental controls on the export of certain types of instruments. However, it will be an opportunity for foreign delegations who may see or hear something that they want to know more about to go around and at least window-shop and get prices. Whether they can do more at the trade show or not, I don't know.

Q. What kind of instruments are they?

DR. WEIL: Well, geiger counters, detecting instruments, radiation detection, health instruments, prospecting instruments, amplifiers. I think it runs the whole gamut of reactor energy.

DR. RABI: I think that is quite an industry. The manufacturing of these instruments runs to many millions of dollars right now in the United States.

Now the response to a question asked earlier about the Middle East countries: Looking at my list here, they are — Afghanistan, Iran, Iraq, Lebanon, Saudi Arabia, Israel, Jordan and Syria.

Q. Egypt?

DR. RABI: Let's see. Yes, Egypt is on the list.

Q. May I come back to the trade exhibition? Will this trade exhibition last longer than the Conference, or will it be closed by the end of the Conference?

DR. WEIL: I can't really answer that question because we are not taking part in the trade exhibition. It is a very new consideration.

It was only announced about a week or so ago that such a trade fair would be held, and our instructions were to advise exhibitors who were interested to write directly to Geneva. It will be handled through the Geneva organization, I guess, somewhat like the Chamber of Commerce.

DR. RABI: What Dr. Weil means is it is not an official United States exhibit; it is a private exhibit. Whoever can get in will get in.

Q. It might last longer than the Conference?

DR. WEIL: It might.

Q. And when you speak about the Exhibition Palace at Geneva, do you mean what they call Batiment Electoral?

DR. WEIL: I have been informed that that's correct.

Q. Dr. Rabi, have you had a chance to look at the abstracts of the papers being submitted by the other countries?

DR. RABI: I have been so busy that I haven't availed myself.

Q. Well, will you or Dr. Weil be able to say whether on the basis of what has come in that the countries with the most advanced knowledge in this field, presumably ourselves, Britain and Russia, that our scientists will be able to learn something as a result of this interchange of opinion, or will they already know everything that will be presented at this Conference?

DR. RABI: My own expectation is that we will learn a great deal. What has been presented so far, according to the agreement which we reached at the last meeting of the Advisory Committee in New York, are abstracts of the papers, not the papers. The papers themselves won't be due probably until the first of July. The abstracts look very interesting. How they will come out as papers, we can't say now. But certainly our impression has been, on the dealings with the different nations, that this is being done in a perfectly straightforward way, and that it would not just be a re-hash of stuff which has been published years ago. It will be cogent, modern, and up-to-date.

Q. There's something about sodium graphite on your chart there.

DR. WEIL: Yes, that is one of the Atomic Energy Commission's five-year program reactors which is under construction near Los Angeles.

Q. What is the significance of sodium there?

DR. WEIL: The sodium is the coolant, extracts the heat from the reactor.

Q. Is Mr. Cisler going to read his own paper?

DR. WEIL: Well, I should have added that we are only submitting abstracts to the United Nations, that the purpose of the meeting in Paris on May 23 is to select from all of the abstracts submitted an oral presentation. So I will be unable to say today whether that particular paper will be selected or not.

DR. RABI: Let me give the plan as we understand it now. It can be changed at the meeting in Paris.

Every country which wants to submit a paper can submit it. Now there is to be set up an organization within the United Nations under the Conference Secretary General who reports to Mr. Hammarskjold for studying these papers to see whether they conform to the type of paper we want. We do not want any political or propaganda papers. That is in the resolution. These will be studies and the appropriate papers then — all the papers which conform to the rules — will be published in the proceedings of the Conference, together with the discussions. Now, some of these papers will be read. The selection of papers to be read, actually read, will be made in Paris. Thus far, this is open, so we cannot say specifically that any one paper will definitely be read. All those which pass the test of being cogent to the Conference will be published in the proceedings.

Q. Why was a water cooled reactor chosen as a model rather than any other kind of reactor?

DR. RABI: It is a simple one. It is one which we could get up, and it is one which can be seen. You can see what is happening inside because water is transparent. It is a simple kind of reactor and a very useful one, and it is the sort of reactor we would recommend to a country which is just, so to speak, getting its feet wet in entering the atomic energy field. It is cheap and easy to assemble and easy to use.

Q. This fall, when the matter was up for discussion in the General Assembly, there was some discussion between the Russians and ourselves as to whether there were processes by which fissionable material could be denatured so as not to make it potentially war material. Will there be any discussion of those processes at Geneva?

DR. RABI: I do not think there is any paper from the United States Delegation on that. What the others have, I don't know.

Q. Is that because the material is classified?

DR. RABI: You are entering an area which is difficult for me. I can't go into any detail clearly. But that does not mean necessarily that the material is classified.

Q. Can you say how many papers the United Nations has already, including the 524? I mean, abstracts?

DR. RABI: To my latest knowledge, I think they have something like 800.

Q. How many do they expect, do you know?

DR. RABI: Well, all the countries haven't been heard from. I guess they will get a thousand.

Q. So we will have more than half?

DR. RABI: Of those submitted, which is natural since we are the first in the field and the largest effort in the field. That does not mean that we will give more than half or half the papers. We have to see what shows up.

Q. Can you tell me if the United States has declassified any atomic information in view of the approaching Conference?

DR. RABI: I am glad you asked that question. As you know, there has been a change in the law recently on declassification — and declassification is going on all the time; it is a continuing process within the Atomic Energy Commission.

Now, we are not declassifying anything for this Conference just because the Conference is being held. But we are declassifying a great deal all along as the situation changes in the law and in the necessities of building up within the United States of this large atomic energy enterprise which is going on.

Private industry is entering this in a big way. We have to do a good deal of declassification for our own needs.

So we will have, I think, a lot of new material to present but not because we have declassified it for this particular occasion.

Q. Dr. Rabi, am I correct in my assumption that all of the material will be presented at this Conference has never been published, that is that the United States is submitting?

DR. RABI: No. What we hope to accomplish, one of the objectives of the Conference, is to get the nations of the world to have a better understanding of what atomic energy means in their own context. So the purpose will be to clarify information which has been published in fragments here and there, and has not been put together in a thought out, reasonable, consistent whole, which the governments of the different countries might use in planning their future in atomic energy.

It will be difficult to publish any scientific paper in the first place without referring to past work, but this is just not restricted to a few words about a new accomplishment.

We are going to try to make a setting. After all, most of the nations who will attend this Conference have had no atomic energy experience of their own, at least nothing very large. For many of them this will be a new rich offering and the proceedings of this Conference will be, I hope, a wonderful introduction to the whole field.

Q. I know that there is no arrangement, there is no intention that this Conference should lead to the setting up of an organization of any kind, but do you expect that any perhaps informal channel for this exchange of information on the peaceful uses of atomic energy will result from the thing?

DR. RABI: Well, I do hope that this Conference for the gathering of such a galaxy of scientists will result in a new spirit, a better acquaintance, more trust and understanding, which might lead to such an organization.

We are carefully avoiding any political aspect to it. We are not making plans for this. What people will talk about in the halls, of course, is their own concern.

Q. You said you didn't have a chance to avail yourself of the papers submitted by other countries to the United Nations. But do you have any idea in what fields the Russians will be submitting papers?

DR. RABI: They have come in. They have to be translated. I haven't seen them as yet. The United Nations is putting them out as fast as they can get them translated. Part of the general agreement on procedure was when these abstracts come in they are translated and sent out to all the member countries. I just haven't seen them and can't tell you, but we will have all of that material available before we meet in Paris. And our delegation is going to get to the meeting well before the 23rd of May when our meetings start, and we will be thoroughly prepared with a knowledge of other offerings as well as ours.

Q. Dr. Rabi, have there been any plans made to follow up the results of the Conference? I mean, this is a United States initiative. Any result coming from the Conference will trickle down to the populations concerned, and I have in mind the Soviet Union and the iron curtain countries. Is there any way to check up whether they are making use of any gains which are gained from them?

DR. RABI: Well, I am not an expert in finding out what other countries are doing. We have not yet matured any plans for what the next step might be after this Conference. I hope we don't have one the following year! It is just a tremendous job.

Q. Dr. Rabi, in your statement you emphasize the fact that no classified material will be made available by the United States. Are you referring to classified material for peacetime uses or are you referring to classified material in the sense that your material is classified for valid reasons of national security?

DR. RABI: When I referred to classified material there I referred to classified material under the definition of the law. You see, there is a declassification guide, which is the bible and which one is expected to follow. And there is a group known as the Senior Responsible Reviewers consisting of eminent scientists from all over the country who meet quite frequently to go over the material that exists and what should be declassified. They recommend to the Commission. The Commission then does what it thinks best to do. That is the procedure. In other words, when I am referring to classified material, I am referring to this procedure, and --

Q. What is the criterion of classified material beyond the ordinary sense of the word as it affects of course national security?

DR. RABI: It is not a popular word -- it refers to what the Atomic Energy Act describes as classified material, and I'd have to be a lawyer to explain it in detail.

Q. Well, I'll tell you what I have in mind. For instance, suppose there were a patent -- nothing to do with national security -- and we withheld that purely because it is a patent.

DR. RABI: A patent held by private concerns?

Q. Yes, and other countries, for instance, would feel the same way. This might reduce this Conference to what you called a re-hash of something, of showing off how much knowledge each country has instead of making a real genuine build up of the sum total of scientific knowledge that the world could proceed with on the maximum basis of progress.

DR. RABI: I think that you are picturing a situation which exists in all fields. That is to say, suppose there is a congress of oil technicians. They get together very happily and exchange useful information. Yet each company may be withholding some information for further development. What you are describing is just the ordinary course of events, and I am glad to bring this atomic energy subject down to a sort of normal situation, away from the flights of unrealistic idealism and to the ordinary relations between countries and between industries.

Q. How much uranium will it take to run this reactor? And is it above the 100 kilos that Mr. Lodge offered, or is it part of the 200 kilos?

DR. WEIL: It will be something on the order of 5 kilograms of uranium 235. So it will be roughly a twentieth.

Q. Is it part of the offer made by Lodge to the United Nations or is this over and above? I am trying to find out whether this is the first time any of that is being used.

DR. WEIL: It may be the first time a bilateral agreement will involve the transfer of fissionable material.

DR. RABI: I am not sure the bilateral agreement has been made, but the transfer will not be made for a long time with Turkey. This may turn out to be the first transfer. I don't know.

Q. Will this be the first use of that uranium that was offered in the United Nations?

DR. RABI: I am not sure. I haven't anticipated that question. I should have been prepared.

Q. Will the sale to Switzerland include the raw material?

DR. RABI: Yes, under appropriate arrangements for safeguarding the raw material and its return to the United States for processing.

Q. What are the practical uses of this reactor? Why should the Swiss Government want it? It is a research reactor — can it go beyond the field of research?

DR. RABI: It is a research reactor only. It is for training scientists in its use, for making measurements of fundamental material properties which are useful in reactors, of various kinds of radiations, and so forth. It is mostly for basic science and basic knowledge.

DR. WEIL: You can produce many isotopes with this that can be used in current and other types of research.

Q. Dr. Rabi, is this a new reactor design or is it the model pretty much after something we have here?

DR. RABI: It is an adaptation of a design which was first made, I believe, in Oak Ridge and which is actually operating there every day for research purposes.

Q. May I ask whether the rest of the nuclear material in this reactor is part of the 100 kilograms the United States has pledged and do I understand that this is five kilograms of the same basic material as the 100 kilograms?

DR. RABI: Let's see. I think that what Dr. Weil meant was that there will be five kilograms of contained uranium-235 and that this is 20 per cent; so altogether there will be 25 kilograms of uranium, of which five kilograms will be uranium 235. I might just mention that two United States universities are building this sort of reactor for instructional use and research.

Q. Can you explain why we are getting 4,000 square feet of floor space in the library at the Palais des Nations, whereas the United Kingdom is getting 5,000? It is a matter of their asking for more, or their being allotted more?

DR. WEIL: No, it is probably more a matter of that they asked for more. We actually were the first nation to request space for exhibits and we sent a man over early in March to look the place over, and he selected a room which he felt was the best one for showing an exhibit. He is an exhibit man. That happened to be 4,000 square feet. Now, since then, the United Nations has invited the other nations to put in requests for exhibit space. There is another room which is now a museum which I believe the United Kingdom and the Commonwealth group will use cooperatively for their own exhibit.

Q. Is the exhibit that we saw last fall during the General Assembly at the United Nations part of the popular show that you are going to have, or is that the exhibit?

DR. RABI: I am told it is similar.

Q. Dr. Rabi, you say in your statement that this country knowing most will gain most. Well, now, knowing most does that mean that this 1,000 extra feet of space the British want simply represents an ineptitude on their part and the efficient utilization of space on our part?

DR. RABI: Sir, I am not an exhibit man. I am sure they will have an interesting exhibition. I am sure we will have a fascinating exhibition.

Q. Dr. Rabi, actually how much would you say of the Conference material comes into the question of classification in this country?

DR. RABI: All the papers have to go through a declassification procedure. And this declassification procedure depends not only on us alone but on other countries with which we have agreements. According to the Atomic Energy Act, all information brought forth is born classified.

Q. I am not talking about the world historical situation but of the papers you are submitting now. Approximately how much would have been classified prior to the time they were submitted?

DR. RABI: I would say that a very large part of them in the area of reactor technology and reactors would have been classified say a year ago. As I explained this declassification process, it is a continuing one, like digestion.

Q. Thank you very much.

ATTACHMENT I - STATEMENT OF DR. I. I. RABI

I have invited you here today because our delegation is leaving Sunday for Geneva and Paris to deal with matters of great importance for international cooperation about which I think you will want to know and are certainly entitled to know.

Those of you who are close to the United Nations are no doubt aware of the International Scientific Conference on the Peaceful Uses of Atomic Energy. For the rest of you, let me present a brief summary of the history of this endeavor — and I hope that in doing so I can make the whole thing a little less forbidding than the title suggests.

One of President Eisenhower's first acts, after his inauguration, was to propose that the United Nations proceed with all vigor toward the application of atomic energy for peaceful purposes on an international scale. Some steps that have already been taken by the United States are known to you all — the release of fissionable material for the use of other countries, the negotiations of bilateral agreements tending toward joint efforts in the field of nuclear energy.

Pursuing the President's purposes, Lewis L. Strauss, Chairman of the United States Atomic Energy Commission, announced on April 19 of last year in California the President's interest in calling an international conference on the peaceful uses of atomic energy in order to exchange scientific and technical information with other nations, and to discuss in general the technical problems that the vast and important field immediately brings into being.

The response was immediate and enthusiastic. By the end of the year, the proposal had received the unanimous approval of the United Nations Assembly — and I do not have to tell you that unanimity in a matter of substance is not easy to come by in the United Nations. Since then, the project has gained tremendous momentum. It is no longer merely an idea. Preparations for the Conference are already in full swing in Geneva, where it will begin August 8. This country, Great Britain, Canada, France and the U.S.S.R. are giving it full support. It is going to be one of the greatest and the most fruitful international conferences for the application of science to human welfare.

Let me give you some idea of the scope of this Conference. In all, 84 countries were invited — all nations in the United

Nations or in any of its Specialized Agencies. To date 51 of them have accepted — 38 United Nations Members and 13 non-Members. In this number is included every major nation in the world — most nations that might be said to have an immediate or a prospective interest in the peaceful uses of atomic energy. Eastern European countries are liberally represented by the U.S.S.R., Czechoslovakia and Poland; India, Japan and Pakistan are attending from Asia; most of the Latin American countries as well as the Western European and Commonwealth countries will be on hand. The Middle East will also be well represented. Technical papers will be submitted by each country — and each country, of course, will be sole judge of what it chooses to submit. I say this to emphasize the fact that no classified material will be made available by the United States, and there is nothing in the structure of the Conference that will make it possible for other nations to gather from us material we do not want them to have — material, that is, that we would not make publicly available to our own industries.

The outpouring has been incredible. Here in the United States we have been offered more than one thousand papers by our scientists. Somewhat ruthlessly, we will weed out all but the most significant, and we expect to go to Geneva with several hundred. Britain will have about 100 of its own and France about 70, and I have been informed that the United Nations has already received more than 100 from the Soviet Union. I have been attending scientific meetings all my life, and I can say to you frankly that the quantity and the quality of the material that will be offered at Geneva exceeds my greatest expectation.

Dr. George L. Weil, who is the Technical Director for planning United States participation in the Conference, is here with me to inform you about the technical areas of the Conference, and I do not want to trespass on his territory. But let me suggest some of the matters that will be covered:

First, all the economic aspects of energy production in general and the scientific and technical aspects of atomic energy specifically. The countries of the world have to know what atomic energy costs, how it stacks up against other forms of energy, what the future is for these other forms. We have to know about raw materials — where they are available, what they will cost, when they will run out.

Next, the technology for the future. What can atomic energy do in medicine, in biology, in agriculture and nutrition, in industry? In these fields the United States is proud that it has much to give the Conference — and certain that it has much to learn.

Then the hazards of atomic energy — the disposal of waste material, the protection of health. Again, we know a lot about these things and I need not tell you that some of the major problems of atomic energy lie squarely in this area.

We can profit from anything we can add to our own knowledge in any of these fields. I would like to go on about this, but Dr. Weil can be more specific and more accurate than I. I leave the field to him.

I have spoken to you so far as an enthusiast for this Conference—as I must admit I am. Now let me say a few words about the plans for United States participation in the Conference.

To begin with, this country plans to throw its full weight behind this meeting. We are gathering the best work of the best brains in our scientific fraternity. We are planning major exhibits in Geneva, including a working nuclear reactor — something that most of the scientists who attend have never seen. This is a major effort. Those of you who will be in Geneva will have an opportunity to inspect this reactor at first hand. Part of our mission abroad at this time is to check on the progress being made in setting up this reactor and the other exhibits in Geneva.

With respect to the reactor, I have been authorized by Washington to inform you that arrangements are now being made between the Government of Switzerland and the United States under which the reactor now being erected in Geneva will be sold to the Swiss Governmental authorities for the research use of Swiss scientists following the Conference. The details of this agreement will of course require some time to work out, but there is a firm intention to reach agreement on a purchase arrangement. The reactor will, of course, have to be moved from the Palais des Nations grounds to a location suitable for research purposes after the Conference has ended.

Our delegation has not been firmed up but I can assure you that it will be representative of the American scientific community. Its members will make a great contribution to the Conference. It is our hope that Commissioner Strauss will head the delegation.

Now, as to our plans for this trip. From Geneva, we will go to Paris. President Eisenhower has appointed me to represent the Government at the meeting of the United Nations Advisory Committee to Secretary General Hammarskjöld. This committee is made up of one member from each of the following countries: Brazil, Canada, France, India, the United Kingdom, the USSR, and the United States. Among us, we will complete the plans for the Conference.

I am, as I said, an enthusiast for this Conference. I have to confess that it has in a sense a deep personal meaning for me. I was, as you may know, one of those who aided in the development of atomic energy, ten years ago and more, in the New Mexico desert. I did not believe then, and I do not believe now, that the end of our efforts was destruction. Our country shared in one of humanity's greatest discoveries, and we have always been aware of our responsibility for turning this discovery to the betterment of human conditions everywhere. Now we, as a nation, have another opportunity to go ahead in the course we ourselves prefer to take. No nation can lose from this Conference. We will all learn, and we will all profit. This country, knowing most, will gain the most. Countries will be present whose delegates will learn from every word that is spoken or read, and who will go back to their countries to begin making a richer, better life for their peoples.

All this is international cooperation at its very highest and its most useful. It is inspiring to me, as an American, to realize that it was the United States that initiated this Conference. The United States will make every effort to ensure the success of the Conference.

PRESS CONFERENCE, NUCLEAR ENERGY WRITERS ASSOCIATION
OVERSEAS PRESS CLUB, NEW YORK CITY, June 24, 1955

PRESENT:

Jerome D. Luntz, President, Nuclear Energy Writers Association.
Lewis L. Strauss, Chairman, U. S. Atomic Energy Commission
George L. Weil, Technical Director, U. S. Delegation to the Geneva Conference.
John P. McKnight, Information Director, U. S. Delegation to the Geneva Conference (on temporary assignment from U. S. Information Service, Rome).
Morse Salisbury, Director, Division of Information Services, U. S. Atomic Energy Commission.
Members of NEWA and other press representatives.

MR. LUNTZ: My name is Jerome Luntz. I am speaking for the Nuclear Writers Association, which, as many of you may know, is the organization that is sponsoring this press conference.

NEWA -- the Nuclear Energy Writers Association -- is a new-born group, just about one month old. I thought that before getting into the conference itself, I might just take one minute and tell you something about NEWA as a slight sales talk.

I just want to read to you two paragraphs from Article I of our Constitution:

"The Nuclear Energy Writers Association is a professional, non-profit organization of individuals interested or engaged in the preparation or dissemination of factual information concerning the development or application of nuclear energy.

"The purpose of the Association is to encourage and promote the widespread dissemination of factual information concerning the nature, development or application of nuclear energy."

As the first activity of NEWA, we thought it would be very appropriate, because of the tremendous public interest in the Geneva United Nations Atomic Energy Conference, to have this as the subject of our first activity; and we are quite delighted that we have been able to get the Chairman of the Atomic Energy Commission to visit with us and talk to us about the Conference.

Admiral Strauss has said that he has to catch a plane at 5:30 and he will have to leave here at about 4:30. First, there will be some introductory remarks, following which we will go to the questions and answers.

Therefore, I am going to turn the conference over to Mr. Lewis L. Strauss, the Chairman of the Atomic Energy Commission. (Applause)

CHAIRMAN STRAUSS: Thank you, Mr. Luntz. I do not know whether I am a black-balled applicant for this body or not. Corbin Allardice, who is a member of this organization, told me that I was eligible and I asked him to propose me for it. I wouldn't want to embarrass you by asking you to tell me whether my suspicions are correct or not.

It is both a privilege and a great pleasure to meet with you here today, specifically because I have just understood that I am participating in your initial service meeting. Therefore, this would seem to be a most appropriate occasion to express gratification that the organization has been formed and to wish it well.

The expanding interest in atomic energy is both an opportunity and a challenge for you and for us in the Commission. The people of our own country and of other nations as well have to be kept informed of the progress which is being made in the various fields of nuclear science and technology and in the significance of the peaceful applications of nuclear energy as they relate to the lives and well-being of all of us.

This progress will be exhibited and will be illuminated also, I hope, six weeks hence, when the International Conference on the Peaceful Uses of Atomic Energy convenes in Geneva.

For you -- the nations' top-flight writers on nuclear subjects -- it could be an exciting and challenging event and I hope that most, if not all, of you will be there.

Speaking for the Atomic Energy Commission, I can assure you that we intend to do all that we can at Geneva to cooperate with you and facilitate your work.

At this point, I would like to speak about our Government's attitude toward the Geneva Conference and our policy governing our participation in it. I will confine my remarks to a very few sentences in order to afford you an opportunity for questions, because I think the answers to your questions will probably be more serviceable than a monologue from me.

First, I would like to have you meet the key people who have come up here with us and who are going to run the show. I would like to introduce Dr. George Weil, the handsome gentleman on my right, who is the technical director of the United States Delegation. He has been living with the Conference, in the organizational stages, about a period of three months now.

MR. WEIL: Four.

