EXTRACTS FROM AUI BOARD AND EXECUTIVE COMMITTEE MINUTES 1946 - 1994

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AUI BOARD
October 10, 1947

The President reported orally on the action taken at the meeting of Deans and other representatives of medical schools held at the Laboratory during the two preceding days. He reported that he had put the whole matter of a medical program at Brookhaven National Laboratory up to the group assembled at the meeting.

The President reported that at the first evening meeting the Medical Group indicated that they considered it desirable to have medical research conducted at Brookhaven National Laboratory as well as medical care for the Staff and further indicated that hospital facilities with from ten to twenty research beds would be needed at the commencement of the research program. Remodeling of existing buildings was definitely recommended as thoroughly satisfactory and preferable to construction of any new hospital facilities, and it was indicated that only minimum clinical facilities would presently be required.

The next day, the President reported, the discussion took the following lines:

> It was recommended that there be formed an Advisory Committee for the Life Sciences including biology, human biology and medical science. The medical group on motion recommended that Trustees of this Corporation should not be members of such Committee ex officio, but should be chosen individually. The group upon motion recommended that this Committee be composed of seven members. By a third motion the group recommended the formation of an ad hoc Medical Advisory Board to study the need and purpose of hospital and clinical facilities to be established at the Laboratory and their relation to other medical research institutions in the region, the President stated that he thought it desirable that these recommendations be presented to the Board of Trustees at the Annual Meeting.

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AUI BOARD
January 22, 1949

Dr. Haworth reported to the Trustees the proposal by Dr. Rhodes *(sic)* of Memorial Hospital in New York to send between six and ten cancer thyroid patients to the Brookhaven Hospital. The necessary particular care of the individual patients would be supplied by members of the staff of Memorial Hospital., and general hospital care by the Brookhaven staff. He said that Dr. Van Slyke and Dr. Farr both considered this an excellent opportunity to start clinical investigation under the guidance of experienced physicians. It was the sense of the meeting that Dr. Rhodes' proposal should be accepted.

****** - indicates non-relevant text omitted.

EXECUTIVE COMMITTEE
February 18, 1949

Dr. Haworth reported that a formal proposal for care of cancer thyroid patients at the Laboratory Hospital had been received from Dr. C.P. Rhoads of Memorial Hospital, New York and that, in the opinion of Dr. Sinnott, Dr. Hastings, Dr. Van Slyke, Dr. Farr and all of the members of the ad hoc committee headed by Dr. Barr, the proposal should be accepted. He emphasized that the project proposed by Dr. Rhoads, a description of which had been sent to all the Trustees, would be directed by the Laboratory with the consultative assistance of the Memorial Hospital staff and that it would in no sense be a true joint project. Thereupon, on motion duly made, seconded and carried, it was unanimously

> RESOLVED: That the Director be and he hereby is authorized to accept the proposal made by the Memorial Hospital on substantially the terms outlined in the letter sent to the Trustees dated February 11, 1949.

AUI EXECUTIVE COMMITTEE
April 14, 1949

A meeting of the ad hoc Committee on Clinical Investigation was held on March 28, 1949 at the New York Hospital under the chairmanship of Dr. Barr. Mr. Shoup attended the meeting, together with Drs. Van Slyke, Farr and Madden. Pressure of other duties prevented the attendance of Dr. Haworth. It was learned that the Suffolk County Medical Society had appointed a Committee on Atomic medicine who would make recommendations for appointees to practice at the Brookhaven Hospital. Dr. Farr expressed the view that 14 of the 42 beds in the hospital would be required for medical care, which would leave 28 beds for clinical research and such other needs as might develop. He informed the Committee that under the arrangement with Memorial Hospital one thyroid cancer patient was already at Brookhaven and that four more were expected. The average stay was estimated to be three to four months. Under the plan worked out with Memorial Hospital, the Brookhaven staff will handle all ordinary care of the patients but during the first year of operation Dr. Trunnell of the Memorial Hospital will come to Brookhaven once a week to advise the Brookhaven staff. In the future it is planned to work out exchange arrangements with Memorial Hospital and other institutions as well.

AUI BOARD
July 15, 1949

In the life sciences the ad hoc Committee on Clinical Investigation headed by Dr. Barr had approved plans for undertaking clinical research on a modest scale. As a result, by arrangement with Memorial Hospital, thyroid cancer patients have been coming to the Laboratory hospital for treatment. There are usually between five and seven patients at a time, and a total of fifteen or twenty have been treated. The program, which is under the supervision of a leading physician from Memorial Hospital, is partly educational for our own staff, and in this connection nurses from the Laboratory hospital have been receiving training at Memorial. Dr. Haworth emphasized

that the existence of this working arrangement with Memorial Hospital did not mean that similar cooperation would not be developed with other institutions. The Advisory Committee for Biology and Medicine met at the Laboratory on July 13, 1949. This Committee has only one member who is engaged in clinical work and is made up for the most part of biologists. They expressed approval of the progress which is being made under the supervision of Dr. Farr, Dr. Hale and Dr. Madden and particularly praised the improved arrangements for medical care.

