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NEW PROGRESS AT CANCER THERAPY FACILITY







...CTF staff during tests: Left, M. Awschalom, A. Jones. Center, Lionel Cohen. Right, D. Young...

Several developments in the plans for the Fermilab Cancer Therapy Facility (CTF) have strengthened the hopes for beginning clinical trials with human subjects as early as May. This optimism comes from the success of a drive to raise private funds for the construction of the CTF and from the results of the recent physical and biological studies carried out in the facility.

<u>Dr. Robert Wilson</u>, Director of Fermilab, announced in January that through the efforts of the medical profession in the Chicago area, led by <u>Samuel Taylor III</u>, Director of the Illinois Cancer Council, private benefactors have contributed \$175,000 to the Fermilab Cancer Therapy Facility.

The funds from these donations will be used to modify the linear accelerator gallery to create a medical facility, to improve the neutron shielding, and to buy equipment, blazing a new trail for cancer cure.

Among the first donors to the Fermilab CTF are: The Field Foundation, which contributed \$50,000; the Joyce Foundation, donor of \$50,000; the A.B. Dick Company, \$5,000; the Chicago Community Trust (through the generosity of Harry L. and Elizabeth Marshall, Dr. Adolph Gehrmann, and the William Allen Pusey Fund), \$50,000; Elliott Donnelley, \$10,000, and the Chauncy and Marion McCormick Charitable Fund, \$10,000.

The measurements of the neutron beam properties between last October and January of this year took the CTF to the end of its first phase of development. These measurements allowed the preliminary characterization of the neutron beam physically and radiobiologically. They also furnished important data to design the neutron shielding and the facility controls. The physical studies included simulation of the distribution of dose by neutron beams in tissue-like materials as well as the possibilities of forming well-defined beams.

While these physical measurements were in progress, six groups of radiobiologists were busy performing a series of biological experiments. The experiments were varied, but in all cases measured how some biological function is affected by either different neutron doses or the same doses given at different dose rates.



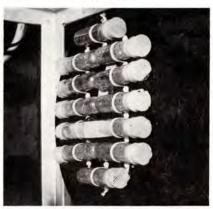
...Allan Jones setting up equipment for lymphocyte experiment...



...Dr. Levan preparing test tube with lymphocytes for radiation...



...Dr. Wayne Hanson coaxing test mouse into holder...



...Tissue equivalent disc holding 12 mice ready for irradiation...

Two of those groups measured the reduction in rate of growth of bean roots (vicia faba) when the roots were in well-aerated and oxygen-free water. Two groups measured the survival rate of Chinese hamster tissue cultures. Two other groups measured the effects of neutrons on mice marrow and intestines. Another group measured the difference in survival rate of normal human and leukemic human lymphocytes. These biological systems are relatively easy to use and are not expensive in materials. They provide a biological yardstick to compare the quality of the various neutron beams.

Although analysis of the tests is not complete, it appears that the properties of the neutrons in the new facility at Fermilab are somewhat similar to those in use elsewhere. Hence, the data from those institutions can be used as guidelines when starting the clinical research at Fermilab.

The biological experiments included some very interesting studies. For example, <u>Dr. L. Redpath</u> of the Michael Reese Medical Center exposed two strains of E. coli bacteria to Fermilab and University of Chicago neutrons,

as well as to fast electrons from the Michael Reese electron linac. From his measurements and those done elsewhere, it seems that one of the strains is indeed insensitive to the nature of the radiation, and its survival rate depends only on the total dose. Therefore, his work may have established a dosimeter based on biological rather than physical changes.

<u>Dr. J. Levan</u> of the Hines Veterans Administration Hospital exposed human normal and leukemic lymphocytes (One type of white blood cell) to the Fermilab neutron beam and to

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REVIEW BOARD HOLDS

FIRST MEETING HERE

The first meeting of the Fermilab Institutional Review Board (IRB) will be held at the Laboratory on Friday, February 20. The IRB is legally charged with reviewing experiments involving human subjects. Members of the IRB review the proposed experiments and consider the safety and potential benefit to the participants. Board members bring a variety of expertise to these deliberations. None of the members may have a direct involvement in the proposed experiments. Two radiotherapists, one oncologist, one medical physicist, one professor of theology, one lawyer, and one social worker comprise the Fermilab board membership. Dr. William Powers, who will deliver the third bicentennial lecture at Fermilab on the same day, is a member of the Fermilab IRB.

CANCER THERAPY FACILITY (Continued)

x-rays, the more conventional radiation used in radiotherapy. His work, too, produced interesting results.

By February 1 enough information had been gathered about these physical and biological characteristics of the Fermilab neutron beam that it could be shut down to rebuild the neutron shield and to create a medical facility. The present plans call for the completion of this remodeling by April, 1976.