CHAIRMAN STRAUSS: Dr. Weil was Deputy Director of the Reactor Development Division of the Atomic Energy Commission until he resigned two years ago to enter private practice. Prior to that, going back to the days of the Manhattan Project, he was active in the development of atomic energy when it was a secret project, hidden away under the stands at Stagg Field. I think it can be said that Dr. Weil brought the atomic age into being by starting the first pile into criticality.

Next, I would like to introduce John P. McKnight, whom we were fortunate to kidnap, temporarily, from his post in Rome with the United States Information Service, to direct the overseas publicity job and all the public relations of the American Delegation. He is an old A. P. hand and is probably known to most of you.

Then, Morse Salisbury, long the Commission's Director of Information, who will work with our American press, radio, television and other media.

This Geneva Conference, as I am sure you know, was conceived here in this country and came about as the result of the initiative of the United States. It is a natural sequel of the President's stirring speech to the General Assembly of the United Nations on December 8, 1953, setting out a plan that has come to be popularly known as "Atoms for Peace."

In the April following the President's speech, I announced that we would call such a Conference, and later a specific American proposal to the United Nations resulted in the unanimous adoption by that body of a resolution last December 4th calling for this international technical conference on peaceful uses of atomic energy.

From the very moment of the birth of the idea, we regarded the Conference as a great opportunity to form a partnership at the scientific and engineering level to advance the peaceful exploitation of atomic energy throughout the world.

All of us associated with the Commission are gratified by the response that has come from the American scientific and engineering communities. As a result of that response, we know that we are going to be able to make a significant contribution to all segments of the conference agenda.

In toto, we hope to present about 150 papers which will be read and we expect to have a total of more than 500 in the aggregate which will appear in the printed proceedings that will be published, we anticipate, by the United Nations.

Of course, we will be receiving as well as giving. Many nations are going to contribute to the success of the meeting. In the formal scheduled sessions and in the informal conversations, the Conference presents a unique opportunity for exchange of rapidly accumulating knowledge which will enable the peoples of the world to use the atom for benign purposes.

Just one other point: This is not to be a sort of scientific Olympic games. At least we have not envisaged it as that. As a matter of fact, we are not going to Geneva with any idea of competing or of attempting to dominate the program. Actually, it is to be in no sense a contest from our point of view. In numbers of people involved and in terms of investment, it is true that we have perhaps the richest and most diverse atomic energy program and the one that has been running the longest. Therefore, it naturally follows that we should make an outstanding contribution, but, as I have said, we are not going in just for the sake of proving that we are better than anyone else.

Our contributions and those of the other participating nations will be more useful because, in adopting the Conference rules, it was formally agreed to make this gathering strictly non-political. There shall be no resolutions or political discussions and it will be a perversion of the purpose of the Conference if it develops that any occur.

What should be provided is an atmosphere favorable to good relationships and a freer sharing of information. When the President spoke before the United Nations some eighteen months ago, he voiced the hopes of peoples everywhere that this great new source of energy could be turned entirely to peaceful ends. He gave certain assurances then as to what the United States would do to help reach that goal, and, as a result, you know that the agreements with twenty-two nations have already been negotiated. We initialed the last one yesterday afternoon with the Government of Uruguay. Incidentally, I did not know until I put my name to it that the title of the Uruguayan Government is the Oriental Government of Uruguay. That is what it is called.

The United Nations Conference at Geneva represents a further step toward the fulfillment of those assurances and hopes. It is an earnest indication of the determination of this country to bring to full realization the world's hopes that the atom shall be the servant, not the master of mankind.

I think I have done enough speechmaking and I will step aside and turn the meeting over to Dr. Weil, Mr. McKnight and Mr. Salisbury, except for this: that since I do have to leave before this session will conclude, if there are any questions that you wish to put to me personally, perhaps I should stand here and take the fire until you are ready to have me sit down.

QUESTIONS: Are you going to head the American Delegation personally?

CHAIRMAN STRAUSS: The names of the delegates, Mr. Laurence, have not yet been announced. I expect the White House will do so shortly, and I think, in advance of that, it would be out of place for me to anticipate it.

QUESTIONS: A couple of days ago the Russians announced that the Soviet Academy of Sciences was having a meeting on peaceful uses of atomic energy July 1st to 5th and that scientists from forty-one countries had been invited. What do you think they are trying to do there?

CHAIRMAN STRAUSS: I have speculated a good deal about it, sir, but I don't believe those speculations have a part in a serious session such as this. I think that one might take note of the fact that it was called on very short notice; that to invite serious men to attend such a meeting on two weeks' notice, a meeting held thirty days prior to a formal long-planned session in which Russia, as a member of the United Nations, is one of the hosts, could only have some bearing upon the second and more important session. What it is, is just a matter of speculation.

QUESTION: Do you know if the National Academy of Sciences is accepting the invitation?

CHAIRMAN STRAUSS: I know the answer to that, sir. I have some question as to whether the proprieties would be served by my stating it. I think it had best come from them. I think it is only fair to say that the wire services have indicated that the academies of science in certain European countries which were invited have been reported as having declined on the grounds of the shortness of the notice and of the fact that they were busy preparing for the Geneva Conference.

QUESTION: How technical will be the reports presented at Geneva?

CHAIRMAN STRAUSS: I can only answer that with reference to my own technical capacity. I have reviewed the abstracts of a number of them. I might say that at the meetings at which some

of them will be delivered, I might just as well be climbing an Alp for all that I would understand of the subject. There are others which are within my competence to follow. There are some fields that are so specialized that I think only the specialists in those fields will derive a great deal from the papers. They range all the way from the very abstruse, not to the popular, but to the moderately comprehensible to the uneducated reader.

QUESTION: I understood they were going to have liaison men to bridge the gap between the popular interpretations and the scientific presentations.

CHAIRMAN STRAUSS: We are taking a number of our technical staff away from their duties in the Commission to have them at Geneva with that purpose, among others, in view. We will have -- from research and development and reactor development, and biology and medicine--a sufficient number of our technical people to serve you in these specific areas.

QUESTION: There have been statements in the press that the Russians -- a rumor that the Russians are going to reveal a great deal more about this subject than has been told to the American people in general. You have probably seen those statements. Can you say something about that?

CHAIRMAN STRAUSS: I heard nothing but the rumors to which you refer. I hope the Conference will result in much material of that sort. It will certainly justify its calling.

QUESTION: Is the American Delegation preparing to drop any technological bomb shells at the Conference?

CHAIRMAN STRAUSS: No. We had one little surprise which is no longer a surprise, but which we hope will be both instructive and illuminating. It is a research reactor which will be installed and operating in its own building, closely adjacent to the Palais des Nations, just a short putt from one side of it, not even a chip shot. It will be open to the members of other delegations to watch it operate and to operate it, and of course, to you ladies and gentlemen who come over and want to see it.

I have seen those men who have it in charge and I have seen photographs of the installation which I had feared, as a disillusioned old man, would probably be like other such exhibits that are completed the day a world's fair or an exhibition closes. This building is finished. The landscaping around it is finished. Grass will be growing in front of it, and the reactor has been operated and is now being disassembled prior to shipment. It will be shipped to Geneva, will be installed and will be operating before the doors open for the first day's session.

QUESTION: I have read reports that some European countries have gone to one another in order to get information to establish research reactors. Have they any research reactors operating? Do they ever come to us for information about the kind you are referring to now?

CHAIRMAN STRAUSS: Yes, some twenty-two countries have come to us within recent months about that particular type of reactor. Until the Atomic Energy Act of 1954 was enacted, and was signed by the President the 30th of August of last year, and the rules of the game were changed, we were not in a position to exchange the kind of information which we are now prepared to exchange under these bilateral agreements.

It is true that certain European nations have banded together. You have heard of CERN and there are one or two other such combines. They are helping one another.

We have stated that we would be prepared, in the case of European countries and specifically in the case of Asiatic countries, where there is a shortage, by comparison with Europe, of trained technicians, to assist groups of countries, if they wished to band together to build a reactor.

QUESTION: Do I understand by these reports that we are now in a position to give out more information so that countries which come to us now will be able to get more than in the past, when they had to go to different European countries?

CHAIRMAN STRAUSS: They could not get from other European countries, so far as I know, the precise kind of information that we are prepared to give them, nor could they get the fuel for such reactors. It takes more than the information as to their construction and operation to make them realities.

Previously we could not give this information. We could not have given it heretofore until the agreements to which I refer, that is, the bilateral agreements had been negotiated, had been approved by the President, and had lain before the Congress for a period of thirty days while Congress was in session. That period of thirty days has already elapsed with respect to the agreement with Turkey, the first such country to negotiate a bilateral agreement with us. I believe the thirty days now begins to toll quite rapidly with respect to a number of other bilateral agreements.

Unfortunately, I don't remember them in sequence and can't tell you the countries.

QUESTION: Will the meeting be confined to the twenty-two countries?

CHAIRMAN STRAUSS: No, sir. Some sixty countries are involved in the meeting.

QUESTION: Does that include Russia?

CHAIRMAN STRAUSS: It does include Russia and a number of satellite countries. It is a United Nations Conference, and all the member countries were invited. At least, if there were any omissions in the invitations, I don't know of them.

QUESTION: When you say bilateral, what are the other countries going to give us? What are we to expect from them?

CHAIRMAN STRAUSS: In the first place, Mr. Laurence, we recognize the fact, which I am sure you would be the first to agree with, that there is nothing peculiarly American about the development of atomic energy. If one thinks of Einstein, Bohr, Meitner, Wigner, Fermi and Von Neumann - - I could go on for an hour and name you names without naming a single native born American - - who are important figures in the genesis of this whole enterprise.

It would be flying in the face of facts to assume that suddenly all atomic discoveries have flown Europe and are going to be made within our boundaries. Things will be, have been and will continue to be discovered in friendly countries in Europe. We will benefit by this exchange. We will have access to these reactors which they will build, and there will be a cross-fertilization between our people and theirs which is bound to be productive for both of us.

That is the fundamental philosophy behind the President's idea.

QUESTION: To pursue Mr. Laurence's query further, I wanted to know - - I understand that the British bilateral agreements are specifically raw ore in exchange for - - and I wondered if we had gone into anything as concrete as that?

CHAIRMAN STRAUSS: You mean the bilateral agreements that Great Britain is executing with other countries?

QUESTION: Like Australia and those other countries, like heavy water and materials that they have unprocessed.

CHAIRMAN STRAUSS: I can't answer that because I don't know whether there is any uniformity between the agreements which Great Britain is executing with other countries. I have only seen one of them. I saw that on a privileged basis. It was not dissimilar to our own, that particular one, but I simply can't tell you about those. We are publishing ours. As fast as they go before the Congress, they are inserted in the record and are available for everyone to see.

QUESTION: Do you anticipate that Russia would give information to us as freely as we may give it to them at this Conference?

CHAIRMAN STRAUSS: I can't answer that, I am afraid.

QUESTION: Or would they give us anything?

CHAIRMAN STRAUSS: I just don't know.

QUESTION: The twenty-two bilateral agreements, and more specifically the three with United Kingdom, Canada and Belgium, set fairly close limits on the kind and nature of information we exchange. Can we presume that in a meeting of this kind, at Geneva, where others besides these twenty-two nations are included, the limits will be even tighter, the area even smaller?

CHAIRMAN STRAUSS: The information that will be exchanged at Geneva, as far as our contribution is concerned, will be information which we have declassified or are prepared to declassify.

The bilateral agreements between the United States and the United Kingdom, Canada and Belgium differ in the sense that there is some restricted data involved in those exchanges since there has been a raw materials partnership -- perhaps association is the better word than partnership -- between our government and those three governments dating back to the very beginning of the atomic energy enterprise.

QUESTION: Recently, Mr. Gordon Gray indicated that this country should reveal more information about the peaceful use of atomic energy. Do you feel that this Conference and our participation in it will fulfill this qualification he has set up, or nearly fill it?

CHAIRMAN STRAUSS: You refer to Mr. Gordon Dean, not Gordon Gray. Mr. Dean was Chairman of the Commission and he knows the problems that have confronted the Commission in years past. One of the results of the fact that the law has been materially amended since his period of service terminated has enabled the Commission, during the fiscal year which closes the 30th of this month, to have declassified and put into the public domain something more than twice as many reports as in the preceding fiscal year: 14,000-odd as against 7,000-odd, and one and a half times as much as in the year prior to that.

I am sure Mr. Dean did not have that information at hand because, had he had it at hand, being a very meticulously fair person, he would not have said that, if you are correctly quoting him.

I have not seen his statement, and so I am not replying to it.

QUESTION: Does the Commission take any measures, let us say, to make the contents of the 14,000 papers available to the public at large instead of only to scientists?

CHAIRMAN STRAUSS: Well, we have published a considerable number of them, not all of them. We have published substantially more last year than we did the year previously.

We publish an abstract every two weeks, or rather a book of abstracts, that runs about twenty-five or thirty pages each issue and there are about, on the average, seven or eight abstracts to the page. It is probably true that there are a considerable number that we do not publish, but the task and the expense of publishing them all would be almost beyond us.

QUESTION: I don't think you would be expected to publish them all, but there may be some selection made out of the 14,000. Maybe, let us say, there would be several hundred items that would be of great interest to the public at large.

CHAIRMAN STRAUSS: It runs to considerably larger than that. I am told it runs to over 2,000. Yesterday afternoon, for example, we presented, on behalf of our Government, to the Government of the Union of South Africa, a library of atomic energy publications which we have issued.

We have given them to a number of governments as goodwill gestures. They are the same libraries that we have placed in a number of depositories in the United States. A sample of it was placed on a table in my office so that the South African Ambassador would get some idea of what it looked like and so that he could be photographed standing with it.

This sample was a quite respectable mound of books, something like that (indicating). I asked what relationship that bore to the total. I was told it was about a tenth. It is a very respectable pile of publications, all of which are available, can be acquired either from McGraw-Hill or from the public printer or from Nucleonics or other sources. I am afraid I am monopolizing this. The best part of this program is going to come from Dr. Weil, Mr. Salisbury and Mr. McKnight.

QUESTION: I would like to pick up just briefly the one statement you made. You said papers which we may then declassify. Did you plan to declassify any papers at the Conference?

CHAIRMAN STRAUSS: At the Conference no, but for the Conference, perhaps. They are being reviewed now with that in view.

QUESTION: Will they be made public before the Conference?

CHAIRMAN STRAUSS: No, I think they will be read at the Conference. I don't look for anything startling or anything of that sort. I wouldn't call them revolutionary.

Would you, George?

DR. WEIL: Well, it is new information.

CHAIRMAN STRAUSS: But not equivalent to E equals MC^2 .

QUESTION: Your announcement in your speech today about doubling the contribution — that is the most concrete and definite thing that has come out since Eisenhower went before the U. N.

CHAIRMAN STRAUSS: No. It seems to me the most concrete thing was his statement — well, there were two things. In the speech which he made at the United Nations, he said, in suggesting that we and other nations would contribute amounts of fissionable material for peaceful purposes to some central stockpile — he said that in any such arrangement, the participation of the Soviet Union must be assured. The Soviet Union must be a part of it, something like that.

Then, if you recall, a period of months elapsed in which nothing appeared to happen. We did announce our intention of calling what has developed into this Conference.

Finally, on the 6th of September, Labor Day of last year, when he was breaking ground for the Shippingport reactor, the President said that we would go ahead with the Russians if they would come in and without them if necessary.

That is not a direct quotation, but it is approximately what he said.

Accordingly, the Commission allocated a hundred kilograms of fissionable material, I think about the middle of November of last year. We didn't do anything with it at that time because no bilateral agreements were in existence.

There wasn't any possibility of making any of these agreements because Congress adjourned. It did come back, if you will recall, for the extraordinary session having to do with the censure resolutions. It didn't deal with anything else during that period or at least with very little else.

As soon as the new Congress convened and reorganized, or within a very short time of that, we began the drafting of these prototype agreements, and with the execution of the first sixteen

of them, on the assumption that it would take about six kilograms of fissionable material to power one of these research reactors, it was clear that the hundred kilograms would be overdrawn and therefore, within the past few days, the Commission decided that it was appropriate and feasible and within the proprieties to double the amount. The President approved it yesterday and I announced it today as a matter of interest in an otherwise dull speech.

QUESTION: I didn't hear your speech. I understood you said that is equivalent to five billion kilowatt hours of electrical energy, is that right?

CHAIRMAN STRAUSS: Yes, we have been wrestling with this here, Mr. Laurence and I. I was calculating without a slide rule. Twenty percent enriched material, which is what we are thinking of for these research reactors, would involve the calculation that this would be one-fifth of the total amount of uranium, both 235 and 238, and we have always made these calculations on the assumption that if it all could be burned up, the following amount of power would result: we have some ratios there and I just took that ratio and multiplied it by five. In reaching the coal tonnage which I used, I took 200 kilograms and said that is 440 pounds, and 440 pounds at 1300 tons to the pound was 572,000 tons, times 5 is 2,750,000 tons and I rounded it off to 3,000,000 tons.

Don't hold me to these things because I am not an IBM, but I think that is close enough. If I am inaccurate, I am sure someone is going to correct it before any harm is done.

QUESTION: I understand Morehead Patterson's company, A.M.F. has designed what they call a packaged atomic reactor which can be shipped off in an airplane and one shipment of fissionable material should keep it running for a year or so. At least this is something I have read about in the A.M.F. annual report, and the different brochures.

In view of the kind of propaganda the Soviet Union gets for setting up a domestic power plant, I wonder what it is specifically, availability of material or non-existence of contracts, which can prevent A.M.F. from actually building these things and shipping them to underdeveloped countries, since it seems, from what I understand, fully designed.

CHAIRMAN STRAUSS: I would rather try to answer your question without reference to any particular company because, in the first place, I don't know about this. In the second place, I think it is more proper.

There is nothing to prevent any American company from making a contract with a country which has executed a bilateral agreement, building and getting permission from the Commission, a license, to export, erect and operate, if necessary, such a reactor in such a foreign country.

That would be true of any company that qualified as a licensee.

QUESTION: There haven't been any so far though?

CHAIRMAN STRAUSS: I don't know. I think perhaps some licenses have been issued, not many, but you will find that just as prior to May 4th there were no bilateral agreements and now there are twenty-two, suddenly there will be a great many applications for licenses and a great many licenses will be issued all at once.

QUESTION: Do you mean to say, then, that any private industry can build, not a research reactor, but a power reactor in a foreign country, or are you talking of research reactors?

CHAIRMAN STRAUSS: The lady was speaking of research reactors.

QUESTION: I said power.

CHAIRMAN STRAUSS: No fissionable material has as yet been allocated by the United States for power reactors.

QUESTION: You mean it would have to be within the limit of the 200 kilograms?

CHAIRMAN STRAUSS: That is right.

QUESTION: Wasn't the original 100 kilograms to be allocated to this international organization when it was formed?

CHAIRMAN STRAUSS: There were no limitations. It was simply allocated for use pursuant to the President's "Atoms for Peace" plan, and that envisaged both bilateral agreements and the eventual creation of the international agency. It was clear that the bilateral agreements would be much easier to organize and could be organized much sooner than the international agency.

It is easier to drive one horse than a tallyho.

QUESTION: If these licenses are granted to build these things, is special legislation needed also to provide the fissionable material?

CHAIRMAN STRAUSS: No. The President, under the law, is charged with the disposition of fissionable material. The Congress, by reason of the fact that these agreements or treaties must lie before it for thirty days, before they become effective, has some opportunity to intervene, by whatever legal steps are possible, to express dissatisfaction with an agreement that did not please it, by a joint resolution or in some other parliamentary manner. I am not a parliamentarian and I don't know what that manner would be.

QUESTION: Under the law at present, could a private American corporation help a foreign nation produce its own fissionable material outside this country? Could, let us say, the American Machine and Foundry go to Turkey right now and if there is uranium in Turkey, let's say, help Turkey produce and refine its own uranium?

CHAIRMAN STRAUSS: It is a nice point, Mr. Laurence. I would like to answer it with this qualification: to say that I believe — but I would want to check — that an American concern which was not using classified information which it had received in the course of its business with the Commission could do so. However, I may be mistaken in that. I simply cannot answer that positively.

QUESTION: I am under the impression, which may be wrong, that after the material is used in that country, it has to be sent back here to be reprocessed?

CHAIRMAN STRAUSS: That is right.

QUESTION: So that is this a rental or a sale?

CHAIRMAN STRAUSS: It is not a sale.

QUESTION: Sort of a rental?

CHAIRMAN STRAUSS: It is a lease or a rental or an arrangement. It not only has to be sent back here, but is very much in the interest of the recipient to do so because the reprocessing of these fuel elements is an expensive matter, requiring an installation generally more costly than the reactor, and to require each country to do its own processing would mean that they would simply not build the reactors.

QUESTION: May I also ask if the Swiss fuel comes under the 100 or now 200 allotment, and if this has the same regulations attached to it, or is this outright?

CHAIRMAN STRAUSS: I am going to betray my ignorance. The arrangement with Switzerland was made during the period when I was abroad, but I would believe that it is included in the 100 kilograms, the first 100 kilograms.

I would not want to be held to that. It is possible that the Commission may have set that aside separately. I doubt it.

QUESTION: I have heard it stated that in discussions of commercial power from nuclear sources, such as the discussions that were held at the Atomic Industrial Forum, are somewhat unrealistic at present because no one can be sure what the price of uranium is going to be, as the present prices are incentive prices paid by the Atomic Energy Commission. Do you think that during the Geneva Conference some sort of clarification is apt to emerge, a free world price for uranium?

CHAIRMAN STRAUSS: I wouldn't exclude its possibility, but I wouldn't want to say definitely yes.

QUESTION: I have another question, too. Do you expect any surprises from other countries? You said there were going to be no surprises from us.

CHAIRMAN STRAUSS: Dr. Weil corrected me. He said there would be some new information, but no new field theory or anything as shattering as that.

Do I expect information from other countries? I could only express the hope that there will be, but nothing in the way of knowledge. I hope there will be a great deal of information presented in the interest of all concerned.

QUESTION: I believe you originally suggested the idea of the Geneva Conference. What is the principal good that you feel will come out of it now that it is actually going to occur?

CHAIRMAN STRAUSS: In the first place, it will be the first time, really since the war, that a number of men who regarded themselves as a scientific community will have a chance to get together, other than in groups representing only one or two or three nations. Here will be an opportunity for a number of men to meet who know each other personally or by the papers they have published. They are going to meet in an atmosphere of mutual respect, in an atmosphere in which military and political matters are excluded, in an atmosphere sanctioned by their governments.

I would say that that is one enormous advantage. Out of that, I would expect that a good deal of advancement in the art will follow.

QUESTION: Do you expect that declassification would be at the Washington level or below?

CHAIRMAN STRAUSS: I don't think that there will be any change in the declassification procedures. The Commission has certain responsibilities under the law which it may not delegate.

QUESTION: I remember the President's first suggestion some time back was for an international agency to develop peaceful atomic energy.

Do you consider that this has been superseded by the bilateral agreements?

CHAIRMAN STRAUSS: No, sir. The bilateral agreements can exist in the presence of an international agency, although if an international agency is sufficiently comprehensive and survives over a period of years, it may make the bilateral agreements obsolete.

May I ask Dr. Weil, if he hasn't been bored to death by me, to stand up here at this microphone. May I thank you for bearing with me, some of you twice today.

