NORRIS COTTON CANCER CENTER HISTORY

THE EARLY YEARS

HISTORY OF THE NORRIS COTTON CANCER CENTER

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Introduction

> "The tears that it has wrung from weeping women's eyes would make an ocean; the blood that it has shed would redden every wave that rolls on every sea; the nameof this loathsome, deadly, and insatiate monster is 'cancer.' "
>
> --Senator Matthew M. Neeley (May 18, 1928)

The first official suggestion that the federal government might have an appropriate role to play in the effort to find a cure for cancer came from Matthew Neely, a Democratic Senator from West Virginia. As early as 1928, he introduced a bill in the Senate authorizing the National Academy of Science to investigate cancer and report on mechanisms by which the government could assist in coordinating cancer research and conquering the disease. The House of Representatives failed to act on this bill, however, and Neely lost his bid for reelection that fall.

No further attention was paid to the idea of federal support for cancer research until 1937, when the federal government established the National Cancer Institute as the first speciality division of the National Institute(s) of Health. This initial step created a mechanism through which the government could appropriate moneys for cancer research, but in terms of actual funding it would be another 34 years before cancer research became a high priority item within the NIH.

In 1970, the government's role in cancer research was once again debated on Capitol Hill. A number of Congressional representatives expressed concern that although expenditures in this area had increased 200-fold since 1937, cancer research facilities were still not receiving sufficient federal support to ensure that a cure would be found. Finally, momentum was beginning to build around this issue.

In the summer of 1970, a resolution was adopted by Congress which declared:

> "That it is the sense of the Congress that the conquest of cancer is a national crusade to be accomplished by 1976 as an appropriate commemoration of the two hundredth anniversary of the independence of our country; and
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> That the Congress appropriate the funds necessary for a massive program of cancer research and for the buildings and equipment with which to conduct the research and for whatever other purposes are necessary to the crusade so that the citizens of this land may be delivered from the greatest scourge in history."

A further spur to federal action came in late 1970, when a group called the National Panel of Consultants on the Conquest of Cancer presented a report entitled "National Program for the Conquest of

Cancer" to the Senate Committee on Labor and Public Welfare. The report emphasized the fearsome aspects of the disease and pointed out that although cardiovascular disease was the leading cause of death in the United States, cancer was the illness most dreaded by the American public:

> "No affliction that man is heir to is quite so heavily freighted with dread and mystery as cancer. One reason for this is that, to many, the word is synonymous with death--and with protracted suffering. For no part of the human body is immune to cancer. The malignancy eats into nerve and muscle, bone and organ, blood and lymph gland alike; and it acquires an extra measure of terror because its deadly origins are inexplicitly intertwined with the secret of life itself."

The panel noted that although cancer incidence was rising, the amount of money spent on research to cure the disease was grossly inadequate. It concluded that "a national program for the conquest of cancer is now essential if we are to exploit effectively the great opportunities which are presented as a result of recent advances in our knowledge."

The government's rising concern about cancer was embodied in President Richard M. Nixon's State of the Union address of January 22, 1971, in which the President shared his dream of finding a cure for cancer before 1976. "The time has come in America," he said, "when the same kind of concentrated effort that split the atom and took man to the moon should be turned toward conquering this dread disease. Let us make a total national commitment to achieve this goal."

Less than a year later, on December 23, 1971, President Nixon signed the National Cancer Act of 1971, in which the President and Congress announced their partnership in a "total commitment" to conquering cancer. From that point on, the funds made available to the NCI increased markedly--from $180 million in 1970 to $233 million in 1971, $378 million in 1972, and $815 million in 1977.

As funding increased, so did the pressure for results, but many members of Congress, educated by cancer specialists, came to understand that cancer is not one, but many, diseases, requiring many cures, and that, short of a miracle, progress would be gradual. Warren G. Magnuson, the Democratic Senator from Washington, repeatedly stated that discovering a cure would entail time, money, and total commitment. And he emphasized that while basic research would eventually provide the key to conquering the disease, the most immediate form of assistance needed by cancer patients was care.

It was during this period of increased federal recognition of the importance of cancer research, and increasingly liberal appropriations for this purpose, that the idea of establishing a federally-designated cancer center in Hanover, New Hampshire, was formulated and brought to fruition.

Mary Hitchcock Memorial Hospital

Hanover's historic role as a center of medical care for the surrounding area made it seem an ideal place in which to locate a facility dedicated to treating the cancer patients of the region and conducting cancer-related research. This aspect of the town's identity stretched back to 1797, when Dr. Nathan Smith convinced the trustees of Dartmouth College that their educational institution ought to include a

medical school. In response, the trustees constructed the first building in the entire country to be devoted solely to the training of physicians, thus creating the fourth medical school in the nation.

In time, it became evident that the medical school needed to be affiliated with a hospital so that the students could have a place to practice what they were taught. It was for this purpose, almost one hundred years later, that the Mary Hitchcock Memorial Hospital was built. The hospital was funded by Hiram Hitchcock, a hotel magnate, Dartmouth College trustee, and part-time resident of Hanover, who had been looking for a way to honor his late wife, who had died in 1887. The 36-bed hospital dedicated to her memory was completed in 1893.

Throughout its history, Mary Hitchcock Memorial Hospital has expanded to meet the needs of the region--not only serving as a teaching hospital for the medical school, in accordance with the founders' original intent, but also providing excellent care for the people of the community. In 1927, the hospital's five staff physicians, led by John P. Bowler, M.D., formed what was probably the nation's first multi-specialty group practice in a rural area--the Hitchcock Clinic.

The opening of the newly-built 120-bed Faulkner House on April 29, 1952, confirmed the fact that Mary Hitchcock Memorial Hospital was no longer simply a community hospital, but had become, over the years, a major regional referral center, serving all of rural northern New England. Increasingly, physicians from New Hampshire, Vermont, and even Maine consulted Hitchcock Clinic specialists on complex cases; and by 1969, it had become clear that the hospital's reach extended well beyond the immediate region. In that year, patients from 32 other states and 9 foreign countries as well as 209 New Hampshire and 155 Vermont communities were treated at Mary Hitchcock. Thus, from its earliest history, Mary Hitchcock Memorial Hospital--an institution unique for a rural area in terms of its size, specialty coverage, technological expertise, and connection with a medical school--was commited to a population that extended far beyond the Hanover town boundaries.

Dr. Frank Wesley Lane, Jr.

As Mary Hitchcock Memorial Hospital had expanded in the past to accommodate growing needs and new challenges, so it was to expand again in the early 1970's, in response to increasing concern over the high cancer mortality rate that plagued northern New England. By that time, cancer was the second highest cause of death in the United States. Over 300,000 Americans died of the disease each year, and the cancer death rate for northern New England was well above the national average.