The Fermilab CTF has evolved from research in recent years showing that some types of cancerous tumors which cannot be cured with x-ray or gamma ray radiation -- 10-15% of all cancers -- might be controlled with fast neutron radiation. The Hammersmith Hospital in London and the M.D. Anderson Hospital and Tumor Institute in Houston, as well as the Naval Research Laboratory, are among the centers where clinical trials with neutrons are being conducted. Production of a neutron beam with clinical value compatible with the high energy physics program at Fermilab is possible because the linear accelerator is on "standby" conditions for most of each main ring operating cycle. The protons available during those periods can therefore be extracted from the linear accelerator and put to other uses. To create the CTF, one tank of the linear accelerator was moved seven inches, a hole was cut in the wall of the linac enclosure and an extraction and transport beam line for 66 MeV into the adjoining gallery were built. The proton beam strikes a target, creating neutrons which can then be directed to the cancerous tumor.

The first beam was achieved in the CTF in July, 1975. Since then, with enthusiastic support from the staff of the Accelerator Division at Fermilab and with the valuable guidance from physicians and radiotherapists outside the Laboratory, the CTF has been moving toward being the first facility of its kind in the Chicago metropolitan area. Staff members assigned to the CTF are Miguel Awschalom, Donald Young, and Allan Jones. Lionel Cohen, head of the Department of Radiology at Michael Reese Hospital, heads the Cancer Therapy Facility at Fermilab on a part-time basis.



...Linear accelerator provides beam in CTF...



...CTF test facility in linac gallery...

BICENTENNIAL LECTURE SERIES

THIRD LECTURE

Fermilab's entry into medical research with high energy particles will be high-lighted this week by the visit of <u>William E. Powers</u> who will deliver the third in the Fermilab Bicentennial Lecture Series. Well-known in the profession for his concern with new technologies for treating cancer in both adults and children, Dr. Powers will speak about "The Physical and Biological Basis of Cancer Therapy."

The lecture will be given at 8:30 p.m. on Friday, February 20, in the Auditorium. There is no charge for the lecture, but tickets are necessary, available from the Guest Office, CL-1W.

Dr. Powers comes to Fermilab from St. Louis where he is professor of radiology in the Medical School of Washington University. He is also a member of many committees and organizations devoted to cancer problems, such as the National Cancer Advisory Board.

PERSONNEL NEWS AND NOTES

JOB OPENINGS AT FERMILAB

The continued success of Fermilab depends on the proper use of the skills and aptitudes of its employees. Employees are urged to check bulletin boards within the Laboratory for a current list of job openings, prepared about once a week depending on the employment activity. More than 125 copies of the openings are distributed throughout the Laboratory and all recipients are requested to post the listing.

An employee who has a definite interest in a specific job opening should contact the Employment Office, CL-6E, and express interest and qualifications. If the employee's qualifications and employment history meet the requirements of the opening, the employee will be considered with other applicants for the job, and a transfer may be arranged. Employees will be notified of the outcome of their interview.

Further information about internal job openings may be obtained by calling Ext. 3324.

NALREC PLANS TWO TRIPS FOR EMPLOYEES

NALREC has scheduled two trips for Fermilab employees and their friends and relatives. Aruba, in the Dutch Antilles, is the destination for a week, departing from Chicago on May 8. The cost, which includes round trip air fare, accommodations at the Divi Divi Beach Hotel and many discount coupons for dinners, chips at the casinos and optional tours, is \$309 per person double occupancy.

In September, fly with NALREC to Munich. This trip is on an air-only basis for two weeks in Europe during Oktoberfest and departs from Chicago on September 14, returning on September 29. The bargain cost for this is \$305 per person. Information will be available on car rental discounts, etc.

Brochures will be distributed soon, and additional information can be obtained by contacting <u>Liz Foster</u>, Ext. 3396. Both trips are open to friends and relatives as well as all Fermilab-associated employees, and are being handled through Elkin Tours.

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YOUR HELP IS NEEDED

Contributions for the earthquake victims in Guatemala may be sent to <u>Jane Theis</u>, CL-1W, <u>Jesse Guerra</u>, CL-11, or <u>Gene Valdes</u>, CL-5W until Friday, February 20.

Clothing, food, blankets or money for medicines are needed.

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...NALREC HAPPY HOUR, Thursday, Feb. 19, 5-7 p.m. in the Village Barn - pizza, cash bar.

REMINDER ...

All parking spaces in the horseshoe in front of the Central Laboratory are now one hour only parking spaces.

CLASSIFIED ADS

FOR SALE - Ladies Bowling Shoes (new), Size 81/2N, \$12.00 Call Ruth Hutchinson, Ext. 3222.

FOR SALE - 3 bedroom home, fully carpeted, stove & refrig., L-shaped living room, attached garage., basement w/washer & dryer, 2 blk. from grade school. More. A. Hively, 879-2465.

FOR SALE - 8' Pool Table, not slate. Bench Press-Leg extension, adj. holders. Call Erene Garcia after 6:30, 293-0795.

FOR SALE - 1975 Kawasaki, 175 cc, off and on the road bike, 65 mpg. Erene, after 6:30, 293-0795.

FOR SALE - Camping lot, Woodhaven Lakes, beautifully wooded, ½ blk. from lake, quiet rd. in south phase one area. Will accept camp trailer in trade. H. D. Clover, Ext. 3685/554-1375.

WANTED - Slide trays for Argus Slide Projector, Argus Brand or equal. D. Cosgrove, Ext. 3977.

SUBLET - 1 bedroom furnished apt. in Batavia, \$175. Call A. Kotlewski, X3204 or 879-1918.