AUI BOARD
April 21, 1950

The Visiting Committee of the Department of Medicine met at Brookhaven on April 6 and 7, 1950. This meeting was devoted to presentation of programs, informal discussions, an executive session of the Committee and consideration of future plans. In general, the plans for research were favorably received, although the Committee emphasized the need for expanding personnel. Plans for the future also met with a favorable reception. These include shifting the location of the Department to a place where it will be nearer the other departments of the Laboratory. The permanent hospital should have 12 to 15 beds for medical care and a maximum of 60 beds for research. The Committee considered that particular attention should be devoted to research on the assimilation of active alpha substances. Dr. Haworth said the Department has definite need of another laboratory wing, for the construction of which no funds were specifically available.

AUI EXECUTIVE COMMITTEE
July 20, 1950

Research in the Medical Department is proceeding at an increased rate. The number of research patients is growing. Most of the work is devoted to thyroid cancer and nephrosis. The Department of Reactor Science and Engineering has developed a generator for short-lived iodine which is expected to be of importance in medical research. The program has gained support from the Commission's Division of Biology and Medicine. Plans for a new medical building are in progress, and the budget for the fiscal year 1952 contains provision for actual design. Construction is planned for the fiscal year 1953.

AUI BOARD
January 19, 1951

Dr. Farr then gave a brief description of the number of research activities in his Department among which are the effect of administration of isotopes on the kidney function, effect of radiation on membrane permeability in distribution of body water, which is of particular importance in nephrosis and cancer, the search for a compound which can be irradiated and introduced into a brain tumor, the effects of radiation on general metabolism, the control of hyperthyroid conditions through radioiodine, studies of the effect of radioiodine on thyroid cancer, the effects of radiation on immune mechanisms, on bacterial metabolism, intestinal parasites and, through mechanical injury, on body protein stores.

In response to questions, Dr. Farr said that no evidence of a cure for thyroid cancer had been obtained, but by increasing doses of radioactive iodine without apparent harm to the blood system or other organs some increase in life expectancy and a substantial increase in comfort have apparently been obtained, and there seemed to be some possibility of achieving a static condition. The patients are also better able to lead normal lives than has heretofore been the case.

AUI BOARD
April 20, 1951

Dr. Farr then described the three cases in which brain tumors have been treated with a neutron beam from the nuclear reactor. He described the method of treatment in some detail and the effects on each of the three patients. Although the beneficial results observed in two of the cases have not continued, Dr. Farr considers that the study is one worth pursuing. However it has presented, he said, instrumentation problems of a serious character which will have to be solved before anymore patients can be treated. None of the patients suffered serious radiation effects.

AUI EXECUTIVE COMMITTEE
Feb, 15, 1952

For the first time, the Medical Department has been able to administer two treatments at the reactor to the same patient suffering from a brain tumor. Recent evidence has indicated that this procedure is safe and may be beneficial.

AUI BOARD
April 18, 1952

Dr. Lee E. Farr, Chairman of the Medical Department, then described the ways in which the reactor was used by his department. Between a half and three-quarters of the staff are concerned with experiments in the reactor. By way of illustration, he described the treatment of brain tumors and expressed the view that the treatment was on the right track in this work.

AUI BOARD
April 16, 1954

At Dr. Haworth's request Dr. Lee E. Farr, Chairman of the Medical Department, then gave the Trustees a detailed account of the research programs now under way and the staff of the department. He emphasized the progress made during the last three years and the gratifyingly rapid growth in the volume of research. In describing the work of the department he said the problem is now one of selection. The entire program of the department is much more clearly defined than it was two years ago on the last occasion when a report was made to the Trustees. The lines of research which are really profitable for Brookhaven to follow are rapidly emerging. In general terms, the bulk of the research is on the effect of neutrons on biological substances and in the use of short-lived radioisotopes for medical problems. In the latter area Brookhaven performs a valuable function in training members of the medical profession who are on the staff for relatively short times.

Dr. Farr described in some detail the work done on brain tumor patients through neutron irradiation at the reactor. A great deal has been learned about distribution of the boron in the patient's body, and mechanical improvements now make it possible to carry on these treatments without shutting down the reactor. Interesting work is also being done in treating cancer of the pancreas with manganese 56 and thyroid cancer with radioactive iodine.

