1925-1975

To each his farthest star

# Lo each his farthest star

UNIVERSITY of ROCHESTER MEDICAL CENTER 像

UNIVERSITY OF ROCHESTER MEDICAL CENTER - 1925-1975

University of Rochester Medical Center

1925 - 1975

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University of Rochester Medical Center

# 1925-1975



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A book of essays commemorating the fiftieth anniversary of the University of Rochester Medical Center, 1925–1975

Conceived, assigned, edited, and assembled by the members and staff of the Publications and Publicity Committee

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## General Introduction

"The use of history is to give value to the present hour." -Emerson

In September 1925 the School of Medicine admitted its first students and in January 1926 Strong Memorial Hospital opened its doors to patients. Thus, in the period September 1975 to June 1976, the Medical Center is fifty years from its operational beginning. It was proposed that there should be some form of recognition of this historic milestone.

At the request of Dean J. Lowell Orbison, a steering committee, to consider plans for a celebration program, was appointed in January 1972 by Chancellor Wallis, following which an executive and other committees were appointed by Dean Orbison; Dr. Gordon Meade, special assistant to Dean Orbison, was program coordinator. The membership lists of the several committees appear in the Appendix.

The Committee on Publications and Publicity was the committee responsible for the preparation of the book of essays and for the brochure. It met monthly from mid-March 1973 through the summer of 1975, when the several materials were submitted for publication.

After considerable study and discussion, the Publications Committee decided to prepare the major fifty-year history in the form of a series of essays. In addition, a companion publication, a brochure, was prepared, consisting of 75 percent photographs and a minimum of text. The brochure is to be distributed widely to the public, as well as to the University family.

It became apparent to the committee that the fifty-year history could not be written in the form of the historical accounts prepared earlier—"The First Decade—1926-1936," and "The Quarter Century—1925-1950." We could not hope to recount in detail the departmental reports prepared for the earlier periods, and we believed that such accounts were available in the individual department files. The committee therefore decided that the book of essays would try to capture that which is original and that which is clearly representative of this University Medical School and Hospital.

Obviously, it would be impossible to cover every and all aspects of our fifty-year history. Necessarily, then, the book of essays is a selective history, although the committee believes that the content of the essays is truly representative of the major developments and problems of this School and Hospital over the past fifty years, and touches on all functions and departments. Furthermore, we believe the essays also reflect the major issues of medical education, research, and clinical service as experienced by other university medical centers in our nation in the years 1925–1975.

Thus, it was our wish and our plan that this commemorative volume not only serve as a record of how we have met the challenges of the past fifty years, but that it would prove a window through which one may look out upon the broader scene of medical education, research, and clinical service in the nation at large. With this objective, we believe the book of essays will have more than parochial interest, and that scholars, teachers, scientists, and historians, as well as current-day planners of educational, research, and health delivery systems, may learn and profit from our experience.

The essays are grouped under nine sections: The Early Years; The Ongoing Years; World War II; After the War; Students Then and Now; Fifty Productive Years; View from the University at Large; View from the Community; and Beyond Town and Gown. In the Appendix are listed the memberships of the fiftieth anniversary program committees; and, in chronologic sequence, the administrative officers of both School and Hospital; department and division chairmen; student committee chairmen; and student and faculty awards.

As the appropriate close to a book that is the record of a tradition of uncompromising and talented leadership, the concluding essay, which appears after the Appendix listings, is Dr. John Romano's recounting of how he and his staff succeeded in rescuing a precious piece of School history—the tape of Dr. Wallace Fenn's address on the occasion of the dedication of the George Hoyt Whipple Auditorium. The presentation in this volume of the text of Dr. Fenn's address is the result—and reward—of that search.

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George Hoyt Whipple, Abraham Flexner, and Donald Grigg Anderson on the occasion of Mr. Flexner's visit to Rochester, December 13, 1954. Mr. Flexner died September 21, 1959, at the age of 92.

## George Hoyt Whipple, M.D.

#### 1878 -

This book of essays is dedicated to George Hoyt Whipple with the affection, admiration, and appreciation of his students and colleagues. Nobel laureate, physician, teacher, scientist, and dean of our Medical School from 1921 to 1953, it can in truth be said of him, "He has done immense service to mankind."

Prepared at Andover, educated at Yale and at Johns Hopkins, he remained in Baltimore for a decade following his graduation in 1905, advancing rapidly in the Department of Pathology under his illustrious teacher, William H. Welch. Then he became professor of research medicine, later dean, at the University of California Medical School and director of the Hooper Foundation, San Francisco. In 1921 he came to Rochester to organize a new medical school. He planned and built the School and Hospital and chose its faculty with unerring discrimination—but built much more—the tradition for distinguished teaching and research which has been the hallmark of the School from its inception. His researches, begun in 1917, led to the observation that liver diet was most effective in blood regeneration. This discovery led to the further investigations of Minot and Murphy and subsequently to the award of the Nobel Prize in Physiology and Medicine in 1934.

Dr. Whipple has said that teaching and research represented the ultimate pleasure and satisfaction in his career. Research, he added, may have given him a greater sense of accomplishment, but teaching carried greater personal happiness; to quote Dr. Whipple: "I believe a good medical teacher must be an investigator, philosopher, and/or clinician. *I would be remembered as a teacher*." It was Whipple, more than anyone, who established and nourished the Rochester tradition, that individual differences between students must be identified and respected and that each student must be afforded every opportunity to fulfill his potential for growth. It is because of this tradition and its practice that the committee chose for the title of this book of essays, "To Each His Farthest Star."

Our committee decided that the dedication of this book of essays to George Whipple could be best done through the words of his great friend and colleague, our Distinguished Professor of Physiology, the late Wallace Osgood Fenn. The dedication of the George Hoyt Whipple Auditorium in the School of Medicine on October 12, 1950, was the occasion for the following principal address given by Wallace Fenn.

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## Wallace Osgood Fenn (1893-1971)

Wallace Fenn was educated at Harvard, where he received his undergraduate degree in 1914 and a Ph.D. in plant physiology in 1919. That year he married Clara Bryce Comstock. After working for three years in the Department of Physiology at Harvard and two years as a traveling fellow of the Rockefeller Institute in the laboratory of A. V. Hill at Manchester, he came to Rochester in 1924 as professor of physiology and chairman of the department. Although he retired as chairman in 1959, he continued as an active faculty member and administrator with the title of Distinguished University Professor of Physiology. The University also recognized his achievements and contributions by awarding him an honorary D.Sc. in 1965.

Dr. Fenn was known to many medical students as a brilliant lecturer and an exciting and helpful teacher in the laboratory. The Ph.D. candidates whose work he guided have distinguished themselves in many places in the world. He focused his research efforts in several fields of physiology—muscle-nerve function, electrolyte metabolism, respiration, and gas toxicity—and in each area many of his papers have become classics.

His concern for the relationships between science and the government was reflected in his membership on numerous national committees and efforts on behalf of the National Academy of Sciences and the American Philosophical Society.

He was honored as a leader in science by degrees from the University of Chicago, San Marcos University in Peru, the University of Paris, and the University of Brussels. In 1964 he received the coveted Feltrinelli International Prize for Experimental Medicine from the Accademia Nationale dei Lincei of Rome. He also served as president of the American Physiological Society (1946-48) and the American Institute of Biological Sciences (1957-59). At the time of his death he had just completed a term as president of the International Union of Physiological Sciences.

## Dedication of the George Hoyt Whipple Auditorium

WALLACE OSGOOD FENN, PH.D. Professor and Chairman, Department of Physiology

October 12, 1950

Dr. Kaiser, Dr. Whipple, Ladies and Gentlemen:

I must count it a great honor that I have been requested by the informal committee in charge of renovating this amphitheater to represent the faculty at this dedication ceremony. It is a task which I have undertaken with real pleasure and satisfaction, to be sure, but also with much diffidence, lest I prove unequal to the grave responsibilities of so great an occasion. My task is not to sing the praises of Dr. Whipple, for they are obvious to all, but rather it is to set before you the reasons for this venture, to discuss its significance and, above all, to put Dr. Whipple at ease in the new surroundings. What we are doing today is something altogether natural and proper and as inevitable as the incoming tide. Sooner or later we should have found some way of honoring Dr. Whipple by attaching his name to some part of this institution. He founded this School here and guided it with unexcelled skills through its formative years, years which are not yet at an end. Under such conditions even an unpopular dean would deserve to have at least an auditorium named after him. Dr. Whipple enjoys the unstinted admiration and esteem of all his associates, and this makes it abundantly clear that the dedication of a Whipple Auditorium, or its equivalent, is something which ought to be done sometime. In addition, there are two compelling reasons why this should be done now. We needed a better auditorium and we needed it badly. We have just passed a twenty-five-year milestone, and we need some tangible monument to celebrate that event. Only the George Hoyt Whipple Auditorium could satisfy all of these needs simultaneously. It is unnecessary to mention another all too obvious truth-that it was

no idea of Dr. Whipple's and that he could never have dreamed of such a thing, even in a psychiatric trance. He did admit that the amphitheater needed improving, but he did so reluctantly. For the rest of the time in every way he offered his vigorous opposition, but in vain. Against the irresistible force of public opinion, even Dr. Whipple, the immovable fortress, proved unavailing. The administration gave its approval, the faculty voted an enthusiastic yes, the alumni said they wanted to have their part in it, the students want to present a portrait of Dr. Whipple to the School, which will be hung in the near future under the inscription on your left. And most of this transpired completely without Dr. Whipple's knowledge. In fact, his friends have forced him, as courteously and tactfully as possible, to accept the fait accompli with such grace as he can muster. I can assure him that I speak for all of you when I tell him that this gift gives us much genuine pleasure, and we hope that it does not really displease him and that he will forgive us in time, when the first shock is over.

Let me make it clear at the start that it was never proposed that the cost of making the amphitheater presentable and serviceable should be borne by popular subscription. The University itself has undertaken that function and fully met its responsibilities in that direction. As usual, the total cost has exceeded our initial expectations, and a large portion has been borne by the hard-pressed University budget. This has supplied a new expensive ventilating system, the new lighting, and the general framework. Other support was provided only for the extra decorations which were needed to make this room a suitable tribute to the man whom we honor today. You cannot hang a portrait in a cellar, and it must be carefully and artistically blended with its surroundings. The private contributions which have been made therefore are definitely for the purpose of honoring Dr. Whipple in this splendid fashion and not for the purpose of renovating one of the University buildings. The committee in charge of this work was not officially appointed and could hardly be said to have had any formal membership. It just grew up haphazardly and functioned without legal right. The whole enterprise has been irregular, but the job has been done after many disheartening delays. It has been the work of many men who have given time and thought to the project in all its many baffling details. It is difficult to mention names without omitting so many others

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#### Dedication of the Auditorium

that I feel embarrassed. I must, however, in all fairness single out a few, beginning with Mr. Leonard Waasdorp, the architect. You can't expect to make a Miss America out of a hunchback. But his efforts in that direction have been, to my mind, little short of miraculous. Without the devoted and time-consuming efforts of Dr. Jack Goldstein and Dr. Einar Lee and of the other graduates who helped us, the effort could never have succeeded. They made the alumni a living force and won the hearts of the faculty in an unforgettable way. Dr. Basil MacLean has been urging amphitheater improvements for the last ten years and fortified us greatly in our high resolve. To Dr. Karl Mason we are indebted for his constant watchfulness during the progress of the work last summer, when many important decisions had to be made. The University treasurer, Mr. Raymond Thompson, kindly looked the other way while we were fumbling with the pursestrings of his treasury. He gave us not only generous support but much sound advice in the details of construction. The rest of the list of our collaborators is too long for this occasion. I feel assured, however, that they, like all of us who have been concerned with this work, would find ample satisfaction in the contemplation of the finished product, which is already a very beautiful auditorium. The old auditorium served us well for the early years. In its puritanical architecture it was like the rest of the institution, adequate but not decorative. I expect it reflected the utilitarian instincts of our great benefactor, Mr. George Eastman, as well as the rugged simplicity of our honored New England dean. We must agree with them that a medical school is a group of men and not a pile of bricks or an assembly of marble columns and graceful arches. The lectures will be no more illuminating because the well-chosen phrases of the speakers are reflected from elegantly stained mahogany instead of crumbling brick. And the art of teaching is just as demanding and difficult, whether the students line up on a stone wall or a row of plushbottom chairs. The large amphitheater in its original form was an old friend and a scene of many a memorable meeting. I would not speak ill of the departed. But times have changed. Nitrate film has been ruled out of existence; we have no need for a projection booth. Better ventilating systems have been developed -the old ones were noisy and required extensive geriatric care from the engineers. Innumerable minor improvements were continually being suggested, but none of them could possibly

be carried forward until these basic needs had been met. Any improvement was an all or none proposition. Earrings, necklaces, and beauty spots do very little for our hardened and acromegalic face. Even now we have only a suitable framework upon which we can continue to improve. Some day, when funds permit, we shall have upholstered seats, which will enhance both the color and the comfort of the auditorium. Such seats are already authorized for the front half of the hall in accordance with the funds available. We are exploring the possibilities of a better call system by some "telegraphon" or television device. A decorative curtain, possibly containing the seal of the institution, may perhaps conceal the glaring white of the screen when slides are not being projected. The job, in short, is not complete but we all have something worth working on.