These statistics greatly troubled Frank W. Lane, M.D., Director of Mary Hitchcock Memorial Hospital's Radiation Therapy Department. Dr. Lane, a graduate of Harvard College and Harvard Medical School, had joined the Hitchcock Clinic as a radiologist in1956. Over the next fifteen years he played an active role in the region's cancer-related organizations. In 1960, he became a member of the New Hampshire Cancer Commission and, in1964, was appointed its chairman. In 1967, he chaired the New Hampshire Medical Society's Committee on Cancer. He was also a member of the Board of Directors of the New Hampshire Division of the American Cancer Society and later a two-term president of that organization. In 1968, he

became a member of the Cancer Advisory Committee for the Tri-State Regional Medical Program.

It was Dr. Lane who, in the course of studying ways to increase his department's capacity to serve a growing patient population afflicted by cancer, first perceived and articulated the need for a regional cancer center in Hanover that could serve all of rural northern New England, and who played the leading role in the initial fundraising and planning effort to achieve this goal. Without his initiative and forceful perseverance, the Norris Cotton Cancer Center would not exist today.

Dr. Lane had first addressed the problem of the region's high cancer mortality rate by formulating several possible theories that could explain the New Hampshire and Vermont statistics without reference to quality of care. Perhaps, he thought, there might be a higher incidence of disease in the region to begin with. Or, it might be that the patients in the area were first diagnosed at a later stage in their disease than were patients elsewhere, thus rendering any treatment less effective.

To explore these possibilities, Dr. Lane looked to information about the nature of cancer and cancer patients in New Hampshire that he and his colleague, Edward Sternick, Ph.D., a radiation physicist at Mary Hitchcock Hospital, had been compiling since 1957, with the help of the computer capacity available through Dartmouth College. These data did not bear out his initial hypotheses. Instead, they showed that the incidence of cancer in the region (as opposed to the mortality rate) was close to the national average, and that the region's cancer patients were not seen initially at a later stage in their disease than were patients in other regions.

These findings led Dr. Lane to conclude that the high cancer death rates in New Hampshire and Vermont were probably attributable in some way to treatment. Although he could not pinpoint specific aspects of treatment that might be related to the regional mortality statistics, he became convinced that the death rate could be lowered by improving the region's diagnostic and therapeutic facilities. He knew that many patients from the immediate area were reluctant to travel to Boston for treatment--especially those undergoing radiation therapy, which required multiple hospital visits over extended periods. Instead, they continued to go to local community hospitals, where treatment facilities, in many cases, had not changed in twenty years.

In 1972, for example, only three out of New Hampshire's 33 hospitals had cancer programs that were found acceptable by the American College of Surgeons, with two others receiving provisional approval. This lack of accreditation did not prevent all the other hospitals from continuing to treat cancer patients--often following outdated protocols and utilizing equipment that had never been intended for the particular treatments involved.

A report entitled "Radiotherapy Facilities and Personnel", prepared by Drs. Osler L. Peterson and Benedict J. Duffy, Jr., of Tufts University, underscored Dr. Lane's concern. According to this report, the region's hospitals contained a more-than-adequate supply of orthovoltage radiotherapy apparatus. The authors concluded, however, that this was not sufficient. "Only supervoltage apparatus should be considered for measurement of radiotherapy potential, since, with the exception of skin cancer, the present practice of curative radiotherapy requires supervoltage equipment." In 1972, only two of the state's

hospitals, Mary Hitchcock and the Elliot Hospital in Manchester, had the "supervoltage" equipment the authors deemed essential.

In addition to more supervoltage radiation therapy units, Dr. Lane also saw a need for more advanced diagnostic radiology facilities and nuclear medicine technology. Increasingly, he came to believe that it would be best for local hospitals to limit their cancer-related services to diagnosis and refer patients to Mary Hitchcock and Elliot Hospitals for treatment. But even this ideal division of services would not solve the problem of finding trained personnel to perform diagnoses and administer treatment. Dr. Lane was frustrated not only by equipment shortages, but also by the scarcity within the state of Board-certified specialists in thoracic surgery, neurosurgery, plastic surgery, and otolaryngology, as well as medical oncologists, diagnostic radiologists, radiation therapists, and radiation physicists.

He decided that the only way to reduce the cancer death rate in this predominantly rural area would be to provide local care that was on a level with the care that could be found in Boston. Since Mary Hitchcock Memorial Hospital was already treating one-third of all the cancer patients in the area and had the capability of functioning as a modern cancer hospital, Dr. Lane felt that establishing a cancer center in Hanover would be the best way to solve the regional problem. He realized, however, that the hospital would need additional facilities in order to offer services equivalent to those in Boston. Mary Hitchcock could provide adequate cancer management, but it had neither the research capacity nor the educational programs necessary to upgrade treatment on an ongoing basis.

Dr. Lane believed that these resources could be made available through the several institutions that were soon to be affiliated within the Dartmouth-Hitchcock Medical Center: Mary Hitchcock Memorial Hospital, Dartmouth Medical School, the Veterans Administration Hospital in White River Junction, Vermont (which also served as a teaching hospital for the medical school), and the Hitchcock Clinic (whose members served as the medical school's clinical faculty). Collectively, these institutions could provide both the staff and theenvironment needed to maintain high-level cancer research and educational activities.

Dr. Lane's initial goal was to expand the Radiation Therapy Department, which he had established in 1957. While he hoped that a broad-based cancer center would eventually be established, he realized that the achievement of this goal in its final form would require significant amounts of time and money, and felt that that it was necessary to begin with small, attainable steps. Since he was committed to providing the best patient care available and since radiation therapy, along with surgery, was then the only curative form of cancer treatment, it seemed logical to begin by improving existing facilities in this area.

With the help of Dr. Sternick and Marchant E. Tulloh, M.D., a colleague in the Hitchcock Clinic, Dr. Lane presented a plan to the hospital's Board of Trustees, recommending expansion of the Radiation Therapy Department's personnel, equipment, research programs, and physical facilities. The Board said that no funds were available for such an expansion, but promised to give support in any other way possible and authorized Dr. Lane to seek independent funding for the project.

Accordingly, Dr. Lane' next step was to solicit donations from private individuals and foundations. After making numerous applications, he received two grants, both of which designated the funds

specifically for the purchase of equipment: the Alexander and Margaret Stewart Trust gave $80,000 for the purchase of a Theratron 80 Cobalt Unit; and the Irene Heinz Given and John Laporte Given Foundation of New York gave $500,000 for the purchase of a Brown-Boveri Betatron and a Diagnostic Gamma Camera. The Betatron was purchased in Switzerland, where it remained for four years until the funds could be raised to construct a building to house it. Despite the leverage that owning this instrument provided, Dr. Lane could find no private foundation that was willing to donate funds for construction rather than new equipment. Therefore, he decided to turn to other sources.