AUI BOARD
October 21, 1955

The (Medical Visiting) Committee also commented on legal problems connected with the administration of radio isotopes and the license requirements of the State of New York. Mr. Dunbar explained to the Board that the procedures of the Department had been considered in detail by Mr. Baker, of the firm of Milbank, Tweed, Hope & Hadley, and himself, and the conclusion reached that all possible steps were being taken to minimize the likelihood of an accident of any sort. Some improvement appears to be possible in recording systematically all decisions made, and Dr. Farr has instituted procedures to achieve this result. Tho question of the applicability of New York statutes dealing with licenses to the Medical Department at Brookhaven is under consideration by the Board of Regents. Mr. Dunbar also described the Admissions Form used by the Hospital.

AUI EXECUTIVE COMMITTEE
March 20, 1959

The reactor at the Medical Center became critical Medical on March 15, 1959. However, patient treatment will be difficult, if not impossible, until certain deficiencies which result in lack of isolation between the reactor and the operating suite have been corrected.

AUI EXECUTIVE COMMITTEE
June 5, 1959

The medical reactor has been used for the treatment of four patients.

AUI EXECUTIVE COMMITTEE
July 16, 1959

The Medical Reactor is now in full operation and has been used for patient treatment. Dr. Tape reported that the AEC provided additional funds to be used to correct the air locks, and work will commence at the earliest possible date.

AUI BOARD
October 27, 1961

Dr. Goldhaber then took up the report of the Visiting Committee for the Medical Department and called particular attention to the Committee's comment on the possibility of treatment by neutron capture of malignant tumors other than those of the central nervous system.

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The question whether there should be greater emphasis on treatment of animals in the neutron capture work before using this technique on patients was discussed. Dr. Sweet and Dr. Rhoads both strongly endorsed the present practice of treating patients, particularly in the case of brain tumors, which have a peculiarly devastating effect on the patient.

AUI BOARD
October 19, 1962

Dr. Tape informed the Trustees that the neutron capture therapy program had been under examination, not only by the Brookhaven staff, but also by the AEC. Patient treatment is being suspended pending further investigation of treatment effects. In response to questions, Dr. Tape said that this suspension would not reduce the use of the medical reactor, since much of the investigative work now in progress will involve irradiation of animals and inanimate substances.

AUI BOARD
October 18, 1963

Dr. Goldhaber commented on some of the points emphasized in the lengthy report submitted by the Visiting Committee for the Medical Department, of which Dr. A. Baird Hastings is the Chairman. The report emphasized the responsibility of the Department to advance medical knowledge in general, and especially to utilize the techniques and facilities of the entire Laboratory to advance knowledge on the effects of ionizing radiation. In the opinion of the committee, Brookhaven and the Medical Department gain greatly from the fact that Brookhaven is not a service institution, but is engaged in pioneering research.

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The Medical Reactor continues to be a useful facility, and studies are being carried on with a view to providing an epithermal beam. Work with the reactor is now at least one step away from direct application to patients, and emphasis is being laid on studying the effects of radiation on tumorous tissue in animals.

AUI BOARD
July 20, 1967

Dr. Goldhaber then gave a brief description of the scientific presentation which had been arranged. Dr. George C. Cotzias, of the Medical Department, has been asked to discuss the work which he and his colleagues have been doing on Parkinsonism.

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Dr. Cotzias gave a brief account of the research which has been going forward into the physiological effects and origins of Parkinsonism. He described the use of radioactive tracers in the investigation of the effects of some metals, such as manganese, on individuals. His work has led to the finding of a chemical compound (Dihydroxyphenylalanine), referred to as Dopa, which has been used to good effect on patients on a trial basis. Results have been decidedly favorable, in a little over half of the cases treated. Dr. Cotzias then presented four patients to the Board on whom the compound has had a beneficial effect. He preceded the introduction of each patient by a short motion picture film showing the condition of the patient upon arrival at the Medical Center for treatment.

AUI BOARD
April 20, 1972

Following the Executive Session three scientific presentations were made.

Dr. Alfred P. Wolf
Chemistry Department
Brookhaven National Laboratory

A group under the direction of A. P. Wolf in the Chemistry Department at BNL is devoting an increasing part of its activities to the preparation of radiopharmaceuticals labeled with isotopes of short half life. This is primarily from a research point of view with clinical evaluation and application being an integral part of the program.