(Applause)

(Whereupon, at this point, Chairman Strauss left the conference.)

MR. WEIL: I have some charts which I use for briefing purposes. I apologize to any of you here who have perhaps seen them already. I will review briefly the preparations that have been made in the United States for the Conference.

(Chart displayed to the audience.)

MR. WEIL: This is the setting for the Conference. Geneva and the hotel district is around the end of the lake here. The Palais des Nations, where the Conference will be held, is about a mile or two from the center of Geneva.

The reactor, which I will talk about a little later, is located right in back of this library wing of the Palais. The Conference itself will be held in this large assembly hall. The United States exhibit at the Conference will be in this room, which is a wing of the library of the Palais.

The other exhibitions which will supplement the Conference will be held at the Exhibition Palais, which is about another half-mile from the center of town, or perhaps two or three miles from the Palais.

(Next chart displayed to the audience.)

MR. WEIL: I don't believe there is any point in going into this. The plenary sessions will be held in this large chamber. The United States exhibit will be in this room here, about four thousand square feet. The United Kingdom will be practically in an adjoining room. The Soviets will be in a room of about 2,600 square feet.

The technical sessions of the Conference will take place not only in the main assembly hall, but also in two supplementary rooms. There will be parallel sessions following the first three days of plenary sessions.

(Next chart displayed to the audience.)

MR. WEIL: As a result of the invitations which we sent out to some three thousand organizations, we received about 1,100 abstracts of papers which individuals belonging to these organizations wanted to contribute. This gives some idea of how the response was distributed among various segments of the nation.

The AEC contractors and personnel contributed about fifty-one per cent; other government agencies, about fifteen per cent; private business, about fifteen per cent; educational institutions, twenty-one per cent; hospitals, two per cent; and foundations, two per cent.

This was the raw material that we received, which we then reviewed from the point of view of content and from the point of view of interest, classification and so on.

(Next chart displayed to the audience.)

MR. WEIL: We set up review committees in each of the major fields of the Conference: Reactor, Reactor Chemistry and Metallurgy; Reactor Physics, Health and Medicine, Agricultural Uses of Isotopes, Industrial Uses of Isotopes, and so on.

Starting with this raw material of slightly over a thousand papers, we rejected some, consolidated others and wound up with something about 550, which was the actual number of papers which we submitted to the United Nations on May 15th.

This was still in the form of abstracts, 500-word abstracts.

This table indicates the technical sessions of the Conference. The plenary sessions will cover all of the material on raw materials, on energy requirements, energy production, waste disposal, health physics, medical, biology and industrial uses of isotopes.

These will probably be survey papers which will be of general interest. Once you get into the technical sessions, the papers will be more highly scientific and will be primarily of interest to the people in the various fields.

However, as Admiral Strauss indicated, we will have translators in Geneva who will evaluate the papers for the benefit of the press and others who will be there.

The total number of hours of the Conference is 165. They are broken down roughly this way (indicating), according to the different topics to be discussed.

The papers which we have submitted, or the abstracts of the papers, are given in this column, indicating that we have covered pretty well all of the topics which will be discussed at the Conference.

In view of the fact that we had such a large submission of abstracts to choose from, we have set very high standards for the papers in terms of interest to the Conference and in terms of being new material that has not been previously published.

(Next chart displayed to the audience.)

MR. WEIL: Supplementing the actual technical papers, we are having a number of exhibits, and probably the most interesting one, as you heard, is the research reactor, which is now being dismantled in Oak Ridge and will be shipped to Geneva and erected in Geneva.

The reactor is what we call the pool type. There is a tank about ten feet in diameter, an iron tank, which is sunk into the ground, which will be filled with water. The core of the reactor — the fuel elements containing the uranium — will be near the bottom of the tank, sitting on a pedestal. There will be slightly under four kilograms of uranium 235 contained in this core.

The water acts as a shield and also acts as a basic component of the reactor to make it operate; but because of the nature of the water, you can see the core, and, while the reactor is operating, you will be able to see the Cerenkov radiation effect, which is a blue glow that emanates from the water immediately in the vicinity of the core.

This reactor will be operated at about ten kilowatts. It will be flashed to about a hundred kilowatts in order to emphasize the blue glow.

A temporary building has now been erected in Geneva to house this reactor. It has about three thousand square feet of floor space.

The reactor is shown in this artist's conception. It occupies a relatively small part of the floor space. The rest of the space will allow exhibits of components and information related to the reactor. The building, as I say, is now completed and looks somewhat like this.

QUESTION: How deep is that?

MR. WEIL: This is about 22 feet.

QUESTION: You mean 22 feet underground?

MR. WEIL: Well, the lip of the tank itself is slightly above ground. I think the excavation is 22 feet.

QUESTION: Ten feet across?

MR. WEIL: Ten feet in diameter.

QUESTION: What is the fuel?

MR. WEIL: It is the same fuel: twenty per cent uranium.

QUESTION: Is that four kilograms of U-235 content?

MR. WEIL: That is right -- three and one-half, actually.

QUESTION: The enrichment or the total is four kilograms?

MR. WEIL: The total amount of uranium 235 is a little less than four kilograms, but it is contained in uranium which is enriched. It is about 17-1/2 kilograms.

This research reactor is a very useful instrument and is the type that many people and many companies and universities and other research laboratories are interested in. This will provide a very dramatic and visual display of how these reactors can be used.

Experiments will be done in Geneva and, as Admiral Strauss mentioned, certain qualified people will be allowed to operate the reactor.

(Next chart displayed to the audience.)

MR. WEIL: This is a floor plan indicating the reactor in this position. The control room will be here (indicating). The water in this tank will be continuously circulating and cleaned. There will be exhibits lining the walls of the reactor building.

(Next chart displayed to the audience.)

QUESTION: Will the water be distilled water, absolutely pure?

MR. WEIL: It will be absolutely pure.

QUESTION: No minerals?

MR. WEIL: No; it is demineralized.

QUESTION: The moderator is the water, too?

MR. WEIL: The water moderates, shields and cools.

QUESTION: And it provides the visibility?

MR. WEIL: You can see through it.

QUESTION: How much are the Swiss paying for the reactor?

MR. WEIL: I believe \$180,000.

QUESTION: How much of that, approximately, would be the fuel supply?

MR. WEIL: I don't believe that that includes fuel. The fuel is being loaned.

QUESTION: Is the shielding distilled, too? All the water in it is purified, or just the reactor itself?

MR. WEIL: That's all the water there is. It is continuously circulated and purified.

QUESTION: Can you say how many reactors like that there are in existence?

MR. WEIL: I can give you some idea. There is one in Oak Ridge that has been operating for four years. The University of Michigan is building one; Pennsylvania State University is building one. I am not sure how many others there are.

QUESTION: You say they are paying \$180,000 for it?

MR. WEIL: Yes.

QUESTION: Isn't that rather below cost even for the reactor?

MR. WEIL: Well, the salvage value of bringing it back here is included in that. It would cost us money to bring it back.

QUESTION: Is this the Weinberg one?

MR. WEIL: It has been developed at Oak Ridge.

As a further part of the exhibit, to supplement the technical papers, we have an exhibit in this room of the library, which is about forty by a hundred feet, 4,000 square feet, which will essentially provide an integrated story from raw materials through fuel elements, through models of reactors, reactor components, chemical processing, instrumentation, the uses of isotopes in biology and medicine, the uses of isotopes in industry and, finally basic research.

This exhibit has been completely designed and built under contract with the Atomic Energy Commission. Every component or model in this exhibit has been requested from some organization that has been in a position to supply it, and some eighty organizations have supplied parts for the exhibit. Of these eighty, about fifty are industrial. The others are government agencies and laboratories.

Now, insofar as possible, wherever the occasion presents itself, we are providing instruments that are working. For instance, the chemical plant here will be a working chemical plant and there will be two or three operators here showing how one accomplishes these processes with mechanical manipulators and so on.

The instruments will be operating instruments. As to medical uses of isotopes, there will be a number of instruments which have been developed which will also be operating.

QUESTION: Will you show how plutonium is processed?

MR. WEIL: This will show how uranium can be separated from a mixture of chemical elements.

The Commission's five-year reactor program is represented here by five models. There will be some research reactor models, and there will be a reactor simulator.

(Next chart displayed to the audience.)

MR. WEIL: This is a picture of the model of the exhibit, which was made in order to fit the pieces together. It indicates two views of the same room. This is the entrance. Here are the raw materials. These are the reactor models. These are the instruments and the exhibits on the uses of isotopes, and here is the chemical processing plant.

The model indicates that the exhibit will be fairly crowded, particularly if we are going to have a number of people demonstrating various parts of the exhibit, but we hope not too much so.

(Next chart displayed to the audience.)

MR. WEIL: As supplement to the technical program, we have developed a film program. Before I forget it, I might say that all the captions in the exhibit will be in the four official languages of the Conference, the four official languages being English, French, Spanish and Russian.

Similarly, all of the films which we hope to present in Geneva will be shown in the same four languages. There will be about an hour and a half on reactors. Some of these are films that have recently been declassified; some have been in existence, and others have been made purposely for this Conference.

The "Nuclear Reactors for Research" is a North American Aviation film; "Construction of the Argonne Research Reactor" is from the Argonne National Laboratory; "Developing Homogenous Reactors" is an Oak Ridge laboratory film; the "Sodium Graphite Reactors" is a recently declassified film from North American Aviation; and "Safety Experiments on a Boiling Reactor" is a recently declassified film from the Argonne National Laboratory.

There will be about an hour of film on uses of radioisotopes in general science, chemistry, metallurgy and biology, and a film on their application to humans for tracer studies in medicine.

(Next chart displayed to the audience.)

MR. WEIL: Finally, we will have immediately outside the entrance to the exhibit, in the foyer, a technical library which will consist of, first, this depository library which, as Admiral Strauss indicated, the United States is presenting to a number of foreign governments as well as being available in a number of locations in this country. There will be about 5,000 Atomic Energy Commission and other government agency reports which have been declassified.

There will be a complete card file and people familiar with the other languages of the Conference to help the delegates to find their way around this file.

There will be a book collection which is being contributed by the publishers in this country, about 300 volumes, technical and others, dealing with the field of atomic energy. This will be presented to the United Nations library at the conclusion of the Conference.

Finally, there will be a collection of journals representative of this country which deal with atomic energy.

This is a brief review of what we are presenting in Geneva and, as Admiral Strauss said, we are doing this not in any spirit of competition, but to present as much useful information as possible to the Conference to make it a success.

QUESTION: In sending the material back to be reprocessed here, we incidentally circumvent any effort to stockpile weapons -- there is no way of stockpiling plutonium, for instance, on this allocated material if it comes back here for reprocessing and if we reissue what we want, is that right? That is the way I have it figured.

MR. WEIL: I am not sure whether you are asking me a technical question or a political one. Technically, what you say is correct. Plutonium will be contained in the fuel elements.

QUESTION: The question keeps arising, if we send them uranium, how can we be sure it is only for industrial, but if we get it back for reprocessing then we reallocate an amount which is controllable?

MR. WEIL: That's correct.

QUESTION: In one of the charts you show from what sources the papers came. Can you indicate how the 550 are broken up?

MR. WEIL: I don't have that breakdown, but I don't think it is very much different.

QUESTION: About the same percentage?

MR. WEIL: I would guess about the same.

QUESTION: In this business of fissionable material, the New York Times had a story the other day about some kind of an internal home heater someone had designed. I understood that in this case it could run with the kind of fissionable material which could

not be used for weapons, at least for atomic bombs. Is that so?
Is this the same kind of material which might be utilized by a power plant?

MR. WEIL: Well, if you confine your question to a power plant and not to a home heater, I will be glad to answer it.

QUESTION: All right, to a power plant.

MR. WEIL: It is the same kind of material that could be used in a power plant, this 20 per cent enriched material.

QUESTION: You mean anything that goes into a power plant has to be the same thing which would go into an atomic bomb?

MR. WEIL: No, I didn't understand your question to be that way.

QUESTION: I never read anything about the fissionable material which might be used in a power plant, but on the home heater they did say something about the fact that it was a type which could not be used for military purposes. In other words, it would just run this little power plant.

MR. WEIL: Well, the material that would be used in a reactor like this could not be used for military purposes. Does that answer your question?

QUESTION: When you say a reactor like this, you are talking about a power reactor and not a research reactor?

MR. WEIL: I am talking about the fissionable material, which is 20 per cent U-235 contained in natural uranium. Whether it is used in a research reactor or in a power plant doesn't make much difference.

QUESTION: It is still not the same thing someone could take out and make into an atomic bomb?

MR. WEIL: That's right, it is not the same.

QUESTION: Doesn't it produce material that can be used in a bomb?

QUESTION: If you separate it, but you have to separate it. The amount that would be produced in a reactor like this is infinitesimal.

QUESTION: Is the entire problem of getting a small power plant built and set up — is the entire problem technicians or legal technicalities or what, if the fissionable material used in it is not the same thing that goes into an atomic bomb? Maybe I am being terribly naive, but do you follow the question?

MR. WEIL: I am not sure that I do. You would have to put this material through a gaseous diffusion plant in order to get material which you can put into a bomb. In other words, any country without a gaseous diffusion plant could not use this material.

QUESTION: If the material went out and were operating in a power plant, is the danger, if there is one, that it could be taken away and put through a gaseous diffusion by somebody else? In other words, getting into the problem of controlling atomic energy. I don't know anything about the difficulties of controlling it as a military weapon, except that they are great, but when it comes to peaceful uses of atomic energy, is it just as difficult or is there more leeway?

MR. WEIL: It is much more difficult. In other words, one can use uranium in the peaceful uses, which would be very difficult. I am sorry I can't be any more specific about this. It is getting a little outside of my immediate interest.

QUESTION: In underdeveloped countries, this is their immediate interest. Of course, if it is something that can be done — these newspaper articles come out and say one day the Soviet Union is going to do this and beat us to the gun.

Apparently, if I follow you correctly, it can be done without any great danger that it can be used for military purposes?

MR. WEIL: That's right.

QUESTION: Yet we are not doing it, is that right?

MR. WEIL: I think you are leading me a little astray here.

QUESTION: I don't mean to.

MR. WEIL: I don't want to get into a discussion of the uses of atomic power in underdeveloped countries.

My primary purpose is to describe what we are doing at the Geneva Conference. I would rather leave it at what I have already said on that score.

QUESTION: Did you say something about the participation of American industrial firms? I understand there is quite a struggle for space over there.

MR. WEIL: We have not heard of this struggle, except by reading the papers. In other words, no exhibitors have complained to us. There are going to be three exhibits in Geneva. The Conference itself is only sponsoring one. That is the one at the Palais, which they have indicated or at least requested be of a highly technical nature.

Now, there will be fifty industrial firms exhibiting within the Palais exhibit.

Since that time -- and I might say that the whole idea of exhibits originated from the United States -- until we made a request for space, there had been no idea of having an exhibit in Geneva. Following that, we requested more space downtown at the Exhibition Palace. You recall there were two locations, the Palais and the Exhibition Palace.

The USIA is having their "Atoms for Peace" show down there, which is currently in Germany, I believe, and we arranged with a number of the exhibitors who were interested in exhibiting at Geneva to work their exhibits in with the USIA show.

This is a supplement, essentially, to the Geneva Conference. It isn't an official part of the Conference, but the United Nations has indicated that they would welcome such a show.

Even later, the United Nations stated that they would also welcome a trade fair in Geneva. This also will be held in the same building, and the space, as I understand it, is more or less adjoining the "Atoms for Peace" show, and other countries have taken space in this building, as well as out at the Palais.

As I understand it now, there will be something like forty companies exhibiting down at the Palais, United States companies, either with USIA or in the trade show, as well as fifty up here at the Palais. There is some duplication. I can't tell you exactly the number of separate companies. There are about forty or fifty industrial exhibits at the Palais. There are a total of eighty organizations, fifty industrial, contributing to the exhibit that I showed you at the Palais.

QUESTION: A number of foreign companies, too?

MR. WEIL: A number of foreign governments are also going to be exhibiting down here.

QUESTION: Do you have any idea of how much that is going to amount to, the foreign participation?

MR. WEIL: In the exhibits?

QUESTION: Yes.

MR. WEIL: I don't know the figures offhand, but there are tens of thousands of square feet available. This whole space is something like 180,000 square feet, so there isn't any shortage of space.

QUESTION: I thought the British asked for 20,000.

MR. WEIL: Yes, I think something like that. I know they have space down here for the United Kingdom and this will include both trade fair and popular atoms for peace types. The USIA has something like 15,000. We reserved 30,000 originally.

I think they are now using fifteen or twenty thousand.

QUESTION: Do you know whether other countries are going to have anything like research reactors?

MR. WEIL: To the best of my knowledge, they will not. We have not heard of any.

QUESTION: Have many countries now, outside of the fact that they are going to exhibit them -- Britain and Norway would have some facilities, but do other countries in general have this kind of thing yet on their inter-European exchange that one reads about? Have they built these things?

MR. WEIL: A number of countries have built research reactors, Great Britain, France, Sweden, Norway, and Belgium is building one.

QUESTION: At that Palais exhibit, at which fifty companies will be represented, does each of these companies get individual credit or are they all lumped into the United States?

MR. WEIL: There will be two types of credits. There will be a plaque indicating the organizations that have contributed to this exhibit. In addition, if there are instruments, they will have their nameplate on the instruments.

MR. LUNTZ: I think we have really put Mr. Weil through his paces. It is getting quite late. There may be some of you who have an interest in specific arrangements, as far as the press is concerned, from the United States point of view at Geneva.

Mr. McKnight, who has responsibility for that, is here and will answer any questions you may have.

QUESTION: Where are we going to sleep?

MR. McKNIGHT: The United Nations is taking care of questions of correspondents. I believe you are supposed to get your applications in by July 1st. I understand that the United Nations has arranged with the Swiss National Tourist Commission to find hotel reservations. They will have facilities for something like five hundred correspondents.

That looks like a fairly good guess as to the number that will be there.

Be sure your expense account is adequate because Geneva is high-priced. The second suggestion I would make is to take nylons and wash them yourself because hotel laundry prices are just outrageous.

QUESTION: In this dispersal of the correspondents, do you know what area it will cover?

MR. McKNIGHT: Actually, wire facilities will be at the Palais des Nations. I heard yesterday that the Swiss are also setting up a downtown press as they did for the Far Eastern conferences last year, so that you will have the option of filing from either place.

Most of your news will originate, I guess, at the Palais des Nations. That is where the sessions will take place and spot stories probably will be filed out there. Most of the delegations will be housed in the downtown hotel area.

The hotels are fairly close together; that is, the leading hotels. The press house, I imagine, will be somewhere in that area. As I say, I just heard this yesterday.

QUESTION: Will the papers be downtown as well as out at the Palais?

MR. McKNIGHT: The United Nations is arranging to distribute papers and press summaries as they become available, I think at the convenience of the correspondents. They have a fairly elaborate setup over there of messengers and delivery and so forth.

QUESTION: How are you supposed to go about getting applications?

MR. McKNIGHT: I think all you need, according to Mr. Aylen at United Nations, is a letter from your managing editor, saying that you are going to the Conference.

In the case of free-lancers, people who are writing on their own, he tells me there will be no problem about that, just so long as you present yourself.

QUESTION: But you have to get in this letter by July 1st where?

MR. McKNIGHT: At United Nations Headquarters here or Geneva, or at any U. N. information office, of which they have about twenty.

QUESTION: There is no special form, just a letter?

MR. McKNIGHT: Just a letter. I have no doubt that persons arriving without U. N. accreditation will have no difficulty working, but it does open up certain facilities to you so that it is convenient to have.

QUESTION: Whom do we send that letter to in the U. N. ?

MR. McKNIGHT: I should say to the information office. Mr. Mossbacher is working with the U. N. on this.

MR. MOSSBACHER: We don't have a standard as yet, but address your letters to Matt Gordon at the press section, which is Room 385 in the United Nations Building. Accreditation will not guarantee you hotel space. We will do everything we can through our Geneva headquarters to help you, but I think it is only fair to warn you now that hotel space is almost -- well, it is already short. We will do our best, but we are not saying that if you are accredited you are guaranteed a hotel room.

MR. McKNIGHT: I don't know a darn thing about atomic energy. I was brought into this about two weeks ago, and I doubt very seriously that I can master any physics in six weeks left, but we will do our best to be helpful and get you to people who do know.

Admiral Strauss has assured us that the total brains of the American Delegation will be at your disposal to elucidate these esoteric mysteries.

I will be glad to see you over there.

MR. LUNTZ: Thank you very much.

(Whereupon, the conference was closed at 5:00 p.m.)

PRESS CONFERENCE, GENEVA, SWITZERLAND, AUGUST 6, 1955

PRESENT: George L. Weil, Technical Director, United States Delegation
John P. McKnight, Information Officer, United States Delegation

MR. MCKNIGHT: We will make this very short, especially so as to leave time for questions, if you like.

This afternoon is primarily what Charter Heslep calls the "nuts and bolts" conference. We will try not to repeat anything that was said at the United Nations this morning, and if there are some of you here who weren't there and want to ask questions about it later, you can.

Very briefly, the arrangements are that the downtown exhibits will open at 10:30 tomorrow morning—that is the USIS exhibit and the commercial exhibit—for both press and photographers. The reactor will be open to photographers and the press as of 12 o'clock tomorrow. It is not included on the regular tour of the exhibits scheduled in the afternoon because there didn't seem to be time, but you can drop in there as you like. The technical exhibits at the Palais des Nations will be open, by arrangements with the press offices of the delegation, to photographers, still and movie, at 1 o'clock. The formal opening of the exhibits takes place at 2 o'clock. There will be some ceremony, very brief, at the opening—a very quickly conducted tour of all the exhibits, after which correspondents are free to spend the remainder of two hours looking at the exhibits. As far as our exhibits are concerned, there will be available at the reactor and at the exhibits tomorrow illustrated brochures describing them fairly fully. If anybody is pressed for a story tonight and wants some advance stuff on that, drop in at the Hotel du Rhone office in the lobby and I will see that you get an advance copy of it.

We said this morning that we had made up a sheet of paper giving the names of all of us, with whom you would be working at home and office telephone numbers and addresses. I think that quite a few of you missed getting these in the shuffle at the end of the UN briefing. I brought along a stack here if anybody wants one after this is over.

There are on this Information Staff here, in addition to me, Morse Salisbury, Information Director of AEC, whom a great many of you know; Joe Hanson, who has been more or less the USIA atoms-for-peace

plugger; and Dick Friedman of the State Department. You haven't seen much of Dick because we sort of lent him to Alexis Johnson for three or four days, so he could work with him on the talks with the Chinese, but he will be on tap. Most of your working contacts will probably be with ~~Morse~~ Salisbury and with Charter Heslep and Al Johnson, whom a great many of you know. Charter especially will be your contact if you want to reach any member of our delegation, any of the scientists or members of the delegation for interviews, recordings or whatever you have in mind. The Chairman has promised me that the whole staff of the delegation will be available to the press, their other duties permitting; that is, time when they are not tied up with actual Conference work. In addition to our working staff, we have three brains assigned to us: John Hogerton, Bob Tumbleson and Gordon Dunning--all three of whom from their private life have been borrowed because they are expert in explaining the unexplainable in understandable terms.