In the Hospital there are, to be sure, some tastefully decorated spots, such as the main lobby. But in the Medical School proper, this is the only room where there has been any compromise between the stern demands of strict utility and the more subtle beckonings of architectural beauty. Here we can introduce our speakers with pride. Here we can hang the portraits of those whom we sufficiently admire without feeling that their surroundings do not do them justice. In future quarter centuries there will be other portraits to join with the one of Dr. Whipple in the interested and friendly contemplation of future classes. To those hundreds of friends and colleagues who have contributed money so generously for this auditorium I can offer only the blood, sweat, and tears of altruistic devotion to a common goal. I hope that you and they may be sufficiently rewarded by the warm feeling of having shared with a host of others in paying a fitting tribute to one of the great figures in medicine of our day. To each of these contributors we shall try to express the gratitude and appreciation of the institution by sending them a suitable card of acknowledgment.

Furthering this point, I must be forgiven if I utilize this opportunity to say another word to the alumni who have assisted so handsomely both with this auditorium and with the Medical Alumni Loan Fund. In this School it is our first experience of this sort. I can assure you that it means a great deal to us to know that our graduates still have so much interest in this School. Their substantial financial contribution made the difference between success and failure. But its effect on the facul-

#### Dedication of the Auditorium

ty, in my opinion, was worth even more than its actual value in fine gold. Let me mention here that the full-time and part-time faculty have not lagged behind the alumni in their contributions to the Auditorium Fund and it far exceeded our most optimistic expectations. It is particularly encouraging that so many had wanted to have a share, however small. Let me mention further that the students have also surpassed our expectations in their contributions to the Portrait Fund. We all know that most students are in no position to make financial contributions, and you will be interested to know that the portrait will be presented to the School at a special ceremony in the near future, when the whole student body will assemble in the auditorium, with priorities for the limited seating accommodations. I might add that the faculty also will have its own celebration of its twentyfifth anniversary in this auditorium on the evening of November 3. 1950.

This auditorium has, it seems to me, a certain philosophical significance which should not be overlooked. Dr. Whipple has devoted his life to this institution. Many of the rest of us have done likewise. For most it is only a temporary or part-time focal point of activity, but in all cases it is a vital one. We represent a large family growing up around the School. Its reputation is our reputation. Its success is our success. We can't be satisfied with anything but the best. There is danger that we may tend to regard the institution as the Uncle Sam from whom all good things should be expected to flow freely. Are we not likely to forget that we get back only what we put into it? An occasional community-wide campaign to make some actual contribution to the institution has an ennobling and uplifting effect on all of us far beyond the actual value of the contribution in time or money. I think that this venture belongs in this category. By a largespread family effort we have accomplished a splendid face-lifting operation which enhances immeasurably the dignity of this School and Hospital. It has meaning only because it was done by many individuals working together.

Dr. Whipple has served as the focal point, or should I say the unwilling victim, for this act of communal sacrifice. If he has in any way given reluctant consent to the operation, I am sure it is only because he realizes that in honoring him with such unanimous enthusiasm, we are likewise honoring ourselves and the institution to which we belong. We are cementing the ties which

bind us together, making a living whole out of a heterogeneous collection of individuals. Let this be the first of many such wholesome enterprises, at least one every quarter century. We have certainly been very fortunate in our dean during the first twentyfive years. He has been more than a dean; he has been a longtime and sympathetic friend and a loyal leader. Only administrators who are deeply admired and respected can continue in office for so long without arousing some degree of opposition and disunity. Dean Whipple compels unity by his own wisdom in picking the best policy and by the honesty, sincerity, and fairness with which he supports his convictions. Perhaps not every decision he has made has been the wisest, but as far as I can remember, the Advisory Board has always thought it was and has given him a vote of confidence. He picks the best man he can find as the head of every department, and makes him feel thereafter that he is the captain of his own ship. In my experience, when I disagree with him, I always, or almost always, turn out to be wrong.

Dr. Whipple likes to spend long hours angling for a good strike on the banks of the Margaree, and he can pull his fish to a safe landing with infinite skill and patience. The same careful tactics bring many wandering colleagues safely back to terra firma. As a very amateurish hunter, I look back with the greatest of joy to the days which I have spent hunting pheasants in the company of Dr. Whipple. Let me tell you what actually happens when the dog finally puts up a bird with a sparkling whir of wings. Dr. Whipple gets his bead on the bird and then holds fire for a few seconds until my gun goes wildly off. Then he calmly brings down the now far distant bird with a neat shot to the head. Similarly, all day long, someone is continuously shooting up problems for him in rapid succession like clay pigeons. And all day long he sits calmly at his desk and busts them wide open with his well placed shots. You don't come away from his office with just a nick in your clay-pigeon problems. He first talks through them with a tight pattern of good arguments, and they disappear in a cloud of inconsequentials. When the trees of confusion become so thick that you cannot see your way through the woods, he can usually see the stream of light ahead that provides a tenuous passage through the maze of obstacles which oppose you.

Now there is much more I would like to say about Dr. Whip-

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#### Dedication of the Auditorium

ple, but we did not assemble here to overwhelm him with personal tribute. Let me now point out, then, that this amphitheater would never have been rebuilt in this manner, and that inscription would never have been placed upon the wall, if there had not been a greater depth of feeling for him in this institution than anyone would dare try to put into words, even with the opportunities afforded by the artificial formality of an occasion of this sort. The inscription itself is a simple statement of fact and no call for embarrassment. It is somewhat difficult to read at present. We are seeking means of making it more legible. But it reads, "In honor of the first dean of the School," which is obvious, "a distinguished investigator," witness the Nobel Prize, "a wise administrator," the faculty knows, "an inspired teacher," ask the alumni, "and beloved friend." As for the last epithet, I must point out that all those who put their hearts into this institution over the years can claim to be beloved friends in this same sense, although we do not proclaim it from the housetops without good reason. The dedication of this amphitheater, then, is a spontaneous expression of the desire of this Medical Center, and we can only hope, Dr. Whipple, that you will forgive us for imposing upon you in this way while you are still guiding our progress. It is also, may I add, a clear indication of our earnest hope that you may continue as dean as far into the second quarter century as your own health and desires permit. Some of our leaders may feel impelled for good and sufficient reasons to desert us in our hour of need, but we know that we can count upon you to remain just as long as possible in the mission which we must believe is second to none in importance. Nevertheless I must admit that our action today might well seem to create a rather difficult situation for a less sturdy and understanding man than Dr. Whipple, and we could never have asked him to accept this honor if it had not had a larger significance for which he is only the unwilling symbol. This is part of our twenty-fiveyear celebration. And we are dedicating this auditorium not only to Dr. Whipple, but also to the progress made by the whole Whipple team during that period, including faculty, alumni, alumnae, students, and many others. Dr. Whipple has always tried to make us believe that we were members of the team, and this auditorium simply proves that he has succeeded in that effort. But however proud we are of our record to date, we must not be too smug and self-satisfied in our appraisal of past per-

formances. We are off to a flying start, but the obstacles and difficulties still remain great. We cannot rest on our laurels or run before the wind. We must rather continue the long, hard beat to windward with our sails close-hauled and the leeway in the whitewater. Rochester has no corner on brains or ambitions or facilities, and we must meet the growing challenge of other schools by a continuous and vigorous advance of our own. Thus, in dedicating this auditorium in honor of Dr. Whipple, we must not forget at the same time to dedicate ourselves under his continuing guidance to the enduring progress of medical education and medical science in the University of Rochester and the United States of America. Only, I think, by doing this can we thoroughly justify this George Hoyt Whipple Auditorium and all it stands for.

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# The Early Years

## "A Modest But Good Institution... And Besides There Is Mr. Eastman"

1.

The Background



## Edward C. Atwater, M.D.

Edward C. Atwater is associate professor of medicine and, more recently, assistant professor of the history of medicine as well. A graduate of the University of Rochester (B.A., 1950), where he majored in history with Professors Arthur May, Dexter Perkins, Glyndon Van Deusen, and John Christopher, he completed his premedical requirements in 1951 and went to Harvard Medical School (M.D., 1955). Returning to Rochester as a house officer in 1955, he later spent two years as NIH trainee in arthritis and metabolic diseases with Ralph F. Jacox, was chief resident in medicine in 1959–60, and has been a member of the Clinical Rheumatology Unit since that time.

During eight years as director of the Medical Clerkship he became interested in what things were responsible for the changing fashions in medical instruction and in the evolution of American medical education generally. In 1970-71 he spent a sabbatical year at the Institute of the History of Medicine and subsequently received a master of arts degree from Johns Hopkins University. His thesis, Financial Subsidies for American Medical Education before 1940, examined the influence of money on the way medical students are taught. Other studies,

including the present essay, deal with the interaction of social, political, economic, and scientific factors in shaping the medical profession.

**I**HE DEPARTURE of William Osler from the faculty of Johns Hopkins Medical School in 1905 drew attention to the diminishing influence of the practitioner on medical education in America. As Osler stepped from the platform after commencement that year, he turned to the professor of anatomy, Franklin P. Mall, and remarked, "Now I go, and you have your way."<sup>1</sup> Osler, who had been at Hopkins for the previous sixteen years as professor of medicine, a position he considered the finest clinical chair in the English-speaking world, was retiring to become Regius professor of medicine at Oxford. The "way" of which he spoke and to which he was opposed was the establishment for the clinical faculty at Hopkins of the same salaried full-time system which had existed for the preclinical faculty since the school's opening in 1893.

Osler's prediction was correct: clinical full-time came to Hopkins eight years later. The controversy which the subject started was to occupy reformers of medical education for at least a generation. Among those graduating on that same day in 1905 was George H. Whipple, who in fifteen years would become dean of a new medical school whose very existence was a result of the struggle to establish the clinical full-time system.

Full-time, or whole-time as it was called then, meant that a faculty member spent all his working day within the walls of the school and hospital. Though he might see patients, any income derived from this activity reverted to the school. His entire professional income was in the form of a fixed salary and was in no degree dependent on his caring for patients. Such an arrangement, by freeing the faculty member from remunerative clinical obligation, permitted the luxury of unlimited time to teach and investigate. Such luxury made it essential to have funds from which to provide the salary.

Throughout the nineteenth century the traditional way of paying all medical professors had been through the purchase of lecture tickets. Each professor kept the proceeds from the sale of his own tickets, his income varying with the popularity of his lectures. The income was often substantial for what was usually

#### The Early Years — Atwater

about three months' work. At the country school in Fairfield, New York, there were 182 students in 1830, the tickets were \$10 per course, and the professor's income \$1,820. At the University of Pennsylvania, leading school of the day, tickets were \$20 per course, there were 422 students, and proceeds were \$8,440.

Though it was not until income-producing resources from philanthropists became available that salaries became a reality, the idea of providing a financial subsidy for medical professors had a long history. Throughout the nineteenth century the professoriate repeatedly urged that public funds be used for this purpose. Legislatures, however, though they had at one time been generous supporters of medical education as far as provision of buildings and equipment were concerned, were seldom willing to support a profession for which the means of selfsupport seemed assured.

Occasionally, in country schools where attendance was low and the professor's income meager, it was necessary to provide a minimum in order to attract and hold good faculty. In 1804, Nathan Smith had been offered \$200 a year by the Dartmouth trustees if he would move to Hanover from Cornish, where he was then living. In the earliest years of the medical school at Fairfield, New York, each professor was guaranteed a minimum income of \$500 for his twelve weeks of teaching, and if the proceeds from sale of his lecture tickets exceeded that amount, he was guaranteed a subsidy of up to \$200 until a total of \$800 was reached.<sup>2</sup> When the University of Virginia opened, in 1824, the professor of anatomy and medicine was paid a salary of \$1,500, in addition to which he had use of a house and received the income from fees of those students attending his lectures.\* The proscription of practice had made the chair a difficult one to fill.<sup>3</sup>

In 1838, the tax-supported medical school at the University of Georgia was apparently the first to make it possible for professors to devote their whole time to teaching by providing

<sup>\*</sup>This university did not, at this time, offer professional training comparable to other medical schools. The professor of anatomy and medicine, who was one of five members of the university faculty, was expected to teach medicine as part of the undergraduate curriculum, partly to make students aware of its limitations. His lectures were, of course, also attended by students studying medicine with their preceptors. See "The Autobiographical Ana of Robley Dunglison, M.D.," *Trans. Amer. Phil. Soc.*, n.s. 53, part 8, 1963, p. 9.

adequate salaries for the chairs of anatomy and chemistry.<sup>4</sup> Twelve years later, the new University of Michigan, with substantial annual tax support, opened with each member of the medical faculty receiving part of his income from university funds. Unlike the situation at Georgia, these salaries in no way replaced the professors' much more substantial income from practice; they merely removed the obligation of selling tickets and provided a steady subsidy.