At this juncture, Dr. Lane was fortuitously approached by Stewart Lamprey, co-chairman of the New England Regional Commission. Lamprey had heard of Dr. Lane's efforts and wanted to help. His first step was to arrange for Dr. Lane and William Wilson, the administrator of Mary Hitchcock Memorial Hospital, to meet with representatives of the Health, Education and Welfare Department at the agency's regional headquarters in Boston. This meeting was not a success. The HEW representatives saw no need for further New England cancer facilities, since, as they told Dr. Lane, there were very good roads connecting Vermont and New Hampshire with Boston--which they felt was the appropriate place for cancer patients from northern New England to be treated.

So Lamprey and his administrative assistant, Maureen Shea, began to look elsewhere for construction funds. Lamprey had formerly been Speaker of the New Hampshire House of Representatives and was a friend of Norris Cotton, the Republican Senator from New Hampshire who had himself held that position some twenty-five years before. Thanks to this connection, and the logistical expertise of Ms. Shea, it was arranged for Dr. Lane to meet with Senator Cotton.

Senator Norris Cotton

Norris Cotton was born in Warren, New Hampshire, on May 11, 1900, and received his education at the Phillips Exeter Academy, Wesleyan University, and George Washington University Law School. In 1928, he was admitted to the New Hampshire bar and began his practice of law in Concord, New Hampshire. He then moved to Lebanon, New Hampshire, where he served as Grafton County Attorney and as Justice of the Lebanon Municipal Court. In 1943, he was elected to the New Hampshire House of Representatives. Three years later, he became Speaker of the House. In 1954, he was elected to the United States Senate. Despite this steady rise to power, Senator Cotton always remembered his small town background and often referred to himself as "only a country lawyer."

In 1962, Senator Cotton became the minority leader of the Senate's Subcommittee on Health, Education and Welfare Appropriations. He described his work on this committee as "perhaps the most satisfying experience of all my years in Congress, because you feel as if you're doing something for somebody." In this position, he developed a reputation as a powerful advocate for improving health resources in rural areas. He favored subsidies to remedy New Hampshire's manpower shortage, supported nurses' training, created tax incentives to encourage physicians to move to areas with doctor shortages , and established fellowships for medical students who agreed to practice in such areas. He also

developed expertise in the funding of medical centers--in urban slums as well as rural districts.

Over the years, Senator Cotton had often consulted his many friends at Dartmouth and at Mary Hitchcock Memorial Hospital on medical questions. His familiarity with these institutions enabled him to help Dartmouth Medical School return to full medical degree-granting status in 1971. In 1914, the medical school had terminated its four-year program, substituting a new arrangement whereby students would spend their first two years at Dartmouth focusing on academic work and then transfer to another institution to complete their clinical training and receive their degrees. The Senator worked with the medical school's dean, Dr. Carleton Chapman, to reverse this action, and was able to draw upon federal Health Manpower funds for this purpose by stressing that the medical school's proposed change in status would help to reduce the nation's physician shortage.

During Senator Cotton's first ten years on the Appropriations Subcommittee, federal health appropriations increased enormously across the board. The budget of the National Institutes of Health rose from a little over $565 million in 1962 to more than $2 billion in 1972, including an increase in the National Cancer Institute's budget from about $142 million to almost $380 million. During that same ten-year period, federal expenditures in the mental health field rose from just under $110 million to over $610 million, and in health manpower training from almost zero to over $670 million.

Because of his strong record and great interest in health appropriations, Senator Cotton was particularly sensitive to the point made by Dr. Lane that although northern New England had one of the highest cancer mortality rates in the country, the region received practically no federal support for cancer-related activities.

The Senator felt that the region's high cancer death rate might be attributable, at least in part, to the high radon content in the granite of the two mountainous states, but recognized that the shortage of trained doctors and the complete absence of nurses in some places were more immediate problems. He also had a sympathetic understanding of the nature of much of the area's population. "For some of the poor, it's a long way to Boston, and you know, they dread to go anyway, until it's too late," he said.

As a result of this meeting with Dr. Lane, which took place in 1970, Senator Cotton became convinced that there was a need not only to improve Mary Hitchcock Memorial Hospital's cancer treatment facilities but also to establish a regional cancer center in Hanover, and from that moment on he dedicated himself unstintingly to obtaining HEW funds for this purpose.

Throughout its construction and growth, Senator Cotton never wavered in his support for the cancer center and was constantly searching for additional ways to obtain funds for its development. He recalled that the other senators used to kid him about it, saying "you and your pet." The Senator repeatedly referred to the cancer center as "the apple of my eye", and often said that his work on its behalf was, of all his accomplishments, the one he was most proud of. "Though you don't brag about what you drag home for your district, this is the single greatest satisfaction of all my 26 years in Congress."

Senator Cotton's support was not limited to obtaining funds. As a member of the Commerce Committee, he was in a position to ensure that the Betatron, waiting to be transported from Switzerland,

would be exempted from federal surcharges on imports. He accomplished this by invoking a 1966 law permitting instruments to enter the country duty-free provided that they were to be used for educational and scientific purposes and that no comparable devices were manufactured domestically. The savings amounted to nearly $40,000. Senator Cotton also helped to arrange for the immigration of a young woman from Germany who was one of the few technicians in the world trained to operate a Betatron.

Senator Cotton realized that the first hurdle in getting a cancer treatment and research center built in Hanover would be to convince the NCI of the need for such a center. He and Dr. Lane worked together to prepare the case the Senator would present to the Appropriations Subcommittee and to Congress. To supply the necessary evidence in support of the Senator's testimony, Dr. Lane organized the results of all his investigations of cancer in the region into a single written proposal, describing in detail the rationale for a specialized cancer center; the clinical, research, and educational advantages it would offer; and the construction, equipment, personnel, and budgetary resources that would be required to establish it. In his presentation, Senator Cotton also stressed the proposed cancer center's ability to enrich and be enriched by the resources of the Dartmouth-Hitchcock Medical Center.

The combination of Dr. Lane's exhaustive preparation and the Senator's persuasiveness carried the day. Their proposal was given a high priority by the Appropriations Subcommittee, and both Congress and the NCI pledged their support for the project.

Senator Cotton was joined in his efforts by subcommittee chairman Warren Magnuson, the Democratic Senator from the state of Washington. Senator Magnuson was interested not only in health care in general, but in cancer research specifically, and was a strong advocate of increased funding for cancer-related and all other biomedical research. Indeed, it was he who had introduced in the House of Representatives the original 1937 bill calling for the establishment of the NCI, the passage of which signaled a new era of government support for cancer research.

Senator Cotton described long weeks and months when he and Senator Magnuson (whom he called "Maggie") sat day after day listening to doctors present evidence in support of the need for a cancer center in northern New England as well as a panoply of other needs across the nation. "We listened probably to some 200 or 300 witnesses during the term. We worked hard and sat up nights."