Radiopharmaceuticals are radioactive drugs that can be given orally or by injection; they are used for organ imaging, for diagnosing metabolic malfunction, and for diagnosing a number of other physical disorders. The short-lived isotopes are particularly useful because of their useful decay characteristics and because in general they result in a reduced dose to the patient. The group in Chemistry has concentrated on the isotopes carbon-11, fluorine-18, and iodine-123. Carbon-11 has been incorporated in organic compounds such as dopamine-^{11}C which shows promise as a tumor localization agent. Glucose-^{11}C has been prepared via a biosynthetic route utilizing an "on-line" system involving carbon dioxide-^{11}C and freshly harvested swiss chard leaves. It has been possible to prepare the glucose-^{11}C in forty minutes and use it in the study of diabetes in obese patients. Thymidine-^{11}C also produced by a biosynthetic method has been used in studying DNA synthesis in mice and shows promise in diagnostic procedures. Fluorine-18 has been used in p-fluorophenylalanine-^{18}F and 6-fluorotryptophan-^{18}F. These show superior properties as pancreas scanning agents and will probably replace the commercially available selenomethionine-^{75}Se currently in use for this purpose. Iodine-123 which is produced in very high purity containing no iodine-124 and less than 0.2% iodine-125 by a unique process developed by the BNL chemists has been extensively tested in humans as sodium iodide-^{123}I for iodine uptake in the thyroid and imaging of the thyroid. It has shown itself to be superior to both ^{131}I and ^{99m}Tc and will probably replace these two nuclides should the iodine-123 become commercially available.

The Chemistry group is continuing to investigate a broad spectrum of methods for producing isotopes and preparing new radiopharmaceuticals. Currently about thirty such radiopharmaceuticals have been made. There is enthusiastic interest in this new and challenging field which provides a good example of the direct application of fundamental research carried out at BNL to medical problems of the society at large. Intense effort in this area in the U.S., Britain, France, and Germany is in its infancy and can be expected to grow rapidly in the next ten to twenty years.

Dr. Harold L. Atkins
Medical Department
Brookhaven National Laboratory

The interdisciplinary approach to nuclear medicine at BNL was illustrated by three examples. With the Chemistry Department, the use of ^{123}I has been studied in comparison with ^{99m}Tc for thyroid imaging. The higher target/nontarget ratio in distribution of radioactivity with ^{123}I results in superior images. The development, in collaboration with the Department of Applied Science, of a ^{99m}Tc label for red blood cells has made possible the imaging of blood vessels with good resolution for detection of abnormalities due to arteriosclerosis. Lastly, a method was outlined for the imaging of the thyroid by differential transmission of monoenergetic photon beams. Contrast is due to iodine naturally in the thyroid.

AUI EXECUTIVE COMMITTEE
January 14, 1976

Dr. Tape called the attention of the Trustees to a proposed Statement of Ethical Principles, copies of which had been furnished to the Trustees in advance of the meeting, and asked Mr. Rathvon to explain the purpose of the proposed principles. Mr. Rathvon explained that all organizations receiving grants from the Department of Health, Education, and Welfare for research on human subjects must submit to the Department an assurance that the supported work will be carried out in accordance with the requirements of the Department. The form of the assurance is specified in DHEW Regulations which require, among other things, a statement by the institution of the ethical principles that will govern its research work with human subjects. Mr. Rathvon stated that the principles submitted to the Trustees had been prepared by him to meet the DHEW standards, and had been reviewed by Dr. Cronkite, Dr. Bond, and Dr. Vineyard, among others.

The proposed principles were discussed by the Trustees. It was suggested by one of the Trustees that it would be well if official corporate documents avoided the use of masculine pronouns to refer to persons of both sexes. The necessary editorial changes were made in the proposed Statement of Ethical Principles and, thereupon, on motion duly made and seconded, all Trustees present voting, it was unanimously

VOTED: That the "Statement of Ethical Principles," with the corrections noted at this meeting, be and the same hereby is approved.

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STATEMENT OF ETHICAL PRINCIPLES
COVERING THE USE OF
HUMAN SUBJECTS IN RESEARCH

Associated Universities, Inc. accepts as basic principles that: (a) the rights and welfare of all human subjects involved in research, training, demonstration, development and other activities shall be adequately protected; (b) any risks to an individual must be outweighed by the potential benefit to the individual or by the importance of the knowledge to be gained; (c) no human being is to be exposed to unreasonable risk to health or well-being; and (d) adequate and appropriate informed consent is to be obtained without duress, deception, or improper inducement in those cases where human beings will be or are likely to be "at risk." AUI also accepts the principle that medical care of patients will be provided when a requirement for care of the subject develops from the research or other related activity.

To this end:

1. all persons involved in initiating, approving, conducting, or supervising activities involving human subjects must be aware of their joint responsibility for the welfare of the individuals who serve as subjects;

2. whenever possible and relevant, any possible hazard to health resulting from procedures utilizing human subjects must be or must have been first investigated at Brookhaven National Laboratory or elsewhere through animal research;

3. the nature of the activity, the procedures to be followed, and the possible risks involved must be carefully and fully explained to the subject, parent, or guardian, as appropriate. The explanation must have been fully understood and informed consent properly obtained;

4. the subject's personal privacy and the confidentiality of information received from the subject must be protected;

5. any subject may request termination of participation in an experiment at any time, and this request will be honored promptly and without prejudice; and

6. remuneration may be offered to subjects as recompense for their time and cooperation

AUI BOARD
October 18, 1978

During the recess the following scientific presentations were made:

Robert T. Drew	-	"Inhalation Toxicology"
Stanton H. Cohn	-	"Medical Applications of Nuclear Isotopes"
Harold L. Atkins	-	"Brain Glucose Metabolism Studies "In Vivo"

Following the scientific presentations there was a tour of the Medical Facility.