Furthermore, there were no chairs with sufficient endowment to relieve the professor of the need to support himself by practice. As late as 1890, only eight schools had capital funds of as much as \$20,000; only three had any endowed professorial chairs, and these chairs provided only a financial subsidy, not a full salary.\* The trend toward teachers of basic sciences who were not practitioners began with Henry Pickering Bowditch, who became professor of physiology at Harvard in 1871, though Harvard cannot claim much pioneering credit since it was Bowditch's family resources and not Harvard's generosity which made possible the arrangement. It was not until 1893 at Johns Hopkins that a preclinical faculty was wholly (or adequately) salaried, with \$5,000 annually.† The laboratory sciences had by then become so sophisticated that the idea of a full-time preclinical faculty seemed reasonable to almost everyone.

The question of clinical full-time was not quite so easily decided. There was little argument that it would be better for a physiologist or a chemist, or even a pathologist, to devote all of his time to the laboratory and to the instruction of students. It was only necessary to find the money with which to support him. With the clinical teacher the situation was somewhat different. Though advances in pathology, physiology, and microbiology had made the teaching of clinical medicine and the conduct of significant clinical research so involved as to be difficult for a part-time devotee, an equally important part of what he taught was practice. It soon became apparent that coordinating the new technological capabilities of medicine with the art of medicine would be difficult. There was no simple solution.

By 1910, Johns Hopkins was in the throes of the full-time controversy. Two events in particular were responsible for this. That

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<sup>\*</sup>The oldest endowed chairs in an American medical school are the Hersey Chairs of Medicine, and of Anatomy and Surgery at Harvard.

<sup>+</sup>Equal to about \$31,000 in 1972 buying power. See footnote on page 9.

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year, Clemens von Pirquet, pediatrician in chief of the newly organized Hopkins Department of Pediatrics, who was spending a year's leave of absence in Europe while the pediatric hospital building was completed, was offered the chair of his retiring teacher Escherich, in Vienna. Hopkins counter-proposed that von Pirquet become hospital full-time with an increase in salary from \$5,000 to \$7,500, but von Pirquet considered the sum inadequate. The trustees declined to accept faculty pledges for an additional \$2,500, and Hopkins was disappointed that it could not hold its German professor.

Meanwhile, Dr. William Welch, the school's dean, had been negotiating with the Rockefeller-sponsored General Education Board for a grant with which to erect a laboratory building for the school. In these circumstances, the board's secretary, Abraham Flexner, saw an opportunity to consummate his dream of establishing clinical full-time. Hastening to Hopkins, he prepared for the General Education Board a confidential report containing two alternative proposals—each including the desired laboratory —one calling for an increased class size and the necessary facilities, and the other proposing to establish clinical full-time salaries of \$7,500 and no increase in student enrollment. Mr. Flexner urged that the latter plan be accepted.<sup>5</sup>

#### "A SET OF CLINICAL PRIGS"

In the discussion which ensued, many participated. Writing from England to the president of Johns Hopkins, Osler expressed concern lest "a set of clinical prigs" develop with the educator isolated from the practitioner.\* "I fear," he wrote, "lest the broad open spirit which has characterized the school should narrow, as teacher and student chased each other down the fascinating road of research." The issue of clinical full-time, he continued, "has been forced on the profession by men who know nothing of clinical medicine, and there has been a 'mess of pottage' side to the business in the shape of big Rockefeller cheques at which my gorge rises."<sup>6</sup>

To Osler, "the primary work of a professor of medicine in a medical school is in the wards, teaching his pupils how to deal with patients and their diseases. His business is to turn out men

<sup>\*</sup>Other expressions Osler used in this context included "cloistered clinicians" and "clinical monks."

who know how to handle the sick. His business, also, is to bring into play all the resources of the laboratories in the investigation of disease..., to get into close touch with the profession and the public, and with both to play the missionary; and this he can only do if engaged part of his time in consulting practice."<sup>7</sup>

Osler saw a place for the whole-time clinician in research institutes but felt strongly that teachers of physicians should be active practitioners. Unfortunately there are never many men of Osler's caliber, and though the clinical research at Hopkins was, during his time, commensurate with that of the preclinical departments, it was probably a rare practitioner who could sustain such productivity. It was because of these tremendous demands on his own time that Osler retired prematurely.<sup>8</sup>

Equally capable men supported the other side of the argument, among them the anatomist, Mall, to whom the German university system was a model, Simon Flexner, full-time pathologist at Hopkins and later at the Rockefeller Institute, and his brother Abraham Flexner, a teacher by profession. These and others who agreed with them saw the unrelenting demands of patients on a clinician's time as compromising his effectiveness as a teacher and investigator. "The old-fashioned medical school had conspicuous clinicians," recalled a student many years later, "…and they were largely names. They'd come out perhaps occasionally, two or three times a week for about an hour or so, but they were really in practice."<sup>9</sup> William Halsted, the brilliant but reclusive professor of surgery, went so far as to say that "laboratory men are of a higher order than the clinicians."<sup>9a</sup>

Flexner best expressed the view of those who favored fulltime in his classic report on medical education, "Carnegie Bulletin Number Four" (1910). He wrote that "there is no inherent reason why a professor of medicine should not make something of the financial sacrifice that the professor of physics makes... in order to teach and investigate." Flexner would have a clinical professor "develop—preferably in close connection with the hospital—a consulting practice, assured thus that his time will not be sacrificed to trivial ailments." There was emphasis on the educational benefit of contact with obscure problems and the conviction that "consulting practice—developed in a professional or commercial, rather than in a scientific spirit—may prove quite as fatal to scientific interest as general practice."<sup>10</sup>

Here was the heart of the matter. Flexner wished to create a

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scientific elite to teach physicians. Osler felt that such teachers could not be separated from the hurly-burly of practice, from contact with other practitioners, and from a share of the "trivial" complaints which predominate in the disabilities and suffering of mankind. He also pointed out that those who favored clinical whole-time really had no first-hand experience in the practice of medicine. Like nonpractitioners before and since, they entertained a somewhat mechanistic view of how medical care is "delivered."

One cannot fault the preclinical professors, who were receiving \$5,000 a year at Hopkins, for feeling some resentment regarding the much greater income of the clinical professors. Osler in his peak year (1903) earned \$47,275, of which \$5,000 was salary, \$5,120 came from textbook royalties, and \$37,155 from consulting practice.\*

Even more important than the discrepancies in individual income was the fear that if Hopkins did not get the Rockefeller money—a million and a half dollars, it turned out to be—some other school would be the recipient and would thereby ascend to the primacy then held by Baltimore. It was not wholly clear whether it was the reform or the money which was of primary interest to the Hopkins preclinical faculty. Dr. W. H. Howell, professor of physiology, answered Osler that clinical whole-time was the price of the Rockefeller money that the school so badly needed. "The Rockefeller people," he wrote, "…are interested in what they believe is a great reform in clinical teaching and if we do not agree with them it is likely that they will buy some other place—probably St. Louis. In which event I fancy that we will be performing as the second fiddle ten years hence."<sup>11</sup>

The full-time controversy, which Osler called "the burning question to be settled by this generation,"<sup>12</sup> did, in fact, dominate medical education for three decades prior to the second world war. The creation of a medical school at Rochester was a direct result of the effort to extend the full-time system. Flexner had encountered little difficulty in persuading the smaller schools to

<sup>\*</sup>George T. Harrell, "Osler's Practice," *Bull. Hist. Med.*, 47:545-568, 1973. Referring to "the sin of prosperity" which Flexner found so distasteful, Osler wrote that "there is much misunderstanding in the minds, and not a little nonsense on the tongues of the people about the large fortunes made by members of the clinical staff." When he left Baltimore in 1905, he had "income from investments of less than \$4,000 per year" though his total income during the sixteen-year period had been \$384,342.

establish clinical full-time, but Harvard, Columbia, and Cornell, though they desperately wanted Rockefeller money, were not so easily won over. Their size, diversity, and traditions made compliance difficult. At Columbia and Cornell the preclinical schools were physically separated from the hospitals, where the clinical teaching was done entirely by prominent practitioners, and these men were not prepared to abdicate their influential roles.

#### "A Modest but Good Institution"

Flexner conceived a flanking action to cope with this problem. Speaking of Rochester one day to Wallace Buttrick, then president of the General Education Board, he said, "it has occurred to me that if we could help to plant a first-rate medical school there, perhaps New York City would wake up." He had chosen Rochester because the University was "a modest but good institution," its president Rush Rhees ("a fine college head") was a fellow Baptist preacher whom Buttrick knew well, "and besides there is Mr. Eastman."<sup>13\*</sup>

George Eastman, the developer of flexible dry film and of the amateur's Kodak camera ("You press the button, we do the rest"), had already demonstrated some interest in health by founding free dental dispensaries for children in several American and foreign cities after observing the success of such a venture in-augurated in 1914 by the Forsyth family in Boston. Eastman hoped that other rich men would follow suit. There should be one "in every city in this country," he wrote. "They should be built and operated by government money, but until that time comes when the government can do the work, men and women of wealth must carry on."<sup>14</sup>

<sup>\*</sup>Flexner's thinking may have been turned in this direction by the following events: Dr. Harvey J. Burkhart, director of the Eastman Dental Dispensary in Rochester, read in September 1919 of John D. Rockefeller's intention to give \$100,000,000 for medical education and wrote to the General Education Board that there was a "need for an improvement in dental teaching, and it seems to me that if dental departments might be organized in strong medical colleges, it would very greatly improve the output." According to Dr. Burkhart, Eastman subsequently discussed this possibility with members of the board prior to Flexner's first solicitation of him for the Medical School. Eastman had originally become interested in free dental care through his colleague William Bausch and had concluded that for it he "could get more results for my money...than in any other philanthropic scheme I had investigated." See Harvey J. Burkhart, *Centennial History of Dentistry in Rochester*, Rochester Historical Society Publication Fund Series, vol. 13, 1934, pp. 307-309.

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Flexner persuaded Eastman to match \$5,000,000 from the General Education Board with a gift of \$4,000,000, plus the Dental Dispensary.\* During several years of planning, enough income accrued from these funds to build the Medical School with hardly a nibble at the endowment; and Rochester had a medical school.†

There can be little argument that as a result of the "full-time" controversy and the tremendous funds in search of an innovative reform, several schools were created or renewed (Washington University, Yale, Vanderbilt, Chicago, Tulane, Cornell, for example) and medical education rejuvenated. But the doubts about the strict Flexnerian full-time system for clinicians persisted and second thoughts occurred. Clinicians pointed out that it was almost exclusively those who had little or no experience in the practice of medicine who favored the idea. Shortly, it became apparent that it was too costly as well.

After three years as the first full-time professor of medicine, Theodore C. Janeway, who came to Johns Hopkins from Columbia in 1914, was about to resign when he died unexpectedly. He had already expressed great reservations over "full-time," insisting that it was fundamental for every clinical teacher to be "a practitioner of the medical art" and that no problem is solved until an experiment "has succeeded in curing the sick man. Furthermore, the clinical teacher must be ready at all times to subordinate ultimate scientific achievement to the present and pressing human problem, and, unless he is willing to do this he has no right in the clinic, but should be a laboratory worker only."<sup>15</sup>

<sup>\*</sup>That Eastman's interest in the Medical School was more than financial by this time is clear from comments in the diary of his 1926 African safari. The ship which was to take the returning group to Genoa was delayed two days. "If it is much later," wrote Eastman, "we may not be able to connect with the *Aquitania*, sailing October 16, and which is the last boat that will get us home in time for the Medical School opening...Much as I dislike functions of the kind I should be sorry to miss the Medical School formal opening by such a close margin as one boat." (George Eastman, *Chronicles of an African Trip*, privately printed, Rochester, 1927.)

<sup>\*</sup>By the time the land was bought and the original physical plant completed \$2,566,504 had been spent (6/30/1926). This seems to have included the funds given by the Strong family for the Hospital. Only \$264,226 of the capital was used, reducing the \$9,014,226 endowment to \$8,750,000. Once the School was in operation, the annual endowment income of something over \$500,000 soon proved inadequate as the size of the faculty grew. See the University of Rochester's annual treasurer's reports 1925 ff.

Janeway was not alone in his opinions. His eminent successor, G. Canby Robinson, who served as acting professor of medicine at Hopkins for only a year (1921–22), said, "No one who has had any actual experience with the university plan now holds that clinical departments are to be manned exclusively by men who have no interests outside the medical school and who do not engage in private practice...Diversity is necessary."<sup>16</sup>

By the end of the 1920s disenchantment with Flexnerian fulltime was widespread. An increasing number of speakers and writers were pointing out the economic impracticability and expressing doubts about the educational desirability of the system.<sup>17</sup> At the 1930 Congress on Medical Education, held in Chicago, there was general agreement that clinical teachers must be clinicians and that modification of the full-time plan was necessary.