It was during the last of these late-night sessions, he recalled, that "we decided that we ought to get some reward for our labors, a little something to take back to our states. Maggie asked, 'What do you want, Norris?' And I said what I wanted most, and what I'd been striving for, was an endowment to start a cancer center associated with the Mary Hitchcock Memorial Hospital in Hanover, New Hampshire. 'Well, how much do you want?' he asked, and I said--and I wanted to be reasonable on this--'three million dollars.' Oh, he laughed, and said, 'You can get five just as easily as three. We'll put you down for five to start a cancer center at Hitchcock Hospital.' " (Senator Magnuson also included a similar request for a cancer center in his own region--the Fred Hutchinson Cancer Center in Seattle.)

The Senators' joint sponsorship resulted in the appropriation of $3 million in the1971 NCI budget for the construction of a new facility at Mary Hitchcock Memorial Hospital, to be used for radiation therapy

and research. Additionally, the facility was to receive half a million dollars a year for the next ten years. Another $500,000 was given to Dartmouth Medical School to strengthen its general teaching progr am.

The two Senators shared Dr. Lane's vision that the Radiation Therapy facility would eventually expand into a full-range cancer center. In his report from the Appropriations Subcommittee, Senator Magnuson first stated the underlying purpose of the requested appropriation:

> "...The upper northeastern part of the United States has great need for a center which will provide patients up-to-date cancer treatment without having to travel great distances. Such a center requires extensive services in radiation therapy, clinical oncology, and nuclear medicine and must include laboratory support in radiobiology and radiophysics."

He then expressed the hope that an upgrading of radiation therapy facilities would only be the first step:

> "While this center is presently a facility intended primarily for radiologic purposes, it is the desire of this committee that the center shall become a full-fledged comprehensive cancer research center. The monies are to be utilized for construction,radiological equipment, positions and other items necessary to allow the region in which it is located."

Building the Cancer Center: Stage One--Radiation Therapy Expansion

Once the NCI had allocated the funds appropriated by Congress, Dr. Lane, with the assistance of the specially-established Committee for Radiation Therapy Studies, began to adapt his general ideas into specific, multi-faceted plans that provided for new construction, equipment, and personnel as well as for additional research and educational programs.

Dr. Lane's goal was to utilize the existing facilities at the hospital and Dartmouth College to provide sophisticated diagnostic and therapeutic services not only for Hitchcock patients, but also for patients at surrounding hospitals, physicians, medical students, and all other members of the community. Physician training and community information would also be included.

In the clinical area, he foresaw a cancer center staff that would coordinate both with local physicians and with physicians from smaller hospitals in outlying areas of New Hampshire and Vermont, making cancer specialists available for consultation on treatment decisions. Furthermore, these smaller hospitals would no longer need to expend their resources on expensive diagnostic and therapeutic equipment, since this equipment could be made available to their patients through the cancer center.

For example, patients at community hospitals that could never have afforded a Betatron would be able to receive this treatment at Mary Hitchcock. And the cancer center's Tumor Registry could be used to assist local physicians in maintaining more frequent follow-up of patients after treatment. As a concrete demonstration of the benefits of centralization, it was determined that the cancer center could provide patients at the Veterans Administration Hospital with one thousand individual radiation therapy treatments a year without charge for a period of ten years.

In the area of education, the cancer center would work with Dartmouth Medical School to provide

new elective seminars and summer research programs for students. Courses in radiation and cancer management would be offered for the first time. Residency programs in radiation therapy would also be introduced. Training programs in radiotherapy and radioisotope technology would be established to relieve personnel shortages in these associated paramedical fields. And, though the nation's first interstate medical education television network, INTERACT, which had been established at Mary Hitchcock in the late 1960's, the cancer center staff would be able to conduct courses and provide consultation services for physicians at hospitals throughout northern New England.

In research, a series of approaches were designed to apply computer technology to radiation treatment. Programs were developed to record the patient's contours and the location and relative density of tumors and adjacent normal organs, and, based on this information, to calculate the optimum individual dose by means of an algorithm that took into account tissue homogeneities and the oblique entry of the radiation beam. Another program, Localization Research, was designed to develop accurate localizing devices for use in a computerized treatment planning system. A third research program, Cancer Epidemiology, sought to devise better methods of collating reliable data for the benefit of participating hospitals, local physicians, cancer epidemiologists, and, ultimately, patients as well. Research in physics was also planned, in order to determine the best uses of the Betatron. Radiobiology research was another area slated for development.

Personnel needs were also addressed. The plans called for the recruitment in 1972 of a third radiation therapist and a second radiation physicist. The Committee for Radiation Therapy Studies recommended that registered technologists, dosimetry technologists, research assistants, computer programmers, an oncology nurse, orderlies, and secretaries also be added to the staff. A consultative staff of medical and surgical specialists could be made available through the Hitchcock Clinic, and the faculties of Dartmouth Medical School and Dartmouth College could provide the necessary expertise in the basic sciences.

Once Dr. Lane and the Committee for Radiation Therapy Studies had agreed upon the additional resources that would be required, the next step was to design a physical plant that would accomodate them. The architectural contract for the new facility was awarded to the firm of Ellerbe Architects of St. Paul, Minnesota. Construction was carried out by Bion E. Reynolds Construction, Inc., of Concord, New Hampshire. Groundbreaking took place on July 3, 1971, a year-and-a-half after Dr. Lane and Senator Cotton's first meeting.

The first cancer center building--a two-story cement structure, located entirely underground, with three-foot-thick walls to shield new multi-million-volt radiation therapy equipment--was completed the following year. As a result of this construction, the hospital's radiation therapy facilities were expanded from 2500 to 22,000 square feet, enabling the hospital to treat 1,000 additional patients a year. The new building also contained facilities for clinical oncology, nuclear medicine, radiobiology, and radiation physics research.

The radiation therapy equipment in the new building consisted of three units for megavoltage

radiation: the Brown-Boveri Betatron, a Theratron-80 Cobalt-60 unit, and an Eldorado-8 Cobalt-60 unit. The cobalt units were the most effective versions of their kind then available, and the Betatron--one of three such instruments in the world, and only the second in this country--represented state-of-the-art technology. With an extremely high voltage beam of 45 million electron volts, the Betatron could be directed to a tumor area much more selectively than could any of the other instruments then in use.

To supplement this new equipment, a treatment planning simulator was purchased that could duplicate all the motions of the various treatment machines, enabling radiation therapists to plan treatments more accurately. The simulator was equipped with a tomography unit that could produce cross-sectional outlines of the body for use in the treatment planning computer, ensuring that the radiation given would be homogeneous throughout the treatment area. Other new equipment included the patient contour device previously described and an ultrasound unit that could outline the body and determine tumor locations by means of pulse-like ultrasonic waves. A computerized Gamma Camera, an Ohio Nuclear Dual Scanner, and a Picker Magnascanner, were housed in the radioisotope section. An orthovoltage x-ray machine was also located in the new facility.