AUI EXECUTIVE COMMITTEE
March 18, 1979

In nuclear medicine and its applications, new techniques have been developed that will be important for the pulmonary toxicology program. Fluorodeoxy-glucose allows in vivo studies of brain metabolism, and the Laboratory is seeking major funding for a study to be conducted in collaboration with NYU and SUNY. Some of the medical applications of highly-specialized nuclear technology unique to BNL include in vivo activation analysis, and the measuring of cadmium and iron in the kidney, heart, or liver. The role of cadmium in hypertension is a study that has been funded by DOE. Funds from sources other than DOE have supported studies in osteoporosis, metabolism, nutrition, diet, and aging.

AUI BOARD
October 21, 1982

The Chairman introduced Dr. Ronald Crystal and asked him to comment on the Report of the Medical Department Visiting Committee.

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Dr. Crystal stated that all appeared to be going very well in the nuclear related areas. The work of Dr. Brill and his colleagues in nuclear medicine is quite interesting, as is that being done by Dr. Cohn in the medical physics program. The radiopharmaceutical program is a very important resource. The neutron capture therapy program seems to be well conceived and uniquely utilizes the facilities and staff of the Department.

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Dr. Bond termed the Report quite helpful. He agreed that an advisory group for nuclear medicine was desirable and noted that the suggestion is being implemented. Neutron capture therapy work is proceeding well.

AUI BOARD
January 15, 1987

A joint project with SUNY to develop a Radiation Therapy Facility at BNL is being prepared and it has a good chance for success. A new PETT scanner has been ordered for Dr. Wolf's facility. An offer is being proposed to add a research psychiatrist to work in the program.

AUI BOARD
April 21, 1988

Dr. Chanana reported on new initiatives in the Medical Department.

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A joint BNL/Stony Brook radiation therapy effort has been proposed. BNL has no medical experts in this area, whereas SUNY does, so the joint effort makes sense. BNL has the facilities and would be involved in training. The project needs New York State approval. A 6 MeV linac, which might be extended to 16 MeV, would be located in a BNL-supplied building.

Dr. Samios has appointed a committee with membership drawn from the Director's Office, AGS, DNE, and the Medical Department to look at biomedical applications of charged particle beams. Items being looked at include linac utilization on a year-round basis and biomedical applications of heavy ions and protons. A report will be available in the near future. A preliminary conclusion is that there appears to be real potential. The AGS Booster can be useful in supplying heavier ions for medical therapy. These efforts could lead to a major center for radiation therapy at BNL.

There is also a suggestion that the Medical Department become involved in a pilot study with the BNL Chemistry Department on the effects of cocaine use on the brain. This is a very sensitive topic and BNL is not the motivating force on this research. The population would have to be carefully selected and would involve the County of Suffolk, interacting with BNL via the Department of Psychiatry at SUNY, Stony Brook.

The Medical Department is also continuing its efforts in neutron capture therapy. Two year's ago it was realized that this effort needed more basic research. Funding was obtained, and some basic and preclinical studies are being started. The program is now expanding.

Dr. Chanana then reported on an incident involving a radioactive iodine compound prepared at BNL for use by North Shore Hospital in a research project. The radioactive iodine is prepared by the BNL Medical Department. On March 3 a shipment containing the wrong dose was delivered to North Shore Hospital. The excess radiation did not show up in the standard test.

North Shore compounded this mistake in failing to block the uptake mechanism in the patient's thyroid with a nonradioactive dose. As a consequence, the patient received about 120 rads to her thyroid. DOE has set up a committee to review the incident. In the meantime, BNL has stopped preparing the iodine doses and a Laboratory committee has been appointed to review all procedures.

AUI BOARD
June 21, 1989

The Chairman next introduced Dr. John McAfee, a member of the Medical Department Visiting Committee, and asked him to present the Committee's Report on behalf of the Committee Chair, Dr. John Little.

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Medical applications of nuclear technology under Dr. Weber has been focused. Dr. Som is doing excellent work with whole-body autoradiography of animals. Dr. Volkow's work on the effects of cocaine on the central nervous system has been very successful. This group has also excelled in instrument development with a fiber optics network, a novel high resolution SPECT imager for small animals, and methods for minimizing Compton back scatter in SPECT images.

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The collaboration with the NSLS is progressing well. Two important projects on the x-ray ring are head-and-neck-computed tomography and angiography. These projects are imaginative and take advantage of the unique features available at the NSLS.