Though there can be little question that it was Flexner who goaded the universities into assuming greater control over clinical faculties, his own ideas were not workable. Most schools did, indeed, come to have one or more members of their clinical faculties on strict salaried full-time, but economic reality if not pedagogical wisdom ultimately brought almost universal abandonment of Flexner's universal full-time system. Other plans were adopted, and the ones evolved at Harvard and at the University of Chicago became prototypes.

At Harvard, the strict full-time system had never been established. Harvey Cushing, trained in the Osler tradition, would not hear of it at the Brigham. "Coming from a race of general practitioners, the intimate and confidential relation between doctor and patient—one of the most precious things in medicine—was in my blood," he wrote.<sup>18</sup> At Harvard, the clinician remained within the walls ("geographic full-time") but was allowed to keep a specified amount of the income he derived from seeing private patients, the remainder reverting to the school.<sup>19</sup>

Chicago, on the other hand, provided the entire salary, but the teacher was obliged to participate in intramural group practice to generate the necessary funds. By the early 1950s 60 percent of the income of the University of Chicago Medical School came from patient care and only 10 percent from endowment.<sup>20</sup> Some saw in such a plan dangers that would "threaten the whole educational system."\*

\*"If clinical departments can successfully exploit private practice," Dock

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Rochester abandoned the strict full-time system July 1, 1930, five years after the School opened, with the consent of the General Education Board, and adopted the "Harvard" plan, in which the clinician was allowed to keep patient care income to an amount which equaled his salary.<sup>22\*</sup>

The issue of clinical full-time was not so new a matter as it seems at first glance. It was simply a new aspect of the long evolution of specialism in the teaching and the practice of medicine. In our own time this has been characterized by the development of university-controlled hospitals and graduate training programs. But it traces its ancestry to the beginnings of collegiate medical education in the late eighteenth century and has evolved steadily since then.

#### "A SAD AND MORTIFYING DISAPPOINTMENT"

Prior to the establishment of medical schools in the latter part of the eighteenth century, virtually all physicians were teachers during part of their careers; education for the profession was accomplished by apprenticeship. This prolonged relationship often had some economic reward for the physician, usually provided him with assistants, and resulted in a certain degree of professional quality control since the teacher was likely to be particular in choosing a student with whom he would be in close contact for three years. But standards of selection were not matched by quality of the curriculum.

By the late eighteenth century certain shortcomings of this system of education were becoming apparent. The brilliant but caustic Charles Caldwell, a pioneer teacher of the Ohio Valley, identified some of the problems he had encountered. About 1792, he placed himself, he later wrote, "under the tuition of a

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wrote, "one can look forward to the time when other departments will follow a similar plan. Why should not the English department take over furnishing of material for the five-cent magazine, the Sunday supplement and the movie scenario; the engineering school all sorts of building projects, railroads, bridges, sky-scrapers, etc.; the department of commerce run trust companies and banks; the law department take charge of the legal work of corporations, would-be divorcees or violators of the Volstead law; the chemical department run soap factories or chains of corner drug stores."<sup>21</sup>

<sup>\*</sup>In 1956, further clarification of the faculty compensation plan was made with specific provision for reporting income from practice and for remitting funds in excess of ceiling limits. In 1971, some departments changed to the Chicago plan, which required faculty to practice and to pay all income from patients to the university in return for guaranteed salary.
gentleman of reputation and standing...but...encountered a sad and mortifying disappointment. Though my preceptor was a man of respectable talents, and no inconsiderable stock of knowledge, and though he was exceedingly attentive and communicative to me, in conversation, that was almost the only source of which I could avail myself. He had no library, no apparatus, no provision for improvement in practical anatomy, nor any other efficient means of instruction in medicine."<sup>23</sup> Another student of the time, Samuel D. Gross, who later became one of America's outstanding surgeons, complained that he received little clinical instruction since "few of his [preceptor's] patients could be visited by an 'unfledged doctor." "\*

The first step to rectifying these deficiencies was the development of the private medical school in which a group of practitioners shared responsibility for several apprentices. This type of specialized teaching developed before there was any collegesponsored school. The private medical school provided broader intellectual experience for both student and instructor and was important in giving more adequate opportunities for dissection. Many of the private schools continued well into the nineteenth century, and some provided training which surpassed that of the collegiate schools. The Tremont Street Medical School in Boston was conducted by members of the Harvard faculty as an adjunct to the lectures at the Harvard Medical School and offered clinical and laboratory instruction until 1858, when it was absorbed into a lengthened term at Harvard. Further south, the Philadelphia School of Anatomy operated for almost a century, and few were the surgeons of prominence in Pennsylvania who had not studied there.

Further specialization of medical education resulted from collegiate sponsorship of lectures. After the organization of a medical school in 1765, under the leadership of John Morgan and William Shippen and the authority of the College of Philadelphia (predecessor of the University of Pennsylvania), there came in succession collegiate schools at New York, Boston, Hanover (N.H.), Baltimore, Fairfield (N.Y.), Lexington (Ky.), Cincinnati, Charleston, and Charlottesville. By 1840, 39 medical schools had been started and only 3 had failed. During the 1820s the

<sup>\*</sup>It was not customary for students to examine patients or assist at deliveries at this time. (Samuel D. Gross, *Autobiography* [Philadelphia, 1887], 2 vols., vol. I, p. 28.)

number of students graduating from medical schools with the degree of Doctor of Medicine rose sharply. In 1814 there were 95 such graduates, or one for every 87,000 of the population. In 1826, 533 doctors of medicine were graduated, one for every 21,000 of the population, a four-fold rate increase in twelve years.<sup>24</sup> (In 1971, American medical schools graduated one doctor for every 23,300 people.)

The fact that most of the early collegiate schools—and every one of the first ten—developed around private anatomy schools which were already operating emphasizes what an important role dissection had come to play in medicine. William Shippen, in Philadelphia; Wright Post, in New York; John Warren, in Boston; Nathan Smith, at Dartmouth; and John Davidge, in Baltimore—all were teaching anatomy privately, and it was in each case such a course which became the nucleus of the expanded curriculum sponsored by the colleges.

That it was the surgeon who gradually became the dominant figure on the American medical scene may have reflected the fact that it was his art which was first in modern times to benefit from scientific method. The introduction of practical anatomy observation of dissection performed by each student—was one of the most fundamental changes which ever came to the medical curriculum. Besides, it had practical importance. As a contemporary professor pointed out, even with "no extraordinary natural gifts" a man of good sense and sound practical anatomical knowledge could rise to "the most trying emergencies of surgical practice."<sup>25</sup>

# "The Medical Student Cometh"

Though dissection of the human cadaver was done in Alexandria in the days of the Roman Empire, and even in medieval England, it was reintroduced and knowledge of it disseminated (perhaps partly because printing had become available) by Vesalius in the fifteenth century. It remained, however, for centuries an activity restricted to a few, and it was not until the early nineteenth century that it became common for medical students to perform dissection individually. Learning anatomy was not without problems, however. At first, the only cadavers legally available for dissection were those of executed criminals. Not only did this provide a wholly inadequate number of subjects, but also it associated dissection with punishment and humilia-

tion. The resulting stigma was long a barrier to an enlightened approach regarding human dissection.\* The public, in an impressive display of inconsistency, made incompetence punishable by law while at the same time it would not allow the means of acquiring the necessary training. Efforts to substitute manikins of papier maché, or demonstrations by the professor to passive students, did not make apt practitioners.

The natural consequence of the cadaver shortage was graverobbing, and this activity was common until the late nineteenth century, a fact which led one writer to define a grave as "a place in which the dead are placed to await the coming of the medical student."<sup>26</sup> A whole subculture of popular art developed as a result of grave-robbing. A tombstone in the small village of Hoosick, in eastern New York State, tells a typical story:

> Her body dissected by fiendish men, Her bones anatomized, Her soul, we trust, has risen to God, Where few physicians rise.<sup>†</sup>

Though tales of such activities are now a source of amusement to us, grave-robbing was then a serious and unpleasant business. Violations of the churchyard added to the already unsavory reputation of medical students for rowdyism and incurred disrepute for medical schools, which were not considered community assets in those days.<sup>‡</sup> Schools invariably went out of their way to reassure local citizens regarding this activity by implying that their cadavers were imported from afar. A school in southern Vermont spoke of seaport towns, intending, no doubt, to conjure up visions of sailors killed in tavern brawls in Boston or New York. But it was, in fact, the local grocer, a medical school trustee, who imported the bodies, in barrels marked whiskey, from the nontidal Hudson River towns of nearby Troy and Albany.

In 1820, New York State broadened its law to permit the

<sup>\*</sup>This had not been the case in France, where cadavers were legally available in abundance. This may have been responsible, at least in part, for the developments in medicine which made France the world leader in the early nineteenth century.

<sup>&</sup>lt;sup>†</sup>The facts were simple: Ruth Sprague, aged nine years, had died on June 11, 1846, and was buried, only to be almost immediately (and surreptitiously) disinterred for the purpose of dissection by one Roderick R. Clow, a medical student in the nearby office of Dr. P. M. Armstrong. Dr. Clow later had an honorable career as a practitioner in New York City.

<sup>&</sup>lt;sup>‡</sup>On the other hand, the citizens of Auburn considered themselves most fortunate to have the state prison built there in 1820.

body of any prisoner dying and remaining unclaimed for twentyfour hours to be used for instructional dissection. Other states followed, and in 1831 Massachusetts pioneered a broad provision for the use of any unclaimed body to be buried at public expense. New York did not have a similar law until 1854, and these two states were the only ones to make and sustain adequate provision for this important part of medical education prior to the Civil War. Even then the motivation of the lawmakers was as much economy in disposing of the bodies of the increasing number of paupers as it was improvement of professional education. The matter of anatomy instruction illustrates the recurring conflict between the needs of science and the prejudices of society.

The purpose of the early collegiate schools was to provide didactic lectures, anatomy facilities, a library, and a pathology museum of sorts. Lecture subjects usually included anatomy and surgery, chemistry, medicine (then called theory and practice of physic), therapeutics and materia medica, obstetrics and diseases of women and children. Dissection of a cadaver was the only laboratory experience for the student, and even that, though popular, was not obligatory in most schools of the time.\* Chemistry was inorganic and descriptive; it consisted of demonstrations by the professor. Physiology had not evolved as a separate subject. Great emphasis was placed on botany and regional plant life in the hope it might have medicinal uses.

The school term was three or four months, starting in November. The winter months were probably no more a concession to agricultural necessity than to the fact that dissection of the fresh, unpreserved, unrefrigerated cadaver was less distasteful in cold weather. Even then it was an unpleasant orgy lasting but a few days. The main part of the course was a series of daily lectures in each of the various disciplines, one after the other, and these identical lectures were repeated annually. The degree Doctor of Medicine was awarded after a student had attended two fourmonth lecture courses and completed three years of apprenticeship with a reputable physician. Because there was no grading of

<sup>\*</sup>By 1849, 17 schools, including Geneva, Buffalo, and all but 2 of the 12 southern schools (where cadavers were most available), required that students do dissection. It was not required at any New England school, or at University of Pennsylvania or Jefferson. See *Trans. American Medical Association*, 1849, pp. 284–299.

the curriculum, students often went to a different school the second year. Many students were able to afford, or felt the need for, only one year of school, and it was not until the 1830s, when the M.D. degree became in many states itself sufficient license to practice, that it achieved great popularity.

Though such an educational system may seem unattractive in today's view, it had many good points and was an improvement over the apprenticeship alone. In the early years (1765-1840), the school did not replace but rather added to the apprenticeship, and it was the apprenticeship which remained the fundamental three-year clinical experience. The school provided more informational instruction than most preceptors had time, inclination, or ability to give, and a more extensive library than was usually available in a practitioner's office. It offered social contact among students, which meant, to some degree, intellectual and academic competition, and which created a basis for subsequent participation in a professional organization. The educational standards were high in the early years of the nineteenth century. Most students had a "good English education" and many, especially in the cities, had college preparation, which was then unusual among the population at large. Though many of the "country" schools, such as those at Dartmouth, Fairfield, or Berkshire, provided no clinical facilities, they did provide instruction for a large number of local youths who did not have access to metropolitan schools and who would otherwise have had nothing but a preceptorial. Even in the cities, where clinical exposure was available in hospitals, the experience was elective and didactic.\*

There were drawbacks, of course. As it became more common to attend the medical lectures, the status of the practitioner-preceptor as a teacher diminished, and he became isolated not only from an educational process in which he himself had benefited but also from significant participation in the selection of students. As the century progressed, the preceptorial became a meaningless charade sanctioned by law and perpetuated by the school; students frequently came to medical school with no more qualifi-

<sup>\*</sup>Though students had been able to question and examine patients on the professor's rounds during the late eighteenth century in a school like Pennsylvania, this privilege was soon abandoned in favor of the clinical lecture as the class size became unwieldy. Significant clinical training was provided by many of the private medical schools in metropolitan areas. These were usually group tutorials conducted by faculty members as an adjunct to the lecture course.

cation than ability to pay tuition and no more than nominal sponsorship by a preceptor. This delegation of responsibility to the school, which the school was unprepared to assume, was the most serious flaw in the system. The situation was further aggravated as various states, in the 1820s and 1830s, made the medical diploma equivalent to a license as an incentive to encourage student attendance. This compromised the power of professional societies, whose censors had previously been the sole arbiters of licensure. At the same time the prestige of the professional teacher grew.