Building the Cancer Center:
Stage Two--A Multidisciplinary Cancer Center

Although the original building for the cancer center was only two (underground) stories high, the structure was initially seen by all concerned as the first stage of what would eventually be a full-service multidisciplinary cancer center; and its foundation was built to support eight additional floors. After the underground facility had been completed, however, interest in further expansion died down because of the widepread belief that additional funding would be impossible to obtain.

But Senator Cotton never subscribed to this theory and continued his unflagging efforts on behalf of his "pet." At the final meeting of the Appropriations Subcommittee before Cotton's retirement in 1974, his friend Senator Magnuson, the subcommittee's chairman, asked him, as a "going away present", what he would like included for his consitutents in the coming year's health appropriations bill. "Some more money for my pet project," Senator Cotton replied. Consequently, $5 million specifically allocated for this purpose was inserted into the Committee's recommended budget for the NCI that year. (The amount finally appropriated was $4.5 million, plus a rider, issued in the form of a Special Project Grant, providing an additional $500,000 to Dartmouth Medical School.)

Once the Dartmouth-Hitchcock Medical Center received word of this additional funding, Dr. Lane was appointed Chairman of the Cancer Planning Committee, which was charged with planning for the cancer center's second stage of development. The committee was asked to determine the resources that would be needed to upgradediagnostic, treatment, research, and education services; to identify existing program areas in which the cancer center could play a role; to recommend an administrative structure for the oncology activities to be carried on within the cancer center; and to develop extramural programs. The committee was also responsible for investigating funding mechanisms and identifying further sources of institutional grants.

In addition to Dr. Lane, the committee included representatives of the medical center's various cancer-related departments: Drs. Robert Crichlow (Surgery), O.Ross McIntyre (Hematology), L. Herbert Maurer (Medical Oncology), and George Sorenson (Pathology). Dr. Dean Seibert (Community Medicine) was later appointed as well. The cooperation of all these physicians and their departments would be required for the creation of a truly interdisciplinary institution.

The committee asked every department in the hospital and the medical school to submit proposals for projects appropriate for cancer center support, focusing on the project's anticipated value to the entire medical center as well as to the requesting department. After considerable discussion with all parties, the committee began to rank these proposals and integrate them into an overall plan within a reasonable budget structure--a process in some ways more complex than planning the original construction had been, since at this stage all aspects of the medical center had to be considered.

As this process continued, it became evident to Dr. Lane that the emerging design was linked more closely to broad oncology concerns than to the specific needs of the Radiation Therapy section, which remained an integral part of the existing hospital structure. Hence, the leadership of the new cancer center was transferred to Dr. McIntyre, who was then Chairman of the hospital's Hematology/Oncology section.

Dr. O. Ross McIntyre

Dr. McIntyre was a graduate of Dartmouth College and Dartmouth and Harvard Medical Schools, and had received much of his specialty training in oncology at the Dartmouth-Hitchcock Medical Center. He had joined the Mary Hitchcock Hospital staff and the Hitchcock Clinic in 1964 .

Like Dr. Lane, Dr. McIntyre had long been convinced of the need for a multidisciplinary cancer center in Hanover. He anticipated the major impact that the National Cancer Act would have on cancer-related research, and as soon as the bill had passed, organized a committee to work toward establishing such a cancer center within the Dartmouth-Hitchcock Medical Center. Although this committee received the backing of the medical school's dean, Dr.Carleton Chapman, it was not supported by the hospital administration, and Dr. McIntyre was forced to set aside his plans at that time.

Upon the signing of the bill appropriating funds specifically for the purpose of constructing a cancer center in Hanover, Dr. McIntyre had made his strong interest in this area known to Dr. Jarret Folley, the medical director of the medical center. It was Dr. McIntyre who assumed the responsibility for actually obtaining the federal funds that had been designated for the second stage of the cancer center's construction. This proved to be a more difficult task than had originally been conceived. The mood of the NCI was no longer as expansive as it had been when the first construction funds were granted, and its staff had become much more sophisticated in dealing with requests for cancer center funding in general.

Thanks to the special provisions obtained by Senators Cotton and Magnuson, the Dartmouth-Hitchcock Medical Center had been exempted from the need to compete with all other cancer centers in the country for the limited funds available. But before any of the moneys that had been specifically appropriated for the cancer center could actually be awarded, it was necessary to establish that the

medical center would be able to provide the proper scientific environment to sustain a cancer research and treatment facility. It fell to Dr. McIntyre to coordinate the preparation of a grant application that would demonstrate the medical center's resources in this regard and encompass every aspect of planning necessary for NCI approval.

The Planning Stage: Clinical Facilities, Research and Education

As this grant application was being prepared, the planning process for the cancer center's second stage of development continued. Dr. McIntyre and the Planning Committee worked with representatives of the various departments to determine exactly what the new cancer center should contain, realizing that it would be necessary first to upgrade existing treatment facilities and then to expand the related hospital departments in order to carry out their plans.

The concept that began to emerge was that of a coordinated Medical Oncology Program that would encompass the divisions of medical oncology (including chemotherapy and immunotherapy), surgical oncology, pediatric oncology, diagnostic radiology, pathology, radiation therapy, biomedical engineering, screening, detection, and both basic and clinical pharmacology--supplemented by related programs in research, education, outreach, and cancer control.

By 1974 there was a new emphasis on early detection, and more advanced methods of treatment were becoming available. No longer were radiation therapy and surgery, administered separately, considered the treatments of choice. Now, combinations of these modalities as well as chemotherapy were more widely used. With improved treatment methods, cancer patients were more likely to survive for longer periods of time, necessitating expanded services in the areas of psychiatry, social work, and rehabilitation to help patients and their families adjust.

The Planning Committee responded to these changes by calling for expanded outpatient facilities and for an inpatient unit specifically designated for cancer patients. This unit would be staffed by a team consisting of an attending physician, an oncology fellow, house staff, nursing staff, a social worker, a psychiatrist, a pharmacologist, and a pharmacist. It was felt that such a team approach would be the most effective way to provide optimum care.

The increasing emphasis on early detection mandated an updating of the medical center's diagnostic facilities. Consequently, many of the major proposals for the new cancer center came from the Diagnostic Radiology section, including requests for additional outpatient clinics for screening and also for a Compu- terized Axial Tomography (or CT) Scanner. This diagnostic device could provide more accurate means of x-raying the body than had previously been available by recording miniscule differences in soft tissue absorption and using computer analysis to interpret this information. At the time, the only CT scanners in the region were located in Boston and Montreal, requiring people living between these two population centers to travel long distances in order to benefit from this non-invasive diagnostic tool.

