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UNITED STATES GOVERNMENT

Memorandum

TO : S. R. Sapirie, Manager
Oak Ridge Operations

DATE: December 27, 1961

FROM : R. G. Humphries, Director
Contract Division

714692

SUBJECT: REQUEST FOR AUTHORITY TO NEGOTIATE A CONTRACT FOR THE
PRODUCTION OF A PUERTO RICO NUCLEAR CENTER FILM

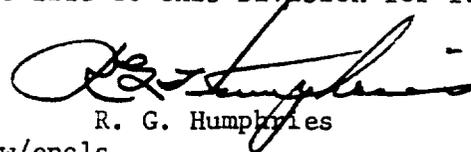
AC:RGH

This office has been requested by Mr. Stokely in the attached memorandum dated December 26, 1961, to initiate action leading to the award of a contract for the production of a movie film covering the Puerto Rico Nuclear Center activities. Mr. Stokely has furnished the names of five (5) movie production firms which he considers to be highly qualified for this type of an undertaking with an indication that the name of a sixth firm will be furnished shortly. He has recommended that the procurement be handled on a negotiated basis with proposals being solicited only from these six (6) firms in order to assure that the firm receiving the contract will have proper qualifications to produce a film of the desired quality.

I concur in the desirability of handling this procurement on a negotiated basis and believe the Commission is vested with ample authority under Subpart 1-3.210(a)(5) of the Federal Procurement Regulations.

In accordance with the provisions of your memorandum dated August 13, 1957, Subject "Proposed Contracts to be Entered Into Without Formal Advertising", it is recommended that you authorize the procurement of the production of the Puerto Rico Nuclear Center film on a negotiated basis with the invitation for proposals to be issued to the five (5) firms named in the attached memorandum plus the additional qualified firm which will be furnished later.

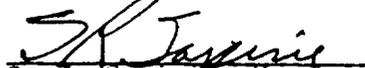
If you do so approve, kindly indicate by signing in the space provided below and return the file to this Division for further handling.


R. G. Humphries

Enclosure:
Memo 12-26-61 fm Stokely w/encls.

CC: E. E. Stokely

RECOMMENDATION APPROVED:


S. R. Sapirie, Manager
Oak Ridge Operations

REPOSITORY Oak Ridge Operations
COLLECTION Records Holding Area
Documents 1944-94
BOX No. Contracts AT-(40-1)-2873-2935
101 Bldg. 2714-4
FOLDER Negotiations + Backup for
Photo of Motion
Picture AT-(40-1)-2930

1097363

UNITED STATES GOVERNMENT

Memorandum

TO : R. G. Humphries, Director
Contract Division

DATE: DEC 26 1961

FROM : Edwin E. Stokely, Assistant to the Manager
for Public Education

SUBJECT: PUERTO RICO NUCLEAR CENTER FILM

MY:EES

This is in reference to our recent discussions concerning the production of a motion picture film on the Puerto Rico Nuclear Center. The Division of International Affairs, Headquarters, has requested we proceed to produce such a film. Accordingly, we now are ready to seek a qualified film producer to carry out this work under contract with the Commission.

As I noted in our discussions, we believe it is highly desirable to select the producer on a negotiated basis for a fixed-price or a lump-sum contract covering all phases of the work, including script and actual production. We believe advertised, competitive bids are not feasible for this project since we are interested in acquiring the professional services of only highly qualified firms which can offer the best talent available to produce the film. The importance of this cannot be over emphasized since the film is to be produced almost entirely for foreign audiences. It will be for the purpose of depicting the activities at the Nuclear Center in the most complimentary manner so as to attract people of the Latin American countries to the Center. The film is to be produced in at least two languages, with an option to provide prints in a third language.

Because of the foreign audience for which the film is intended, we consider it essential that this film be of the highest quality.

In order to insure that we receive a high quality film, we request that invitations for proposals for production of the Puerto Rico film be limited to approximately six firms, which are listed below. There are hundreds of motion picture firms throughout the nation. Many of them are qualified only for limited productions and, as such, do not have the talent, the equipment, the experience, the personnel or the know-how to produce a film of the quality we are seeking. Many of the firms probably could produce a film at extremely low cost.

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DEC 26 1961

However, the quality of such productions would be inferior and would reflect on this nation's atomic energy program if distributed abroad. Thus, we would prefer to limit proposals to only those firms which we know through past experience and through reputation to be capable of producing films of the quality we require and at reasonable costs. This type of procurement is not unusual with Federal agencies.

Attached you will find a memo from Headquarters concerning procurement of professional motion picture services on a negotiated basis and a memo from the United States Information Agency outlining that agency's practices in this regard and its justification for producing films under negotiated contracts.

We also have attached a draft outline of the scope of the work and specifications for inviting proposals for this project. We would appreciate your preparing the proposal package and soliciting proposals from the following firms:

Audio-Productions, Inc.
Film Center Building
630 Ninth Avenue
New York City, New York
Attention: Alexander Gansell

The Calvin Productions, Inc.
1105 Truman Road
Kansas City 6, Missouri

The Jam Handy Organization
~~1775 Broadway~~ 2821 East Grand Boulevard
~~New York City, New York~~ Detroit, Michigan
(Trinity 5-2450)

Sam Orleans & Associates, Inc.
211 West Cumberland Avenue
Knoxville 15, Tennessee

Wilding, Inc.
1345 Argyle Street
Chicago 40, Illinois.

We may provide you with a name for a sixth firm shortly.

We would like the solicitation of proposals to be scheduled so that we could reasonably negotiate a contract by March 1, 1962.

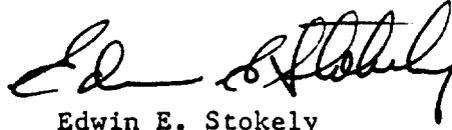
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R. G. Humphries

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DEC 26 1961

I will be glad to provide any additional information you may need.

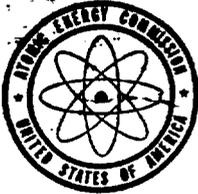


Edwin E. Stokely

Enclosures:

1. Memo dtd 12-22-61 fm Edwin L. Wilber to Edwin E. Stokely
2. Letter dtd 12-20-61 fm Frank C. Tribbe to Edwin L. Wilber
3. Information and Scope of Work for PRNC Movie

1097366



UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON 25, D.C.

December 22, 1961

MEMORANDUM

TO: Edwin E. Stakely, Assistant to the Manager
Oak Ridge Operations Office

SUBJECT: MOTION PICTURE CONTRACTING: PROCUREMENT OF A PROFESSIONAL SERVICE

Most Government agencies do not use unconfined, widespread, advertised bids to obtain a motion picture contractor. Certainly, this HQS would not request bids from any and all sources.

The U. S. Information Agency is an excellent example of limited bidding -- or, informal competition, as it is termed. The important thing to understand about USIA is that it is one of the largest producers of films in the Government. Its contracting work is under careful and constant surveillance by the GSA, Congress, the Comptroller-General, etc. Nevertheless, the USIA has not had one bit of trouble in its contracting under the negotiation method during the last eight years.