## "People Should Pay for What They Want."

As the nineteenth century progressed, medical education deteriorated. Earlier the profession had attracted capable men, many of whom saw in it a means of acquiring education at modest cost and who went on to become community leaders. Following the War of 1812, massive trans-Appalachian migrations began from the well established colonial seaboard societies into New York. Ohio. Kentucky, and the rest of the northwest territory. By 1830, onethird of the nation's population was beyond the mountains. In the north these immigrants, who preceded the waves of Irish and Germans soon to come, were mostly Calvinist Yankee farmers who had failed to thrive in the pre-Revolutionary economic hierarchies of the east. Protestant, predominantly fundamentalist, and egalitarian in outlook, they found intolerable the prospect of anything privileged or established, whether it was religious denomination, social group, or professional system. In addition, it was difficult for these people to appreciate the necessity of education in the practitioner, whose results were often indistinguishable from a neighbor herbalist.

The sectarianism which became characteristic of religion in rural America was no less apparent in medicine, and a lower-class movement of botanic or Thomsonian practitioners became powerful between 1820 and 1845. That this movement had antiprofessional implications beyond medical therapeutics is clear from some of the doggerel published in 1824 by its leader, Samuel Thomson, in a pamphlet entitled *Learned Quackery Exposed*:

> The nests of college-birds are three, *Law, Physic* and *Divinity*. And while these three remain combined, They keep the world oppress'd and blind.

These wholly untrained, uneducated practitioners attracted enough support—especially in New York, Ohio, and Georgia, areas in which a yeoman population predominated—to challenge the exclusive rights conferred by medical licensure laws. In some states the established (regular) profession itself supported the abolition of licensure laws in preference to seeing their botanic competitors given formal legal recognition through the separate licensure those practitioners were so persistently demanding.

Between 1830 and 1846, by popular demand, almost every state abolished restrictive laws on who might practice medicine, and free trade came to medicine. Thereafter, anyone could charge (and sue) for his healing services and be liable only for negligence or malpractice. This was a serious blow to established professional societies. Without licensure leverage and the moral authority societies had hitherto enjoyed, their ability to attract new members diminished, as did their income. Many societies adjourned *sine die*, not to be reactivated for decades.

Demoralized, the medical profession proceeded to organize a national society, the American Medical Association. Though the expressed purpose of this organization was to improve medical education, it was singularly ineffective in this goal until early in the twentieth century. Instead, its energies were directed toward the struggle for economic survival vis-à-vis sectarian physicians, by then primarily the homeopaths, who had become numerous in mid nineteenth century. By 1855, a loyalty oath—a promise not to consult with unorthodox (i.e., homeopathic) practitioners—became mandatory for good standing in the AMA.

After 1840, not only the number of medical schools increased rapidly (at least 255 were started between 1840 and 1900) but also the number which failed or were merged. In a profession which continued to resist specialization or differentiation, one of the ways to professional fame and fortune was to become a professor. Though diploma mills designed to make a profit for their promoters were not uncommon, there were also a lot of legitimate but inadequately funded schools designed to promote the local professional stature of their faculties. Once legal recognition of a "regular" medical profession ended, the state could no longer continue to provide financial subsidy to "regular" schools and withhold support of sectarian institutions. Faced with this dilemma, legislatures stopped all direct support of medical education. Having provided at least \$750,000 to American medi-

cal schools between 1804 and 1861, about 25 percent of total income of the schools, the public now left schools to go their own way, depending solely on tuition.<sup>27</sup> Medical education deteriorated even in the best schools, chiefly because the ability and preparation of the candidates declined. At Harvard, for example, the number of medical graduates with baccalaureate preparation, which had averaged over 60 percent prior to 1840, dropped to 25 percent in the three decades thereafter, reaching a nadir of 14 percent in 1860. At other schools the record was even worse and did not improve until the end of the century.

By the middle of the century an increasing number of general hospitals were being opened, and public appropriations were directed toward them, partly in the enduring hope that through medical care the problem of poverty might be resolved. It is not surprising that medical education became more hospital oriented. Hospitals provided the first subsidized laboratories for medical education, and for several decades in midcentury their presence was the only way in which medical education benefited from tax support. It is hardly surprising that the basic sciences which had been stressed at an earlier time declined and that medical education took a turn toward pragmatism. In spite of the major developments occurring in the science of medicine—physical examination, pathophysiologic correlation, numerical analysis, anesthesia, sanitation, and asepsis—the trend away from investigation and toward applied science continued.

This was but one aspect of deterioration. Medical students, always of rather unsavory repute—whether for rowdyism, brawling, drinking, whoring, or grave-robbing—became even less desirable citizens. The peculiar penchant for public hilarity of Virginians attending medical school in Philadelphia earned for all medical students the derogatory appelation of "Ginny students,"<sup>28</sup> and a local newspaper called them ignorant and licentious.<sup>29</sup> A quarter century later, a writer in *Harper's* reaffirmed these opinions. "The presence of medical students is not considered a desirable element in many large cities. They are apt to be lawless, exuberant, and addicted to nocturnal disorders."<sup>30</sup> Not a few were the riots, large and small, proceeding from medical student activities.

In an effort to improve this image, a group of students at the College of Physicians and Surgeons in Chicago organized an honorary fraternity, Alpha Omega Alpha, to encourage its members "to avoid that which will make them unworthy of their calling." (The letters AOA are the initials of the key words in the phrase meaning "to be worthy to help the poor.") At the organizational meeting a speaker had noted the lack of honesty among medical students, the need of "nailing" securely all articles of value, and the general lack of scholarship. As the selection of medical students became more stringent, emphasis on scholarly attainment and future promise gradually increased. Chapters were organized in other schools and by 1906 they were functioning in Cleveland, Philadelphia, Boston, Baltimore, St. Louis, and Toronto.<sup>31</sup>

## "THERE IS A NEW PRESIDENT."

With the accession of Charles W. Eliot to the presidency of Harvard, significant reform in medical education began to take place, gaining real momentum after the opening of the medical school at Johns Hopkins University in 1893. During the fifty years before the organization of the medical school at Rochester, the whole system of American medical education was restructured and the pattern designed which persists today. This reformation was possible because licensure requirements were reimposed and huge financial subsidies were provided.

Prior to 1870 there had been many attempts to introduce reforms, and there was no lack of recognition as to what changes were needed. Almost invariably, however, the efforts failed, victim of the style of the time and the economic pressure of competitor schools which did not follow suit. When reforms did come, at the end of the century, it was not new revelation which made them possible: it was money with which to pay for them.

As early as 1808, Dr. Nicholas Romayne, in his first annual report of the College of Physicians and Surgeons in New York, called upon the state legislature for endowment, noting that the maintenance of liberty required an informed citizenry and proposing what was then a new idea, that basic science instruction be developed in medical schools. Twenty-four years later, Daniel Drake, in *Practical Essays on Medical Education*, called upon legislatures to provide endowment for the medical schools they chartered so that the professors might do research. Throughout the nineteenth century the traditional addresses given by professors at the annual opening of medical schools reiterated the need for endowment funds so that the term might be lengthened,

the faculty selected on merit, or so that the course might be graded. But the funds did not appear, and one had to be practical. As Oliver Wendell Holmes pointed out, it was unreasonable to expect a school to commit suicide for the sake of reform.

There was no lack of attempts to institute reforms without financial subsidy. At a conference of northeastern medical schools held in Northampton in 1827, it was agreed to extend the course to three years; when the time came, however, no school was prepared to take the lead in doing so. Two decades later, the American Medical Association, founded for the express purpose of improving medical education, appointed a committee which studied the problem and proposed sweeping reforms, which were supported. The effort was not notably successful, however, until the twentieth century. A half dozen schools, including the one at Buffalo, extended their terms from four to six months, only soon to retreat to their original way.

The proposals of the American Medical College Association met a similar fate. After this organization, which existed from 1876 to 1889, advocated a three-year, graded course with sixmonth terms, enthusiasm waned and the membership gradually dwindled. It was not until states began to set up legal requirements regarding medical education that the reorganized group, now the Association of American Medical Colleges (1889), met with success. Only Michigan, a tax-supported school, had been able to continue its system of part-time salaries to the faculty, and at Lind (predecessor to Northwestern) a graded two-year curriculum was continued after 1859. One other noteworthy reform, which continued from 1857 until the closing of the school in 1870 (closed also from 1861-65), was a clinical clerkship at the New Orleans School of Medicine. Though it was William Osler who permanently established the clinical clerkship during his years at Hopkins, Erasmus D. Fenner, professor of theory and practice of medicine at New Orleans, was probably ahead of him.\*

<sup>\*</sup>Annual circular and catalogue of the New Orleans School of Medicine, June 1860, p. 8: "The plan consists in placing each student in charge of a patient, and requiring a minute record of the case from the beginning to the end. For the assistance of the Student, printed blanks are furnished, containing necessary questions relative to the *origin, previous history, diagnosis, treatment,* etc. A narrative is thus kept, and read aloud by the Student when the Professor reaches the bed at his morning service. Errors and omissions are then pointed out, the Professor offers any remarks which may be deemed appropriate, and thus the Student finds himself at once learning *what to observe* 

Even the attempt to admit women into the medical schools was not very successful, partly because the chief proponents were dissenters, both religious (Quaker) and professional (Eclectic).\* In 1849. Elizabeth Blackwell, daughter of English Dissenters, was the first woman to graduate from an American medical college. She had applied to many and was finally accepted at a "country" school, Geneva Medical College, after the students had voted in favor of her admission. "One of the radical principles of a Republican Government," they resolved, "is the education of both sexes; that to every branch of scientific education the door should be open equally to all."<sup>32</sup> Economic pressure may have played a role in this innovative undertaking. The enrollment at Geneva had dropped from 183 students in 1844-45 to 101 in 1849-50, largely, no doubt, as a result of the opening of a medical school in nearby Buffalo, in 1845. After Miss Blackwell, no more women were graduated for sixteen years at Geneva.

From May 1849 until 1852, when it moved to Syracuse, the Central Medical College, an Eclectic school, functioned in Rochester and awarded M.D. degrees to several women. Sarah Adamson (M.D., 1851), a Friend from Philadelphia, was the second woman to graduate from an American medical school.† The only "regular" medical school which graduated a substantial number of women was Western Reserve. Between 1852 and 1856 it awarded M.D. degrees to six women.‡ Medical coeducation came to a halt after 1856, when the American Medical Association resolved against it. Except for one woman who graduated from the dying Geneva Medical College in 1865, it was not until 1871 that

- \*Eclectic physicians, like their Botanic predecessors and homeopathic contemporaries, were usually trained at separate, though not necessarily inferior, schools. They were eclectic in their use of therapeutic modalities from any medical system or sect, including homeopathic or Botanic, and were, consequently, viewed as "irregular" by the main body of medical practitioners.
- †She was also the first to serve an internship (at Blockley Hospital in Philadelphia). She later married one of her professors and practiced medicine in Rochester until 1910.
- <sup>‡</sup>Including Elizabeth Blackwell's sister Emily, who, with Mary Putnam Jacobi, was the driving force of Woman's Medical College of the New York Infirmary, and Cordelia A. Greene, who operated a famous private medical sanitarium at Castile, N.Y., for many years.

at the bedside of the sick, and the proper method of taking notes." Though the techniques of auscultation and percussion developed by Laennec and others and of thorough anamnesis taught by P. C. A. Louis were brought back to America by graduate medical students in the 1830s and 1840s, this is the earliest clear application to undergraduate teaching in the United States.

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coeducation was reestablished, at the University of Michigan.\*

In the meantime, medical schools for women only had been started in the early 1850s in Boston and Philadelphia, but only the Woman's Medical College of Pennsylvania, which survived to our own time, was considered a "regular" school.† The New England Female Medical College was absorbed into the subsequently coeducational homeopathic Boston University School of Medicine. The other medical department for women was part of the short-lived Eclectic Penn Medical University. For a long time women doctors had a segregated role in American medicine, dealing mainly with women and children—especially as medical missionaries to the Orient, where male physicians were proscribed to women.