The Diagnostic Radiology section also suggested that funds earmarked for research and equipment be used to develop and refine new techniques in tumor diagnosis and treatment that were virtually

unavailable at any other hospital in the region--including mammography, thermography, angiography, lymphography, percutaneous biopsy, endoscopy, and ultrasound.

The Planning Committee also received many proposals for improving the hospital's surgical facilities, including the suggestion that a chemosurgeon be added to the staff (there being no such specialists closer than New York City at the time). The sections of Dermatology, Plastic Surgery, and Radiation Therapy felt that improved chemosurgery facilities would be required if the new cancer center were to provide comprehensive services. They also emphasized that additional surgery would require additional support facilities, including an enlarged blood banking donor operation with more processing space and a larger staff. An increase in surgical procedures would also necessitate an expansion of the Anesthesiology section. And additional chemosurgery patients would significantly increase the pharmacy service's workload, prompting a request for an additional pharmacist and more storage space and equipment for that area.

It was also suggested to expand the cytology laboratories, in order to expedite the evaluation of cellular material both from patients with known or suspected malignancies and from healthy individuals being examined for prevention and screening purposes. Increasing the capacity of these services would yield research and educational as well as clinical benefits, and could provide the basis for establishing detection programs throughout the region. Other proposals were made to begin or improve work in lung cancer detection, gynecologic oncology, ocular neoplasms, and tumor immunology. A pain clinic and the expansion of the Urology section were also suggested. And the section of Medical Physics requested an upgrading to departmental status within the hospital.

A great many proposals for research projects were also submitted, including expanded drug trials in clinical pharmacology, and new work in tumor immunology, carcinogenesis, and tumor and cell surfaces. Other suggested projects included the development of data collection and data handling systems for clinical therapeutic studies, utilizing desk-top computers to record information about patient-physician encounters and to analyze scanning data.

As part of its planning function, the Planning Committee worked with Dartmouth Medical School to determine how the $500,000 Special Project Grant would be used. It was agreed to use these funds to: 1) assist faculty members engaged in developing model programs in cancer education; 2) recruit skilled individuals who could develop new programs to carry out the cancer center's educational mission--thus enabling faculty members to devote more time to cancer education; and 3) to develop an audiovisual cancer education program located within the Dana Medical Library for use by medical students, house staff, fellows, and paramedical personnel.

Educational programs were also needed to disseminate the knowledge gained through research to practicing physicians so as to upgrade clinical care. Dr. McIntyre called for multidisciplinary fellowship programs, and specifically requested funds for training fellows in hematology/oncology.

A number of suggestions were made regarding the coordination of services among regional community hospitals and the cancer center. The Veterans Administration Hospital recommended the

organization, documentation, and collation of data about cancer patients throughout the region, producing a comprehensive body of information that could be shared among all the hospitals in the area as a way of promoting regional cooperation. Another proposal was for the establishment of an Office of Regional Cancer Planning and Evaluation and an Office of Cancer Detection, premised on the assumption that the success of the cancer center would depend on the extent to which it could establish cancer control programs designed to reach out into the community.

In addition to coordinating proposals from constituencies throughout the medical center, the planners also worked with the architectural firm of Trossen, Wright, and Associates, of St. Paul, Minnesota, which had been chosen to design the cancer center's new addition--making crucial decisions about the core facilities and equipment that would be needed.

The cancer center's administrative and fiscal structure had also to be determined. The committee hired consultant Robert Milch, of the accounting firm of Peat, Marwich, Mitchell & Company, to assist them in this endeavor, asking him to design an operational and management scheme modeled on the successful experience of other cancer centers that would enable the cancer center to compete successfully for a cancer center core grant from the NCI when its initial, specially-obtained, grant expired.

Approval by the National Cancer Institute

In evaluating the numerous proposals submitted by groups throughout the Dartmouth-Hitchcock Medical Center, the Planning Committee also had to take into account the priorities of the National Cancer Institute. A group of medical center administrators, including Howard Newman, the medical center's president; Dr. Jarrett Folley, its medical director; Dr. James Strickler, Dean of Dartmouth Medical School; and William Wilson, Executive Director of Mary Hitchcock Memorial Hospital, worked with Drs. McIntyre and Lane and representatives of the NCI to ensure that the plans that were formulated would meet the approval of the funding body.

This group had to contend with two opposing philosophies within the medical center regarding the use of the funds. A number of clinicians and administrators felt that the moneys designated for the cancer center should be spent on clinical equipment needed by the hospital in its day-to-day operations--such as ultrasound and angiography equipment, a CT scanner, and expanded blood banking facilities--and for construction to provide a place for these improvements.

Others on the medical center staff, however, including Dr. McIntyre, pointed out that most hospitals were able to construct clinical facilities and purchase clinical equipment without the assistance of federal funds, and urged that the cancer center rmoneys be used solely for research-related purposes, such as the construction of research space, the recruitment of research personnel, and the development of programs that would foster new levels of achievement in all related disciplines.

Dr. Lane believed that a compromise was possible. On the one hand, he saw the need for new equipment for the clinical treatment of cancer and was concerned that an overemphasis on basic research might have a detrimental effect on clinical care. On the other hand, he realized that in order to ensure

continuing federal support after the initial contract period, as well as to maintain the medical center's high standards, the cancer center would have to develop research programs that conformed to NCI guidelines and would be viewed favorably by the agency's site visit teams. Therefore, he advocated spending equal amounts of money for basic research and for clinical care, with equipment and program development being provided for in both areas.

Since the appropriation for the cancer center had taken place outside the normal granting mechanism and had been explicitly earmarked for the purpose of "serving the citizens of the region", and since Senators Cotton and Magnuson had stressed the need for "health care delivery", Dr. Lane felt that the NCI would approve his compromise approach despite the agency's research orientation. He also suggested that construction funds, too, be allocated to serve both clinical and research needs--providing for clinical care for outpatients, an expanded diagnostic radiology area, clinical laboratories, and improved operating room facilities, as well as for research laboratories.

On May 23, 1974, Dr. McIntyre, Dr. Folley, and other representatives from the cancer center travelled to NIH headquarters in Bethesda, Maryland, to meet with Dr. Palmer Saunders, Director of the Division of Cancer Research Resources and Centers, and Dr. Thomas King, the division's Acting Associate Director for Research Programs, to discuss the progress of the cancer center's grant application.

These talks continued on August 12 and 13, when NCI representatives came to Hanover to discuss arrangements for amending the existing contract in Radiation Therapy in order to provide for the facilities, equipment, and personnel appropriate to a multidisciplinary cancer center. Specific program elements were also discussed, as were construction plans, cancer control activities, and contract terms in general. The NCI delegation was led by Dr. George Jay, Deputy Associate Director of the NCI, who had been designated to serve as the cancer center's main contact within the agency.