Its method is to ask anywhere from 4 to 12 companies (minimum of 3) -- as it thinks best -- to submit a bid or quotation on film production. Then, USIA selects from the bidders, usually taking the lowest bid. It is important to note that USIA will not offer bidding-opportunity to any group that it does not know and is not willing to accept. It offers opportunity to bid on the basis of a producer's experience, capabilities in a particular field of motion picture activity, reputation, facilities, etc.

I asked the Head of Administration and the Assistant General Counsel of USIA (Mr. Tribbe) if they considered (as I do) that under a motion picture contract you are actually procuring a professional service. Their answer a strong yes. The USIA Deputy General Counsel said that he considers "procurement of a motion picture contract as a professional or personal service within the general meaning of Section 302-C-4 of Public Law 152." He is confirming this by memorandum, and I will supply you with a copy as soon as it is received.

When USIA negotiates a contract after receiving limited bids (informal competition) from selected producers, the Agency usually refers in its paperwork-backup to particular items in Sec. 302. These are cited as authority for negotiation. The items are C-2, C-4, C-9 and C-14, as applicable, which refer respectively to a time factor (cannot afford the delay in time by full bidding), personal and professional services, impracticability, and otherwise authorized by law.

1097367

I believe GPO would be on solid legal ground in operating in this way. I am not suggesting that GPO skirt the regulations or operate just within the edge. On the contrary, I believe firmly that the greatest advantage to the Government lies within carefully controlled bids. The country has too many vest-pocket producers who can "capture" a bid, but do not have the facilities, experience or talent to do grade-A work.

If USIA -- which has been subject to the closest possible scrutiny in the field of contract negotiation -- can operate properly under limited, selected bidding, then I believe any Government agency can use similar methods.

Edwin L. Wilber, Chief
Audio-Visual Branch
Division of Public Information

Note: Mr. Tribbe's letter (attached) came in as this was being typed.

1097368



UNITED STATES INFORMATION AGENCY

WASHINGTON

December 20, 1961

Dear Mr. Wilber:

This refers to your telephonic inquiry of December 19 respecting Governmental legal authority for the negotiation of contracts for the production of motion pictures.

This Agency uses, *inter alia*, the contracting authority of Public Law 192, 81st Congress (41 U.S. Code 151 et seq.) Contracts such as those for the production of motion picture production contracts are always negotiated - under the authority of Sec. 302 - usually utilizing informal competition based upon the solicitation of cost estimates for a lump-sum price, such estimates supported by a detailed cost breakdown on an Agency Form. A negotiating conference, utilizing the cost breakdown, usually follows; it usually is held with the offeror of the lowest price; there may be negotiations with other firms. This procedure gives the Agency maximum administrative flexibility, but primarily the negotiation process permits the disclosure and possible use of bidders' ideas -- which facet is invaluable in making contracts for this kind of product.

Subsection (c) of the said Section 302 lists fourteen bases which agencies may use for negotiation -- as exceptions from the formal bidding requirements. The subject contracts fall clearly within Exemption No. 4 - "Contracts....for personal and professional services"; this Office (of General Counsel) has always so held -- however, there is no formal interpretive ruling, regulation or decision (inter-agency) to that effect, nor is any such needed. The Contracting Officer makes a bare finding to support the file of each case, and he will cite as many Exemptions in each case as apply; the ones most commonly cited by us for motion picture production contracts are 2, 4, 9 and 14 (No. 2 where "the public exigency will not admit of the delay incident to advertising" - meaning formal competition; No. 9 where there are "services for which it is impracticable to secure competition" - meaning formal competition; No. 14 where "otherwise authorized by law"). At times

Mr. Edwin Wilber
Chief, Audio-Visual Branch
Division of Public Information
Atomic Energy Commission
Washington 25, D. C.

1097369

Other exemptions apply to such contracts; No. 3 where less than \$500.; No. 5 where contracting with an educational institution; No. 6 where a significant part of the contract services is to be outside the U.S. and substantially all use is outside the U.S.; No. 10 as a part of a developmental or research project; No. 11 where the project is classified.

Of course, it is not unusual in contracting for these productions to find that a single firm is uniquely qualified to do a specific job, or has exclusive access to film footage or other subject matter; also, one firm may provide a file and support the production with a script, or may have an exclusive proprietary right - and/or may offer a special price on the basis of a joint production with the sharing of use. When the file is appropriately documented, any of these situations would justify dealing with only one firm - without even informal competition.

I trust that the above will adequately serve your need. If I can be of further assistance please do not hesitate to let me know.

Sincerely,

Frank C. Tribbe
Assistant General Counsel

1097370

INFORMATION AND SCOPE OF WORK FOR PUERTO RICO NUCLEAR CENTER MOVIE

1. Purpose:

The Commission desires to produce a promotional-type motion picture covering the activities of the Puerto Rico Nuclear Center which can be used to create greater interest on the part of qualified people in Latin America in utilizing the training and research facilities available at the Nuclear Center.

2. Subject:

The basic material to be considered is described in the enclosure entitled "Puerto Rico Nuclear Center." This description, however, is not an outline for the film. The film will describe visually and audibly the major training and research activities of the Puerto Rico Nuclear Center and the facilities available there so as to present these activities in the most favorable light.

3. Type of Film:

Semitechnical, documentary with off-screen narration. The picture will be in 16-mm color and release prints are to be in 16-mm color with sound. There will be two versions of the film, One with the narration in English and a second, identical to the first, but with the narration in Spanish. The proposal should provide an option for producing a third version with the narration in Portuguese.

4. Audience:

Semitechnical. The film will be directed to an audience which will include university science students, faculty members, technical personnel in industry, technical and scientific groups, all largely in South and Central American countries. When completed, the film will become a part of the AEC's motion picture film lending library and will be distributed through the United States Information Agency, the Department of State (including embassies and consulates), Organization of American States, and by the University of Puerto Rico and the AEC.

5. Production:

The contractor will be expected to provide all facilities, equipment and services necessary for the production of a semitechnical motion picture equal in quality to the best the motion picture industry can produce. The length of the picture will be two reels (20 minutes).

6. Script:

The contractor will be expected to first produce a film treatment or outline for the picture showing the proposed method of covering the subject as described in section 1 above. Upon approval of the treatment, the contractor will be expected to produce and submit for approval a draft script in accordance with the approved treatment. Upon approval of the draft script, he will prepare and submit a final script for approval. In connection

with the preparation of the treatment and script, the contractor will be expected to perform the necessary research, including reviewing written materials on the subject; review existing motion picture footage; visit the Puerto Rico Nuclear Center facilities at San Juan and Mayaguez, Puerto Rico; confer with AEC and PRNC personnel in Oak Ridge, Tennessee, Washington, D. C. and in Puerto Rico. At each stage of the production, the contractor will be expected to submit the treatment and scripts to the AEC for approval before proceeding to the next phase.

The contractor will be expected to produce the script originally in English. He will be responsible for translating it into Spanish for use in the Spanish version of the film (and under the option, into Portuguese). The Spanish translation must also be submitted to the AEC for approval.

7. Animation:

No need for animation is anticipated.

8. Location:

Photography will be accomplished principally at two sites in Puerto Rico -- at San Juan and at Mayaguez. No set construction or dramatic talent (other than off-screen narrator) will be required.

9. Approvals:

The Commission reserves the right to approve or disapprove the script writer, the director and the narrators, including the Spanish narrator (or Portuguese in the option) assigned by the contractor to this production, as well as any changes in writers, directors or narrators during the production.