We will have the President's statement to the opening session, which will be delivered on Monday, which will be reproduced and delivered to the United Nations and will be distributed about 9 o'clock Monday morning for release at 11 a.m., Geneva time. That statement will also be available in Washington through the White House, and I assume through the AEC Information Office too. So if any of you want to save cable tolls, just make sure your stateside offices pick it up. That is for the American correspondents, of course.

Q. This is a statement by the President of the United States, not the statement of the Conference?

MR. McKNIGHT: It is the statement of the President to be delivered by Strauss at the opening of the Conference.

That is all I can think of right now. Unless you want to ask questions now about arrangements, we can defer all questions until you hear from George Weil. Dr. Weil is the Technical Director of the Conference for the American Delegation. He has been working on this for about six months and is just about dead--but he did it. He is himself a veteran in the field of atomic science. He has been with it since 1939 or '40 and was actually the man who pushed the control rods when Enrico Fermi started the first chain-reaction at Stagg Stadium in Chicago in 1942. Some of you may have heard something of what George will say, if you covered press briefings in New York and Washington.

Dr. George Weil.

DR. WEIL: Thank you, John. I wasn't at the meeting at the United Nations this morning, so forgive me if I cover some things that you may have heard there.

The program, which the United States has assembled as its part in the International Conference, breaks down into four areas. The first and probably most important, the central focal point, of course, is the papers which will be presented at the Conference starting on Monday. Of the something like 450 papers that I think are on the Conference agenda, in the order of 175 or 180 will be presented by United States scientists, engineers and others. This represents about 40 percent, or perhaps a little more, of the program.

We have covered all of the technical areas that the Conference will discuss—energy, power resources, and so on—and we have assembled, I think, a very top caliber group of delegates, something like 183 of them who will represent the United States either in presenting papers or in discussing them. Now, I don't want to spend more time on the Conference, on the technical part, unless—I'm sure it has been covered this morning, what the subject matter of the Conference will be, and I am sure you have all seen the agenda.

I would like to spend a little time on the exhibits, which I feel are an important supplement to the technical papers which we are presenting. I don't know how many of you have been out to the Palais, I know that I have seen a number of you in the various buildings out there, but perhaps it might be interesting—and I apologize to those of you who have seen this before—to take a look at what the various exhibits are, how the exhibit areas appear.

This is an artist's conception of the reactor building (indicating) and I think probably most of you have seen it. The reactor itself is a ten-foot diameter tank filled with water about 20 feet deep and the fuel elements, the core, is at the bottom of the tank. This reactor is particularly interesting because of its flexibility as a research tool in nuclear physics, chemistry, metallurgy, production of radioisotopes, and so on. If you have seen it you know you can see the coil, you can see what goes on down there. You can easily insert instruments, samples to be irradiated and, as a research tool, it is ideal. And it is for this reason that we have built this reactor here, to demonstrate the sort of thing that can be made available to other countries through the appropriate bilateral agreements and which can be assembled with the fissionable material which the United States Government has made available to the international agency, when it is formed.

The rest of the room is designed to supplement the reactor with panel exhibits illustrating the uses of the reactor, the properties of the reactor for the technical people, and various experiments that can be done with the reactor. The reactor contains about seven or eight pounds of U-235, which is mixed with U 238 in

the proportion of about one to five, which is the 20 percent material which has been made available to other governments and the international agency, when it is formed. The reactor is completely automatic from shutdown to operations; one can press a button or one can set a switch to the power level that one desires and the instruments will then take over. This is the first time that this has been done with a reactor.

This is a layout of the reactor building (indicating exhibit of reactor building floor plan). This is part of the blue glow which you can see when the reactor is operating (indicating), and here is the control room (indicating). You go up a ramp (indicating). There are several exhibits along the walls and here is the reactor proper (indicating). This is the water in the reactor tank (indicating), which is circulated continuously and is clean. I think you will find this a very spectacular exhibit, if you haven't already seen it. And, in my opinion, the concept and the way it has been executed has been magnificent.

The next exhibit (indicating)—now, in the library wing of the Palais in Room 15, Salle XV, we have the technical exhibit which supplements the papers; the technical exhibit and the reactor itself in Salle XV supplement the technical papers. Now, although this exhibit is perhaps not as spectacular as the reactor, in many ways I think it has a greater interest, a greater over-all appeal to the scientists. And I would like to spend a few minutes telling you what we have in this exhibit. This exhibit has been designed from scratch and planned to tell the story from raw materials, from the ores, to the uses of isotopes and reactors. It has been built up by requesting more than a hundred organizations to contribute pieces and equipment, which has been then built into the exhibit, to tell this story. The exhibit has been planned in nine areas.

The first area is production of raw materials (indicating). As you come in the entrance here (indicating), you will find a large piece of equipment which we call a fission cloud chamber. This piece of equipment shows cosmic rays as they are passing through the room continuously. As you look into it you will see these cloud tracks which illustrate the paths and the collisions of cosmic rays as they go through the air. I think it's a very interesting exhibit.

Then, immediately to the left of the entrance is a reception desk here (indicating) where you can pick up booklets describing the exhibit and this panel and this area illustrates raw materials through production phases to metal, uranium and thorium (indicating). On this side (indicating) we have a panel reactor materials, zirconium, beryllium, uranium, the effects of corrosion and water, and so on uranium aluminum, the effects of heat, the fact in a reactor the temperature may go up and down—this has a very serious effect on the uranium. And these are all illustrated in these panels with samples (indicating).

In this corner (indicating) we have examples of actual fuel elements which are used in the reactors, in power reactors and in research reactors. This is where the uranium is contained, and it indicates the complexity sometimes that we have to go to in order to make those fuel elements last a long time and deliver large quantities of heat.

This area (indicating area number three) is made up of reactor models, and I believe there are something like a dozen reactor models. Along this wall and around the corner (indicating) are models of the reactors which the Atomic Energy Commission is building—they are now under construction—as a part of the five-year power program. The Shippingport reactor, which is being built near Pittsburgh by Duquesne Light Company, is being designed by Westinghouse. I won't go through all of these. There is the boiling water reactor that Argonne is working out; and the sodium graphite reactor by North American Aviation Company; and the homogenous reactor of Oak Ridge National Laboratory; and a fifth one which at the moment I don't recall.

MR. McKNIGHT: Thorium.

DR. WEIL: The experimental breeder reactor.

Q. Experimented with thorium?

DR. WEIL: The homogenous reactors will eventually have thorium in them. The breeder reactor is a plutonium reactor.

This (indicating) is a very large and, I think, a very excellent example of model work of the materials testing reactor, which has been operating for about two years out at the National Reactor Testing Station in Idaho. And this is the borax experiment, the first boiling water experiment which was done at Idaho (indicating), and this is a research reactor (indicating) of the Argonne National Laboratory; and over here (indicating) we have something like four or five models and photographs of reactors which are now under consideration by industries. In some cases they are to be completely financed by the companies, in other cases with some arrangements with the Atomic Energy Commission.

As the last item in this area, area number three, we have a reactor simulator, where you can actually control a panel as though you were controlling a reactor, and the instruments will react as though it were a reactor. This is completely electronic and is a very useful device for studying the behavior of reactors when one does certain things to them.

Well, then we move into area four (indicating), which illustrates the components that have to go into reactors—the pumps,

the valves, things like that, which are made to carry the coolant or to transfer the coolant from the power reactor in order to make the steam which drives the turbines.

On this side (indicating), I think is one of the most spectacular exhibits (indicating area 5), which is a chemical processing plant. When you reach that, there is a model here of the actual chemical plant which is in operation in Idaho at the National Reactor Testing Station; and alongside of it is an operating chemical process with uranium, but it is not irradiated so you don't have to worry about it, where the uranium is separated from impurities like copper. Here we have a device for sampling this process (indicating), which in ordinary circumstances would be very radioactive and one couldn't approach it and one couldn't handle the solutions. We have a mechanical arm sort of thing, that you can operate at one side of a four or five foot concrete wall and on the other side you can do very delicate manipulations like picking up glass beakers and pouring them and transferring them, and so on. And I think this is a very interesting part of the whole exhibit. It is operating, as I say, and there will be people there who will demonstrate this to you and explain it to you.

Well, this takes us to area 6, which displays instruments which are used in the atomic energy industry, from mining prospecting to the instrumentation for health physics for maintaining proper health precautions and plants, and so on. And we have there, I would say, an almost complete display of all instruments from various companies in the United States who are manufacturing this type of instrument. These will be operating instruments. You can see them working. You can see how, for example, the prospecting instruments will react differently to different types of ores.

We pass quickly then into area 7, where we display and demonstrate the uses of radioactive isotopes which are produced by reactors in biology and medicine. There are some very interesting photographs of the uses of isotopes in medical therapy and cancer therapy, and also in uses in agriculture, in the genetics, in changing the properties of plants by irradiating the seeds. We have a little display there which I think is most interesting, showing how different types of carnations of different colors can be grown just by radiating the seeds. You can get different colored blossoms on the same plant.

On this side (indicating) in area 8 are the industrial uses of isotopes. These areas are not quite as sharply defined as indicated here. Some of the agricultural exhibits are over here (indicating), and some of the medical exhibits are over here (indicating). There will be examples of some of the cobalt and thulium sources that are used in radiation therapy.

The final area is what we call basic research (indicating), where we display samples of some of the elements that have been produced above the 92 which occur in nature — plutonium, neptunium, americium, and so on.

MR. MCKNIGHT: George, how many are there of those now, ten?

DR. WEIL: As I recall, there are 101, so that would be about nine. Of course the high ones, 101 down to about 95 are so short lived that you can't save them. So the only ones that are displayed here are the ones that have long lives.

I think that about covers the general layout. As I say, this has been very carefully planned to illustrate the atomic energy field from ore to uses, and I'm sure that you will find it interesting and as interesting in a different way as the reactor itself.

This is a photograph of a model (indicating) which was prepared in planning this exhibit but now you are in Geneva and I think it will be much more interesting to see it.

Now, as the final supplement to the papers program, we have prepared seven films which will be shown by the United Nations, and I think they also will be of great interest. I won't read the names of the films. They are there (indicating). They have been prepared by places like Oak Ridge National Laboratory, the Argonne National Laboratory, North American Aviation Company, the Medical Guild, and so on. Each film is perhaps about 20 minutes. The whole show lasts about two and a half to three hours, and they are shown in four languages.

I might also mention that the captions in the exhibits, both in the reactor building and in the Palais, are in four languages.

The United Nations is making up a schedule. I understand that they have received films also from Norway and from the Soviets. We have given them our films and they are preparing a schedule for showing.

Q. What are the four languages, sir?

DR. WEIL: English, French, Russian and Spanish. And I might say, if anybody has ever tried to get two people to agree on a translator, I'd like to hear about it. I'd like to find the man who did the translation.

We will go on to the next exhibit. We have a technical library (indicating), which is also in the Palais. It is slightly removed from Salle XV. If you know where the United Kingdom exhibit is in the Museum -- as you come up the stairs the United Kingdom exhibit is on one side and the United States Exhibit and the Belgium and the Scandinavian Exhibits are on the other. Well, on the same side as the United Kingdom Exhibit, down a passage way (indicating) there is a room which is the United States technical library. And this library again is a supplement to our program. It represents the background of unclassified information which has been released in the United States, I might say a selective background, something like 5,000 or more reports that are available for the delegates for whoever wants to read them. We have a complete file card system. We have girls who can speak Russian, Spanish, French, and I hope English. And we hope that this will be a useful adjunct to the United States Delegation and to the other delegations. It's available to them.

Q. That goes to the United Nations, doesn't it?

DR. WEIL: At the conclusion of the Conference this will be presented to the United Nations library. It will be kept in the same room. This is the same collection that has already been given to some 27 nations by the United States Government.

I think that covers the major areas that we have prepared for participation. I'd like to emphasize again what has been said many times by others, that we have done this in a spirit of cooperation and in a desire, a sincere desire, to assure the success of the Conference. We have not done this in any spirit of competition but to present with the greatest possible effect and to make the best possible showing and demonstration of what the United States has been doing in this field of peaceful uses of the atom.

I'd be glad to answer any questions.

Q. Doctor, can you tell us whether, sir, your main objective here is to demonstrate what the United States has been doing in non-military phases of nuclear science or whether your main anxiety is to help the rest of the world learn as much about it as the United States knows?

DR. WEIL: I think to some extent they are a little inseparable. This is the first time, the first opportunity that we have had to present the information in as coordinated and concentrated form as we have for this Conference. Our main objective, I would say, is to contribute to the purposes of the Conference, which is to promote the international cooperation and the development of the peaceful uses, and we feel that this is what we have to contribute.

Q. Could you say something about the attitude of the United States Delegation towards the commercial exhibition at the Palais des Expositions. I might say parenthetically that Professor Whitman, at the session you did not attend this morning, made it perfectly clear he had a scientist's disdain for any attempt to apply to these theories on a commercial basis. Now, I'd like to know whether the United States Delegation feels the same way, or whether you have some other attitude.

DR. WEILL: I am not sure I can speak for the delegation. I'd like to say my own views on it.

First I'd like to say my feeling has been that we are here to sell an idea, not a geiger counter. We are here to sell the idea of atoms for peace. This has been the purpose of the conference and the whole participation from the beginning has been focused on this, on a technical conference to discuss ways of promoting international development in the fields of atomic energy for peaceful uses.

I believe the downtown exhibits are a very valuable supplement to this. But I think it would not be good if they were considered the highlight of the Conference because I don't think that we are competing for world trade or world markets. You can't, of course, eliminate this from the picture, but I think we mustn't lose sight of the fact that this is a technical conference. Now, by themselves I think Trade Fairs and atoms-for-peace exhibits are fine. I think they are a very valuable adjunct to this Conference.

Q. I take it you are aware—I don't want to prolong this, but the United Kingdom has taken a very different attitude toward the trade side of the Conference. I wondered—

DR. WEILL: I am aware of it. I say again, I'm not speaking for the United States Delegation, I'm talking—

Q. I would say you were, Doctor. You are the spokesman for the United States Delegation, aren't you?

MR. MCKNIGHT: No, Mr. Strauss is that.

DR. WEILL: I think Mr. Strauss has made the same comment. So I don't feel that I have said anything that Mr. Strauss would disapprove of. But I'm here to describe the technical participation. I would say that this question gets a little into the political arena and I would prefer to let it go at that.

Q. Professor Whitman this morning stressed the exclusively scientific nature of the Conference. It appears that quite a number of political representatives are going to be among the delegation. Could you perhaps explain what their function would be at this Conference?

DR. WEIL: I would not like to reply to that question for the same reason, that my part in this Conference has been associated with preparing the technical programs. And who is on the delegation and who isn't has not been part of our responsibility.

Q. I want to ask a question and I want to ask you to look for more in it than there is in it. There is classified material and unclassified material. And from your words I make that what is unclassified can't be so much any more, but do you think personally that in the classified material there is still much that could be useful--of atomic energy? Is the question clear?

DR. WEIL: In the classified area, do I believe that there is still a lot that could be used.

Q. Yes, that also could be cleared for use, for peaceful use of atomic energy. I mean in the classified area, is there still much that could be drawn out for the other side?

DR. WEIL: I think the answer to that is "no".

Q. That is what I wanted to know.

Q. What was the question?

DR. WEIL: The question is, do I believe there is still a lot of information that is classified that is useful in the peaceful applications of atomic energy; and my answer is "no." And I'd like to explain any piece of information is useful. And it's hard to say that something is not useful in developing the peaceful uses, so there is no sharp line. But I would say that by far any information which is primarily of use to the peaceful uses and not directly associated with the military applications is unclassified.

Q. At this moment?

DR. WEIL: Well, within the judgement of people. I would hate to make a blanket statement that everything has been unclassified.

Q. I meant before the Conference and now and after the Conference.

DR. WEIL: No, I think there will be a lot of information which will be discussed at the Conference which has not been publicly available, which has been made available within the last few months and has been made available under the declassification rules which have been established since about a year ago.

Q. May I ask my question now? Have you had an opportunity to look at all the papers?

DR. WEIL: No, sir, I haven't.

Q. Or have you just seen those from the United States?

DR. WEIL: Not even those. There are 550 of those.

MR. McKNIGHT: Dr. Weil has been a very busy man in the last six months.

Q. I was wondering whether you could characterize the quality of the papers and tell us whether information contained therein is sufficient to go into a program for a nation that does not now have one.

DR. WEIL: Well, I really haven't examined them from that point of view, but my guess is that there is a tremendous amount of information in there that would be useful for a country, either to go into a program or to evaluate for themselves what it would mean to go into a program, which is equally important. I'd like to emphasize that I realize, and all of us realize, that the papers are highly technical, except for perhaps the first day or two, which is to discuss energy resources and energy requirements, and we arranged with John McKnight to help him, and to help you through him, in evaluating the papers as they are presented — our own papers — their significance and their relationship to things that you understand.

Q. Have you found a common anxiety as you examined these papers as great as that of the United States among all of the countries participating to share what they know about atomic energy?

DR. WEIL: I'm afraid I can't answer that.

Q. You said that anything useful to peaceful application and not related to military application has been declassified by us.

DR. WEIL: Well, I also said that it is awfully hard to draw a fine line and it's a matter of judgement of people. Now, to say that everything has been declassified is not correct. I should like to retract that.

Q. Just theoretically speaking, if I may finish my question, if we could just suddenly, tomorrow, declassify everything on atomic energy, military and otherwise, would there be things in that classified storehouse that would give some considerable help to the peaceful uses?

DR. WEIL: Well, if I answer that question one way I will get kicked in the teeth, and if I answer it the other way I will get kicked in the teeth. I think it's a difficult question to answer. I don't think there is any point in trying to hide the fact that there is classified information and why there is classified information. We all know the reasons. And the rules of classifica-

DR. WEIL: I hate to make any blanket statement in any area as complicated as this one. I think that as a general practice this is true. For all I know, there may have been information held back for one reason or another that I'm not aware of.

Q. You spoke about an international agency, and you used the words "when this international agency will be set up".

DR. WEIL: This is not a part of this Conference. I'd like to emphasize that this Conference is independent of the negotiations which are now going on in connection with this international agency. Therefore, I'd prefer not to discuss this topic.

Q. There is one question on it. What will that international agency do?

DR. WEIL: What can it do?

Q. Yes.

DR. WEIL: Well, it would take another afternoon, I'm afraid.

Q. Would you care, Dr. Weil, to say in which fields the information now unclassified is the most striking — unclassified by the United States, just very broadly which field is the most striking, novel in the material now unclassified?

DR. WEIL: This would require some thought on my part. I think that in the field of reactor technology we have declassified a very large amount of material. Of course this doesn't mean that it is the most useful to other countries.

Q. No, no, that is a separate point.

DR. WEIL: Because in the field of isotopes and isotope applications we may well find that other countries are primarily interested in these things rather than reactors.

Q. No, I just meant apart from the use, the biggest jump forward, so to speak, and you say it is in reactor technique?

DR. WEIL: Yes.

Q. Do you have any comment on—

DR. WEIL: I believe this gentlemen had a question first.

Q. I'd like to come back to this classification business.

MR. MCKNIGHT: Well, I'd like to emphasize that this was intended this afternoon as primarily a conference on arrangements, of

mechanics, and you're taking Dr. Weil into water that he hasn't been swimming in very recently.

Q. I'd just like an answer "yes" or "no".

DR. WEIL: I think you would have to read the papers.

Q. I'm sorry, but may I just try to make the whole question clear for my own ears? The reactors, do you think or don't you think, that there is still any classified material which you could make look, if declassified, well, make the modern reactors look old fashioned if the reactor was declassified?

DR. WEIL: I think the answer to that is "no".

Q. Well, thank you, sir.

DR. WEIL: The modern reactor is something that doesn't exist.

Q. Well, most modern up to now.

Q. I'm wondering whether you had any comment on the American visit to the Russian exhibit today?

DR. WEIL: This was a completely informal arrangement and I prefer not to comment.

Q. I'd like to ask either you or Mr. McKnight, how is American industry represented on the United States Delegation?

DR. WEIL: Well, I can answer that, I think. Of course on the Delegation itself--by which you mean people?

Q. Yes.

DR. WEIL: I would say that there are probably 10 or 15 percent or more, actually it's higher than that--I don't want to quote a figure because the contract is of the AEC, in many cases the same industries that are also interested in the industrial atomic energy field. I'm thinking, for example, of Westinghouse, North American, and so on. And, looking at it from that point of view, I would say our delegation comprises probably 80 percent industrial representatives, even though they may at the moment be paid by public funds. In the exhibits, of course, we have some 80, I believe, companies that are either exhibiting in the Palais show or in the reactor building or associated with them, some 80 to 100, including those associated with the USIA and the Trade Fair at the Palais des Expositions.

Q. Would you spell out in that connection the role of observers, American observers?

DR. WEIL: Well, I might just mention that there will be some 200 or more people from the United States representing industry and private organizations who will attend the Conference as observers.

MR. McKNIGHT: Those are people who in some way or other have been active in the Atomic Energy Commission program or have contributed to the Conference itself, but do not actively participate in the Conference. Is that right?

DR. WEIL: That is right.

Q. Dr. Weil, does the American Delegation expect to learn anything here, or is it all a matter of sharing?

DR. WEIL: I'm glad you asked that. We expect to learn a lot. We know that we will learn a lot.

Q. Do you have any particular technique for going about it—that is what I'm getting at.

DR. WEIL: Well, we have several. We have interpreters. We hope to see their exhibits, and I think we certainly hope to learn as much as we are able to give.

Q. Dr., would you want to make a rough guess how many United States firms are participating with the AEC program as important contractors?

DR. WEIL: Well, this is a pretty difficult thing to do off-the-cuff. I'm sure that that kind of information is available and in reports which Mr. McKnight has. This is a matter of numbers. I could do it, but it would take me 15 minutes to add them up.

MR. McKNIGHT: We had a release put out in Washington several weeks ago listing all the firms which participate in any way in any phase of the Conference, including the Trade Fair and the USIA exhibit, and I believe I'm safe in saying that is just about all the firms that are importantly engaged in atomic energy activity.

DR. WEIL: You will find this same list in the exhibit brochure which you will find in the Palais, in Room XV. The whole list of companies who have contributed is in the brochure. And, as John McKnight says, they are practically the same list of companies who are working with the AEC in the United States in some capacity or other.

MR. McKNIGHT: I might say finally that the popular digests of the papers are now being released, passed out very fast at the Palais des Nations. They have not been released in order, some arrived out of order and the process is a little bit disorderly but they are getting around with them as fast as they can. As far as the United States digest is concerned, we can backstop you at the Hotel du Rhone office. We have a complete collection there. We also have some other material put out over the last month or so that could be used as background.

(The Press Conference was adjourned at 4:55 p.m.)

PRESS CONFERENCE, GENEVA, SWITZERLAND, AUGUST 8, 1955

PRESENT: Lewis L. Strauss, Chairman, United States Delegation;
George Weil, Technical Director, United States Delegation;
John P. McKnight, Information Officer, United States
Delegation.

MR. MCKNIGHT: We will have to make this conference today fairly short because Mr. Strauss has to be in his seat at the Assembly at 2:30 or very soon thereafter, and we will have to take five minutes at the end of the conference to read a brief statement requested by some of the TV and sound men.

MR. STRAUSS: This is the first opportunity I have had for a press conference. As Mr. McKnight has said, it will have to be a brief one. I will try to be available as often as you wish me during the time that I am here at the Conference. I haven't a great deal to report to you in the brief time this afternoon but there are a couple of announcements I would like to make to you.