On September 11, Dr. McIntyre, Dr. Lane, and medical center president Howard Newman travelled to Bethesda to meet with Dr. Jay. At this time, Dr. Jay expressed the NCI's view that the earmarked funds should be used solely for the construction of facilities for basic and clinical research. One advantage of this arrangement, he pointed out, was that construction payments could be spread out over the entire course of the construction project, whereas all the funds for program development would have to be made available at the start of each funding period.

As a result of these deliberations, both within the medical center and with the NCI, a compromise was finally reached: $3 million would be awarded for construction and $1.2 million for program development. This second category would include seed money for promising projects, the recruitment of additional faculty to close gaps in program areas, certain core equipment and laboratories, a portion of patient research costs, data handling and statistical support, and core administration costs.

Because of the size and special nature of the cancer center's grant, the NCI conducted two site visits in 1974. The first team of visitors had come to the cancer center on February 20 and 21, before the above-described meetings between the medical center and the NCI. On that occasion, the cancer center had successfully defended the concept that routine hospital construction would be necessary in order to

provide research space, and received a favorable recommendation. The final review took place in December, 1974. This review, too, was successful, and the Norris Cotton Cancer Center was finally declared worthy of receiving Senator Cotton's $4.2 million "going away gift."

The awarding of the appropriated funds was only the first step in this stage of the cancer center's growth. There were other hurdles that remained to be cleared before the moneys could actually be spent. The Planning Board of the town of Hanover had to approve all new construction within the town. Approval by the New Hampshire Health Planning Agency was also required, as was approval by the Connecticut Valley Health Compact, the regional health systems agency governing the area, which had the authority rule on all new hospital construction within the territory it regulated.

On May 21, 1975, when the formal plans for cancer center expansion were first reviewed, the Compact rejected them and gave the hospital three months to address what it felt were weaknesses in conception. The Compact wanted more information about the medical center's corporate structure, its role in continuing education, and its efforts to involve other health institutions in its planning processes.

A major point of contention was the recently-acquired CT scanner, the funds for which had been donated by Mr. and Mrs. Oliver J. Hubbard of Walpole, New Hampshire, early in 1975. The exceedingly high cost of this piece of equipment plus the fact that no other hospital in the area had expressed a need for such an item made it difficult for the medical center to justify its purchase of this state-of-the-art device.

In June, the Compact finally approved the cancer center's plans, but identified certain areas that it felt needed to be more clearly defined. Emphasis was placed on the need for the cancer center to be comprehensive with respect to the entire northern New England region. The Compact also recommended the establishment of an Advisory Committee, preferably including a nurse, that would participate in decision- making. And it wanted assurance that the Compact and all successor health system agencies would be kept informed as to the cancer center's progress, especially with respect to any deviations from the formal proposal.

In addition to approval by these local, regional, and state authorities, approval of the budget by the hospital's Board of Trustees was also required. This approval was willingly granted in December 1975. At that time, the trustees also approved the use of $2.6 million of the NCI grant for construction, and voted $1.1 million of the hospital's own funds to supplement the NCI's $4.2 million--bringing the total cost of the project to $5.3 million.

The cancer center's second phase of construction began in the fall of 1975 and was completed in 1977. The completed addition consisted of two above-ground stories built atop the underground radiation therapy structure and linked to a 25-bed inpatient unit in Mary Hitchcock Memorial Hospital. This new space significantly expanded the facilities available for outpatient diagnostic radiology and research.

The first floor contained expanded blood banking facilities; a cytogenics area; administrative offices, and rooms for cancer control and educational activities, consultations, and conferences televised by INTERACT. There were also facilities for ultrasound, lymphography, angiography x-rays, mammography, thermography, xerography, and EMI scanning. Additional offices for administration staff and for physicians

and their secretaries were located on the second floor. The cancer registry was also located on this floor, as was the cancer center library. And there were rooms for treatment, blood drawing, endoscopy, expanded cytology and screening activities, and conferences, as well as special outpatient examination and chemotherapy treatment clinics.This physical expansion also permitted the expansion of cancer center programs in clinical and basic science research, in education, and in cancer control.

Shortly after the completion of the new addition, the Friends of the Norris Cotton Cancer Center was established. This group, initially made up of long-standing friends of the Senator, soon grew into a statewide volunteer organization contributing significant support to all the Cancer Center's activities.

The Cancer Center Within the Medical Center

The various components of the Dartmouth-Hitchcock Medical Center--Dartmouth Medical School, Mary Hitchcock Memorial Hospital, the Hitchcock Clinic, and the Veterans Administration Hospital--have always been closely interrelated. Their long-term collaborative association was first formalized by contract in 1973, occasioned by the return of Dartmouth Medical School to a four-year curriculum. This reorganization affected all the medical institutions within the community, prompting each to redefine its functioning relationship with the others. The result was the establishment of the Dartmouth-Hitchcock Medical Center as a confederation under the leadership of Howard Newman as president.

In 1982 and 1983, this association was further cemented by a series of contracts establishing the medical center as the corporate boody linking the component parts. In the resulting entity, the chairmen of the clinical departments and the cancer center director are all vice presidents of the corporation and receive their salaries and appointments directly from the medical center.

The medical center's president, vice presidents, and other officers meet annually to develop a plan for the coming year that sets priorities for program development and the use of resources. All recruitment of clinical faculty, all major equipment purchases, and all program development within each component of the medical center must first be approved by this group. The medical center has been organized so that all of its components depend on collaboration and cooperation with each other, and the Norris Cotton Cancer Center both benefits from this structure and contributes to the overall effectiveness of the medical center as a whole.

The cancer center is adminstered by an Executive Committee chaired by the cancer center director. This committee also includes the associate directors for basic science and for radiation therapy, the program administrator, and the directors of the individual research programs. An external Scientific Advisory Committee consisting of representatives from other institutions, meets regularly to advise the director on program development and on personnel and fiscal matters. In addition, *ad hoc* scientific advisors are often called upon to contribute to the cancer center's planning process. All cancer center staff members also have faculty appointments either at Dartmouth Medical School or in the academic departments of Dartmouth College or its associated graduate schools.

The director of the cancer center appoints the cancer center's administrative staff and research

program directors. He reports to the president of the medical center, and is responsible to the medical center's medical director for the coordination of clinical activities and to its academic director (the dean of Dartmouth Medical School) for the coordination of educational and research activities. The cancer center's director, together with these three medical center officers, is responsible for the integration and continuity of the cancer center's clinical, educational, and research functions within the medical center.

The medical center director provides the cancer center director with the resources necessary to carry out the clinical programs that have been approved. It is the cancer center director's responsibility to allocate and organize these resources. It is also his responsibility to coordinate the cancer center's plans with the NCI, the hospital, the community, the medical school, the Scientific Advisory Committee, and the various departments within the medical center, as well as with the medical center's board of trustees.