The treatment and script are to be submitted to the Commission for approval as noted in section 5 above. Any changes in the script after final approval must be approved by the Commission.

The Commission reserves the right to approve the motion picture at the following stages of production and at the following places:

STAGE OF PRODUCTION

PLACE OF APPROVAL

Rough-cut picture with
cued narration.

Offices of the Commission at
Oak Ridge, Tennessee and
San Juan, Puerto Rico.

Inter-lock picture and
recorded narration.

Commission offices in Oak
Ridge, Tennessee, or
contractor's plant.

Answer print or pilot
print.

Commission offices at Oak
Ridge, Tennessee.

Each of the above stages must be approved in the order shown above before the next operation is undertaken. It will be the responsibility of the contractor to hold additional screenings at each stage of the production if this is necessary for approval.

10. Rights:

The Commission is to retain all rights and ownership of film.

11. Music and Effects:

Titles and stock music will be of a conventional nature.

It is expected the music will be used throughout the film.

Sound effects, if any, will be stock and recorded.

12. Delivery elements:

Subsequent to the approval of the answer or pilot print, the following is to be delivered to the Commission:

1. Five composite 16-mm color release prints with English narration and with reels, cans and fiber cases;
2. Five composite 16-mm color release prints with Spanish narration and with reels, cans and fiber cases;
3. If option is exercised, five 16-mm color release prints with Portuguese narration, and with reels, cans and fiber cases;
4. The edited original picture film;
5. The narration sound tracks in English, and Spanish and, if option is exercised, Portuguese on film or synchronized tape;
6. The music and effects sound track on film or synchronized tape;

7. The mixed, sound track on film suitable for making release prints;
8. Four color corrected internegatives suitable for making release prints;
9. All original and work print outtakes and overs.

An option for the Commission to purchase 25 release prints each with Spanish and with English narration and the price per print should be quoted in the proposal, and in Portuguese, if option is exercised. The quoted price for release prints should include reels, cans and fiber cases.

13. Delivery Dates:

Within 90 days after award of contract, the contractor should deliver a completed script;

Within 120 days following final approval of the script, deliver the pilot or answer print;

Within 30 days after approval of pilot or answer print, deliver the remainder of the delivery items.

14. Type of Contract:

A lump-sum or fixed price contract is contemplated. If it is impractical to estimate travel costs accurately in advance, separate arrangements could be provided for reimbursement of

travel in accordance with Government Travel Regulations on an actual cost basis.

15. Payments:

Payments to be made to contractor on performance and approval of following stages of production:

1. Upon completion of script, the amount specified in contractor's proposal for production of script;
2. Upon approval of inter-lock, one-half of remainder;
3. Upon delivery of release print and items listed in 10 above, the remainder.

16. Government-furnished supplies and services:

The Commission, at no cost to the contractor, will furnish the following supplies and services to the contractor:

1. Necessary electrical power required for operation of the contractor's equipment at the shooting sites;
2. Reasonable labor assistance to the contractor's crew to assist the contractor in moving equipment and in making electrical connections, etc.
3. A representative at the shooting sites to accompany the script writer and the motion picture crews and to assist in identification of scenes and to furnish other appropriate assistance at the shooting sites.

17. Security:

Since the film will not involve classified information, no security clearances or special security measures will be required.

18. Information to be submitted with proposals:

1. Since the work is to be a professional undertaking, primary emphasis is to be placed on the firm's qualifications and experience in such work.
2. For the purpose of evaluating the proposals and in order to obtain the best qualified producer, the following information should be required as a part of the proposal:
 - a. Unit or fixed price for the entire production (in both Spanish and English versions) and method of reimbursing travel and including:
 - (1) Cost of producing the script, including travel;
 - (2) Complete cost breakdown of other costs in completing the film;
 - (3) Estimated man-days in travel status.
 - b. Outline of firm's past experience in similar work with emphasis on experience in producing films in foreign languages.

- c. Furnish names, qualifications, and experience record of script writer, director, chief photographer, film editor, and narrators, including Spanish and English narrators who will be assigned to the job, and indicate whether such personnel are presently employed by the firm or whether recruitment will be necessary.
- d. State whether work has been or is currently being performed for the Atomic Energy Commission and so identify.
- e. Equipment and facilities:
 - (1) Describe briefly major pieces of equipment proposed for use on the work;
 - (2) Furnish location and description of laboratory or production facility which contractor proposes to utilize in performance of work;
 - (3) Indicate what portion of the work may be subcontracted or carried out in facilities owned by other than the contractor and identify proposed subcontractors and facilities to be used;
 - (4) Indicate the type of film contractor proposes to use.

3. Quote price separately on options included as follows:

- a. To produce a version of the film with the narration in Portuguese and furnish five release prints with a Portuguese narration track.

- b. Quote a price per print for an additional 25 release prints with (1) English narration; and (2) Spanish narration.

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(Title Page)

(Copy)

The Puerto Rico Nuclear Center

operated by

The University of Puerto Rico

for

The United States Atomic Energy Commission

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CONTENTS

Page

A Statement of Purpose

History and Organization

Programs at Mayaguez

- Nuclear Science and Engineering
- Health Physics
- Chemistry
- Agriculture and Biology
- The BONUS Reactor
- Facilities at Mayaguez

Programs at Rio Piedras and San Juan

- Radioisotope Techniques
- Research in the Radioisotope Applications Division
- Clinical Applications
- Radiotherapy and Cancer Work
- Radiobiology
- Summer Institute in Radiobiology
- Medical Sciences
- Facilities at San Juan and Rio Piedras

Principal Officials Associated with the Nuclear Center

The Staff

Special Information for Students

Information on Puerto Rico

(Inside Front Cover)

1.

"Brain power is one of our most important expanding frontiers. Learning and discovery today are really the 'new worlds,' one of the great new frontiers . . . We must search out and stimulate the fullest development of gifted young people in all creative fields."

Glenn T. Seaborg, Chairman
United States Atomic Energy Commission
in a speech at Columbus, Ohio
June 9, 1961

In the vigorous new field of atomic energy, one finds the uniquely powerful tools which can dramatically compress the time scale of human progress. Already, we have compelling examples of the usefulness of the atom--in medicine, industry, agricultural science, basic research and in the production of electric power. And yet, in view of the promise of the future, these applications represent only the most superficial use of this exciting new force.

Thus, there is much yet to be done.

In cooperation with other major institutions of knowledge, the Puerto Rico Nuclear Center pursues programs of training and research, tailored to serve the needs of the Latin American peoples, in order that the nations of this Hemisphere might prepare for the benefits of nuclear advancement, and indeed contribute to that advancement.

In establishing the Puerto Rico Nuclear Center, the United States reaffirmed a warm interest in its Spanish-speaking neighbors, and the respect it feels for them.

Throughout the history of man, human advancement has been built upon the energetic, enthusiastic effort of skilled, dedicated, creative people. The Puerto Rico Nuclear Center hopes to make some contribution toward helping such people achieve their maximum development, and to encourage and assist them in the application of their talents.

The goal is a lofty one and the challenges are exacting. But the rewards can stagger the imagination.

In an historic address before the United Nations General Assembly on December 9, 1953, Dwight D. Eisenhower, then President of the United States, first enunciated the "Atoms for Peace" plan--a plan to spread the benefits of this vital new form of energy throughout the world.