The research in boron neutron capture radiotherapy raises some serious doubts about its usefulness. There is a resurgence of interest in this type of therapy, which may be political. There is more experience and expertise in this area at BNL than elsewhere. There is a need to assure that adequate attention has been paid to the effects of radiation from the beamline, recoil, back scatter, etc.

AUI BOARD
June 19, 1991

The Chairman then introduced Dr. Esther Hays and Dr. John Laughlin, Chairman and Chairman-designate of the Medical Department Visiting Committee, and asked Dr. Hays to begin the presentation of this Committee's Report.

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Another important resource is the radiation therapy unit which will soon become operational. This facility is a joint venture with the Radiation Therapy Department at SUNY Stony Brook. The Visiting Committee applauds the cooperative effort and the increasing development of the relationship between Stony Brook and BNL.

The clinical SPECT and PET programs were given high praise by the Visiting Committee. These programs are fine examples of BNL medical research at its best. The study of the drug cocaine and its effect on the brain as well as the study of the effects of alcohol on the brain and other parts of the body are interesting and relevant. The collaborative effort with the Department of Psychiatry at Stony Brook in the cocaine studies was noted. The Committee praised the MECT program as a wonderful example of taking in-house expertise and creating a new approach to computerized tomography using the synchrotron light source. However, the Committee cautioned the researchers not to approach this as improved computerized tomography because of its unavailability as a diagnostic tool to outside practitioners, but rather to focus on its development as a new research tool. Dr. Hays stated that she was glad to read about proposals for increased operation of the isotope production facility at the linac and of the restarting of the High Flux Beam Reactor as reported in the Laboratory response to the Committee Report.

Dr. Hays then turned to a discussion of the Boron Neutron Capture Therapy program that has been ongoing at BNL for many years. She noted that the idea of targeting radiation therapy specifically to tumor cells is a very exciting concept. However, it is an extremely complex process. The Committee sees an almost tenacious adherence to the continuation of these studies. Dr. Hays stated that the Visiting Committee is composed of people who are interested in radiation therapy and who are interested in imaging and radiation biology and they see the intriguing interest in developing this kind of program. However, they question whether BNL has given consideration to whether or not this is something it really wants to continue, whether it is something the researchers really see an end to, or whether it is something that there is just one turn after another with no final solution. There may not be an answer to these questions, but the Committee believes there should at least be a thorough consideration of whether or not it is appropriate to continue.

Dr. Laughlin noted that he believed Dr. Hays had covered all the points raised by the Committee and noted that in his view the strength of Brookhaven is its unique facilities and innovative staff and commented specifically with regard to the in vivo Neutron Activation and Analysis Facility, to the MECT program utilizing the National Synchrotron Light Source, and to

the innovative isotopes developed by the Radionuclide and Radiopharmaceutical group. With respect to radiation therapy, Dr. Laughlin commented that if BNL is to stay in this field, he believes it is necessary to continue to do more of what was already begun with the establishment of the link with the group at Stony Brook.

In discussing the Boron Neutron Capture Therapy program, Dr. Laughlin stated that he believed the overall consensus of the field of radiation therapists is that this area does not hold much promise. However, on a positive note, he stated that BNL and others have begun to investigate the importance of the micro localization of the boron to investigate where the compound actually goes on a cellular basis.

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Dr. Laughlin also stated that despite the hope that exists with regard to the specific application, the caution that Dr. Hays emphasized is something that should be kept in mind. He also stated that although this particular approach may not make a contribution to radiation therapy of brain tumors, it is possible that the technology developed during this exploration may result in a real contribution in answer to melanomas.

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With regard to the BNCT, Dr. Setlow commented that the initial push to begin this research at BNL came from Dr. Goldhaber. He stated that the Brookhaven group is more conservative than others and expressed the opinion that if anyone is to do this research and do it properly, it would be the Brookhaven researchers.

Dr. Joel stated that he was pleased with the positive comments on the progress of the Medical Department expressed by the Visiting Committee.

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Dr. Joel stated that the radiation therapy facility is about to open and said that it is hoped that a residency program for the training of students and fellows in radiation oncology will be approved. BNL will play a major part in the teaching of radiation biology in this program.

The in vivo neutron activation and analysis program should be looking at its first patients in July with a study in osteoporosis. Dr. Joel expressed the hope that the researchers associated with the PET and SPECT programs, the radiation therapy program, and the in vivo neutron activation program would combine forces to study the question of malnutrition in cancer patients.

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Regarding the neutron capture therapy program, Dr. Joel stated

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that he does not share the pessimistic view about the possible success of this program. He believes that there is now evidence to indicate that it will be successful and will be a competitive form of therapy.

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He detailed the steps that will be taken to assure patient safety as the program approaches clinical trials and explained the mechanisms of and rationale for continued pursuit of this procedure.