I might say that I am particularly glad to be here because there are at least a few people in this room that I have known for more than 20 years, one in particular whom I haven't seen for nearly that long.

The particular announcement that I want to make are these: Mr. Henry Ford II, taking note of a paragraph in President Eisenhower's remarks when he was here for the conference at the summit, wrote me a letter which resulted in some correspondence that I think can be most briefly summarized if I read you a statement, copies of which I believe you already have, announcing that the Ford Motor Company Fund, a non-profit philanthropic organization of the Ford Company, has established a million dollar fund to provide world-wide atoms-for-peace awards. If I might take a moment before I attempt to answer any questions that you may have for me on that statement, I would call attention to two points. One is the provision that the recipients of the award, which will be \$75,000 annually, shall be selected from among the world's scientists and inventors and engineers, either as individuals or teams or groups of men without any regard to their nationality or political belief. The other is that the jury, which will make the awards, will be an international jury.

I would like to read just one paragraph from the letter which Mr. Ford wrote me announcing the creation of the Fund. He begins: "We" -- and by this you must understand that he means himself and his two brothers -- "We propose that when the organization of this new memorial fund is completed, the Board of Trustees of the Atoms-

for-Peace Award appoint each year a competent International Jury of Awards for the purpose of selecting from among the world's scientists, inventors and engineers without regard for nationality or political belief, the individual or group of individuals who, in the Jury's judgment, has made the greatest contribution during the year to peaceful uses of atomic energy; that the individual or group so selected be granted, with appropriate ceremony, the Atoms-for-Peace Award for that year; that the Annual Award carry, in addition to the suitable medal to be designed and cast for the purpose, an honorarium of \$75,000; that, if during any year the International Jury of Awards or the Board of Trustees finds no candidates pre-eminently meriting the Atoms-for-Peace Award, the sum at the disposal of the memorial fund be used that year for scholarships and fellowships most likely to contribute to the advancement of the new science of peaceful application of atomic energy."

That is the end of the statement. This is a very clearcut situation. It is a response by private individuals to the President's expression of hope that private business and private individuals would do something to provide incentive for this purpose. I suspect that there will be others.

Now, I have another announcement to make, but perhaps I had best pause and see whether there are any questions with respect to this letter. Are there any?

Q. Yes. Was this released simultaneously in the States?

MR. STRAUSS: I presume it will be. And I have no doubt that questions put to Mr. Ford or Mr. Henry Ford II, will be answered. My understanding is that when I announced this, and I announced it at his request, he would make public the exchange of letters which we have had on the subject.

Q. Would you repeat the name of the fund, please?

MR. STRAUSS: It is called the ATOMS FOR PEACE AWARDS, in memory of Henry Ford and Edsel Ford. The two individuals are the grandfather and father respectively of the three sons who are establishing this award.

Q. Can that award possibly be awarded to somebody who is a scientist of the so-called iron curtain countries?

MR. STRAUSS: As I attempted to say, sir, the awards are to be made without regard for nationality or political belief. My construction of that would be to answer your question yes. But that is only my personal construction of it. It seems to me the language is clear.

Q. Mr. Strauss, did I understand you to say there is a possibility that in some year an award would not be given for the express intention — therefore, it would be scholarships after that?

MR. STRAUSS: Yes, it is conceivable that in this area there might not be an event of sufficient importance to warrant an award. The prototype of such things might be said to be the Nobel awards, and there have been years in which Nobel prizes in certain areas have not been awarded because there was nothing of sufficient moment in the minds of the Jury to warrant it.

Q. Admiral Strauss, to clear up for certain one point, this is the Ford Motor Company Fund?

MR. STRAUSS: Yes, Fund.

Q. It is not to be confused with the Foundation?

MR. STRAUSS: I'm glad you made that point. This is not the Ford Motor Company Foundation, this is the Ford Motor Company Fund, a non-profit organization which, in accordance with the American law, is also, I presume, a non-taxable organization. It's an endowment.

Q. Not connected with the Foundation?

MR. STRAUSS: Not connected with the Ford Foundation, and connected with the Ford Motor Company only in the sense that the Ford Motor Company has established it.

Q. And this International Jury would be selected by whom, sir?

MR. STRAUSS: My recollection of the correspondence, which is now some days old, is that there is an organization committee that is to be named, which has not yet been named, which will select the Jury of Awards. The Jury of Awards will be selected annually. It will not be a permanent jury.

Q. Please, sir, will you just repeat the total amount of the fund?

MR. STRAUSS: The total amount is \$1,000,000; the total annual award is \$75,000, which would allow an amount for administration.

Q. Admiral Strauss, you said that you believed there would be further contributions coming forward.

MR. STRAUSS: No, I don't believe I said so, sir. You must have been reading my mind. I don't think I said so. I said that I thought

that other individuals and businesses might respond in some way to the President's hope that incentives would be provided by private business and private individuals to spur the progress of atoms for the peaceful use of mankind.

Q. Does this mean there will be separate funds established, or one fund established, sir?

MR. STRAUSS: This fund is only the Ford Motor Company Fund. I presume that if John Doe were going to do something about this, he would set it up as John Doe's contribution. And it would have no connection with this whatever. But that is also just a speculation.

Q. Please, in general, it is to work like the Nobel prize because it's written "groups of individuals". But, in general, it could be only one person?

MR. STRAUSS: Well, the reason for that, sir, is that since the days of Dr. Nobel a very great change has come over research. Laboratories were small affairs, researchers were individualists. And, while that condition continues to a limited extent, laboratories are now large organizations and men and women go at the solution of a problem in teams or groups where it is frequently impossible to decide what specific individual has made the contribution.

I might recall to your memories the fact that when, quite recently within the last year, the Atomic Energy Commission made an award of \$400,000 to a group of Italians who had aided substantially in the atomic energy program, one of whom was Dr. Fermi -- and scarcely any of us would deny his preeminence in such a group -- there were nine members who I believe shared equally in the award. Therefore, I think the Fords were quite farsighted and wise in providing that this could be given to teams or groups as well as to individuals.

MR. Mc KNIGHT: May I interrupt at this point to say this statement has been distributed by the United Nations with a three o'clock embargo on it. It is released as of the end of this conference. I believe a good many of your questions will be answered in the release. And I think Mr. Strauss would like to get on to his other announcement, which is of some importance.

MR. STRAUSS: I hate to shut off any questions.

Q. It was released by UN in New York?

Mr. McKNIGHT: It was distributed here and released by the Ford Motor Company people in the States.

Q. Admiral Strauss, is this the first foundation of this kind in this field?

MR. STRAUSS: Well, it's difficult to say. It depends on how far back you go. I set up an award personally which seems rather trivial by comparison with this, some six or seven years ago, of \$15,000 and a gold medal to the individual who made the most outstanding contribution to the natural sciences. That is known now as the Albert Einstein Award. The Atomic Energy Commission last November decided to establish an award of \$25,000, of which the first recipient was Enrico Fermi. He was ill at the time. We did not wish to call it the Fermi Award then for quite obvious reasons. It will be called the Fermi Award and that will probably be renewed from time to time, perhaps annually. So I can't say that this is the first. This is undoubtedly the largest award of its kind in the field and it is the only award that is specifically earmarked for atoms-for-peace. In those two respects it differs from any of the others.

May I then go to the second point? The second point has more to do with our own business. I was simply asked to make this first announcement. The second announcement I make voluntarily.

Mr. McKNIGHT: I will distribute copies at the end of the conference too.

MR. STRAUSS: I'm constantly amazed at the efficiency of the staff. This announcement is so brief that I can read it to you, and I think you can take notes and get the gist of it. (reading):

"The United States Atomic Energy Commission is announcing in Washington today a value for enriched uranium leased for research reactors and sale prices for normal uranium and heavy water." This is being released in Washington simultaneously with this announcement which I'm making, perhaps with a difference only of minutes.

"This price and lease charge schedule are designed to be of assistance to those nations that are planning to use research reactors as part of their program for benign uses of the atom.

"This value established for the lease of uranium enriched to 20 per cent in U 235, for use in research reactors under the bilateral agreements between the United States and friendly nations for cooperation in the civil uses of atomic energy is \$25 per gram of contained U 235." That is the lease price of contained U 235. "The sale prices of normal uranium and heavy water are:

"For heavy water — \$28 per pound." Heavy water, as you know, is used as a moderator and coolant in certain types of research reactors because it enables the reactor system to make efficient use of neutrons.

"For normal uranium metal, \$40 per kilogram."

I will run over the prices again: \$25 per gram of contained U 235 in the lease arrangement; \$28 per pound for the sale of heavy water; and \$40 per kilogram for the sale of normal uranium metal. That is the end of the statement.

Q. For what period is the lease?

MR. STRAUSS: The leases depend on the terms of the individual contracts negotiated with the individual countries.

Q. Is it \$25 per year?

MR. STRAUSS: It's \$25 per gram.

Q. Per year?

MR. STRAUSS: No. A gram might be kept for longer than a year or less than a year. It depends upon how long it takes to burn it up.

Q. Please, sir, is that within the 200 kilograms pledged, or is that an unlimited amount?

MR. STRAUSS: No, this refers to the 200 kilograms; no more has yet been allocated by the Commission for the purpose. Should more be allocated and should the price not have been changed in the interval, this would apply.

Q. And how would be the price of the enriched uranium — because that is only the price of the contained U 235?

MR. STRAUSS: That is the way it is figured. It is calculated on the amount of U 235 in the uranium.

Q. But have you to pay an additional price to the U 238?

MR. STRAUSS: No.

Q. How much normal uranium will you offer for sale?

MR. STRAUSS: We haven't fixed any limit on that, sir. It's in very much greater supply, of course, than U 235, and no figures have been announced.

Q. And the amount of U 235?

MR. STRAUSS: Two hundred kilograms have been allocated. The British Government has also allocated sometime ago an amount of 20 kilograms. Whether that has been increased recently or not, I am unable to say. That dates from some months back and my information may be out of date. They may have increased it.

Q. Mr. Strauss, does that mean, sir, that at any time they may not come to the United States and order from you, say, 20 tons of uranium or do you want to know what they are going to use it for?

MR. STRAUSS: I think it's reasonable to ask some questions. We wouldn't want, for example, to have any uranium used for other than peaceful purposes. This whole program is designed to stimulate and foster the benign use of the atom, and I think a question and assurances would not be out of order.

Q. Mr. Strauss, would you give me an idea of the significance of these prices on a comparative basis? Do they constitute a relatively low cost for these things?

MR. STRAUSS: Well, I think in the case of heavy water they represent a substantially lower cost than the world market has been heretofore, except that it is somewhat difficult to describe it as a world market, as it is not a commodity of ordinary commerce. One could not say what the comparison would be with respect to the price for normal uranium because I don't believe there has been any market or any transactions in it that are quoted.

Q. Are both the natural uranium and the heavy water available to anyone domestically in the United States and outside the United States who meets these Atomic Energy Commission requirements?

MR. STRAUSS: Well, I think within the limitations of (a) ability to provide it, so that it didn't conflict with the internal program, and (b) the user's purpose, it is fairly generally available.

Q. Must it be within the bilateral agreements?

MR. STRAUSS: We have no authority under the law to do this other than through some bilateral arrangement; that is true.

Q. That is both the heavy water and the uranium?

MR. STRAUSS: Not with respect to heavy water. Heavy water is not a material which is specifically limited under the law, but of course uranium is.

Q. Uranium is limited for export to those countries that have bilateral agreements?

MR. STRAUSS: Yes, to those countries which have concluded bilateral arrangements.

Q. Either normal or U 235?

MR. STRAUSS: Yes, that's right.

Q. In talking about the prices ---

MR. STRAUSS: Mr. McKnight calls my attention to the fact that you might assume that this was limited only to the 27 nations that have already concluded bilateral arrangements. Obviously the limitation of numbers there was to some extent due to the fact that Congress adjourned before other negotiations could have been completed and could have lain before the Congress for the 30-day period required by law before they become effective.

Q. Admiral, what has motivated the timing and the nature of the announcement? Is it charity or something like that?

MR. STRAUSS: Oh, no. This was only recently decided by the Commission. There is a great deal of accounting that goes into the determination of these figures. We don't want to make money on them, and we don't want to lose money on them. And the cost of accounting in a large operation of this sort takes time. The decision was only reached shortly before the Commission left for Geneva. There was no design to create anything dramatic and, if I have done so, it is not only out of character for me but I would be giving you a false impression.

Q. How many reactors will you build from these 200 kilograms? How many research reactors?

MR. STRAUSS: We have figured a fraction over six kilograms per reactor. I'm not good at division.

MR. MCKNIGHT: That is 32.

MR. STRAUSS: It's 32, I'm told.

Q. Many people think that plutonium would make a very good reactor, or mixed with uranium, or uranium which has more than 20 per cent of U 235 in it. Are there any facilities for letting people have uranium?

MR. STRAUSS: We have no intention at the present time of releasing uranium enriched beyond 20 per cent in keeping with our

intention not to release material of or approaching weapons grade.

Q. Are we releasing heavy water for industrial or agricultural chemical purposes to other nations at this time?

MR. STRAUSS: I think that the heavy water, which has been ordered from us by several other nations, is intended entirely for use in reactors. That does not foreclose the possibility that some small amounts of it may be used in other kinds of research, and the Commission would look with favor on its happening. We regard that as a very constructive thing.

Q. Admiral, is any country with whom we have diplomatic relations eligible for the conclusion of these bilateral agreements?

MR. STRAUSS: Well, I think that I am incompetent to answer that question. That is a question for our diplomatic people to answer. At another press conference — and I hope that I will have another one soon — if you will be good enough to come and join me, I will try to answer that and any other questions you may have. Now, if I'm not cutting off some question, I would like to be excused. Dr. Rabi, one of my fellow delegates, is presiding this afternoon and, as a measure of respect to him, I would like to be in my seat when he takes the podium.

Q. One last question, Mr. Strauss. Dr. Bhabha, President of the Conference, said this morning that: "I venture to predict that a method will be found for liberating fusion energy in a controlled manner within the next two decades." Would you care to comment on that, sir?

MR. STRAUSS: I'd like to make a comment on it, and I would like to make a comment on it in a subsequent session, not a particularly formal one but I think that what I would say would probably lead to further questions and I would hate to end the interview on an indeterminate or evasive note.

MR. McKNIGHT: Might I ask when you would like to see the Admiral again? Is Wednesday at the same time soon enough?

Q. Could I ask one last question, please?

MR. STRAUSS: Yes.

Q. It would be nice to know when the Admiral makes his announcement so we will get it.

MR. STRAUSS: There will be no announcement. I will just attempt to answer questions. I would hope not to have to say "No comment" to anything that you ask. You may get me into a corner where I would have no other recourse, but I will try not to.

MR. McKNIGHT: Well, then, subject to the availability of this room, we will meet again on Wednesday at 2 o'clock.

(The Press Conference adjourned at 2:30 p.m.)

PRESS CONFERENCE, GENEVA, SWITZERLAND, AUGUST 11, 1955

PRESENT: Lewis L. Strauss, Chairman, United States Delegation;
Willard F. Libby, Vice Chairman, United States
Delegation; John P. McKnight, Information Officer,
United States Delegation.

MR. McKNIGHT: We still have four minutes until 2 o'clock so I will use that time to dispose of a couple of minor matters I have. What I have to say is a little bit unpleasant. We have had reports back from the United States, not from any other country, that there have been one or two cases of jumping the gun on embargo times. I am sure this was entirely involuntarily. It just happened the embargo was jumped on pretty good news stories. Also, I'm not entirely sure that the fact of jumping was the fault of the newspapermen concerned. In fact, there has been a good deal of confusion about embargo times. It probably was entirely involuntary. However, I would appreciate it if all of you would caution your home offices to do their utmost to observe the embargo strictly, otherwise our entire system falls down. We have made every effort to give you all the advanced material, as far in advance as possible because I know how much that helps a working newspaper man.

A report seems to have gotten around that the Chairman will have a sensational announcement to make today. That is incorrect. This conference is merely a continuation of last week's press conference. This is probably the first serial press conference on record. He will have exactly 30 minutes today because he must leave to be at the session at 2:30.

Will you take over, Mr. Strauss.

MR. STRAUSS: I see two members of the American Delegation here and I am not sure that you are all acquainted with them. I would like to have Dr. Shields Warren stand up so that you can see him — a very distinguished and beloved member of our delegation, formerly Chief of the Medicine and Biology Division of the Commission; Dr. Libby, my colleague on the Commission and one of the delegation is also here; and members of the staff — I started to say too numerous to mention, but very distinguished members of the staff.

Just as the hearings — (laughter). Well, it's clear that the laughter is only from the American newspapermen. Just as the press conference broke up on Monday, Mr. Carey of AP, whom I nearly addressed as Senator (laughter) asked me, according to the transcript: He said, "one last question. Dr. Bhabha, president of the conference, said this morning that: I venture to predict that a method will be found for liberating fusion energy in a controlled manner within the

next two decades. Would you care to comment on that?" My alarm watch, as I recollect, had already gone off, indicating that I had to be back at the session at which Dr. Rabi was presiding and I am recorded as saying, "I'd like to make a comment on it, and I would like to make a comment on it in a subsequent session, but I think what I would say would probably lead to further questions and I would hate to end the interview on an indeterminate or evasive note."

If that question — Where is Mr. Carey?

MR. CAREY: Right here. I repeat the question, sir.

MR. STRAUSS: If it is still extant, the answer, Mr. Carey, is affirmative and brief. The Commission is and has been working on the subject for a considerable time. The Atomic Energy Act of 1954, which in many respects parallels the original MacMahon Act, in Section 3 describes the purpose of the Act and the first of those purposes is: The Commission shall conduct a program of assisting and fostering research and development in order to encourage maximum scientific and industrial progress. This controlled thermonuclear program is one of a great number of programs on which the Commission has been at work.

Q. Have you made any progress that you can tell us about?

MR. STRAUSS: Oh, I think it is clear and easy to say progress has been made — progress that sometimes consists of finding that things can't be made. Progress certainly is being made from a scientific point of view. There has been nothing in the nature of breakthroughs that would warrant anyone in assuming that this was anything except a very long range — and I would accent the word very — project.

Q. Is this a large, medium or a small program that we are talking about?

MR. STRAUSS: By what scale of measurements?

Q. By the scale of measurement used in the first years of the Manhattan Project and by the scale used in atomic energy development for peaceful purposes which is used by AEC now, by both scales.

MR. STRAUSS: Oh, I would say moderate. It isn't tiny and it isn't great. It's receiving the amount of support that is requested for it.

Q. Has the research gone to the point, Mr. Strauss, where there are indications that it will be eventually possible to harness fusion energy?

MR. STRAUSS: Well, Mr. Carey, I'd like at this point to look at your question again and Dr. Bhabha's statement, because it is true that he ended his statement with this prediction. But he began it by saying this: There is no basic or scientific knowledge in our possession today to show that it is impossible for us to obtain this energy from the fusion process in a controlled manner. This was a somewhat more conservative approach to it. I think Dr. Libby would bear me out.

DR. LIBBY: Yes, sir.

MR. STRAUSS: That is a statement to which we could subscribe. We do not know that it is impossible.

Q. Admiral, do you have any reason to believe that any other country has made as much or more progress than we have in the study?

MR. STRAUSS: I haven't any information on the subject at all, other than our own. This is not one of the subjects included in the conference agenda. It is not a matter of any immediacy. It doesn't represent anything that we have or anyone else has, as far as I know, ready to reveal as affecting the peacetime uses of atomic energy. It is a matter for the future.

Q. Admiral Strauss, would you say that this work has proceeded far enough so that you could estimate capital costs on the plan of using thermonuclear energy?

MR. STRAUSS: No, Mr. Finney, I could not. I don't know anybody who can, but there may be such people.

Q. Does the metal lithium figure in the program?

MR. STRAUSS: I beg your pardon?

Q. Does the metal lithium figure in the modern program?

MR. STRAUSS: I can't answer that on account of ignorance. I would say it's too early in the program to tell what the particular materials are, other than certainly one would say that deuterium would be possibly a material that would figure in it.

Q. Mr. Strauss, some of the papers have carried stories about the fusion process affecting the future of uranium as a fuel. Do you have anything to say about the possible effect on the, well, equity investment in uranium as a source of nuclear energy?

MR. STRAUSS: Only this, sir, I would regard that program as of such long range that it should not affect the efforts which are being made in order to find and produce uranium or the efforts which are being made and which we are encouraging for the production of reactors to derive electrical energy from atomic energy.

Q. Sir, Sir John Cockcroft of the British Delegation made a statement of what he meant by long range term. He said that he thought it was possible to have the H-power within a generation. Could you agree with what he said yesterday?

MR. STRAUSS: I'm unable to give you any predictions at all. I have never been any good as a predictor and I wouldn't want to start a career at it now. I think that one uses terms like generation and decade, well, they are fairly loose and comfortable terms. They are not very meaningful in a situation of that sort. I wouldn't know how to use them.

Q. Admiral Strauss, I'd like to ask, you are probably aware there has been considerable political agitation, particularly in Europe, on banning hydrogen bomb tests. My question is, would a ban on thermonuclear testing be a detriment to a program of the development of peaceful applications of hydrogen power?

MR. STRAUSS: I think that is a question, sir, that is so much in the political realm as contrasted with those that are being discussed before the conference here that a comment on it would be inappropriate at this time and place.

Q. My question was addressed to the scientific aspect, not the political aspect.

MR. STRAUSS: Would you want to try a hand at that, Dr. Libby?

DR. LIBBY: Well, I think there is no reason that the device or process should lead to any wide-spread contamination, no. If it is successful, not at all.

Q. Could Dr. Libby or Admiral Strauss outline for us in somewhat detail the kind of experiments to be made?

MR. STRAUSS: You mean on this subject?

Q. Yes.

MR. STRAUSS: No, we will have nothing to say about that.

Q. Was there any discussion, sir, between our delegation and any other delegation or between our delegation and the United Nations as to whether this subject should have been included in the agenda?

MR. STRAUSS: The delegations were not parties to the discussion of subjects for the agenda. The agenda was prepared by a steering committee set up by the United Nations. It so happens that a member of our delegation was a member of that steering committee. But, we, as a delegation, were not parties to the preparation of the agenda.

Q. Admiral Strauss, can you give us any idea why this subject, which has caused more interest at this conference, I think, than anything else, was excluded from the conference? You say it wasn't included.

MR. STRAUSS: No, I can only give you my assumption, which is that it has nothing to do at the moment with the peaceful applications of atomic energy.

Q. Well, it has a great deal to do with atomic energy in the eyes of the people who are building reactors, the industrialists.

MR. STRAUSS: I can only refer you to a remark which I made a few moments ago, that I do not regard it as at all jeopardizing the future of the reactor program by what, may we call, conventional methods. (Laughter)

Q. Please, sir, did you make any contacts with other delegations, especially with the Russians, about the international atomic pool? I asked one Russian delegate today how much would be the amount the Russians would give to it, and do you know anything about it?

MR. STRAUSS: No, that is also in the — I hate the word political — that is also in the diplomatic area and is not a question before the conference or before our delegation, sir.

Q. Admiral Strauss, I just want to be clear on the question. I asked you, whether you said any progress was being made. As I get it, you said progress is being made but you must also remember that we make progress when we work and find out something cannot be done.