"My country's purpose," he said, "is 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."

Then, at the 1956 Panama Conference, Mr. Eisenhower specifically urged action to "hasten the beneficial uses of nuclear forces throughout the hemisphere."

A symposium on the Peaceful Applications of Atomic Energy was held at the University of Puerto Rico in January 1957, attended by more than 1,200 educators, officials of the Puerto Rican and U. S. governments, and students. At this meeting, the need for a nuclear center to serve Latin American became more apparent.

On the basis of the symposium and the Panama Conference--and against the general backdrop of the Atoms for Peace concept--the United States Atomic Energy Commission established the Puerto Rico Nuclear Center, leaning heavily on the cooperation and assistance of the University of Puerto Rico.

The Nuclear Center was conceived primarily to aid the Latin American peoples in developing skills essential to their nuclear energy activities by providing graduate level education, research opportunities, and by conducting other special programs.

Working against tight time schedules, detailed plans for the new facility were prepared. The United States Congress approved authorizing legislation and appropriated \$2,500,000 for the start of construction.

Because of its interest in expanding training and research activities, the University of Puerto Rico agreed to operate the new facility without fee, and on October 2, 1957, the University signed a contract with the USAEC for operation of the Nuclear Center, which would be owned by the U. S. Government.

Groundbreaking ceremonies for the construction of the facilities at Mayaguez were held on July 26, 1958, with a large number of officials on hand from the University, and the governments of Puerto Rico and the United States. Dr. Milton Eisenhower attended as a personal representative of his brother, the President.

Puerto Rico was selected as the site for the Nuclear Center for two prime reasons. First, the island commonwealth, a model of Latin American advancement, is a meeting ground of the two great cultures of the Americas. Secondly, it was felt that the Nuclear Center could best function under the auspices of a large established university, and officials of the University of Puerto Rico were enthusiastic in their support of the program from the outset.

The University is accredited by the Middle States Association, and is a charter member of the Union of Latin American Universities. It has received specialized professional accreditation in the fields of law, medicine, medical technology, engineering, public health nursing, pharmacy, social sciences and teacher training.

The main campus of the University is located at Rio Piedras and units there include the Colleges of General Studies, Humanities, Natural Sciences, Business Administration, Education, Law, and Pharmacy. A second campus at Mayaguez houses the College of Agriculture and Mechanic Arts, the Division of General Studies, and the Schools of Agriculture, Engineering and Science.

In addition, in historic Old San Juan, the University operates its School of Medicine-Tropical Medicine, and Schools of Dentistry and Public Health.

The Nuclear Center functions on all three campuses.

The University extends graduate credit for most of the courses offered by the Nuclear Center, and members of the principal teaching staff also are members of the faculty of the University.

This close integration with the University affords the Nuclear Center a vast breadth of specialized assistance, not only from the University staff members themselves, but also from professional people in other organizations with which the University is affiliated.

In addition, as a major link in the USAEC's training and research effort, the Nuclear Center enjoys a depth of support which is unmatched by any other institution of its type in Latin America.

The Nuclear Center has full access to developments throughout the Commission, and it enjoys the complete cooperation of the personnel of other USAEC installations including the large national laboratories. As a result, outstanding research scientists and teachers are available to advise officials of the Nuclear Center, and to give lectures and conduct

seminars. The USAEC maintains liaison with the Nuclear Center and the University through its Puerto Rico Area Office, part of the Commission's Oak Ridge Operations--which also administers the work of such other major training and research installations as the Oak Ridge National Laboratory and the Oak Ridge Institute of Nuclear Studies.

General activities of the Nuclear Center are conducted bilingually, but formal lecture courses are in Spanish. This, plus the Hispanic traditions and culture of Puerto Rico, greatly facilitates participation by students from throughout Latin America.

At Mayaguez, programs are offered at the Master of Science level in Nuclear Science and Technology, Health Physics, Chemistry, Agriculture and Biology. The emphasis in radiobiology is chiefly on plant physiology and radiation genetics. Specialized equipment at Mayaguez includes two nuclear reactors and associated laboratory facilities, and a greenhouse for plant work.

At Rio Piedras and San Juan, the program is largely medically oriented, and activities are carried out principally in the new Bio-Medical Building located in the new Puerto Rico Medical Center in Rio Piedras. Training is offered in Radioisotope Techniques, Clinical Radioisotope Applications, and Radiotherapy and Cancer. Primary emphasis is placed upon new methods of diagnosis, and in improving the applications of radiation in the treatment of malignant disease.

In addition to appealing to the esthetic sense, the tropical climate of Puerto Rico and the island's close ties to the sea offer unusual environmental advantages for specialized training and research activities

in areas such as tropical medicine, tropical agriculture and marine biology. The Nuclear Center already is pursuing some work in these fields, and more is anticipated.

Over and above its function as a training and research organization, the Nuclear Center also serves as a meeting place for scientists, physicians, engineers and educators from both continents. As they travel between South America and North America, specialists frequently stop over at the Nuclear Center for consultation and discussions with members of the staff. This is widely encouraged, for it is of mutual benefit.

Although still in its infancy in terms of years, the Nuclear Center today has a staff of more than 100 trained people, and extensive facilities.

Thus, the Puerto Rico Nuclear Center already is functioning as a major focal point for nuclear activity in the Americas accommodating the special interests of Latin America, and at the same time, serving the universal cause of scientific advancement.

PRNC/PROGRAMS AT MAYAGUEZ

The serene beauty of Puerto Rico and the industry of the Puerto Rican people are immediately apparent in the coastal city of Mayaguez, on the western shore. The third largest city in the island, Mayaguez is a major port, an agricultural center, and the site of expanding commercial activity.

The sea water is a deep blue, and there is a backdrop of mountains rising from the coastal plain which is characteristic of Puerto Rico. The residents of Mayaguez are friendly and ingenious, the climate is consistently pleasant.

Actually, Mayaguez is more typical of island life than is San Juan-- there are very few tourists and the general pace of day-to-day living seems slower. But the gentle naturalness that makes the area so appealing does not conceal the unmistakable signs of achievement in Mayaguez, achievement based on agricultural diversification, increased manufacture, and the widespread influence of the University of Puerto Rico.

The University's College of Agricultural and Mechanic Arts and several other major units are located here. Many new buildings of modern architecture have been built on the campus recently, alongside older structures reminiscent of Spain.

Adjoining the campus is a vast Federal Agricultural Experiment Station which has the largest collection of tropical plants in the Western Hemisphere.

The Puerto Rico Nuclear Center's facilities are located on a tract which formerly was part of the Experiment Station. It is here that the Center conducts programs at the Master of Science level in Nuclear Science and

Technology, Health Physics, Chemistry, Agriculture and Biology. In these activities, students utilize two nuclear reactors and a subcritical assembly, associated facilities, and excellent new laboratories. There is a close interrelationship between the Nuclear Center and the University, facilitated by the physical proximity.

Program details are given in the following sections.

The Nuclear Center offers a full curriculum leading to the degree of Master of Science in Nuclear Technology. The course of study requires one full academic year of 11 months, and the program is designed to give students a thorough background in the theory and operation of nuclear reactors and the associated chemical and metallurgical processes.