EXECUTIVE SESSION

One Trustee expressed some discomfort with regard to what he believed were indirect answers to questions raised during the discussion of the Medical Visiting Committee Report, particularly with respect to the Boron Neutron Capture Therapy program. He felt that what was written with regard to this program seemed rather different than the discussions held earlier and questioned the validity of management decisions to so quickly commence recruitment of a new head for a marginal program upon the untimely death of the group's leader rather than using that unfortunate loss as an opportunity to take time to assess whether or not in fact the program should be continued.

AUI BOARD
October 20, 1993

Dr. John Laughlin, Chairman of the Medical Department Visiting Committee was introduced to the Trustees, after which he presented a summary of his Committee's Report.

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Many programs and potential programs in the Medical Department relate to radiation treatments of various kinds, e.g., the Boron Neutron Capture Therapy (BNCT) program, the possibility of using protons, and the possibility of using heavy ions. Dr. Laughlin described the state-of-the-art process of radiation treatment and commented that it is the enhancement of the primary dose along with the possibility of increased local control that is so extremely important. Emphasis on treatment planning and the initial concentration of dose to as high as one can go without damage to the patient's tissue is all-important.

Dr. Laughlin stated he wished to underscore this point because throughout the Visiting Committee Report there are references to the needs for on-site simulation, on-site CT, and an on-site full-time research-oriented radiation oncologist. All of these are necessary if Brookhaven is to realize its potential with regard to BNCT as well as with regard to the possible use of protons and heavy ions. There is an opportunity for Brookhaven to become the leader in these fields.

With respect to the BNCT program, the Committee recognized excellent progress and concurs that within a few years it may be possible to initiate actual human therapy. Many concerns regarding this program expressed in previous years and discussed at length with the Trustees two years ago have been significantly put to rest. Dr. Laughlin reiterated his belief, which he expressed to the Board in 1991, that there was no other place in the United States other than BNL where neutron capture therapy should be done.

Dr. Samios advised the Trustees that he had set up a committee advisory to the Director to explore the possibility of doing proton therapy at Brookhaven. The committee's report was very positive and was endorsed by the Directorate. Dr. Samios stated that he is now forming a committee to investigate the "how-to" process.

FOURTH EXECUTIVE SESSION

The Trustees met in executive session with only the Trustees, officers, and Dr. Laughlin present.

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Dr. Laughlin noted BNL's long-standing investment in the BNCT program, a program that could have been suspended years ago. However, substantial progress has now been made and the Laboratory should continue with significant efforts to bring this treatment to fruition. Dr. Kuschner affirmed Dr. Laughlin's support of Brookhaven's continuing endeavors in this area.

AUI BOARD
January 19, 1994

Dr. Samios reported on the Laboratory's plans to seek authorization to construct a Proton Therapy Facility that would utilize protons from of the 200 MeV linac. A Laboratory committee appointed by the Director and chaired by Dr. Chanana has reported enthusiastically that the facility contemplated is indeed feasible. It would make use of the beam line constructed as part of the Laboratory's SDI work. Concepts put forth by the committee were briefly reviewed.

These include two rooms, one for horizontal scanning and one with a gantry for vertical scanning. Committees to investigate design and costs have been appointed. Once reports of these committees are in hand, the Laboratory will approach various Agencies, including N.I.H., for potential funding.

Dr. Samios commented that the possibilities for therapeutic treatments at the Laboratory are rapidly increasing. Boron neutron capture therapy is again being actively pursued, there is PET imaging and MRI, as well as the possibility of some therapeutic applications at the Light Source. Investors have expressed interest in assisting the Laboratory with funding and there are a number of legal and other concerns that must be assessed. Dr. Sakitt is chairing a committee looking at the myriad of issues.

One therapeutic facility is already operating on site. This facility is an electron linac built in collaboration with Stony Brook; BNL built the building and Stony Brook provided funding for the machine. The facility treats 25 to 30 patients a day; physicians from Stony Brook provide the medical expertise to run the program.

The importance of setting up strict protocols and consistent procedures was emphasized by one Trustee.

One Trustee inquired about the Laboratory's participation in early radiation research on human subjects, with or without their consent. These matters are being discussed in recent retrospective revelations by Secretary O'Leary. Dr. Samios replied that BNL has had inquiries from DOE and in response has examined records pertaining to all research using human subjects. It appears that appropriate consent was obtained of participants in these programs.

The two major programs involving patients were Dr. Cronkite's program of extracorporeal irradiation of blood in leukemia patients and an early program in neutron capture therapy conducted by Dr. Farr. Radioisotopes were used as tracers in other research, for instance, salt intake studies conducted by Dr. Dahl and development of L-Dopa for the treatment of Parkinson's disease by Dr. Cotzias.

Dr. Samios has asked Dr. Bryce Breitenstein, the physician who heads the Industrial Medicine Clinic, to chair a committee to go through all records of research on humans and to prepare a precise record on all such work.