In spite of these notable attempts at reform, no school had proposed, instituted, and successfully sustained reforms of such a sweeping nature as those envisioned by Harvard's President Eliot. "The whole system of medical education in this country needs thorough reformation," he wrote in his first annual report (1869–70) to the Board of Overseers. What Eliot started embodied the reforms of the next half century and reached full realization a quarter of a century later, when Johns Hopkins was able to add the prerequisite of a baccalaureate degree for matriculants and a fully salaried preclinical faculty.

It came as a bit of a surprise when the new president, contrary to custom, not only accepted the perfunctory invitation of the medical faculty of Harvard to attend its meeting in the fall of 1869 but proceeded to assume the chair. American medical faculties had always been virtually autonomous. Only the name and degree-granting authority cemented nominal relationship between university and medical school. The medical faculty ran its own affairs, academic and financial. An unsalaried self-supporting faculty is an independent faculty.

Eliot proposed to change all of this—to have the university assume control both of curriculum and of finances, to increase the course from two to three years, to grade the course, to increase the term from four to ten months by assimilating the summer

<sup>\*</sup>Coeducation was late in coming to the older established medical schools; U. of Pennsylvania, 1914; Columbia P&S, 1917; Yale, 1917; U. of Maryland, 1921; Harvard, 1945. See G. W. Corner, *op. cit.*, p. 249.

<sup>&</sup>lt;sup>‡</sup>In 1970, this school started to admit men and, shortly, dropped "Woman's" from its title.

clinical term (a vestige of the old apprenticeship) into the school year, to have the university treasurer collect the tuition, and to pay the professors a salary. Entrance requirements would be increased (for example, matriculants with B.A. degrees at Harvard rose from 15 percent in 1860 to an average of 50 percent between 1872 and 1892) and written examinations instituted (in spite of the dire assertion of the faculty that some students could not write).

Not unlike faculties probably before and certainly since, some members were disgruntled. "How is it, I should like to ask, that this Faculty has gone on for eighty years managing its own affairs and doing it well...and now, within *three or four months*, it is proposed to change all our modes of carrying on the school? It seems very extraordinary and I should like to know how it happens," asked one professor. Eliot replied: "I can answer Dr. Bigelow's question very easily: There is a new President."<sup>33</sup>

Oliver Wendell Holmes, the professor of anatomy, wrote a friend a couple of years later that Eliot had "turned the whole University over like a flapjack. There never was such a *bouleversement* as that in our medical Faculty. The Corporation has taken the whole management of it out of our hands, and changed everything."\*

# "More or Less Profit to the Professors"

Eliot's plan could not have been assumed without trepidation. The productive endowment of Harvard Medical School in 1874 was only \$40,000, and while this was larger than that of any other medical school (most had none) it nevertheless did not offer much security. Eliot recognized this critical factor and expressed regret that endowment was not sufficient to make Harvard "practically independent of the number of its students."<sup>34</sup> "A liberal endowment of the School would insure the complete success of the undertaking, and would encourage other schools to imitate

<sup>\*</sup>Holmes continued: "We are paid salaries, which I rather like, though I doubt if we gain in pocket by it. We have, partly in consequence of outside pressure, remodeled our whole course of instruction. Consequently we have a smaller class, but better students, each of whom pays more than under the old plan of management. It is so curious to see a young man like Eliot, with an organized brain, a firm will, a grave, calm, dignified presence, taking the ribbons of our classical coach-and-six, feeling the horses' mouths, putting a check on this one's capers and touching that one with the lash..." (Morse, Oliver Wendell Holmes, pp. 190–1.)

the good example. There is no department of the University upon which money can be more worthily or more usefully bestowed; none in which endowment funds would have more immediate or more lasting effects to advance learning, and to relieve the sufferings, and promote the happiness of mankind<sup>35</sup>...The ignorance and general incompetency of the average graduate of American Medical Schools, at the time when he receives the degree which turns him loose upon the community, is something horrible to contemplate...<sup>''36</sup>

By the following year it appeared that the reformative effort might succeed. Though the number of students had dropped from 301 to 170 and tuition income declined from \$27,700 to \$22,300, the expenses also dropped and the deficit was only \$1,400 in spite of paving faculty salaries. The \$3,000 income from endowment provided a critical 12 percent of the budget (which is about what it provides at Harvard today, having been as high as 76 percent in the 1920s). In spite of his theoretical reason for making the changes, Eliot was no dreamer. "Certainly," he wrote the Overseers, "the example set by this School will be sooner imitated, if it shall appear that the new system is more profitable than the old to medical professors, as well as more advantageous to medical students; for while American medical schools are conducted on the principles which now commonly prevail in their management, the question of more or less profit to the professors is one not likely to be overlooked."37

Endowment was of central importance from 1870 until the Great Depression. During this period, the interest of philanthropists was attracted away from the next world toward this one. In 1880 there were 142 theological schools in the United States, with productive funds of over \$8½ million, 158 endowed chairs, and income of \$115 annually per student from endowment. At the same time, 72 regular medical colleges had capital funds of a little over \$200,000, 9 endowed chairs, and with 10,000 students negligible income from endowment.<sup>38</sup> As late as 1890 there were only 8 medical schools with endowment of as much as \$20,000.

About 1908, the magnitude of philanthropic gifts to medical schools rose sharply and by 1913 had surpassed in amount those given annually to seminaries. By 1926, at least 26 private medical schools had productive funds of more than \$100,000 and 17 of these had more than \$1,000,000. Fourteen state schools had

annual appropriations of at least \$50,000. It is not difficult to correlate changes in fame with those of fortune among the schools of the time. Those which were successful in attracting and conserving financial resources survived; those which were not successful faded. It was the recognition of this fact which had, no doubt, prompted Dr. Howell's rebuttal to Dr. Osler regarding clinical full-time at Hopkins. (See p. 9.)

The accumulation of such resources made it financially possible to restrict medical school enrollment, hitherto virtually open to all. This, in turn, made the establishment of stricter entrance requirements realistic. The smaller student body made the long-sought laboratory instruction, with individual student participation and full-time salaried faculty, a reality at last. By 1920, the number of medical schools and of medical students had each fallen to half the number in 1900. During the same period, the annual income per medical student at the disposal of the parent collegiate institution rose from \$40 to \$700 (Figure I).

From the beginning, Harvard had (and has to this day) the lead in financial resources. Its endowment antedates the organization of the school (1783), dating back to the gift of  $f_{1,000}$  from Ezekiel Hersey, a physician of Hingham, Massachusetts, to provide chairs of theory and practice of physic and of anatomy and surgery. But in the twentieth century Harvard's slow and steady pace was challenged. Old, established schools like Yale, Columbia, and Western Reserve jumped into the race and new ones like Cornell and Johns Hopkins appeared.

Cornell's medical school was virtually the gift of Col. Oliver H. Payne, a former colleague of John D. Rockefeller. From the time the school was started in 1898, Mr. Payne provided it with \$100,000 income annually, up to 80 percent of its budget, until 1913, when he gave it \$4.4 million outright. With this one gift Cornell almost exceeded Harvard's endowment effort of a century and a half.

It was, however, Johns Hopkins which was to provide the greatest challenge, holding always high—and for a while highest —the torch of reform. It was Hopkins which became the prototype of the early twentieth-century medical schools. Johns Hopkins, bachelor Quaker merchant of Baltimore, died in 1873 and left \$3,500,000 to build a hospital and another \$3,500,000 to establish a university including a medical school, of which the hospital was to be an integral part. As a result of a decline in the value of



Graph illustrating the temporal relationship between declining medical school enrollment, decreased number of schools, increasing medical school income, and better educational preparation of matriculants. Note that enrollment had already declined about 25 percent before 1910. Broken line for "total income of schools" signifies that no published data are available after 1916 except for 1926-27. (From E. C. Atwater, op. cit., p. 65.)

the Baltimore and Ohio Railroad stock which had made up the university's legacy, the start of medical instruction was delayed until 1893. Even then it was possible to open the medical school only as a result of a gift of \$500,000, which was contingent on equal admission opportunities for women. Strong faculty opponents to this condition shortly became pioneer reformers in the face of economic reality.\* Probably more important was the requirement that students have a baccalaureate degree and the provision of salaries sufficient to employ the services of preclinical faculty full time.

The last decades of the nineteenth century saw not only the start of a major change in the financing of medical education but also the reenactment of legal restrictions regarding who might practice medicine. Between 1875 and 1900, almost every state organized boards of medical examiners and began to establish and enforce standards of professional education. Unlike the earlier period when enforcement was the responsibility of the professional societies, government now assumed this task. The bitterness and intensity which had characterized the relationship between "regular" and homeopath began to fade. This was due partly to the de facto recognition of the homeopaths' claims to legitimacy by establishing separate boards of medical examiners for them. It was also helped by the reluctant acknowledgement that homoeopaths had popular support among the prosperous.†

The end of the century saw also an increase in the number of endowed professorial chairs, the start of research laboratories, provision for scholarships, and the laboratory instruction of students. Until after the Civil War, no medical school but Harvard had an endowed professorship, and that institution had already

<sup>\*</sup>In his letter of 1911 to President Remsen regarding clinical whole-time, Osler alluded to this. "We are all for sale, dear Remsen. You and I have been in the market for years, and have loved to buy and sell our wares in brains and books—it has been our life. So with institutions. It is always pleasant to be bought, when the purchase price does not involve the sacrifice of an essential—as was the case in that happy purchase of us by the Women's Educational Association..." Osler is here referring to the "Women's Medical School Fund." (William Osler, quoted in Chesney, *Johns Hopkins*, vol. 3, p. 182.)

<sup>&</sup>lt;sup>†</sup>The refusal of conventional physicians to consult with homeopaths had become obligatory after an AMA loyalty oath was approved in 1855. Such refusal naturally excluded homeopaths from hospital staffs and hence deprived them economically. The return of amity followed the development of homeopathic hospitals in the 1880s and 1890s.

five. In the late 1850s, the New England Female Medical College was given funds which ultimately provided two chairs. Between 1876 and 1905, Pennsylvania, Yale, Western Reserve, and Columbia were also given funds with which to endow chairs.

Though experimentation in physiology was undertaken in medical schools prior to the Civil War—John C. Dalton, Jr. was using vivisection in his physiology course at the University of Buffalo Medical School in 1852<sup>39</sup>—the first major laboratory for the investigation of physiology was established at Harvard in 1871 in memory of George Woodbury Swett, who died in 1869, a year after his graduation from the medical school. Under the direction of Swett's classmate, George Pickering Bowditch, the laboratory became famous. By the 1890s, Michigan, Hopkins, Pennsylvania, and Columbia also were able to start research laboratories, in each case as a result of endowment.\*

Laboratories for student instruction have a much longer history. For over a century, American schools consisted simply of a lecture hall and dissection facilities. Though many schools did not require individual performance of dissection, this activity was always a major attraction of the early schools. In 1848, John C. Warren, the professor of surgery at Harvard, gave a substantial sum to endow the museum of pathological specimens. During the 1870s both Columbia and Pennsylvania provided laboratory facilities for the instruction of students in pathology, bacteriology, and physiology; although histology was the only required laboratory work at Pennsylvania, physiology was a popular option-experimental on frogs, observational on students.<sup>40</sup> In the 1880s both Bellevue Hospital Medical School (an NYU predecessor) and Western Reserve had student laboratories; like the earlier ones, however, these too were used primarily for histology. The microscope, which had been in increasingly common use after the 1830s, had remained a toy-in the words of Oliver Wendell Holmes -until after the Civil War.

The first two decades of the twentieth century saw not only the development of geographically full-time faculties but an increasing number of university-controlled hospitals in which a full-time clinical faculty might have patient beds at its disposal. The number of medical students and medical schools dropped

<sup>\*</sup>Independent research institutes were also being established at this time: Pasteur, 1886; Koch, 1891; Rockefeller, 1901.

markedly\* and the educational prerequisites again rose,† each concurrent with a marked increase in the income available to some medical schools as a result of private philanthropy (Figure I). The American Medical Association again became active, and now effective, in educational matters after its reorganization in the early years of the twentieth century and the creation of its Council on Medical Education. Graduate education became more common, starting with an internship for most graduates and continuing to specialty training for an increasing number.

By 1920, the pattern of undergraduate medical education was established which has continued to the present day, albeit with modifications. The years since 1920 have been most notable for development of graduate education and increasing university domination of medical education. The universities have not shown comparable interest or provided similar leadership in postgraduate (or continuing) education of practitioners, but society itself has not yet provided the demand nor the support for such an undertaking. As the pace of technological change increases, the continuing education of physicians has become the weakest link in their training.