The curriculum follows the general outline required for nuclear science and engineering fellowships of the U. S. Atomic Energy Commission, and the course has been approved by the Commission for holders of such fellowships.

The course starts with the fall semester, and requires a minimum of 30 credit hours and the successful completion of a comprehensive oral examination. Students are urged to spend 18 to 24 months at the Nuclear Center in order to complete their course of study with a thesis. Students who receive assistantships are required to submit a thesis.

Participants work closely with two principal divisions of the Nuclear Center--the Reactor Division and the Nuclear Science and Technology Division. The Reactor Division is responsible for operating the reactors, hot cells, gamma sources and irradiators. It is staffed by trained reactor specialists who also are engaged in various research and development projects concerned with reactor design and operation. The Nuclear Science and Technology Division is responsible for the course work and for the development of research programs.

Course work includes mathematics, nuclear physics, reactor physics, nuclear measurements and instrumentation, reactor technology, radiological safety, reactor metallurgy and chemical processing of nuclear fuels.

Much specialized equipment is used, and this is described in a subsequent section.

Prerequisite: A university degree in engineering, physics or chemistry.

The Health Physics Program

The Health Physics program, which requires one year, leads to the degree of Master of Science in Radiological Physics. The curriculum is designed to provide fundamental knowledge in radiation physics and biophysics and covers work in the interaction of radiation with matter and living systems, dosimetry, instrumentation and the principles of permissible exposure. Opportunities are provided for the student to learn the techniques of film badge processing.

The student is introduced to some of the legal aspects of radiation protection, and also to the significance of public attitudes toward radiation and radiation exposure.

The program includes such courses as radiobiology, radiological electronics, atomic physics, nuclear measurements and instruments, nuclear chemistry, advanced radiochemical techniques, nuclear techniques in biological research, biophysics, and seminar work in addition to the specific courses in health physics.

The University of Puerto Rico is a participant in the USAEC's Health Physics Fellowship Program.

As in the Nuclear Science and Engineering Program, participants have full access to the Nuclear Center's reactors and associated facilities.

The general field of health physics is rapidly expanding with the increased use of x-ray equipment, particle accelerators, reactors, and natural and manmade radioisotopes. The health physicist is essential to safe operation in the nuclear industry.

The Nuclear Center program is designed to provide the necessary training to enable a graduate to devise methods and techniques of dosimetry, advise on protection necessary in the handling of radioactivity, aid health authorities, and also assist in fostering an improved public understanding of radiation.

The program also adequately prepares the graduate to teach the fundamentals of health physics and its applications, and to supervise or participate in research in the field.

One important aspect of the program is a period of on-the-job training which is arranged at the research reactor in Mayaguez, and in connection with the medical programs in the San Juan area. This permits actual case studies into the problems and procedures of health physics work.

Prerequisite: A university degree in science. The student must have taken work in chemistry, modern physics and integral calculus.

The Chemistry Program

The Chemistry Program leads to the degree of Master of Science in Chemistry with a major in Radiochemistry. The program requires the completion of a thesis and the passing of a comprehensive oral examination.

Students with interests in the nuclear energy field will write their theses under the supervision of a staff member of the Nuclear Center.

Normally, a period of 18 to 24 months is required for the completion of this program, which is designed to prepare the student for research work employing nuclear techniques in the field of chemistry.

The course includes 14 hours of electives. Thus, the program provides flexibility and permits the material to be tailored to the individual needs of the student.

Required courses include advanced inorganic chemistry, advanced organic chemistry, nuclear chemistry, radiochemistry and nuclear measurements and instrumentation.

Through their thesis research, participants in this program may contribute greatly to the research program of the Nuclear Center.

Prerequisite: A university degree with major in chemistry.

The Agriculture and Biology Programs

These programs may lead to the degrees of Master of Science in Biology or Master of Science in Agriculture, with a major in Nuclear Science.

The basic courses are common to both programs, but the thesis and associated electives determine the field of specialization. Thirty semester hours are required, including a thesis.

The Agriculture and Biology programs are designed to prepare the student for research and application of nuclear techniques in the fields of biology and agriculture.

Examples of research programs in which the thesis research may be undertaken include:

- (1) Physiological and genetic effects of radiation on tropical plants and animals.
- (2) Activation analysis for studies of plant and animal nutrition and metabolism.
- (3) Soil and plant relations, using tracers.
- (4) Cytogenetic studies of tropical organisms using radiation.
- (5) Physiological genetics, including:
 - a. biosynthesis and accumulation of ascorbic acid in acerola using tracers; and
 - b. carotenoid biosynthesis and mutation studies in achiote,
- (6) Studies on the in vivo and in vitro properties of plant DNA.
- (7) Enzyme studies on sugarcane in relation to a mutation and screening program.

- (8) Radio-ecology of tropical plants.
- (9) Life cycles, distribution and radiosensitivity of insects.
- (10) Content and accumulation of calcium, strontium, vanadium, iron, etc., in marine flora and fauna, particularly food chain organisms such as plankton.

Specialized courses at present offered include:

Nuclear Techniques in Biological Research

Nuclear Techniques in Agriculture

Radiobiology

Special Problems in Nuclear Biology

Prerequisite: A university degree in science.

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In 1961, the Nuclear Center initiated the development of a research program in marine radiation biology, functioning in such areas as:

- Studying levels of radioactivity present in marine organisms in the Puerto Rico area
- Determining concentration factors of marine organisms for selected radioisotopes
- Conducting marine productivity studies.

The University of Puerto Rico operates a marine biological station at La Parguera which offers excellent opportunity for the study of tropical marine biology. Of special interest are the opportunities for biological and ecological work in the mangrove-related vegetation complexes of nearby islands, and on the unusual bioluminescent species of the "Phosphorescent Bay" near the marine station.

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The BONUS Reactor

Work began in 1960 on a new power reactor at Punta Higuera, near Rincon, Puerto Rico. The construction site is about 15 miles from Mayaguez.

The reactor is a joint project of the Puerto Rico Water Resources Authority and the U. S. Atomic Energy Commission, and it will generate about 16,000 kilowatts of electric power.

The reactor is known as the BONUS (for Boiling Water Nuclear Superheat) Reactor. It is anticipated that this reactor will advance the USAEC's nuclear superheat program by demonstrating technology and supplying operating data.

The Nuclear Center has participated in training reactor operators for BONUS, and additional areas of cooperation are planned between Nuclear Center specialists and the Puerto Rico Water Resources Authority which will operate the reactor.

Facilities at Mayaguez

The Nuclear Center's Mayaguez activities are centered around a large Reactor and Laboratory Building containing 39,000 square feet of floor area which houses a pool-type research reactor and provides associated laboratory and office space. Immediately behind this structure, there is a Planthouse, and a building housing the Nuclear Center's training reactor and a graphite subcritical assembly.

The research reactor is a light-water moderated, heterogeneous, solid fuel reactor, which operates at a power level of 1,000 kilowatts (thermal). The fuel contains uranium enriched to 20 percent in U-235. The reactor

was built for maximum flexibility, and was so designed that its power level could later be increased to 5,000 kilowatts.

The reactor pool is 49 feet long, 23 feet wide and 32 feet high, and is divided into two sections. A narrow stall at one end contains beam tubes, pneumatic systems and a thermal column. In the larger section, a gamma irradiation facility is available with provisions for removal of irradiated materials to two adjacent hot cells.