JOINT MEETING OF ADMINISTRATIVE AFFAIRS AND EXECUTIVE COMMITTEES
March 10, 1994

Dr. Blume gave a brief report with respect to the conduct of research at Brookhaven in which humans were exposed to radiation. He reminded the Trustees that Secretary O'Leary had called for full disclosure of all research involving human exposure to radiation. BNL has established

a committee to review all such research; it is chaired by Dr. Bryce Breitenstein, Head of BNL's Occupational Medicine Clinic, and has a diverse membership, including representation from the Legal Office, Public Affairs, Technical Information, Safety & Environmental Protection, and Medical.

Over its entire history, there have been 13,000 participants in medical research programs at the Laboratory. Not all of these have been patients; many programs use volunteers. Since 1950 there have been 335 experimental protocols approved by internal review committees. The Laboratory has at all times been in compliance with then-applicable requirements. In addition, in a number of areas, BNL guidelines were in force prior to comparable Federally-mandated criteria for research on human subjects.

Dr. Blume noted the current DOE moratorium on destruction of records and discussed requirements for copying and reduction of records. There are almost 1,000 linear feet of records associated with human research at BNL. The initial estimate of the cost of reviewing, copying, and reduction of records was several million dollars. This figure will not be sufficient to cover costs if instructions for additional copying must be met.

There has been much publicity nationwide with respect to the Secretary's call for openness and DOE has established a hotline for inquiries. BNL itself has thus far received only two calls by former subjects requesting information. A recent article in Newsday, written after the writer had spent a week at the Laboratory, favorably reported on the manner in which BNL has conducted its human subject research.

AUI EXECUTIVE COMMITTEE
July 28, 1994

Dr. Samios next reviewed for the Trustees recent developments with respect to the Boron Neutron Capture Therapy (BNCT) Program at BNL. He cited the article on BNCT in the July 22 issue of Science and reported in considerable detail on the progress being made in the program and the Laboratory's plans with regard to initiating human subject trials. The BNL researchers believe they will be able to treat patients in approximately 12 months.

He then informed the Trustees that a very well-connected and wealthy cancer patient on Long Island has been exerting political pressure for a "compassionate treatment." This individual has terminal brain cancer and a life expectancy of less than six months. The Laboratory has been put in the position of having to defend its unwillingness to initiate a human trial before it believes it is ready to do so. While the program shows great promise for treatment of glioblastoma, instrumentation and procedures have not been sufficiently developed nor is there an approved research protocol.

Numerous meetings have been held to determine how to deal with the current situation. Trustee William Sweet serves on the committee considering the request for compassionate treatment. Dr. Martha Krebs, Head of the DOE Office of Energy Research, visited the Laboratory on July 7 to review the matter.

Dr. Samios stated that he wanted the Trustees to be aware of the pressure being exerted on the Laboratory and also to understand the Laboratory's hesitancy to go forward prematurely for fear of a negative impact on the long-term future of the BNCT program.

GLOSSARY

AGS - Alternating Gradient Synchrotron
Atkins - Physician, BNL Medical Department
AUI - Associated Universities, Inc.
Barr - Physician, New York University Medical School
Blume - Deputy Director, BNL
BNCT - Boron Neutron Capture Therapy
BNL - Brookhaven National Laboratory
Bond - Associate Director, BNL Life Sciences
Brill - Physician, BNL Medical Department
Chanana - Chairman, BNL Medical Department
Cohn - Physician, BNL Medical Department
Cotzias - Physician, BNL Medical Department
Cronkite - Chairman, BNL Medical Department
DNE - Department of Nuclear Energy, BNL
Dunbar - AUI General Counsel, Secretary
Farr - Chairman, BNL Medical Department
Goldhaber - Director, BNL
Hale - Physician, BNL Medical Department
Hastings - Physician, Harvard Medical School,
Chairman, BNL Medical Department Visiting Committee
Haworth - Director, BNL
Joel - Chairman, BNL Medical Department
Kuschner - Trustee, AUI, Physician, Stonybrook Medical School
Madden - Physician, BNL Medical Department
MECT - Multiple Energy Computed Tomography
NSLS - National Synchrotron Light Source
NYU - New York University
PETT, PET - Positron Emission Tomography
Rathvon - AUI, General Counsel, Secretary
Rhoads - Physician, New York Memorial Hospital
Sakitt - Assistant Director, BNL Policy and Planning
Samios - Director, BNL
Setlow - Associate Director, BNL Life Sciences
Shoup - AUI Vice President
SPECT - Single Photon Emission Computed Tomography
SUNY - State University of New York
Sweet - Trustee, AUI, Physician, Harvard Medical School
Tape - Deputy Director, BNL, Vice President, President, AUI
Vinyard - Director, BNL
Van Slyke - Assistant Director, BNL Life Sciences
Wolf - Chemist, BNL Chemistry Department