The Norris Cotton Cancer Center supports major research programs in Carcinogenesis, Clinical Immunology, Endocrinology, Epidemiology, Immunology, Molecular Genetics, and Radiobiology, as well as a program in Clinical Research that has, over the years, enrolled thousands of patients in hundreds of different clinical research protocols--both those devised at the cancer center itself and those made available through participation in national cooperative research groups such as Cancer and Leukemia Group B (CALGB), the Pediatric Oncology Group (POG), the Radiation Therapy Oncology Group (RTOG), the Polycythemia Study Group, and the Mycosis Fungoides Group.

In addition, the cancer center provides a variety of shared services for investigators--including biostatistics, data management, editorial assistance, flow cytometry, glassware washing, histology, irradiation, and tissue procurement as well as a monoclonal antibody library. There are also programs in radiation oncology, nuclear medicine, and medical physics to provide support for clinical care as well as for laboratory-based research.

The cancer center's educational function comprises a wide range of activities--some directed toward the medical community and others intended for the general public. Members of the cancer center staff are responsible for the design and teaching of the cancer-related curriculum within Dartmouth Medical School, including the required second-year hematology and oncology courses (an innovation in medical education) as well as a number of electives. The cancer center also supervises cancer training for the house staff at Mary Hitchcock Memorial Hospital and the Veterans Administration Hospital, and conducts residency programs in nuclear medicine and radiology. The cancer center's medical outreach programs are constantly expanding, and now include regular consultations and tumor clinics at approximately 20 community hospitals throughout the region as well as weekly outpatient chemotherapy clinics recently established at a number of these hospitals to spare patients from having to travel long distances to receive skilled therapy. Since 1981, the cancer center has sponsored a series of biannual continuing education courses on recent developments in oncology, attended by practitioners from all parts of the nation as well as several foreign countries.

The cancer center's public education activities range from legislative lobbying (which led to the establishment by the New Hampshire legislatureof the State Cancer Registry--operated by the cancer

center--and a catastrophic illness fund) to anti-smoking programs in local schools as well as a variety of cancer-related screening projects. The cancer center also prepares a nationally-syndicated newspaper column entitled "Living With Cancer", which responds to the cancer-related questions of readers across the country.

In 1975, when the plans for the cancer center's additional facilities were approved and construction was begun, Dr. McIntyre was appointed Director of the Norris Cotton Cancer Center and Dr. Lane was appointed Associate Director for Radiation Therapy. As the cancer center has grown in both size and scope, the different interests and approaches of these two men have complemented each other and served to create an institution characterized by a multifocused commitment to the integration of basic scientific and clinical research with patient care.

Dr. McIntyre's goal has been to create an environment in which people with a variety of interests in cancer can work together as colleagues in a variety of interdisciplinary programs. He believes that in cancer, as in all areas of medical science, advances are greatest when each patient is viewed not only as an individual needing help, but also as an opportunity for learning. Thus, investigations in the basic sciences must be viewed as relevant to treatment, and clinical research must be viewed as contributing to investigations in the laboratory.

Dr. McIntyre believes that the cancer center must ensure that investigators have access to the facilities and resources they need. It must create an environment in which both those caring for patients and those conducting research have confidence in the newer methodologies and modalities being developed for treatment. And it must provide continuing education for those within the institution as well as those in the community by means of conferences and the constant circulation of information.

He emphasizes that the cancer center's role in upgrading cancer care throughout the area depends upon the extent to which it can form close working relationships with surrounding hospitals. "We view the Norris Cotton Cancer Center as a component of what we hope will eventually be a comprehensive cancer center serving all of northern New England," he says. "Future applications for support may very well be joint efforts involving the cancer center with other institutions throughout the region so that these smaller facilities will also be eligible to receive federal and other public and private grants."

One of Dr. McIntyre's greatest challenges as director has been to bring clinicians and basic scientists together--to organize teaching and research programs in a manner that promotes collaboration among faculty in the various basic science and clinical departments so as to maximize the use of medical center resources. He feels that the cancer center's ability to do this successfully is one major reason why its peer-reviewed funding has continued to grow despite its comparatively small size and the present climate of governmental stringency. Many others within the medical center share this philosophy and have joined together in the effort to preserve and promote those interdisciplinary areas that existed prior to the cancer center's formation as well as to develop strong and innovative new programs.

The Norris Cotton Cancer Center's proven ability to achieve these goals has resulted in continued and enthusiastic support from the NCI. The cancer center's first core grant was awarded in 1978 to cover a

three-year period. This grant was renewed for another three years in 1981. In 1984, the grant was again renewed, but this time for a five-year period--an implicit statement of confidence in the cancer center's ability to maintain and enlarge upon its tradition of excellence.

Conclusion

In 1985, Senator Norris Cotton was awarded an honorary Doctor of Laws degree from Dartmouth College. Dartmouth President David McLaughlin's tribute to the Senator included the following remarks:

> "Attended by your characteristic good humor, keen wit, and charm, the unflagging zeal with which you worked for federal support for the Dartmouth Medical School and for the Hitchcock Hospital and Clinic has helped to enlarge and enrich, in an exemplary fashion, responsiveness to the healthcare needs of this region. The Norris Cotton Cancer Center, located just two blocks north of where we are gathered at this moment, exists as a manifestation, among many others, of the high regard in which you are held by those with whom you were associated in Washington. Perhaps even of greater significance, however, the countless men, women, and children whose lives have been, and will be, extended by the work of that unique resource-facility constitute a further, ongoing tribute to you and your worthy achievements."

Although the Senator was one of six eminent individuals who received honorary degrees at the college's commencement ceremony that year, he was accorded the sole honor of a standing and prolonged ovation from the audience.

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In 1987, Dr. Frank Lane retired, having delayed this step several times at the urgent request of the Radiation Therapy section. At the culmination of his career he was able to look back with pride and a great sense of accomplishment at the concrete embodiment of his original vision--a multidisciplinary treatment and research facility devoted to providing state-of-the-art care for patients from northern New England and beyond, and undertaking state-of-the-art research to contribute to the worldwide effort to understand and, ultimately, to cure cancer.

This history was researched by Kimberly J. Murchison, Dartmouth College '86. It was written by Ms. Murchison and Deborah S. Solomon, Editorial Director of the Norris Cotton Cancer Center.
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ALBUM

The Cancer center on paper. Senator Cotton, Dr. McIntyre, and Dr. Lane (left to right) at preconstruction planning session.

Groundbreaking. Dr. McIntyre (left) and Senator Cotton (second from right) don hard hats for the occasion.

ALBUM

Cancer Center construction–Stage Two. At right is the Mary Hitchcock Memorial Hospital. Beyond, to the left, is the tower of Dartmouth College's Baker Library.

Construction is completed. The Norris Cotton Cancer Center (low building in front) is open for business.

NORRIS COTTON CANCER CENTER
DARTMOUTH-HITCHCOCK MEDICAL CENTER
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