The reactor core is suspended from a movable bridge, making it possible to operate the reactor in either section.

Of the six beam tubes, two are eight inches in diameter, and four are six inches in diameter. There are two pneumatic "rabbit" tubes, through which samples may be moved for short periods of irradiation. Automatic timing devices control the period of irradiation and the reversal of the air valving.

The thermal column consists of a stacked graphite and lead assembly for irradiation experiments with highly thermalized neutrons.

At 1,000 kilowatts the flux on the beam tubes and the "rabbits" is approximately 2×10^{12} neutrons per square centimeter per second.

The characteristics of the pool reactor are such that it is an excellent training facility, and also possesses flexible research capabilities.

The smaller training reactor is a Model L-77 unit, in wide use in the United States. It is a homogeneous solution reactor, using light water as a moderator, and fueled with uranium enriched to 20 percent in U-235. Experimental facilities in this reactor consist of one 1-1/2 inch and four 3/4 inch exposure tubes which traverse the core. Also, there are two

three-inch beam tubes. Flux at the center line beam tube is 2×10^8 neutrons per square centimeter per second.

Reactors of this type have proved invaluable for training reactor operators, and for teaching the basic principles of reactor design and operation.

Other major pieces of equipment include a graphite-natural uranium subcritical assembly, and a nuclear reactor simulator.

The laboratories occupy about 24,000 square feet of floor area, and are well equipped for work with both high-level and low-level radioactivity.

There is excellent equipment for work in metallurgy, radiochemistry and physics. A gamma radiation facility permits the study of radiation effects, and research in food preservation. The gamma facility employs a 10,000 curie cobalt-60 source.

In addition, the building has counting rooms; glass blowing, machine and instrument shops; and classrooms and offices.

The Planthouse contains standard greenhouse equipment plus hydroponic beds. This installation is designed for work into the effects of radiation on plant genetics, in an attempt to obtain basic information on genetics and to improve plant strains--with special emphasis on tropical food plants.

In addition to the physical facilities of the Nuclear Center, certain equipment at the University is available to Nuclear Center participants.

PRNC/PROGRAMS AT RIO PIEDRAS AND SAN JUAN

The picturesque San Juan area perhaps best typifies the bold, swift progress which is taking place throughout Latin America. It is a city of color and movement and contrasts. San Juan combines the dignity, the beauty and the splendor of its Spanish history with the cosmopolitan wonders of the 20th Century, and the blending results in an exotic international atmosphere.

The University campuses in San Juan and in suburban Rio Piedras offer much of these same contrasts.

The Puerto Rico Nuclear Center's programs at Rio Piedras and San Juan fall into four principal categories: Radioisotope Applications, Clinical Applications of Radioisotopes, Radiotherapy and Cancer Training, and Radiobiology. In addition, the Nuclear Center began planning in 1961 for the establishment of a new Medical Sciences Division.

Generally, the work is on the graduate level, and headquarters for most of the programs is the Nuclear Center's new Bio-Medical Building, completed in 1960 in suburban Rio Piedras, a few miles from downtown San Juan. The Bio-Medical Building is an integral part of the new Puerto Rico Medical Center, which represents the first step in a plan toward regionalizing health services.

Some Nuclear Center activities are carried out in the Dr. I. Gonzalez Martinez Oncologic Hospital. A new building for this hospital, at the Puerto Rico Medical Center adjacent to the Nuclear Center's Bio-Medical Building, was scheduled for completion in early 1962.

In addition, the University of Puerto Rico's Medical School is located in Old San Juan, and the Nuclear Center maintains a close working relationship with the Medical School staff.

In all of its training programs, the Nuclear Center utilizes the latest equipment and techniques. New developments and new information are immediately incorporated into the courses—a fact of overriding significance in the ever-advancing science of the atom.

Detailed information on each program is contained in the following sections.

Radioisotope Techniques Course

The Radioisotope Techniques Course is a fulltime four-week program patterned after a similar course offered by the Oak Ridge Institute of Nuclear Studies at Oak Ridge, Tennessee. The program was developed after exhaustive investigation to determine the proper level and content of presentation.

The range of the course is extensive, embracing instruction in fundamental concepts as well as actual laboratory demonstrations and experimentation.

The course work includes basic principles of physics, nuclear physics, radiochemistry, radiobiology, counting statistics, and practical applications of radioisotopes in the fields of chemistry, biology and medicine.

Lectures embrace the following areas:

Basic concepts of physics

Interaction of radiation with matter

Detection of radiation

Nuclear Reactions

Rate of radioactive decay

Statistical aspects of radioactivity measurements

Disposal of radioactive wastes

Basic concepts of radiobiology

Biological effects of radiation

Radiological safety

Radiation dosimetry

Nuclear chemistry and radiochemistry

Clinical applications of radioisotopes

Radioisotopes in medicine

Shielding and laboratory design

Radiation survey instruments

The course includes experiments which are planned to acquaint participants with a large variety of specialized equipment and instrumentation which is used in radioisotope laboratories.

The laboratory phase includes work in such areas as:

- Determination of the operating characteristics of Geiger counters.
- Radiation properties (self-absorption, back-scattering, maximum beta range and energy, half-value layer and gamma energy).
- Use of ionization chambers (Landsverk electrometer).
- Laboratory techniques for the preparation of samples for counting.
- Scintillation detectors and gamma spectrometers.
- Standardization of iodine 131.
- Standardization of carbon 14.
- Chemical separations.
- Isotope dilution techniques.
- Isotope exchange in kinetic studies.
- Phosphorus 32 distribution in rat tissue.

The course is offered five times each year—during the months of March, May, June, July and November.

Prerequisite: A university degree in science, engineering, medicine or dentistry.

Research in the Radioisotope Applications Division

Research programs in chemistry may be undertaken through participation in projects of the Nuclear Center's Radioisotope Applications Division. The work is carried out under the supervision of research leaders, and a minimum program of one year is recommended.

Research projects are concerned with the general areas of:

Physical Chemistry—reactions in solution, particularly electron exchange kinetics and related problems.

Organic Chemistry—carbohydrates reactions.

Participants in research activities have the opportunity of taking graduate courses in chemistry and related fields at the University of Puerto Rico, leading toward a Master of Science degree. Courses in radiochemistry, nuclear chemistry and physics are offered at the University.

Prerequisite: A university degree with chemistry as a major.

The Clinical Applications Program

The Clinical Applications Program offers training and research in the use of radioisotopes in diagnosis, therapy and in clinical research. Two courses are available—a short program which normally lasts two months, and a more extended course of up to one year.

The objective of the Short Course is to equip competent investigators to apply radioisotope techniques to their own fields and to enable them to return to their home institutions and establish and operate radioisotope laboratories. Also, completion of this course provides the necessary background for obtaining a license from the U. S. Atomic Energy Commission to utilize radioisotopes in the treatment of humans.

The Short Course

The Short Course consists of formal lectures, demonstrations, seminars, roundtable discussions, a review of literature, and laboratory work.

The program involves full use of all Nuclear Center facilities for radioisotopes work, and full participation by the Nuclear Center's professional staff. The laboratory contains extensive equipment, and a wide variety of procedures are employed to give participants the broadest experience possible.