MR. STRAUSS: Yes.

Q. Can you say one way or the other whether we are making progress in a positive sense?

MR. STRAUSS: Some progress is being made in a positive sense and some in a negative sense — if you will construe as negative the determination that certain things cannot be done, yes.

Q. Not long ago in America and in Britain scientists announced that they have been able to produce just over one atom of new fuel for every one burned up. At the beginning of this conference the British announced that they had been able to double that speed. Have you any comments on that?

MR. STRAUSS: Dr. Libby, do you think that is a subject you care to comment on?

DR. LIBBY: I had not understood that to have been the statement. But perhaps I am mistaken. It certainly is one of the great problems of atomic power to determine whether you can produce more fuel in making atomic power than you consume. The borderline is about one atom. That is if you produce more than you burn you are on the positive side. I hadn't understood the British to have said they were so far on the positive side.

Q. They did at their handout in writing at which they said they doubled that.

DR. LIBBY: That is wonderful news, if it is correct.

Q. Is it not the case, if you get over one atom you get a double in time?

DR. LIBBY: Well, you produce more fuel than you burn.

Q. Eventually you will double it.

DR. LIBBY: It depends on how many cycles you go through. Yes, perhaps that is the connection.

Q. They said, in fact for every atom burned they produced two new ones in a research reactor.

Q. I would like to come back to some of these semantic terms that are troubling me. You found decades and generations comfortable and I find long uncomfortable. Could you find something more comfortable in that direction, sir?

MR. STRAUSS: No, I think all of us in this business would like to be specific. We constantly bedevil the people who are in charge of our laboratories to tell us just when they will invent something. They think it's unreasonable, just as you probably think I am unreasonable in being unable to answer you as to when a development, that is unprecedented in difficulty and which new problems arise with everyone that is solved, can be finally solved. I can't do it.

Q. But two countries have at this session, spokesmen for two countries have.

MR. STRAUSS: Well, they are in a position perhaps to be more precise than I am. Two generations or two decades to me are a period of time beyond my useful life. (Laughter) I can't speculate.

Q. Can you tell us, Admiral, something about the reasons why this program is being conducted? Can you tell why a research program is being conducted? Have any of the scientists seen any possible advantages over these reactors?

MR. STRAUSS: Well, a research program must be conducted in order to find out everything that there is to discover about the particular material you are working with. That is quite apart from the fact that, as I said a few moments ago, the law under which we operate charges us with it. Then I think you can credit us with some natural curiosity and the desire to be on top of the procession.

Q. Admiral Strauss, I heard you being called as fathering this conference. Can you tell us how this designation came about?

MR. STRAUSS: Well, it came about, I suppose, deservedly or not, in view of the fact that after the President's address to the United Nations in December of 1953 there was a period of apparent doldrums. These were not doldrums, because conversations were going on between the Secretary of State and the Russian Ambassador in Washington, and the French, British and Canadian Ambassadors. I proposed a conference such as this in the course of a very dull speech that I made in Los Angeles before the World Affairs Council. I proposed it with the approval of the President, later on of course it was adopted — the idea was adopted by the United Nations. And this very significant conference, I'd like to feel that I had some parental relationship to it. Thank you though for giving me the opportunity to say so.

Q. Admiral Strauss, can you tell us how much the Atomic Energy Commission is spending a year on this particular project, that is with respect to the peaceful application of thermonuclear power?

MR. STRAUSS: No, sir, I can't. That is a piece of classified information, plus the fact that parts of this operation are so interwoven with other projects that it would be impossible to separate them without an elaborate piece of cost accounting.

Q. Can you tell us your impressions on the conference and what is in your eyes the biggest gain America gets out from it?

MR. STRAUSS: Well, I don't think we went into it in order to get a gain for America. The whole purpose of this was conceived in complete altruism by the President as a gain for the world, which would then be a gain for the United States. I think my impression of the conference to date, and it still has the longest part of its life ahead of it, is that it has become what it was designed to be, truly a scientific conference with no political overtones, with a good deal of frankness between the participants and with a re-opening of lines of communication with each other for many years. Those in general are the preliminary effects that it has upon me. I expect to stay here for a number of days more and will know more about it later.

Q. Admiral, do you anticipate that there will be any decrease in classification of atomic energy for applications of peaceful uses as a result of this conference in the near future?

MR. STRAUSS: No, I don't think the conference will have a result on our policy. Our policy has always been to declassify information as rapidly as we could consistent with the National Defense. The conference has had the effect of stimulating the preparation of a great many papers and those papers, as they were prepared and submitted for clearance procedure, have resulted in the declassification of some of the items that they contain. I think, therefore, the conference has had a substantial effect in that way.

MR. McKNIGHT: Might I add to that, that I myself only learned this fact yesterday. You cannot declassify an idea, you have to declassify a piece of paper. The conference has resulted in getting a lot of ideas written down on pieces of papers that can then be declassified. In other words, it has sort of a catalytic effect for declassification.

Q. Admiral, does the United States intend to make sufficient fuel available for more than one reactor per country?

MR. STRAUSS: I can't answer that question. It would depend on the country. It would depend on the purpose for which the reactor is required. It would depend upon the amount of fuel that we have available over and above our own needs. It depends upon the time scale. So that there are a number of variables that would be required there. This was not a colloquialism in which Mr. McKnight reminded me of this. As a matter of fact, I think Mr. Holles reminded me of this yesterday or the day before, a good story, it seems to me, is in the fact that this conference is taking place here in Switzerland just 50 years after a clerk in a Swiss patent office wrote an article for Annalen der Physik on the subject of the relationship of energy and mass.

A young fellow at that time in his 20's, by the name of Albert Einstein here in Switzerland, and 50 years ago. I think it's a nice round item. I wish I had thought of it first instead of Mr. Holles. I would take the credit.

Q. Admiral, one country has been selling heavy water at about seventy thousand pounds (sterling) per ton. Another has announced that at great cost it is building installations to produce heavy water at forty thousand pounds per ton. Now you say you will sell at about 17,000 pounds a ton. And you have made others look silly by offering heavy water for half that low price. Can you tell us whether your offer is for large quantities or just the small amounts needed for research?

MR. STRAUSS: In the first place, I'd certainly like to disclaim any attempt to make anyone look silly. We have produced this heavy water for our own needs. We found that we had an excess. We wanted to make it available to our friends. We didn't want to make a profit on it. Therefore, we decided to sell it at a figure which would get us out of the hole without making a profit and without taking a loss. Some of the quantities that have been requested and that the Commission has agreed to sell are in excess of the quantities that would be required merely for research reactors.

Q. Admiral, I'd like to just return to fusion for one moment.

MR. STRAUSS: Pardon?

Q. I'd like to return to fusion for one moment.

MR. STRAUSS: I thought we had passed it.

Q. No. There has been a lot of material that has been published concerning what the nature of the problem is in eventually harnessing this energy and none of it has ever been given in any official way that I can find out and I was wondering if Dr. Libby or yourself could tell us in a declassified way some of the main problems relating to this problem.

MR. STRAUSS: I think your question is an interesting one. I don't want to prevent Dr. Libby from answering it, but I would like to delay that to perhaps a conference that we will have in Washington in the fall and talk about the whole subject and nothing else. I am quite prepared to do it, to leave it until later.

Q. But I thought that this was what this conference was for.

MR. STRAUSS: Pardon?

Q. I thought that this was why we had this conference.

MR. STRAUSS: I don't think we could do it in the ten minutes that remain to us and answer everything that you would want to ask about it, sir.

Q. We could meet again?

MR. STRAUSS: That is a very considerate idea. We might think about it. But I'd rather do it after we get back to Washington.

Q. Admiral, have you or any of your colleagues been invited by the Russians either formally or informally to visit Moscow and conversely have you extended any invitation to the Russians?

MR. STRAUSS: Well, I can only speak for myself. I haven't been invited and I haven't invited anyone. But that was simply a plain statement of fact, no inferences are to be drawn from that.

Q. Could you tell us, sir, following on the answer in your previous, you spoke about the conference in Washington in the autumn, has that already been arranged, or is it something you have just had on the spur of the moment?

MR. STRAUSS: I meant a press conference. I meant such a conference as we are having here today.

Q. I'm sorry.

MR. STRAUSS: Yes, nothing like protocol and interpreters and floodlights.

Q. Will you then make a statement, or will you only answer questions, Admiral?

MR. STRAUSS: I don't want to commit myself as to what we will do or if we will do it, but it seems to me it will be an interesting thing to follow up, if you think popular interest in this subject will survive.

Q. Admiral, would you care to comment on the supply of uranium in the western world in view of these reports of large deposits in north Canada? In other words, do you think the world has enough uranium now?

MR. STRAUSS: At the session yesterday Dr. Libby asked Sir John Cockcroft such a question as you have asked me and Sir John responded by quoting our own Mr. Jesse Johnson.

Q. Before the paper had been released too. (Laughter)

MR. STRAUSS: I think the rate of discovery would indicate there is a great deal more uranium in the world than anyone believed ten years ago and that it will continue to be found in increasing amounts.

Q. In view of that, do you anticipate a radical fall in price of uranium as the military demand is reduced or eliminated?

MR. STRAUSS: I wouldn't want to comment on prices or anything of that sort at all. If the military demand for uranium were eliminated, it would mean a great deal more would be available for peaceful use than we can conceive of at the present time. The things have a balancing effect, it seems to me.

Q. Admiral, has AEC set a price for reprocessing spent fuel elements to commercial firms?

MR. STRAUSS: No.

Q. Do you intend to?

MR. STRAUSS: Yes.

Q. On the pricing question, did we apply the same sort of rule of thumb on our uranium prices as we did on heavy water?

MR. STRAUSS: It isn't a rule of thumb.

Q. I mean to say not make a profit but make it available.

MR. STRAUSS: That is the general theory, sir. We are not trying to make a profit but we are trying to protect the government from any loss.

Q. Please, the British announcement about this doubling of plutonium was this, that there is a plutonium core and outside there is natural uranium. Now, the British said they would build an atomic plant working on this principle. Naturally for this principle you need plutonium. Would America be prepared to give plutonium to other countries if an atomic power plant can be built from this principle?

MR. STRAUSS: We haven't announced any possibility at the present time of selling plutonium, sir. We have announced, as you may recall, I did announce I think on Monday the fact that we would sell uranium, that we would sell heavy water, that is normal uranium, and that we would lease for research reactors uranium enriched with uranium. Nothing has been said about plutonium.

Q. In view of the large amounts of uranium which are now available, have you anything to say about the possible continuation of the United States purchasing program beyond March 31?

MR. STRAUSS: No, no comment at this time, sir. You should not infer that there is any change contemplated but I'm just not prepared to make any statement about it at all.

Q. Will the Admiral please take in mind the various financial agreements that have been signed between the United States and smaller countries with this clause which prevents them from gaining information except on reactor projects in which they are themselves actively engaged? It does penalize —

MR. STRAUSS: From gaining information? I don't recall that clause.

Q. In the bilateral agreements you do stipulate that information can be exchanged in those reactor projects where the countries concerned, the other countries and America, are actually engaged in or show positive signs of engaging upon construction of such a reactor.

MR. STRAUSS: I am sorry, your question is obscure to me.

Q. Well, it means in plain language that we can only make graphite reactors and you have got fourteen or fifteen different sorts of reactors. We can only discuss with you how to make a graphite reactor and we can't discuss with you some other project which might show much greater promise for the future.

MR. STRAUSS: Well, without the precise text before me, unhappily, I don't have it, I don't have the text of those agreements before me, I can't comment on it. Let me see whether the general counsel of the Commission, Mr. Mitchell, who is here, can identify the clause from your description of it. Can you, Mr. Mitchell? (No comment) This is a subject that if you would like to pursue it, we will try and have another session before the conference is over and I will refresh my recollection of this precise clause. I don't want to discuss it without having it before me for fear of saying something that is misleading and misinforming.

Q. Admiral, I will try to clarify it this way. Is it the policy of the United States Government to impede and hold back reactor development in the friendly nations with which we have these treaties?

MR. STRAUSS: Oh, most contrary, it is the announced intention and the sincere purpose of the United States to advance the whole field of peaceful applications of atomic energy everywhere and specifically in the friendly nations in every way that we can.

Q. Admiral Strauss, you mentioned friendly nations. Are there any particular strictures placed on the research of this heavy water uranium, and so on?

MR. STRAUSS: No, the sale of heavy water is left entirely to the discretion of the Commission.

Q. I will phrase my question another way. For instance, have any of the countries — Russia, for instance, the People's Republic of China — if they want to buy any uranium or heavy water for research reactors, would you be prepared to sell any?

MR. STRAUSS: I think there is an Act, the Battle Act, that is still on the statute books of the United States which would control that situation. But unfortunately I am just not equipped to answer either a diplomatic or a legal question of that sort. I'm not trying to be evasive, however.

Q. I mean this as a purely commercial question, that is the non-profit sale of heavy water.

MR. STRAUSS: That, I'm satisfied, would be considered a strategic material under the terms of the Battle Act.

Q. Have you yet had any responses to your offer to sell fuel materials the other day?

MR. STRAUSS: Those would not come to me, sir. They would go to the Commission in Washington and the Commission is functioning quite satisfactorily without the assistance of those of us who are absent. I haven't heard.

Q. You haven't heard?

MR. STRAUSS: I have not heard.

Q. Have we given any thought to the time, how far away the time might be in months or years when we might offer to lease or sell or otherwise supply uranium of power reactor grade or plutonium to other countries?

MR. STRAUSS: Yes, we have thought a great deal about it. We don't feel we are at the precise point in time at the moment, but we are close to it, I think, we are approaching it.

Q. I would like to ask you if the American companies selling reactors can offer fuel to go with them?

MR. STRAUSS: Not at the present time, no.

MR. MCKNIGHT: Suppose we have just one more question, if there is one. Before that question, however, may I rectify an omission of the other day. I should like very much to introduce Dr. George Weil, our technical director of the United States Delegation and a participant in the operation of the first nuclear pile at Chicago with Enrico Fermi in 1942. I'd also like to say that if you will let me know later as to whether you would like another press conference and when, we will endeavor to set it up sometime next week.

Q. Will you think of fathering another proposal whereby you can continue this exchange of knowledge between the United States and the other nations?

MR. STRAUSS: It is perhaps out of place for me to say this, but I would very much hope that this will be the first conference of its kind and not the only one. I think that expresses my own point of view very profoundly. It has been a great conference so far and those who are competent to talk about it tell me that it has been extremely useful. It ought not to be the last.

Q. Thank you very much, sir.

APPENDIX XIX - SUMMARIES OF PRESS COVERAGE ABROAD

UNITED KINGDOM

The United Kingdom press as a whole gave heavy coverage to the United Nations International Conference on the Peaceful Uses of Atomic Energy. Exhibits and conference papers of the USSR, the United Kingdom, and the USA were accorded objective treatment. Nationalism arose in articles dealing with commercial rivalries and discussions of leadership in the race for peaceful exploitation of atomic energy.

Published stories dealing with United States activities in the atomic field were by far in the majority, both as to numbers and space devoted to them. Credit was given to the United States for initiating the Conference and suggestions from President Eisenhower and Premier Bulhanin that a second conference be held were widely approved. The United States offer to train foreign scientists, sell nuclear fuel without profit, and the presentation of libraries on atomic energy were favorably commented on in editorials, articles, and headlines.

Summarizing Conference Result:

The NEW STATESMAN & NATIONS said: "Never has there been in the history of Man such a convention . . . To its promise of power unlimited it coupled foresight of social hazards and opportunities . . . It ended the illusion of secrecy which has corrupted science . . . Out of a thousand papers of scientific fact came also a synthesis of wisdom . . ." THE SCOTSMAN (Edinburgh) said: "Looking into the cloudy crystal ball with imperfect eyes", the Conference, while "it exchanged a great deal of information, a lot was held back". Pointing out that "a vast amount of pioneering still lies ahead", THE SCOTSMAN doubted "if the present generation will see any of the more sensational results of atomic energy".

The GLASGOW HERALD surmised that: "As a result of the Geneva Conference the world has become a slightly better place".

The STATIST (London) considered the Geneva conference an "outstanding success" which "may well prove more important than anything achieved there (in Geneva) in the past or immediate future by statesmen and diplomats". The SPHERE (London) wrote that "the benign atom seems brightly in the ascendant", while the MINING JOURNAL declared that the "Geneva conference did

more to condition the World to the fact that Man is now living in the Atomic Age than any other event since Hiroshima. . . . It has translated what hitherto was scientific theory into hard commercial reality."

Calling the conference "perfectly timed", the TIMES (London) described it as "a symbol of transition in world power programs" while the FINANCIAL TIMES (London) hailed it as "turning a page in industrial history".

The MANCHESTER GUARDIAN commented that "a real step towards trustfulness has been taken", and added that the conference "ended in as a big a success as it began" and that "despite all of its hygienic detachment it will have political consequences."

The DAILY TELEGRAPH (London) summing up results said: "The conference had more far-reaching effects than any other meeting of scientists ever held and it has convinced peoples, as no stereotyped propaganda could have done, that peace is worth winning. . . . the prize of peace, a future based on plentiful atomic energy, is better than anything most of us ever dreamed of."

"U.S. Offers the World Training in Atomics" was 2-line, 5-column headline of the HERALD and EXPRESS of Torquay, while the COVENTRY EVENING TELEGRAPH, gave a 4-column streamer to a "historic announcement" at Geneva that the "U.S. is ready to help all Nations' atom training".

The GLOUCESTERSHIRE ECHO (Cheltenham), the OXFORD MAIL, the Gloucester CITIZEN, the YORKSHIRE POST (Leeds) and many other papers gave big play to the presentation of "Atomic Libraries" to the heads of all delegations at Geneva.

The BIRMINGHAM POST and YORKSHIRE OBSERVER commented, under 3-column headlines on the "U.S. Surprise at Geneva" in handing to 73 nations 8-volume sets "giving full details on reactors" contrasting this gift with Russia's presenting "blueprints contained in 61-pages of a 5,000-kilowatt atomic power plant."

Admiral Strauss' announcement of prices for enriched uranium and heavy water also got good coverage but sale and transfer of the U.S. Geneva Research Reactor to the Swiss Government got scant notice.

The question of secrecy in atomic matters drew considerable attention. Most writers agreed that secrecy had been lifted after 15 years; others were skeptical.

The Atom has shed its "cloak of mystery and horror" wrote the BIRMINGHAM POST, while the DAILY RECORD (Glasgow) made much of Prof. Hughes' (Brookhaven National Laboratory) graph which revealed that, despite 10 years of so-called secrecy, Russian, United States and British scientists, in plutonium experiments, reached almost identical results. "It's so close you would think the experiments were made in the same laboratory" the RECORD quotes the American scientist as saying.

The GLASGOW HERALD, foreseeing the era of secrecy ended, echoed the NEW YORK TIMES suggestion for "systematic education" to follow the conference particularly in countries lacking atomic experience.

"Thousands of millions of pounds worth of atomic research were tossed into the international 'kitty' by the United States, Great Britain and Russia" wrote the NEWS CHRONICLE (London) and commented that "nations have taken an irrevocable step and cannot now draw back the curtain of secrecy." Pointing out that "what was treason to disclose a month ago is now common property", the CHRONICLE applauded "the lack of nationalism which characterized the Conference."

The NEWS OF THE WORLD (London) said the most exciting meeting of the Conference was when the world's two greatest builders of atom smashers (Lawrence of the USA and Veksler, USSR) "spoke from the same platform, paying tribute to each other, and the entire audience rose in applause".

The OBSERVER'S (London) correspondent, commenting that the "discreet collusion" amongst scientists resulted in "a great deal more declassification", pointed out that: "Old scientists have learned what others have been doing the past twenty years and younger scientists, for the first time, are breathing the liberal international scientific air they have never known before."

The NEW NATION AND STATESMAN (London) expressed a fear that "the United States is still holding out vital information in the field of peacetime uses of hydrogen power" and quoted United States Congressional observers (on their return to the United States) as saying that America "is fumbling its program to harness the H-bomb for peaceful purposes".

The FINANCIAL TIMES (London) said that Russia's revelations of atomic progress came as "a distinct shock to Britons" and the Americans "simply could not believe that Harwell's breeder reactor doubled the amount of plutonium it consumed."

Writing for the WESTERN EVENING HERALD (Plymouth), ex-Premier Georges Bidault of France said, "Scientists (at Geneva) have opened up their files to one another. Free discussion of matters heretofore considered as top secret are important developments . . . but it would be wise to make a few reservations and bear well in mind that . . . it is obvious that in this convention of scientists, where everybody has been telling everything to everybody else, nobody has been learning anything from anybody."

The Science Editor of the NEWS CHRONICLE (Richie Calder) wrote that: "All security regulations will now have to be drastically revised . . . not because scientists have been indiscreet, but because so much which was supposed to be secret was purely illusory . . . for example, five countries showed that they had, in complete isolation, developed the same techniques for the extraction of uranium from certain ores".

In its commentary on "Atomic Hazards" and the "Success of A-Talks at Geneva", the SCOTSMAN (Edinburgh) conceded that the conference "is generally recognized to have been outstandingly successful." It quoted an interview with Sir John Cockcroft, Chairman of Britain's conference delegation: "I think the Iron Curtain has been lifted quite a lot . . . let's hope it stays up . . . We have got a lot of new information about atomic power plants from the Americans and other countries got a fairly good picture that they never had before".

Radiation Genetic Problems

The question of radiation hazards was raised in some newspapers. The BIRMINGHAM MAIL and MANCHESTER GUARDIAN gave serious consideration to the dangers of genetic mutations, while the GLASGOW HERALD characterized as "tactless" comments on the tabooed subject by Sir Ernest Rock-Carling and Sir George Thomson, British scientists. The GUARDIAN said "one of the blackest spots as Geneva was when scientists divided on the lurking dangers of atomic radiation to the future of the race".

The NEWS CHRONICLE (London) held that the conference "revealed to the world the hazards of atomic war and the need for international controls of radiation dangers".

The EVENING STANDARD (London) and EVENING CHRONICLE (Manchester) speculated on what might happen if a nuclear reactor had a major accident. Against the warning of two British scientists that everyone within a mile and a quarter of an exploding plant would be killed was placed the opinion of three United States experts that: "The operation of nuclear reactors appears safe and is, in fact, deceptively safe". "Runway -- the new disaster of the Atom Age",

said the EVENING CHRONICLE headline, quoting from the United States paper on radiation hazards that might follow in the wake of a "run-away nuclear furnace".

Speculation on what might happen if the ports of the world were filled with radioactive waste matter from atom driven ships; on radioactivity released by airplanes in flight or as a result of crash landings; on contamination of fish and other marine life and the problems of atomic waste disposal and the major effects of atomic radiation on human beings, were covered by stories in a large number of British newspapers.

World-wide research "on a lavish scale" of the hazards of radiation was called for by the SHIELDS EVENING NEWS and the EVENING WORLD (Bristol). Establishment of international agreements on minimum standards for radiological protection and an International Radiological Commission, was urged by THE TIMES (London), which saw important roles for the International Labour Office and the World Health Organizations in this field.