The influence of public opinion and economics on medical education is impressive. Though science often influences public hopes and expectation, it alone does not determine the character of medical practice. Major advances in scientific technology were occurring prior to and throughout the nineteenth century as medical practice and medical education were deteriorating. Vaccination to prevent smallpox was available. The development of the stethoscope by Laennec in 1819 laid the groundwork for physical diagnosis, which brought experimental method to the bedside. The correlation of the observations so obtained with a history of

<sup>\*</sup>The number of schools had reached a high-water mark between 1900 and 1905. In the latter year, Dr. Nathan Colwell, secretary of the American Medical Association's new Council on Medical Education, inspected and graded each of the nation's medical schools, sending a confidential report of his findings to each school. Five years later, after Abraham Flexner repeated this work with the help of Dr. Colwell, the findings were made public. Such publicity proved to be the coup de grace for the poorer schools. Equally important was the relative disadvantage of those schools which did not receive Rockefeller favor and funds. The trend of closings and mergers which began in 1905 continued until, by 1925, the number of schools was less than half. †In 1906, only 5 of 162 medical schools required as much as two years of college preparation. By 1918, 80 of 89 schools had established this standard. In many cases, however, state law had made the improvement mandatory.

the patient's symptoms and a pathological examination after death greatly expanded the concept of the natural history of disease; these data, in turn, when subjected to the numerical analysis developed by Louis, led to new and more conservative concepts of therapy with a consequent decline in bleeding and purging. Physiology was developing under the leadership of men like Beaumont, Dalton, Pasteur, Bernard, and Bowditch, as was pathology, with Virchow, or biological chemistry, with Liebig. Popular movements for reform in dietary and general living habits-temperance societies, the water-cure, the manufactured breakfast food, comfortable clothing, better ventilation-proliferated. Invasive surgery became possible as a result of better knowledge of anatomy, of anesthesia, and later of asepsis. The reduction of malaria and vellow fever by draining swamplands of the South and the reduction of typhoid and cholera by the concurrent development of central water supplies were accomplished; central water supplies provided not only clean water to drink but also enough water to permit a running sewer, an indoor toilet, the abolition of the privy, and better fire protection.\* While all of these innovations were occurring, medical education was withering. Its recovery at the end of the century was the direct result of private philanthropy, and it was on that wave of optimism that the medical school at Rochester was born.

When Dr. George Whipple and his classmates said goodbye to Dr. Osler at commencement seventy years ago, they did not know that most of them would live to see strict clinical full-time faculties come and go. The dilemma of the teacher as practitioner and investigator remains unsolved. The medical instructor has continued to become a more specialized person, the teaching participation of the practitioner has further diminished, and the isolation between professor and practitioner has increased.

At the same time, the intellectual standards and technological capabilities of the profession are the highest they have ever been. The willingness of the public to provide tax support for research programs and to evolve third-party payment systems for medical care brought still another major change to medical education by making the profession financially and socially more desirable, the demand for membership greater, and the selection process

<sup>\*</sup>The sharp rise of fire insurance rates after the Great Fire of Chicago in 1870 and a serious fire in Boston the following year probably provided greater stimulus than health factors in building municipal water systems.

more rigorous. Those who join the profession really determine its character, and those who are attracted are, in turn, strongly influenced by what the public hopes for and is willing to support.

More than two centuries have passed since the first professor of medicine in America, John Morgan, of Philadelphia, enumerated what he considered essential features of a medical school. A student, he wrote, should have a background of liberal education. The curriculum should be graded, starting with anatomy and progressing to clinical instruction, which should include hospital experience. A medical school should be part of a university or college and the teachers should have time to do research.<sup>41</sup> What he was describing was, of course, the system he had known at Edinburgh, where he had been a student.

A long time passed, however, before these things all became a part of American medical education, and the evolution has not always been toward improvement. Though liberal education had been the fact in early years, it disappeared during the middle of the nineteenth century, to return only in the twentieth. Though a graded curriculum had existed at the University of Pennsylvania prior to the American Revolution, this had been abandoned, repetition being used as a substitute for textbooks, of which there was a shortage.<sup>42</sup> It was not until 1859 at Northwestern that the graded curriculum was successfully reinstated. Clinical experience, once substantial, deteriorated after the 1820s, when classes became too large and clinical lectures given in amphitheaters were substituted. Though clinical experience for selected graduate students was not uncommon, and certain schools-like the New Orleans School of Medicine after 1857-provided individual clinical experience for undergraduates, it was probably not until Osler took students on the wards in the 1880s that clinical experience became an established pattern.

Though medical schools were nominally part of universities from the first, in 1765, it was not really until 1870, when Eliot imposed university authority on the Harvard Medical School, that this became a reality. In the matter of research, a system of faculty salaries starting with Michigan in 1850, progressing to full-time preclinical salaries at Hopkins in 1893, and, in most schools, to Harvard's geographic full-time system for clinicians has permitted the professor time for study, investigation, and writing.

The school at Johns Hopkins conceived by Daniel C. Gilman

was really the first to include all five of John Morgan's points, though Harvard was moving in the same direction at an earlier time. Many are the schools which were modeled in the Hopkins image. Rochester was among the first.

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# Foundation and Earliest Years



# George W. Corner, M.D.

George W. Corner was the first member appointed to the faculty in 1923, after the dean and the director of the Hospital. Born in Baltimore, December 12, 1889, he attended the Boys' Latin School in that city, and Johns Hopkins University, where he took his A.B. in 1909 and M.D. in 1913. After his internship in gynecology at Johns Hopkins Hospital, he was assistant professor of anatomy at the University of California, then associate professor at Johns Hopkins Medical School.

At the University of Rochester he devoted his research to the anatomy and physiology of reproduction. This work culminated in 1929-30 in the isolation of the hormone progesterone, achieved with the collaboration of Willard M. Allen, M.D. (Rochester, 1932). Other researches dealt with the reproductive cycle of the rhesus monkey and the human cycle.

Dr. Corner returned to his native city in 1940 to become director of the Department of Embryology of the Carnegie Institution of Washington (laboratory at Johns Hopkins Medical School). Retiring from that post in 1956, he spent five years in New York writing a history of the Rockefeller Institute for Medical Research. At present he is executive officer of the American Philosophical Society, in Philadelphia. Through all these years he has maintained deep affection for Rochester and warm friendship with Dean Whipple.

Dr. Corner is the author of 14 books and more than 200 papers on endocrinology, embryology, the history of medicine, and scientific biography (including a biography of Dr. George H. Whipple).

W<sub>HEN</sub>, in 1910, Abraham Flexner startled and shocked the medical and educational leaders of America by his epoch-making report to the Carnegie Foundation for the Advancement of Teaching, entitled *Medical Education in the United States and Canada*, he did not stop at merely announcing the weakness of the majority of our medical schools. The farsighted trustees of the Rockefeller-supported General Education Board called him to their staff in 1912 and by 1917 he was the board's secretary and chief executive, empowered to spend millions for the improvement of medical education.

Flexner's plans for reform called for supporting five or six new or reorganized schools, strategically located in various parts of the country, one of them to be in New York State. His study of the situation had convinced him that the universities having medical schools in New York City were not ready to administer a school of the true university type he was calling for. The situation in Upstate New York was somewhat more promising. Syracuse University had a medical school integrally associated with its college of arts and sciences that might be raised to a true university level. Albany and Buffalo then had medical schools of the proprietary sort, loosely affiliated with the local universities. Flexner's first proposal was that these should be closed and support given to Syracuse. He concluded, however, that Syracuse University could not, at that time, provide either adequate leadership for the necessary reorganization, or local funds to match what the General Education Board might contribute.

He turned therefore to Rochester and to its small but excellent college headed by an able president, Dr. Rush Rhees, who, said Flexner, speaking for the General Education Board,

belongs in our judgment to the small group of eminent administrators who have clearly defined their objects and who have by a substantial educational success won the confidence and esteem of all critical students of higher education in America...Because the University of Rochester is sound to the core, because it is in

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competent hands, because it will take no forward step unless the ground is firm beneath its feet and the necessary means absolutely assured...in Rochester there is an opening for a school of the highest character.

Rochester had also the other necessary asset, a source of funds. George Eastman, the millionaire head of Eastman Kodak Company, had already recognized Dr. Rhees's abilities and the high quality of the college, and had given it large funds to develop a school of music.

Flexner began his campaign shrewdly. Meeting Rush Rhees in New York City, he asked whether the president would like to have a medical school in his institution. Dr. Rhees said that he would. if it were first class, and soon afterward, in February 1920, laid the proposal before Mr. Eastman. When he found the Kodak magnate receptive-subject to the same reservation that Rhees himself had stated, that he would help only if assured that the new school would be of the highest quality-Rhees passed the word to Flexner, who a few days later was invited to come to Rochester to breakfast at Eastman's home. At that meeting Flexner explained his proposal in detail. Eastman kept him to lunch, and asked him to rejoin him at dinner with Dr. Rhees. That evening Eastman offered a gift of two and one-half million dollars. Flexner persuaded him to double the pledge, making the total large enough to justify the General Education Board in matching it, thus creating a fund sufficient to start the school.

During these early negotiations Mr. Eastman, who in pursuit of his philanthropic interest in the health of Rochester children had a few years before given the city a well-equipped dental dispensary, suggested that the new school should include the training of dentists. Thus, the institution was from the first designated as the "School of Medicine and Dentistry." The joint benefaction of Eastman and the Rockefeller-sponsored General Education Board was announced to the people of Rochester at the University's commencement ceremony, June 11, 1920.

Rush Rhees lost no time getting the new school underway. Even before the June announcement, once he found that Eastman was really interested, he had been studying the American medical schools and knew where to turn for advice. From Abraham Flexner he had learned about William H. Welch of Johns Hopkins University, the undisputed elder statesman of American medicine. Flexner's brother Simon, director of the Rocke-

feller Institute for Medical Research, was very close to Welch, having been a member of his staff in the Johns Hopkins Department of Pathology. Welch had known from the first of Abraham Flexner's plans for endowing a medical school at Rochester and had encouraged him in his maneuvers. To Welch, then, the astute president of the University of Rochester went in March 1920 for general advice about organizing the school.

A fortnight after the June announcement Rhees was on the road again, this time to New York to confer with William Darrach, dean of Columbia University's College of Physicians and Surgeons, and with L. Ernest Holt, leading pediatrician, who twenty years earlier had been one of John D. Rockefeller, Jr.'s advisors in organizing the Rockefeller Institute. All the men Rhees consulted told him that whoever was chosen to organize the medical faculty and preside over it as dean, he should be a pathologist. The branch of medical teaching stands midway between the scientific divisions of the curriculum and the clinical subjects. The pathologist is therefore in the best position to understand and guide the work of the school at large.

When Dr. Rhees asked for the names of professors of pathology who ought to be considered for the deanship, Welch and Simon Flexner both named another former member of Welch's staff at Johns Hopkins, George Hoyt Whipple, then in San Francisco as director of the Hooper Foundation and dean of the School of Medicine of the University of California.

Other men were suggested. Abraham Flexner named Alonzo E. Taylor, a brilliant biochemist then at the University of Pennsylvania; Winford H. Smith, director of Johns Hopkins Hospital, recommended Milton C. Winternitz, who afterward became dean of Yale Medical School. But Welch and Simon Flexner put Whipple at the top of their lists. Hearing what these experienced advisors had to say about him, Dr. Rhees approached Whipple first.

George Hoyt Whipple, born in New Hampshire, son and grandson of physicians, was 42 years old in 1920.<sup>1</sup> After graduation from Yale College in 1900 and a year teaching in a private school, he studied medicine at Johns Hopkins, receiving the degree of doctor of medicine in 1905, in a class that included two future Nobel laureates, himself and Peyton Rous. Welch invited Whipple to join his staff as assistant in pathology, and after a year promoted him to instructor. Whipple began his research

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career at once, with a study of the early spread of tuberculosis in the body. Two years after taking his M.D. he put his name in the books by reporting the first known case of a rare disease now called after him, informally, "Whipple's disease." A year in Panama followed, on the medical staff of the Canal Commission. Back in Baltimore, Whipple succeeded to the post of resident pathologist at Johns Hopkins Hospital. Because Dr. Welch was deeply occupied with the many advisory duties imposed upon him by his virtual leadership of American medical science, Whipple had practically full charge of instruction, meanwhile studying various experimental disorders of the liver and intestines, using physiological methods that presaged his later great discoveries about liver functions and blood formation. A trip to European laboratories in 1909 added to his acquaintance with leading pathologists.

By 1913 Whipple was acquiring a national reputation. In 1910 he had declined professorships of pathology at the University of Pennsylvania and the University of California, but when the latter institution received a large special gift to create an institute for pathological research, Whipple with Welch's blessing left Baltimore for San Francisco to head the new department. At the Hooper Foundation he organized a strong research staff, carried on his own researches in which he looked deeply into the mysteries of blood formation, acquired a good deal of influence in the medical faculty, developed a quite original system of research fellowships for medical students, and fought and won a bitter fight for freedom of medical research against rabid opponents of experiments on animals. Early in 1920 the heavy burden of deanship of the medical school was laid upon him.