Normally, two techniques are introduced each week, preceded by an explanation of the theory and medical aspects of the tests. Participants perform at least eighty tests in an eight-week period. To assure maximum benefit from the program, only two trainees are assigned to a technician.

The program involves the use of such radioisotopes as iodine 131, chromium 51, cobalt 60, sulfur 35 and carbon 14. Procedures studied include thyroid function and urinary excretion, protein-bound iodine, conversion ratio and therapeutic doses, blood volume and protein stores in malnutrition, erythrocyte survival, plasma binding capacity, and location of cancerous metastases. Also, general tracer work is covered.

The Long Course

The Long Course, which may last from six months to one year, stresses research aspects of radioisotopes in clinical medicine. Participants also may take instruction at the University Hospital.

In this course, the trainee concentrates on a special basic technique, and pursues a research project of his particular interest, within the scope

of the Nuclear Center's research program. Several months generally are required to establish and set up such a project. During the preparatory period, the trainee studies pertinent medical literature, and meets regularly with members of the staff to discuss problems related to such matters as experimental procedures, techniques, and biological supplies.

It is anticipated that a participant will prepare a paper on some phase of his project by the end of the academic year, in order that consideration may be given to presentation of the paper before scientific groups, or publication in technical journals.

The number of participants in both the Short Course and the Long Course is limited.

Prerequisite: Basic Radioisotopes Techniques Course or equivalent experience. A medical degree is required for the Long Course only.

The Radiotherapy and Cancer Training Program

The Radiotherapy and Cancer Training Program utilizes facilities at the Dr. I. Gonzalez Martinez Oncologic Hospital in San Juan, and is intimately related to the Cancer Control Program of the Puerto Rico Department of Health.

At the hospital, the Nuclear Center maintains radiation therapy facilities and an extensive assortment of radiation sources.

The Department of Health carries on activities designed for the early detection of cancer by means of cytology. In August, 1959, a Cyto-Technician School was established in the Division of Cancer Control with the cooperation of the Nuclear Center and with partial support from the U. S. Public Health Service. This school now offers a training course in cytotechnology, lasting

for one year, and open to an average of four students each year. The school is located at the Nuclear Center's Bio-Medical Building where it is completely integrated with activities of the Nuclear Center and its cytology research program.

Also, under the Cancer Control Program, the Department of Health encourages trainees in the Nuclear Center's Radiotherapy Division to become acquainted with cancer control.

The main objective of the Radiotherapy and Cancer Training Program is to instruct physicians in the techniques for safe use of ionizing radiation in the treatment of cancer. Two types of trainees are accepted. Short-term participants are accepted for a minimum period of one month, or for longer periods if they desire specialized training in a particular technique or wish to carry on a specific research activity.

Long-term trainees are accepted for a minimum period of one year. Students may stay at the Nuclear Center for as long as three years--the period of training required by the American Board of Radiology for specialty certification.

Trainees are taught to diagnose cancer, determine the extent of the disease, determine the radiosensitivity of the particular tumor and plan and carry out the treatment. Treatment may involve the use of radiation exclusively, or in combination with other methods. The patient's condition is followed after treatment.

In addition, participants are taught to solve various clinical problems associated with the form of treatment. They become familiar with roentgen-therapy of different voltage levels, cobalt teletherapy using both rotational and stationary types of equipment, and the use of radium and cobalt for interstitial and intercavitary therapy. Training in health physics and radiobiology is included in the program.

The Dr. I. Gonzalez Martinez Oncologic Hospital was established in 1938, and has since become the most important cancer center in Puerto Rico. It was scheduled to move into new facilities adjacent to the Nuclear Center's Bio-Medical Building at the Puerto Rico Medical Center in 1962. Its staff includes physicians representing all the specialties related to cancer. The hospital has residency programs in radiotherapy, pathology and surgery, all approved by the respective specialty boards. The number of cancer cases at the hospital is comparable to that seen at large institutions in North America.

Prerequisite: A medical degree with one year of internship or equivalent clinical experience.

The Radiobiology Program

The Radiobiology Program is designed to provide training for medically oriented biologists and physicians in the techniques of using radiation in the basic medical sciences.

The program provides research training on an individual basis for unspecified periods.

The research areas on which work is concentrated include:

- Irradiation of cultured tissue cells, particularly tumor cells, for investigating mechanisms of radiation response, radioresistance, and other phenomena.
- Biochemical and biophysical studies of the effects of radiation on intact and isolated biological systems, including modification of radiation effects.
- Chromosome replication and breakage studies using radiation and tritiated thymidine as well as other labeled compounds.

Prerequisite: A medical degree or a university degree in science.

The Summer Institute in Radiobiology

A Summer Institute in Radiobiology, for high school science teachers, is held under the direction of the Nuclear Center and with the cooperation of the National Science Foundation and the USAEC's Division of Biology and Medicine.

The program is designed to strengthen the basic concepts of modern biological and physical sciences, and introduce the fundamental principles of radiation biology, nuclear energy, instrumentation, and the current applications of radioisotopes.

This Institute is offered in the summer, starting in early June and lasting six weeks. The University of Puerto Rico offers six academic credits for the successful completion of the course.

Prerequisite: Open to high school teachers of biology, physics, chemistry or mathematics.

The Medical Sciences Program

In 1961, the Nuclear Center began planning for establishment of a new Medical Sciences Division which would have as its prime activity medical research and post-graduate medical teaching in broad areas of concern to the tropics. Included would be such general fields as tropical nutrition, experimental cancer chemotherapy, and diseases of Puerto Rico which appear to be genetically determined.

This work would be carried out in close association with appropriate departments of the Medical School and the University Hospital, as well as with the Puerto Rico Department of Health.

The Nuclear Center's Clinical Radioisotopes Division is primarily concerned with the problems of clinical application of established procedures. The Division of Medical Sciences would conduct those special studies, and also offer post-graduate instruction in the areas of medicine for which nuclear energy is essential to understanding.

Facilities at San Juan and Rio Piedras

By early 1961, the Nuclear Center's programs in the San Juan-Rio Piedras area had been centralized in a new Bio-Medical Building on the site of Puerto Rico's new Medical Center. The Nuclear Center's programs in this new facility thus can be closely associated with work in other installations of the Medical Center.

The Bio-Medical Building is close to the new Dr. I. Gonzalez Martinez Oncologic Hospital, and it is convenient to the University Hospital. Some programs of the Nuclear Center are carried out in facilities at the Medical School in San Juan, and on the University's Rio Piedras campus.

The new 22,000 square-foot Bio-Medical Building contains excellent laboratories for work in radiochemistry, radiobiology, biochemistry, biophysics, tumor localization, cytology, and radiotherapy. In addition, the installation has shops, animal housing, counting and decontaminating rooms, a radioisotope storage area, classrooms and other related facilities.

There is full laboratory equipment for complete radioisotope techniques training.

In the medical field, the Nuclear Center has an 8,000-curie cobalt 60 teletherapy unit, and cobalt 60 needles and capsules of various sizes equivalent to a total of about 800 milligrams of radium. It also has a

deep therapy x-ray unit and a superficial therapy unit, in addition to a number of other special items of equipment, including counting and radiation measurement devices.

The Radiotherapy and Cancer Training Program utilizes additional equipment which is owned by the Dr. I. Gonzalez Martinez Oncologic Hospital. This includes a rotational teletherapy unit using 400 curies of cobalt 60, two deep therapy x-ray units, one superficial therapy x-ray unit, and about 700 milligrams of radium in the form of needles and cells of various sizes.