Disposal of atomic wastes and genetic problems due to radiation were covered in special articles in the MANCHESTER GUARDIAN by its Scientific Correspondent. "The only storm of the conference", said the GUARDIAN, "was precipitated by Sir Ernest Rock-Carling's contention that while all "radiation is potentially dangerous genetic mutations should not be taken too seriously since "favourable ones might produce geniuses from the most unpromising stock . . . and one Aristotle or Einstein would well outweigh 99 defectives". The GUARDIAN said that Sir Ernest was in a minority and that there was "unanimous agreement amongst biologists" at the Conference that the "genetic effect of radiation was a potential danger".

National Rivalries

Competition between the United States and Great Britain for the world's atomic energy supply markets was probably the most widely featured story in the British Press. Britain was credited for the best industrial exhibit at the Geneva Conference, but the British delegates -- and representatives at the exhibits -- were criticized for letting the "Americans steal a march" on them. Chairman Strauss' press conferences were described as "exciting", and those of the British Delegation as "miserable frosts" by British correspondents.

Much space -- seven column headlines -- was devoted to Britain's "three-year lead over all other countries in the practical application of atomic energy for industrial purposes", and the claim that

"by 1965 Britain will have seventeen atomic power stations operating" and "by 1975 five times that number generating electricity equivalent to that furnished by 40,000,000 tons of coal". The EASTERN DAILY PRESS (Norwich) commented that "Americans and Russians are putting five times the British effort into their atomic energy projects". The MANCHESTER EVENING NEWS quotes Oliver Townsend, of the ATOMIC INDUSTRIAL FORUM, New York, as saying that the "British Industry is considerably behind the American atomic industry and is not showing much initiative".

The YORKSHIRE EVENING PRESS said the British industry was severely handicapped in the race for atomic markets because only the United States could furnish nuclear fuels. The FINANCIAL TIMES (London) cited British scientists as saying it would be "very difficult if not impossible" for Britain to produce heavy water or nuclear fuels as cheaply as the United States can.

The DAILY EXPRESS (London) commented on what it called Britain's "shoestring salesmanship" at the Geneva Industrial Exhibits and said the "U.S. firms have been magnificently backed by their government", and concluded that the "American advertising avalanche is only just beginning to gather momentum". Other newspapers criticized the lack of support given British Industry and the EVENING ADVERTISER suggested the portfolio in the British Cabinet of a "Ministry of Science".

The TIMES (London) said that "while the United States and Great Britain seem to be well ahead in atomic energy, Soviet Russia is still, to some extent, a dark horse".

The WORLD PRESS NEWS (London) commented on the press relations of various delegations. High praise was bestowed on the U. N. briefings and the releases provided by the US Delegation. The interviews conducted by the British Delegation were characterized as "miserable frosts". "We wanted information", wrote the WORLD PRESS correspondent, "from Sir John Cockcroft and Sir Christopher Hinton, but nothing was forthcoming". In comparison, the WORLD PRESS commented on "the breeziness with which Admiral Strauss received the Press, adding that, "his was a very shrewd performance".

PORTUGAL

Atomic energy in medicine, industry, and agriculture got wide play. Stories in the newspapers of Porto, Lisbon, and Coimbra averaged more than a column in length.

President Eisenhower was credited for the initiative in launching the Geneva Conference and his call for a second conference was endorsed by DIARIO DE NOTICIAS (Lisbon), JORNAL DE NOTICIAS (Porto), PRIMEIRO DE JANEIRO (Porto), and other newspapers.

Chairman Strauss' interview, in which he indicated that the USAEC was studying the problem of utilizing thermonuclear energy for peaceful purposes, was featured in many Portuguese newspapers. The research power reactor and the exhibits at the Palais de Nations by the USA, Russia, and Great Britain received considerable space.

JORNAL DE NOTICIAS (Porto) commented favorably on the US offer to assist in training foreign technicians and to give practical aid to small countries in their atomic energy programs.

"The re-establishment of lines of communication amongst scientists which has been broken for more than a decade" was seen as one of the successes of the Geneva Conference by PRIMEIRO DE JANEIRO (Porto), while DIARIO POPULAR (Lisbon) — and several other newspapers — regarded as significant the admissions that United States and USSR scientists simultaneously were making identical discoveries in the realm of nuclear physics.

O SEculo (Lisbon) was impressed by the "200 tons" of documents at the conference and figured out that in this exchange of information the United States Delegation of "255 members would receive 296,667 documents before the end of the conference".

The hazards of radiation — both from tests of nuclear weapons and industrial atomic-powered plants, were dealt with extensively by many writers. Stories appearing particularly in REPUBLICA (Lisbon), DIARIO DE LISBOA, PRIMEIRO DE JANEIRO (Porto), and JORNAL DE NOTICIAS (Porto) featured this aspect.

Editorializing, the JORNAL DE NOTICIAS (Porto) said: "The Conference has ended its work. Final balance? Unqualified success." JORNAL pointed out that the conference's outcome had "confounded both critics and skeptics who now had before them the evidence". The writer "VALERIUS" pointed out that statesmen, scientists, technicians of 73 nations — of various races, different religions and political beliefs and economic and social philosophies, "fraternized and co-operated". The Conference furnished the world with an "enormously valuable object lesson", and the "climate" of the world has been "profoundly modified". "Humanity", the JORNAL concluded, "has found a common patrimony".

Prospects of the exploitation of uranium bearing ore in Portugal were reported by JORNAL DO COMERCIO (Lisbon). DIARIO DE MANHA (Lisbon) and many Portuguese newspapers published the story on "Ford Fund of Million" to promote peaceful uses of atomic energy.

DIARIO POPULAR (Lisbon) coupled the statements of Dr. Libby (USA) and Prof. Lavrischchev (USSR) on assistance to other countries. While American assistance was earmarked for "friendly" countries and with certain "conditions", DIARIO POPULAR quoted the Soviets as saying assistance should be rendered without infringing upon the internal independence of the recipients.

FRANCE AND NORTH AFRICAN AREAS

The coverage given the Conference by French newspapers was heavier and more complete than that of any other country with the possible exception of Germany. All aspects of the conference were treated: political implications, radiation hazards, thermonuclear studies. An unusually large number of articles was long, one to three columns, and illustrations were used liberally.

The interviews of Chairman Strauss and many of the more important United States papers were covered in detail as were President Eisenhower's and Premier Bulganin's suggestions for a second conference.

Also given considerable play were Russian offers to furnish isotopes free to needy countries and the United States' announcement of prices without profit on uranium, and offer to train foreign specialists and assist small countries in development of their atomic programs.

Conference Results

LE MONDE (Paris) and many other newspapers considered that "secrecy in atomic energy is definitely lifted". Quoting M. Francois Perrin, French High Commissioner for Atomic Energy, LE MONDE commented that "all countries have perceived the absurdity of secrecy and will never return to it". The DAUPHINE LIBERE (Grenoble) declared that "no longer will there be an iron curtain in the atomic energy domain".

Reciprocal exchange visits by scientists, i.e., the visits to Saclay (France) and Harwell (England) by groups of scientists from various countries, including the USSR and Iron Curtain states,

were considered by many editors as one of the more important "practical results" of the Geneva conference. "Invitations" exchanged between the Russians and United States delegates for visits were noted and the hope expressed that the United States and USSR would "open wide their gates" for scientists of all countries.

Impressed by the frank exchanges in debate between United States and USSR scientists, ECHO REPUBLICAIN (Chartres) suggested that this same frankness between political persons might serve to dispel the barrier which separates the United States and USSR.

Possibility of a second atomic conference "in the very near future" as suggested by President Eisenhower and Premier Bulganin got widespread publicity. LE PETIT MACONNAIS (Macon) and DERNIERE NOUVELLE DE ALSACE (Strasbourg) commented favorably on President Eisenhower's plan for an International Atomic Agency as pointing the way to practical international co-operation.

LIBERTE (Fribourg) editorialized: "At last a U.N. Conference is a complete success". Geneva represented "true international collaboration on a non-political plane", said LIBERTE, "the Soviets forgot their detestable propaganda and Iron Curtain" and joined others in an effort to make available the benefits of atomic energy to all countries. The paper concluded that "the USSR has now an opportunity to prove their peaceful intentions by accepting the United Nations disarmament program and plans for international agency on atomic energy". One will "judge them by their acts, not their words", said LIBERTE.

"The hour of the Atomic Revolution" has struck, wrote LE COMTOIS (Besancon) while ECHO REPUBLICAIN (Chartres) concluded that while "The hour of supranational authority in the domain of the Atom has not yet struck" the groundwork for an "effective international collaboration has been established".

Characterizing the Geneva meetings as "a historic conference for the future of Humanity", the REPUBLIQUE DE NORMANDIE (Rouen) said it was the "greatest conference in the past half-century at Geneva". REPUBLIQUE DE NORMANDIE concluded: "We have entered the Atomic Age and we will not survive it unless we learn to put the atom to work for our well-being and our happiness."

Now that the Geneva Conference has been an "unqualified success", it is up to the United Nations Assembly to see that progress continues in the conference field as well as the organization of an international agency proposed by President Eisenhower, said CENTRE-MATIN (Montlucon).

A few French newspapers played up the subject of "harnessing the H-Bomb" for peaceful purposes. Strauss' remarks were given wide coverage all over France. The subject of hydrogen energy — raised by Bhabha (India) interested French editors more than it did those of other countries.

Radiation hazards — both from industrial exploitation of atomic energy and from thermonuclear bombs — were featured sensationally by a few papers. PARIS PRESS — INTRANSIGEANT (after the conference was over) obtained a copy of Nobel Prize winner Muller's paper. The story that "In 1948 three to six million children will be born afflicted with radiation", reported the more sensational deductions in Dr. Muller's paper. Illustrations, showing how atomic radiations might transform hereditary characteristics, were used.

An article on "Manufacture of Idiots" in L'EXPRESS (Paris) discussed genetic mutations induced by exposure to radiations and warned that "international regulation" on atomic energy, even when used for peaceful purposes, was imperative if the future of the human race was not to be placed in jeopardy.

Russia's offer to supply free of charge isotopes to needy countries was widely praised by DEPECHE DE L'EST (Bone), L'UNION (Reims), LA LIBERTE DE L'EST, LE PETIT MACONNAIS (Macon), as also was the offer of the United States to sell uranium "without profit" and to train foreign technicians in American atomic installations, universities, and hospitals, and assist other nations with their atomic energy programs.

Great Britain's reported "three-year lead" in industrial application of atomic energy, U.S. transfer of the research reactor to Switzerland, and the story of the contract with FIAT of Milan to buy a US reactor, led VOIX DE NORD (Lille) to foresee "a period of intense industrial competition in the atomic field" — especially between the United States and Great Britain.

Topics which received extensive attention in the French Press were: (1) "Radioactive Diagnostic Pills" — isotopes in medicine; (2) US and USSR Government exhibits and the US research reactor; (3) Presentation of the eight-volume set of technical data to heads of Delegations and making available to foreign countries by the United States the "Library on the Atom"; (4) appeal of Bernard Baruch to Moscow; (5) radiation hazards and waste disposal problems; (7) announcement of uranium prices; (8) the Arco, Nevada, power experiment and sale of research reactor to the Swiss; (9) use of isotopes in agriculture and forestry; and (10) Chairman Strauss' interviews.

Summing up, LE REPUBLICAIN LORAIN (Metz) commented that "great and significant as have been the results of the conference in the field of pure science, they will have even greater repercussions politically and psychologically". Readers were warned that while the council of scientists marked an important date in world history, the possibility of an atomic war had not been dissipated. "An act of madness is always able to bring war about", concluded LE REPUBLICAIN'S article.

REPUBLICAIN LORAIN gave much credit to the United States for taking the lead in banishing fear of atomic war. "One will never forget that the initiative for the Geneva Conference came from the United States, and more personally from President Eisenhower. Its origin was in his proposition, placed before the United Nations, that an international atomic agency be created." REPUBLICAIN blamed the USSR for delaying progress for two years, and called for banishment completely of "all ideologies which divide peoples".

The "frank exchanges" between American and Soviet scientists came in for much comment by French journalists, DERNIERE NOUVELLE D'ALSACE and DEPECHE DE TOULOUSE (which devoted six columns to one day's discussions on reactors) observed that "all scientists seemed animated with the same hope -- exploiting the atom for peace exclusively". The cross-questioning by a United States delegate of a Soviet scientist and getting answers on what hitherto was "secret" got much space. MARSEILLAISE (Chateauroux) recalled that the Nobel Prize-winning French scientist Frederic Joliot--Curie was not present at Geneva. LE COMTOIS (Besancon), LE BIEN PUBLIC (Dijon) and many others underlined the fact that both Americans and Russians "ignore the Iron Curtain" and fraternized in cafeterias, at the conference, at dinners and other gatherings "in complete amiability".

The closing session of the Conference received unexpectedly heavy coverage. The closing addresses, and particularly the remarks of Dr. Libby (US) and Prof. Lavrischchev (USSR) got excellent and equal play in French newspapers. For several days after the conference ended, newspapers carried articles by their special correspondents summing up results.

TURKEY, EGYPT, ISRAEL, ROMANIA, GREECE,
GIBRALTAR, ISLE OF MAN, MALTA

Scattered clippings from the Turkish, Greek, Israel, Egyptian, and other newspapers indicated widespread interest in the Geneva Conference.

LE MESSENGER (Athens) reviewed the conference fully in a concluding story, giving equal credit to the United States and USSR contributions, particularly to Dr. Libby's final speech and the closing remarks and announcements of the Soviet Delegation.

"While every nation wished the conference success", says the JERUSALEM POST, editorially, "by no means has rivalry among the Powers ended". The POST remarked that "Each (main) delegation is torn by the double wish to keep its secrets and to reveal more to its competitors in order to demonstrate its progress and hint at its potential military superiority". The POST gave credit for the inception — and success — of the conference to President Eisenhower and the United Nations. It concluded, quoting from Gordon Dean, that "The real top secrets in atomic energy are those still held by Nature; those nature has released are generally known."

LE PROGRESS EGYPTIAN (Cairo) was of the opinion that "the most important secrets of atomic energy were not revealed at Geneva". It contended that the real results — if any — would come from the post conference meetings or "The Little Atomic Conference", in which representatives of six nations sought to work out a program for international cooperation. "This group holds the real key to atomic peace and progress", the paper said.

THE EGYPTIAN GAZETTE showed interest in the industrial aspects of atomic energy and speculated on the possibility of commercial utilization of solar energy.

LA TRIBUNE ZIONIST (Brussels) played up Israel's contribution to the Conference, featuring the three papers submitted by the Israeli Delegation. Benefits to be derived from the peaceful exploitation of atomic energy — particularly for industrial purposes — to Israel and similar situated countries, were emphasized.

The Turkish Press as represented by TAN and VATAN of Istanbul; SABAH (Brussa), HURRIYET (Anakara) and TERCUMEN and MILLIYET, gave an indication of the great interest that Turkey has in atomic matters. Nearly all the stories ran over a column. Headlines and illustrations indicated interest particularly in industrial applications. SABAH'S special correspondent, Ismail Hilmi, devoted several columns and a number of illustrations to United States reactors.

Coverage by scattered newspapers — THE TIMES (Malta), THE CHRONICLE (Gibraltar), LUMEA NOASTRA (Romania), etc., consisted mostly of press association stories and features dealing with isotopes in medicine, agriculture, industry, etc.

Clippings were received from the Communist newspapers of France, Great Britain, Norway, and Sweden. NY DAG (Stockholm), HUMANITE (Paris), the DAILY WORKER (London), ARBETERBLADET (Gothenburg), and FRIHET (Oslo) — all Communist organs — appeared to give the United States and USSR contributions about equal treatment. Pictures of Soviet exhibits, scientists and delegates and installations predominated, when illustrations were used. Practically all the papers reprinted articles which had appeared in PRAVDA and NEW TIMES of Moscow.

SWITZERLAND

Newspapers of Switzerland gave credit to the United Nations — and President Eisenhower — for having introduced a new note — the non-political, non-controversial conference. The Geneva meeting "alone justified the existence of the United Nations if it had done nothing the past ten years", said Switzerland's influential GAZETTE DE LAUSANNE, adding that "the spirit of the Charter reigned at Geneva as never before in the past".

Editorializing on "From Hiroshima to Arco", the GAZETTE said "Two weeks of Geneva has given the Atom a new face. Yesterday, it was synonymous with Hell; today, it signifies a benediction; tomorrow, thanks to the atom, the sick will be cured; deserts made to bloom, backward regions industrialized and the engine of death will become a source of life".

Commenting that representatives of "capitalist and communist states, Asiatics and Occidentals, industrial and underdeveloped nations met on common ground", the GAZETTE pointed out that they "spoke, in fact, the same language", and participated in a "great campaign tending towards suppression of wars". One should not, however, continued the writer, be led to believe that the atomic conference would be decisive in determining the results of the big diplomatic maneuvers in the coming years. World peace and outlawry of war will come only by patient "step-by-step development of political statutes of the new world".

Said the NOUVELLE REVUE (Lausanne), the Geneva Conference has proved that secrecy is impossible and ineffective; that the United States, Great Britain, and USSR all reached the same goals independently. "It showed that scientists are in agreement on the removal of political barriers to science", says NOUVELLE REVUE. "They (scientists) spoke their minds freely, about the new world, the Atomic Era, the as-yet-unknown possibilities for good and the unforeseeable lurking dangers attendant upon development of atomic energy". The NOUVELLE REVUE expressed the hope

that scientists upon returning home "will convince their governments that atomic war is unthinkable — is mass suicide". Humanity, says the REVUE, "should be master of its own destiny and men will not choose death when they can live better than they have ever lived before."

LE DEMOCRATE of Delemont said: "The crucial question apropos the Geneva Conference of East and West atomic scientists is if the detente actuelle between America and Russia is the beginning of a historic new step or only a passing phenomena — the calm between two storms". The answer of the "nuclear physicists" who assembled at Geneva was that "the cold war is ended forever". The reason: "an equilibrium in science and technology" has been shown to exist between the United States and USSR. The diplomacy of Stalin, "founded on fear, scientific and military inferiority in the face of American atomic superiority", had passed, LE DEMOCRATE stated, and the Soviet inferiority complex and United States military superiority psychoses — both equally dangerous to peace — were passing. The newspaper admonished that it would be a "temerity to prognosticate about the future which depends upon the courage of men".

The three Geneva newspapers, LA SUISSE, JOURNAL DE GENEVE, and TRIBUNE featured the conference in detail. Prominent play was given with favorable comment to the sale to Switzerland of the research reactor. The governmental and industrial exhibits, both at the United States Exhibit Palais and the Expositions Centre, received ample coverage.

Presentation of the "Atomic Libraries" (Selected Reference material) by the United States to participating countries was commented upon favorably by JOURNAL DE GENEVE and the dedication of a commemorative plaque, to be placed in the United Nations Palace in honor of the first atomic conference, was approved.

Concerning the industrial and economic aspects the NEUE ZURICHER ZEITUNG, the NATIONAL ZEITUNG (Basle), the VOLKSRECHT of Zurich and the TRIBUNE DE LAUSANNE commented on the interest evidenced by representatives of the International Bank, Bank of America, National City and Chase of New York, and of French, German, Italian, and British industries and financial institutions, in the conference. Interest of industry in the Atomic Age, according to the JOURNAL DE GENEVE, was shown by the fact that more than 4,000 persons per day — mostly professional — visited the industrial atomic exhibits.

SWEDEN

The Swedish Press gave comprehensive coverage to the Geneva Conference, dealing with political, industrial, medical, scientific, and commercial aspects.

SMALANDSPOSTEN (Vaxjo) comments: "By emphasizing the potentialities of the Peaceful Atom, the Geneva Conference has reduced the War Atom to a proper perspective", i.e., "put it in the shadows." Equal credit for this is given by the SMALANDSPOSTEN to the United States and USSR which pointed out "the initiative came from President Eisenhower". The paper says that "since the Russians can now make A-bombs and H-bombs as well as the Americans — and more cheaply — " both countries should "put exploitation of the atom for war in the background", and concentrate on "dedicating the second decade of the Atomic Age to the welfare — and not the destruction — of mankind".

The GÖTEBORGS POSTEN said "The Geneva Conference marks a milestone in civilization" and to call it a "clean success" is insufficient. "Its practical results were enormous", says the POSTEN, while "its political consequences are yet to be seen". The POSTEN gives President Eisenhower full credit for exposing the "idea" which has broken down "the icy barriers of the East", and given the world "after long speculation about the destructive atom a glimpse of the blessings it can bestow on humanity".

"When Eisenhower, in 1953, proposed international co-operation on atomic energy", wrote KLIPPANS TIDNING (Ängelholm), "the proposal, though welcomed by all men of good will, was obviously Utopian". After "pondering over" the suggestion for two years, the Russians' acceptance — and "this first example of collaboration" could be the "beginning of a long period of understanding and peace for mankind", predicts KLIPPANS TIDNING. Reviewing the benefits that atomic energy can bestow on humanity the paper puts the responsibility for the world's future squarely on the shoulders of the three great atomic powers — the United States, Great Britain, and the USSR.

Sweden's Communist Press, NY DAG (Stockholm) and ARBETAR TIDNINGEN (Gothenburg), gave approximately equal play to the USSR and US.

Breakdown at Geneva of "barriers which have hindered cultural exchanges between nations" was heralded by ARBETAR TIDNINGEN as indicating a "complete collapse of the cold war between civilized countries especially insofar as science is concerned". NY DAG places emphasis on the "benefits for mankind that can come from the peaceful atom" and said, "all countries are proud to work — under the United Nations — to attain these ends". So far as clippings

available revealed, there was no mention of the thermonuclear bombs or atomic warfare, nor of radiation hazards or outlawry of atomic weapons by the Communist newspapers in Sweden.

Reproduction of the "Atoms for Peace" 3-cent American postage stamp was widespread in Swedish papers. The SVENSKA DAGBLADET (Stockholm) revealed that Gothenburg was planning an Atomic Trade Fair for 1956. BARGSLAGS-BLADET (Köping) reported that Sweden would be producing electric power from nuclear fuels within eight years and that Sweden's 10,000 kw Reactor No. 2, being built on Hano Island in Södermanland, would be completed in 1958-59.

The KURIEN (Eskilstuna) described the Geneva Conference as an "historic event — not an ordinary conference", which was like a "spring break-up of an icepack after 10 years of cold war". It quoted ex-Foreign Minister Rikard Sandler (head of the Swedish Delegation of the Geneva Conference) that "The Iron Curtain of Science has been shattered beyond repair". NORRLANDS POSTEN lauded President Eisenhower for having initiated, through the United Nations, international co-operation on the peaceful atom, and foresaw, if US and USSR continued their fruitful collaboration, a "long period of peace for mankind".

The potential dangers of radioactivity — as a result of industrial application rather than atomic weapons — was the subject of quite a few serious articles. The GÖTEBORGS HANDELSSTIDNING referred to the "frightful unknown factor" of radioactivity and "unanswered questions" at Geneva. NORRBOTTENS KURIEN contended that despite scientific papers to the contrary, "absolute security is impossible" in reactor operation.

Chairman Strauss' interview on possibilities of utilizing hydrogen fusion for peace and Dr. Bhabha's prediction that this might come about within 20 years drew comment in several Swedish newspapers.

SPAIN

YA (Madrid) gave lengthy coverage to all aspects of the conference. The possibility of cheap industrial power, the hazards of radiation and economic possibilities through the exploitation of atomic energy appeared of special interest. YA also highlighted a dispatch from Washington quoting AEC Commissioner John von Neumann to the effect that the USAEC was removing restrictions on special technical data. Quoting President Eisenhower that "the atom is non-political and knows no frontiers", YA welcomed the promise at Geneva of international co-operation, and aid to the "have nots" by states far advanced in atomic fields.

ABC (Madrid) devoted two columns to Chairman Strauss' "sensational declaration" that the USAEC was studying the possibility of harnessing the hydrogen bomb to peaceful uses. The newspaper voiced alarm over the potential hazards of radiation to human beings.

REVISTA (Barcelona) devoted 2-1/2 pages in its August 18 issue to the Conference. In a special article on: "The Atom — Good and Bad", REVISTA recalled that in 1869 the chemist, Marcellin Berthelot, predicted: "Within a century (before 1969) man will know the constitution of the atom and will be able, if he so desires, to control, extinguish or utilize the sun as if it were a simple gas light."

The Spanish Press gave considerable space to the statements of the Vatican's Delegation and to views of the Church on atomic energy. The Official Communication of the Holy See, expressing the hope that the Geneva Conference would "establish the essential conditions for wholehearted international collaboration in the field of peaceful uses of atomic energy" was prominently displayed.

In a resume, ABC said: "On a splendid sunny day in Geneva an episode exceptional in history, concluded". Reviewing the final session of the conference, ABC's correspondent referred to "a rainbow — on this most radiant day of the year — reflected in the fountain across Lake Geneva" and asked: "Will this rainbow be permanent?" The Conference has demonstrated that "Scientists are the aristocrats of the world", and established — at Geneva — that "freedom of communication of scientific ideas is inviolable."

IRISH FREE STATE AND NORTH OF IRELAND

The Irish newspapers gave generous coverage to the Geneva Conference.

The IRISH TIMES (Dublin) believed that Ireland "must rely upon the United States" in matters atomic, but several articles dealt with the impact atomic power would have upon Great Britain's future economy. England has a "three-year lead" over all countries, said the IRISH PRESS (Dublin), predicting that "in another five years British scientists should be able to produce electricity at source as cheaply as it is now obtained from coal and oil."

The BELFAST TELEGRAPH headlines saw Britain "stealing a march on the atomic market", while the NORTHERN WHIG (Belfast)

said the "Geneva Conference has made it very clear that technically Britain is right in the lead in the race to capture world atomic markets." The WMG also predicted that the United Kingdom might become the first "fully atomic powered nation" in the world.

The IRISH TIMES also hailed the dissolving of the "Atomic Curtain" and saw the Conference giving the world a "vision of the benefits of universal peace", adding that the commercial overtones and rivalry of atomic-minded nations should not be overlooked. "Atomic power, on a worldwide scale, is moving fast out of scientific laboratories into everyday life and its potential for good or ill depends on the ability of the major world powers to co-operate and share their knowledge", concluded the TIMES.

The IRISH INDEPENDENT (Dublin) was most impressed at "the 200 tons of documentary material" assembled at Geneva, the experimental reactor exhibited by the USAEC, the "insatiable curiosity" of the "note-taking" Soviet scientists, and the size of the German Delegation.

The views of Dr. Thomas Nevin, one of the Irish Free State delegates to the conference, got wide play. Nevin, in the IRISH TIMES, predicted that well before the end of the century nuclear fuel would have replaced coal and oil (but not hydro-electric plants) in Ireland. Nevin called the lighting of Arco, Idaho, a "stunt" but said there was "no doubt that the Russians had a nuclear energy station generating electricity".

Contamination of the waters of the Irish Sea through disposal of radioactive waste and the Vatican's special interest in atomic energy, were two items of local concern covered at considerable length.

The DUBLIN EVENING HERALD and the DUBLIN EVENING PRESS were inclined to feature the lighter sides of the conference, the former characterizing Chairman Strauss' comment on harnessing hydrogen energy as the creation of "Satellite Suns", while the latter featured such subjects as "Portable X-ray Machines", etc.

Summing up, the IRISH TIMES concluded that: "Scientists of the East and West dissolved the Atomic Curtain . . . and demonstrated that the awe-inspiring power of the atom can be channeled from Death to a fresh and better Life." The TIMES echoed the opinion "of all the delegates that the conference had been an unbelievable success".

BELGIUM

Clippings of the Belgian press came mostly from Brussels and Liege.

The NATION BELGE (Brussels) considered the conference a signal success, "from a practical standpoint" but indicated that it was too early to assess its political implications. "For many, the conference signifies a great moment in universal science", wrote NATION BELGE, and welcomed the promise that both the US and USSR would aid other nations in the development of atomic energy for peaceful uses. The newspaper revealed that the International Exposition to be held in Brussels in 1958 "will be partially supplied with electricity generated by a 10,000 KW atomic plant — a plant "twice the size of the one publicized by the USSR at the Geneva Conference". NATION BELGE quoted a United States scientist at Geneva as confirming that A-bombs could be converted for use in atomic furnaces.

That it is impossible to overestimate the importance of "practical details and concrete results" of the Geneva atomic conference was the opinion of NOUVELLE GAZETTE and LE SOIR, both of Brussels. These newspapers welcomed the promise of assistance to small countries by the United States and USSR in furthering the peaceful uses of atomic energy.

The idea of a second conference — advocated by President Eisenhower and Premier Bulganin of the USSR — was approved by LA WALLONIE of Liege, which gave equal treatment to US and USSR participation in the Geneva Conference.

DRAPEAU ROUGE, (Brussels) played up the closing statements of Dr. Libby (US) and Dr. Lavrischchev (USSR), and of President Bhabha (India) in lengthy windup stories. "As a result of the Geneva Conference", says DRAPEAU ROUGE, "the scientists of the world will be able to exercise considerable influence in the future conduct of world affairs." The paper quoted from speeches and interviews by Chairman Strauss, Dr. Libby, Dr. Whitman, and a number of United States scientists, particularly Strauss' statement that "the Soviets are making a greater effort than we (the US) are to develop atomic scientists". A statement by Dr. Nevin (Ireland) to the effect that the "Soviets are clearly in the lead in the higher level of scientific theory" in the atomic field, also got good play.

LE SOIR (Brussels) gave considerable space to the dangers of radiation and the necessity of measures to protect human beings from radiostrontium and other substances that could be absorbed by animal and vegetable life. The revelation of information heretofore secret "by the United States, Britain, France, and Sweden"

was commented upon. The role that UNESCO could play in encouraging universities to co-operate in producing nuclear physicists, engineers, chemists, and biologists — so badly needed in the Atomic Age — was underlined by LE SOIR.

NORWAY

The Norwegian Press gave widespread and comprehensive coverage to the Conference. Most stories were short, except for the Oslo and Bergen newspapers which used special articles. Very few editorials were found.

The TONSBERG BLAD, editorially, said that Geneva had proved "that the most powerful source of energy in the world is the human brain", and commented that the assembling of the world's most prominent scientific men at Geneva "working on the same problems" should contribute materially towards solving some of the world's problems. Discussing the power needs of the future, BLAD (and other newspapers) gave considerable space to Bhabha's references to harnessing hydrogen bombs and Chairman Strauss' press conference statement that the USAEC was studying the problem.

The MORENYTT (Orstavik), discussing the world's power needs, pointed out that Norway because of hydroelectric possibilities would not face any shortage in electricity for the next 50 years that might affect "living standards".

BERGEN'S TIDENDE, in an editorial on "Alternatives", said that the "alternatives of the Atomic Age become clear as a result of the Geneva Conference". There could now be no turning back to the secrecy and suspicion that had characterized the past decade, said the TIDENDE. "The only way to go is forward . . . atomic energy is something that cannot be isolated . . . the problems it presents cannot be ignored." The writer concluded that the "scientific insight and political sagacity" evidenced at the Geneva Conference, where there was "debate without political restrictions", augured well for the future.

Some larger newspapers, such as MORGENVISEN (Bergen) devoted space to atomic matters of particular national interest, i.e., the effect of radioactivity transmitted to fish through plankton on the fishing industry; the possible influence of atom-driven vessels on Norway's extensive merchant marine; the cost relationship between hydro-generated and atomic-produced electricity, etc.

The news coverage of the FRIHETEN (Oslo), Norway's largest Communist newspaper, was factual, but its editorials after characterizing the Geneva Conference as "a mighty inspiration", charged

that "there were those in the USA and Western Europe, who through life and death would keep the cold war going" and who "foredoomed the conference to failure". Despite them (warmongers), Geneva was a "great success" and all their "hopes came to shame". FRIHETEN concluded that the Geneva Conference was "a mighty appeal — to governments and to peoples — which should lead to an international agreement to outlaw atomic weapons".

NIDAROS, of Trondhjem, pointed out that "Just as it was the scientists who gave birth to the atom bomb", it was the scientists at Geneva "who struck the first blow" towards orienting the public's thinking on atomic energy into peaceful channels. "Thousands of scientists from many countries", wrote NIDAROS, "came from their universities and laboratories" to Geneva to concentrate their efforts on the peaceful aspects of atomic energy". Like their colleague, Harold C. Urey, who wrote "I am Afraid", the scientists today look to world organization to solve the atomic problems, concluded NIDAROS.

The "co-operation engendered at Geneva holds forth great promise for good" in the opinion of FAEDRELANDSVENNEN (Kristiansand) which credited the conference in having "great practical results". Opening in an "atmosphere of greatest optimism", after 12 days in which 3,000 delegates from 73 countries freely discussed the evils and benefits which the world faced through atomic energy, "it became evident that the conference's greatest practical result would be the creation of an international atomic energy organization", said the newspaper.

British-American-Soviet friendly collaboration was highlighted by SUNNMORS POSTEN, while MORGENBLADET (Oslo) pointed out that as a result of lifting of secrecy, nations (USSR and US) need no longer be afraid of each other. "Everyone now knows where they stand" and scientists of all nations — including 30 Norwegian delegates — would return home "rich in experience and impulses" which would be reflected in their future work.

Aside from the concrete and practical results of the conference which were many, said MORGENVISEN of Bergen, "the Geneva Conference opened wide the door on a glowing panorama of promise for a future built upon atomic energy". It was something that "once having been permitted to see people will refuse to forget again". Concluded MORGENVISEN that "after the atomic conference we dare to believe that a new industrial revolution — far more gripping than that of the 19th Century — confronts us".

DENMARK

Articles of special writers and well-known scientists and extensive coverage by staff correspondents features the Danish reports on the Conference. As a whole the press of Denmark took the line that the Geneva Conference augured well for the future, both politically and socially. Equal credit was given to the US and USSR for raising the curtain of secrecy.

BORSEN (Copenhagen) saw the conference results as a promise for a better future and an important step in lessening political tensions among the three great atomic powers -- Britain, the United States, and the USSR. Background for the success of the Conference was laid at Geneva during the meetings between USSR leaders and President Eisenhower, BORSEN said, in applauding the suggestions of the President and Bulganin that a second conference be held.

INFORMATION (Copenhagen) in a serious special article after the Conference was over, asked: "Was the Geneva Atom Conference a turning point -- or bluff?" The writer argued that political figures moved in the background and controlled the scientist puppets. "The atom was born under an unlucky star" and it would continue "to play a major role in the military programs of the United States", INFORMATION warned its readers. In another story INFORMATION, observed that "seldom, if ever, has an international conference been so harmonious, so understanding of the world's interests and so helpful".

Interviews with American scientists and observers who visited Denmark after the conference -- including Drs. Austin Brues, Frank Spedding, and Lee Farr, and Senator William Purtell (Connecticut) were given good play by Copenhagen papers.

The BERLINGSKE TIDENDE (Copenhagen) quoted Dr. Brues as playing down the dangers of radioactivity and saying that "the Geneva Conference taught all men, not the least the statesmen, that atomic energy is first and foremost a peaceful thing . . . atomic energy for weapons is only a small part of the picture." Senator Purtell's observations reported in a 3-column spread, were that the advent of atomic energy would not bring a revolution in capitalism or everyday life, that the seven million Danish kroner the conference cost the United States was a good investment, that the only barrier that separated delegates at Geneva was the Language Curtain.

The AARHUUS STIFTSTIDENDE, featured special writers including interviews with scientists Niels Bohr, and others. It foresaw "great advances in the peaceful uses of atomic energy".

Papers of United States scientists on safety in atomic plants, uses of isotopes, prices of nuclear fuel and isotopes for medical purposes, got good play.

Because of the importance of agriculture in Denmark's economy the role of the atom in agronomy was featured. The nation's dependence on imports for coal and oil and absence of water power promised early production of electricity from nuclear fuel.

The Conference "paved the way" for the creation of an "international atomic agency", according to the POLITIKEN, Copenhagen's leading newspaper. "A late revision" of Dr. W. F. Libby's speech, indicating that creation of a world atomic organization "might be expected in the very near future", was played up by POLITIKEN, while the JYLLANDS-POSTEN pointed to the offers of both the United States and USSR to help other countries with their atomic programs as a good omen for future international collaboration in matters atomic.

In a 2-column editorial POLITIKEN stressed that the conference heralded the dawn of a better day when "scientists will dedicate their genius to the world's well-being". The step forward in lifting atomic secrecy cannot be retraced" said POLITIKEN, adding that the conference had "enormous practical results".

APPENDIX XX -- SCHEDULE OF SPECIAL EVENTS OF THE US DELEGATION

- August 7 The United States Technical Exhibit was opened officially on Sunday, August 7 with a press preview at 2 p.m. At 5 p.m. the doors were opened to the public.
- August 7 The United States Research Reactor Exhibit, featuring the operating "pool" reactor, was officially opened on August 7. There was a preview for United Nations Conference officials and news representatives at noon; at 4 o'clock, the public was admitted.
- August 7 At 6 p.m. Chairman Strauss, on behalf of the U. S. Atomic Energy Commission, gave a reception at the Hotel des Bergues for all members of the U. S. Delegation.
- August 8 In a press conference held on August 8, Chairman Strauss paid tribute to the Conference for "reopening lines of communication between men who have not been in communication for many years", and announced establishment by the Ford Motor Company of a \$1 million fund to provide world-wide atoms-for-peace awards.
- August 9 An initial presentation of the Introductory Volume of the eight volume commemorative set of Selected Reference Material was made to principal U. N. officers of the Conference at a luncheon August 9. The presentation was made by Chairman Strauss on behalf of the U. S. Representatives and the U. S. Atomic Energy Commission.
- August 9 On August 9, the U. S. Official Representatives gave a reception at the Hotel des Bergues for the representatives of other delegations in attendance at the Conference.
- August 11 On August 11, the U. S. Official Representatives gave a luncheon for the congressional advisors and members of the Joint Congressional Committee on Atomic Energy at the Hotel du Rhone.
- August 11 In a press conference held August 11, Chairman Strauss discussed the prospects for thermonuclear power.

- August 12 On August 12, the U. S. Delegation presented a motion picture on production of electricity by experimental boiling water reactor, Borax II. The film, made especially for the Conference, pictured the town of Arco, Idaho, being lighted and powered experimentally by electricity from the reactor on July 17, 1955 — the first American community to receive its entire supply of electricity from a nuclear reactor.
- August 20 In a ceremony on August 20, Dr. Willard F. Libby, Vice-Chairman of the U. S. Delegation, presented to the United Nations Library in Geneva, the U. S. Technical Library which had been operated as part of the United States Technical Exhibit at the Conference. The gift of the Library was received for the United Nations by Dr. A. C. Breycha-Vauthier, Chief Librarian.
- August 20 In a ceremony held at 12:30 p.m. August 20 in the Reactor Building, Chairman Strauss, acting on behalf of the US Government, signed over to Paul Scherrer, Chairman, Swiss Commission for Nuclear Research, acting on behalf of the Swiss Government, the research reactor exhibited at Geneva which they had arranged to purchase.
- August 20 Immediately after the reactor transfer ceremony, the U. S. Official Representatives gave a luncheon for U. S. Ambassador to Switzerland, Frances Willis and prominent Swiss citizens, who had participated in the ceremony.

APPENDIX XXI - UN SCHEDULE FOR CONFERENCE PUBLICATIONS

Peaceful Uses of Atomic Energy will be published in sixteen volumes, each approximating 500 pages; they will comprise all papers submitted at the Conference (about 1050), the text of the oral presentations at Geneva, and the verbatim record of the discussions on the Geneva papers. Since the oral presentations and discussions covered the principal highlights and novel features of each of the papers submitted, it was considered both appropriate and necessary that they be published so that all the most important aspects of each topic could be properly emphasized.

The United Nations publication Peaceful Uses of Atomic Energy will provide for the first time a complete reference work on all the peaceful uses of atomic energy and will certainly remain the standard text and basic documentation on this subject for many years.

Volume I

THE WORLD'S REQUIREMENTS FOR ENERGY: THE ROLE OF NUCLEAR POWER

The most important prospective use of nuclear energy is to provide electric power.

The main subjects covered by this volume are the anticipated requirements for energy and the possible ways in which nuclear power can be used to overcome energy shortage. Additionally there are several broad general papers on the problems involved in organizing and operating a large nuclear enterprise with special regard to the generation of significant quantities of electric power.

Volume II

PHYSICS, RESEARCH REACTORS

The first major step in the organization of a large nuclear energy enterprise is decision as to the method to be followed for the achievement of economic nuclear power. This volume includes all information developed at the Geneva Conference on the background physics and the construction and operation of research reactors (detailed features of each power reactor type are covered in Volume III). Ordinarily it would be necessary to build a research reactor to test components and design features of the power reactors which it is the intention to build later on.

Volume III

POWER REACTORS

One of the most important volumes in this series, Volume III provides a complete summary of the status of reactor technology as of August 1955. Every power reactor throughout the world, designed for central station power, was discussed in detail at Geneva, and it is with particular regard to this volume that the truly international character of the Conference is of such importance, permitting as it did the complete coverage of power reactor development throughout the world.

Volume III also includes the full discussions of the problems and the anticipated direction of research and development for each of the major types of reactors, heterogeneous and homogeneous, fast and slow, breeders and converters.

Volume IV

CROSS SECTIONS IMPORTANT TO REACTOR DESIGN

One of the most significant developments of the Geneva Conference was the declassification by all countries of the fundamental cross section information on which reactor design is based, that is, the cross sections of the fissionable and fertile materials. This volume includes technical papers and discussions of the measuring techniques and the results of measurements on all of these important materials. It is important to note that significant contributions were made by many countries including Canada, United States, United Kingdom, France, the Soviet Union and the Scandinavian countries.

Volume V

PHYSICS OF REACTOR DESIGN

The Geneva Conference was the first international meeting where detailed discussion was possible on the techniques and results of those inter-global experiments important to the design of reactors, such as exponential and critical experiments as well as resonance integrals and kinetic measurements.

Volume V summarizes what is so far known about the physics of reactors.

Volume VI

GEOLOGY OF URANIUM AND THORIUM

The future of nuclear energy is bound up in the availability of high-grade resources of the raw materials, uranium and thorium. Virtually every country presented at the Geneva Conference a summary of its own resources and prospects for uranium and thorium discovery—these contributions are covered in full by Volume VI which therefore constitutes the most up-to-date summary of the total worldwide picture of the future of nuclear energy based upon the availability of raw materials.

In addition to these geology questions Volume VI also includes the discussions of the prospecting techniques which have been and are being used to search out the raw materials of nuclear energy.

Volume VII

NUCLEAR CHEMISTRY AND THE EFFECTS OF IRRADIATION

The most important and difficult problems in the development and operation of reactors are chemical in character—and perhaps the least understood factor in reactor operation is the effect of neutron and gamma radiation on the properties of structural and fuel materials used in nuclear reactors. In Volume VII these problems are discussed in detail together with the fundamental chemistry of the various special materials associated with nuclear energy.

Volume VIII

PRODUCTION TECHNOLOGY OF THE MATERIALS USED FOR NUCLEAR ENERGY

In nuclear energy it is necessary to deal with materials which were previously unknown, both chemically and metallurgically. This whole question of materials is covered by Volume VIII. Details of chemical and metallurgical processes for such materials as uranium, thorium, beryllium, zirconium, and heavy water are considered.

Volume IX

REACTOR TECHNOLOGY AND CHEMICAL PROCESSING

In this volume are collected all the papers and discussions on the fabrication of fuel elements, the chemical reprocessing of spent fuels, the chemical recovery of new fuel produced in a breeder reactor,

the separation and isolation of fission products, etc. The Geneva Conference provided an opportunity for this entire area to be discussed freely on an international basis. The special importance of the subject matter causes Volume IX to be one of the most important in the whole series.

Volume X

RADIOACTIVE ISOTOPES AND NUCLEAR RADIATIONS IN MEDICINE

Extremely important applications of radiation and radioisotopes have been made in the medical field. Covered in Volume X are applications to therapy, diagnosis, and study of disease; and the application of radioisotopes to biochemistry, pathogenesis, and metabolic disorders.

Volume XI

BIOLOGICAL EFFECTS OF RADIATION

People engaged in nuclear energy work must know in detail the effects of radiation on man. This volume includes discussions of the modes of radiation injury, and the biological effects (including the genetic effects) and mechanism of radiation energy.

Also included are the methods, under study, of promoting recovery from over-doses of radiation.

Volume XII

RADIOACTIVE ISOTOPES AND IONIZING RADIATIONS IN AGRICULTURE, PHYSIOLOGY, AND BIOCHEMISTRY

This volume concerns the applications of radioisotopes in the life sciences of agriculture, physiology and biochemistry. The agricultural section includes study of crop genetics, soils, fertilizers, the food up-take in plants, and the promotion of useful genetic mutations. The physiology and biochemistry sections summarize the state of our knowledge of animal and plant metabolism and chemistry as related to the use of various radioisotopes such as carbon-14 and iodine-131.

Volume XIII

LEGAL, ADMINISTRATIVE, HEALTH AND SAFETY ASPECTS OF LARGE SCALE USE OF NUCLEAR ENERGY

The anticipated widespread use of nuclear energy brings with it innumerable difficult problems: questions of insurance, public health,

government and private industry relationships, which affect successful developments in the whole new nuclear field. This volume particularly stresses the health physics problems arising in reactor and chemical processing plants, including recommended precautions for protecting workers.

Volume XIV

GENERAL ASPECTS OF THE USE OF RADIOACTIVE ISOTOPES: DOSIMETRY

Technical papers and discussions describing production, handling, and distribution of radioisotopes are included in this volume. Full consideration is given to the techniques that have been developed for the measurement of detailed properties of the various radioisotopes, including monitoring in industrial situations.

Volume XV

APPLICATIONS OF RADIOACTIVE ISOTOPES AND FISSION PRODUCTS IN RESEARCH AND INDUSTRY

This volume represents accurately and completely the many fields to which the radioisotopes have already been applied and considers the applications of large quantities of fission products to such important problems as the promotion of chemical reactions, the sterilization of food, and the direct conversion of radiation into electricity.

Volume XVI

RECORD OF THE CONFERENCE

Included in this volume are the history of the Conference, the important lectures delivered by twelve of the most outstanding scientists of the world, the official documents of the Conference (communications from heads of States, etc.), and addresses delivered by the President of the Conference.

Please indicate language required:

- ☐ English (Available in January 1956)
- ☐ French (Available late in 1956)
- ☐ Russian (Available during 1956, price to be announced)
- ☐ Spanish (Available late in 1956)