All of this specialized equipment is in addition to facilities of the University's Medical School which are available to Nuclear Center participants.

PRNC/THE STAFF

John C. Bugher, M.D., Director

Dr. Bugher was born in [REDACTED] Indiana, receiving his [REDACTED] [REDACTED]. At the [REDACTED] he received an [REDACTED] [REDACTED]. After teaching at Taylor (1919-20), he was Director of Public Health at South Haven, Michigan (1922-37), and a member of the University of Michigan faculty (1922-26 and 1929-37), resigning to join the Rockefeller Foundation.

Subsequently, he conducted research in Colombia in yellow fever, and was Director of the Seccion de Estudios Especiales there (1940-43). He then went to Lagos, Nigeria where he established and headed the Yellow Fever Institute (1943-48).

Returning to the United States, Dr. Bugher supervised biophysical studies of viruses for the Foundation (1949-51), taking leave to join the USAEC (1951-55). He left the AEC as Director of the agency's Division of Biology and Medicine to return to the Foundation as Director for Medical Education and Public Health until 1959, when the Foundation appointed him Consultant on Nuclear Energy Affairs.

On July 1, 1960, Dr. Bugher became Director of the Puerto Rico Nuclear Center, his services being made available by the Foundation. He has written many scientific papers, and holds numerous honorary degrees and special awards, including a large number from organizations and governments abroad. Dr. Bugher was unanimously elected a Fellow of the New York Academy of Sciences in 1959 in recognition of "outstanding scientific achievement and promotion of Science."

Henry J. Gomberg, Ph.D., Deputy Director

Dr. Gomberg was born in [REDACTED], and received his [REDACTED]

[REDACTED] and later took his [REDACTED]
[REDACTED]

He was employed in private industry (1936-41), first with the Detecto Scales Company and later with General Switch Corporation. He was a member of the University of Michigan faculty (1941-43), leaving the University to work for the Naval Ordnance Laboratory (1943-46), returning to the University as an assistant professor.

Dr. Gomberg later was named professor, then Chairman of the Department of Nuclear Engineering before being appointed Director of the Michigan Memorial Phoenix Project, a privately supported program of research into the implications and applications of nuclear energy.

Dr. Gomberg has served as a consultant to the USAEC's Argonne National Laboratory and the Office of Isotope Development, the International Cooperation Administration, the State Department, the Oak Ridge Institute of Nuclear Studies, the World Health Organization and other organizations. He is the author of about 60 scientific articles. Dr. Gomberg was a Carnegie Visiting Professor at the University of Hawaii in 1961.

He was appointed Deputy Director of the Puerto Rico Nuclear Center in September 1961.

Members of the Staff

(About 40 names)

Members of the Nuclear Center's Advisory Committee for Biology and Medicine

(About 10 names)

Principal Officials Associated with the Nuclear Center

For the United States Atomic Energy Commission

S. R. Sapirie
Manager, Oak Ridge Operations

Floyd P. Trent
Manager, Puerto Rico Area Office

Jose Gonzalez Montalvo
Administrative Officer, Puerto Rico Area Office

For the University of Puerto Rico

Jaime Benitez
Chancellor

Luis Stefani
Vice Chancellor and Supervising Representative of
the Puerto Rico Nuclear Center

PRNC/SPECIAL INFORMATION FOR STUDENTS

Admission

Inquiries concerning detailed course material or for information on admission to the programs of the Nuclear Center should be addressed to:

Office of the Director
Puerto Rico Nuclear Center
P. O. Box 1823 - U.P.R. Station
Rio Piedras, Puerto Rico

In requesting information, it would be helpful to include citizenship, particular program of interest, its starting date and duration, and any plans for requesting financial assistance. The necessary instructions and forms will be sent immediately.

Final applications should be received at least three months prior to the start of the course. However, later applications will be considered in the light of sections already scheduled. All applications are reviewed upon receipt by the Admissions Committee for each program.

Qualified applicants are admitted to the session of their choice, with applications being processed in order of their receipt. Applicants will be notified immediately upon their acceptance.

Degrees and Certificates

Graduates of the full Master of Science programs will receive the diploma of the University of Puerto Rico.

Students completing training courses of four weeks or longer will be awarded appropriate certificates.

Tuition and Fees

Tuition and fees vary from program to program. Tuition and fee information will be provided in response to requests for material on the various programs.

Fellowships

Many organizations provide fellowships which can be used in Nuclear Center programs, but the Center itself does not have fellowships.

For citizens of American countries other than the United States, the principal sponsors are (see PRNC-119 for additional details).

General Programs

International Cooperation Administration and U. S. Department of State.
Apply at the U. S. Embassy in the applicant's country.

Organization of American States, Fellowship Program, Pan American Union,
Room 305, Washington 6, D. C.

All Programs Except Clinical Medical Programs

International Atomic Energy Agency, Kaerntnerring 11, Vienna 1, Austria
Institute of International Education, through the IIE Selection Committee
in the applicant's country.

Medical and Health Programs

Pan American Sanitary Bureau and World Health Organization, through the
National Health Service of the applicant's country.

PRNC Form-119 provides additional data on requirements for support by these agencies.

For United States citizens, the principal sponsors are:

1. U. S. Atomic Energy Commission, for information write the Oak Ridge Institute of Nuclear Studies, Oak Ridge, Tennessee.
2. National Science Foundation, Washington 25, D. C.

PRMO/INFORMATION ON PUERTO RICO

The smallest of the Greater Antilles in the West Indies, Puerto Rico is a land of warm sunshine and trade winds, of luxuriant foliage, beautiful beaches, green mountains, and ancient fortifications and churches. Here, too, are modern factories and business houses and hotels. The island lies about 1,000 miles southeast of Miami and 1,600 miles southeast of New York. Because of the desirable climate, Puerto Rico has a thriving tourist industry.

It is an area of fast growth, rapid technological advances and expanding commerce. Spanish is the native language, but English is widely spoken in most sections.

Columbus discovered the island in 1493, and its settlement began in 1508 under Ponce de Leon. Puerto Rico was highly prized because of its strategic location, and for the first three centuries of the Spanish era, the island was the source of considerable international rivalry.

By the 19th Century, life on the island had become stabilized and relatively peaceful, and agriculture flourished.

With the Treaty of Paris in 1899, Puerto Rico passed from Spain to the United States. In 1917, Puerto Ricans became citizens of the United States and began to participate to a greater extent in their government.

The American era brought dramatic developments in industry and commerce, public education, and health and welfare activities. Then in the 1940's, Puerto Rico launched "Operation Bootstrap," an intensive program designed to speed the expansion of the island's industrial base. Since that time, Puerto Rico has become a model of economic and social development.

In 1952, the island was officially proclaimed an independent Commonwealth, associated with the United States. The Puerto Rican constitution is in complete

harmony with the U. S. constitution, providing for a republican form of government with executive, legislative and judicial branches.

After witnessing the perpetual spring, the floral splendor and the friendly people, some one once was moved to comment that Puerto Rico is as close to paradise as man will ever get on earth.

Is this an exaggeration?

Perhaps. But most Puerto Ricans will tell you it is only a slight one.