When, in October 1920, he received a letter from Rush Rhees, outlining the plans for a new medical school at Rochester and asking him to come East to look into the project with a view to heading it, Whipple replied, courteously declining the invitation. Dr. Rhees promptly took the train to San Francisco, where he presented Rochester's prospects and hopes so forcibly that Whipple's reluctance to leave California began to weaken. Dr. Rhees was soon able to strengthen his appeal with the news that the daughter of Henry Strong, Eastman's first partner in Eastman Kodak, would donate one million dollars for a hospital to be part of the new school of medicine.

Late in May 1921, Dr. Whipple accepted the deanship. He

arrived in Rochester in September of that year, was given an office in the administration building on Prince Street, on the old campus, and at once began the work of gathering a medical faculty and planning the laboratories and hospital in which its members were to work.

Whipple wanted his senior staff to be a group of able, adaptable, well rounded young Americans, ready to work together harmoniously in the freedom to be provided by the newness and ample financial resources of the School. He therefore put aside recommendations from various advisors (including Abraham Flexner) of one or two well known Europeans, and looked for rising young men in the American schools. Because Strong Memorial Hospital was to be an integral department of the School of Medicine and Dentistry, and would be housed under the same wide-spreading roof, a director of the Hospital must be chosen promptly to aid in planning the building. The Massachusetts General Hospital, nationally recognized for its progressive administration, provided the right man: Nathaniel W. Faxon, a graduate of Harvard Medical School who, after practicing medicine for some years in a Massachusetts town, joined Massachusetts General's staff and was in 1922 its able assistant director. Remaining at his Boston post until November 1922, Faxon at first took part in designing the hospital by visits to Rochester and by correspondence.

The dean did not have to search long for the next appointee, the professor of anatomy. George W. Corner had been one of his students at Johns Hopkins in 1910–11, and a junior colleague at the University of California (1915–19). He had won Whipple's good opinion by helping to find qualified students for fellowships at the Hooper Institute. In 1922 Corner was back in Baltimore as associate professor of anatomy, well launched on his program of research on the structure and physiology of the ovary, and in his spare time beginning a secondary career as medical historian. Corner accepted appointment to the Rochester faculty in May 1922. In 1923–24 he took his young family to London, where he worked for a year in Ernest Starling's department of physiology at University College.

The chair of biochemistry also was filled by a man well known to the dean. Walter R. Bloor, Canadian born, took his Ph.D. at Harvard under Otto Folin, and in 1922 was professor of biochemistry at Berkeley and a recognized investigator of fats

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and other lipids. Calm, plain of speech and manner, quietly effective, Bloor at 46 was the oldest member of the faculty, and the only other appointee who already held the rank of full professor. Pharmacology, a separate subject in most medical schools, was included in Bloor's department.

With these three colleagues, President Rhees and Dean Whipple had the nucleus of a medical faculty. This group enthusiastically named for the chair of bacteriology Stanhope Bayne-Jones, an energetic, sociable Southerner with a record of frontline service with the British Army in World War I, and a very broad knowledge of the fields now known as microbiology and public hygiene.

William S. McCann, appointed professor of medicine, majored in chemical engineering at Ohio State University before studying medicine at Cornell (New York City), and was thus qualified to deal with the new and rapidly developing biochemical aspects of internal medicine. He also met Whipple's requirement of breadth of view, having been a surgical intern under Harvey Cushing in Boston before he decided to become an internist. He came to Rochester from Johns Hopkins, where he was associate professor of medicine.

Karl M. Wilson, Canadian born, with an M.D. from McGill University, also came from Johns Hopkins, where he had been a part-time associate professor of obstetrics, with a successful private practice. Rochester, breaking with the Johns Hopkins tradition, gave Wilson a combined chair of obstetrics and gynecology. Awaiting the completion of the Hospital, Wilson spent a year in the Baltimore laboratory of the Carnegie Institution's Department of Embryology.

The professorship of surgery, no less than the other chairs, in both preclinical and the clinical subjects, called for a man of well rounded experience. John J. Morton, a soft-spoken, selfcontained New Englander, with a Johns Hopkins medical degree, had been a surgical intern with Harvey Cushing in Boston, then a staff physician in internal medicine at the hospital of the Rockefeller Institute in New York and resident surgeon at Massachusetts General Hospital. Entering the private practice of orthopedic surgery in New Haven, he served as part-time associate professor of surgery in the Yale Medical School. Moreover, like Bayne-Jones and McCann, he had extensive medical experience in World War I.

For pediatrics Whipple and his colleagues of the growing faculty chose Samuel W. Clausen. Born not far from Rochester, Clausen studied medicine at Johns Hopkins, was intern and resident there under John Howland and became a junior professor of pediatrics at Washington University (St. Louis). Clausen was well prepared to deal with the newer aspects of pediatrics, based on ever-advancing knowledge of biochemistry.

The chair of physiology was the last to be filled. As it happened the University of Rochester already had on its campus a research department of physiology, concentrating its work on nutrition, a subject so close to medicine that it should be attached to the new school. The department was headed by John R. Murlin, a Ph.D. of the University of Pennsylvania, who had been trained in nutritional research by Graham Lusk at Cornell Medical School, in New York City. He had been appointed professor of physiology in the college at Rochester in 1917, but was immediately called by the U.S. Army to direct food services in World War I, and did not set up a laboratory in Rochester until after the armistice, in 1919. Murlin and his small staff moved to the Medical School as soon as the building was ready, in mid-1925. He became at once a member of the medical faculty with the title of professor of vital economics, a term apparently invented by the wealthy trustee, Lewis P. Ross, who had endowed the college chair of physiology.

This very competent nutritionist was of course a considerable asset to the School, but Murlin's group were specialists. An all-round professor of physiology was needed, and for a while no one was in sight. At the time there seemed to be few young Americans suited for the Rochester post. Whipple was staving off pressure from Abraham Flexner to appoint a prominent German. He would have gone so far as to take an Englishman, for physiology was particularly strong then in Britain, but he learned that a young New Englander, Wallace O. Fenn, was doing brilliant work in England. Fenn had taken his Ph.D. at Harvard with W. I. V. Osterhout, an eminent leader in general physiology; he had taught medical physiology at Harvard under W. B. Cannon, and had gone to Manchester and London to work with A. V. Hill on the physiology of muscle. His acceptance of the Rochester chair of physiology completed the senior staff of the new school. At 31 Fenn was the youngest member of the group but second to none in keenness of mind and professional skill.

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The appointment of men to conduct the teaching and practice of the clinical subspecialties was postponed until the major departments got under way, and even then, Dean Whipple planned that the more important specialties should be attached to the senior departments—orthopedics, ophthalmology, and otorhinolaryngology under surgery; neurology, psychiatry, and radiology under medicine. As for public health, Whipple said that was the business of the whole medical profession; all departments of the School should feel responsible for including it in their teaching.

There was some amusement, perhaps even a touch of disapproval, in certain circles on the ground that Rush Rhees and George Whipple, abetted by William H. Welch and the two Flexners, were setting up a junior Johns Hopkins faculty at Rochester; it will be seen, however, from the foregoing list that these ten men, with the dean, brought together experience gained in many of the best medical centers of our own country, Canada, and Britain. Their average age was 37.5 years when appointed, and a little less than 40 when teaching began in 1925. They had not, of course, been recruited as effortlessly as this brief narrative may suggest. Buried in correspondence and the minutes of 1920-24, or partly unwritten and almost forgotten, are the names of physicians and scientists who were carefully considered and found wanting, and a few who declined Rochester's advances. Among the latter-it can do no harm now to name themwere Edgar D. Adrian, now Lord Adrian of Cambridge, Donald D. Van Slyke, and William Mansfield Clark. The subsequent distinction of these men further testifies to the talent of Rhees and Whipple in the art of spotting promising young men.

The question of where to build the Medical School and Hospital finally forced the trustees of the University to broad consideration of the whole institution's future development. Foreseeing that the new school would in the long run require a large area for its operations, no site could be found in the city, as had been done with the School of Music, which was tied to the magnificent Eastman Theater. The site of the Genesee Valley Club on East Avenue and Alexander Street was looked at and found too small. In the 1920s the nearest open land to downtown Rochester and the original college campus on University Avenue was to be found to the south of the city, just east of the Genesee River, where the city streets abruptly gave way to open fields be-

yond Elmwood Avenue, then hardly more than a country road. The Crittenden farm and nursery property in that area was on the market; the University purchased it for the Medical School, and shortly thereafter formed an ambitious plan to acquire the land of the Oak Hill Country Club, north of Elmwood Avenue along the river, to become within a few years the River Campus of the college and other schools of the rapidly growing University.

George Whipple, anxious to resume the research he had left in San Francisco to be carried on by his very competent assistant, Frieda Robbins, started in August 1922 the construction of a small two-story building on the Crittenden site, ultimately to house experimental animals but temporarily to accommodate the professors until the School and Hospital building was ready for them. The animal house was finished in November. Whipple set up a laboratory there in time to receive his forty dogs that Mrs. Robbins brought from San Francisco in December. Walter Bloor also set up a laboratory and Faxon opened the Hospital director's office with a staff of three, before construction of the Hospital was even begun. The head of the School of Nursing, the chief dietician, and the purchasing agent all moved in, and when the professors of anatomy and of bacteriology arrived they too had a place to work awaiting them. Indeed, all the senior staff members shared for a while the simple facilities of the animal house.

Life in the "Research Laboratory," as it was called, was in some ways very primitive, especially in the winter, when the lane from Elmwood Avenue and the avenue itself were deep in mud or blocked by snow. There was no habitation nearer than three blocks, and the closest the letter carrier came was a half mile away, on Mt. Hope Avenue.

In April 1923 the bulldozers and pile-drivers began work on the main building. The story of its construction could alone occupy a whole chapter in this book.<sup>2</sup> To save time and money as well, Whipple had the architects (Gordon and Kaelber, of Rochester, in consultation with McKim, Mead, and White, of New York) lay out a plan of crisscrossing axes in a simple modular form, so that the concrete forms for pillars and girders could be moved along section by section. The walls were of plain brick, inside and out, the floors of bare concrete; the very efficient plumbing was as uniform as possible throughout. Window spacing was consistent throughout the building. Each department head

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had only to fit the needs of his laboratory or clinic into the modular space allotted him.

Two hospitals, in fact, were being built at once, for the city of Rochester had entered into a contract with the University to tie its new Municipal Hospital closely to Strong Memorial, to get the obvious advantage, for the city's patients, of medical diagnosis and care by the University's professional staff. Such an intimate affiliation of public hospitals with medical schools had long been known in Europe. Its adoption in Rochester arose from two sources: first a suggestion to Rush Rhees and George Whipple by Abraham Flexner, already put forward in his Carnegie report of 1910, and more or less simultaneously a generous and self-effacing proposal by George W. Goler, Rochester's dedicated health officer. Dr. Goler had with unending devotion conducted a small municipal hospital, chiefly for patients with contagious diseases, at the eastern edge of the city, while persistently calling upon the authorities to give him a modern hospital equal to the city's needs. His tenacity had won over the city fathers and he was about to realize his dream of a fine new building, when the news broke that the University of Rochester was to have a medical school. Dr. Goler at once proposed to place the city's hospital alongside Strong Memorial, and to turn over to the University the professional care of city patients. The plan was adopted, a contract was drawn between the city and the University, and construction of Municipal Hospital proceeded concurrently with that of Strong Memorial. The professors of medicine, surgery, obstetrics, and pediatrics became chiefs of services in Municipal Hospital and the house staff appointed by the Medical School served in its wards. Special services, such as x-rays and clinical laboratories, were operated in common. This affiliation was for many years satisfactory to both parties; its later history must be told by someone else.

The preclinical departments began to move into the new building early in 1925, when only Wing J was ready for occupation and the far end of the building, toward the east, consisted as yet only of a concrete skeleton. Biochemistry was the first to move. Professor Bloor held his first seminar in his new laboratory on January 2.

The Anatomy Department, first to begin instruction of medical students, had until autumn to settle down in its new quarters. In September the first class of 22 students, carefully chosen by

the Admissions Committee from 13 colleges, representing five states and one foreign country, assembled in what is now the Whipple Auditorium, to be greeted briefly by President Rhees and the dean. The professor of anatomy and his two assistants promptly introduced the students to the dissecting room and put them to work. In March 1926, instruction in biochemistry and physiology began; the Departments of Pathology and Bacteriology started teaching in the fall of that year.

Strong Memorial Hospital was officially opened on January 4, 1926. Although the first class of students would not enter upon clinical teaching until 1927, patients were received at once. The first inpatient arrived on January 5 and the first outpatient on January 7. Professor Morton performed the first surgical operation on the same day (January 7); the first baby was delivered by Professor Wilson on January 14. In October 1926, when all departments of the Hospital were in full operation, a formal dedication ceremony was held, attended by representatives of 70 medical schools and hospitals in the United States and Canada. Addresses by two foreign notables and six eminent American physicians and scientists signaled to the citizens of Rochester their city's possession of a medical center of distinguished promise.

As the several departments of the School prepared to begin their work of instruction, care of patients, and research, the chiefs chose their junior associates. To do justice to the talents of these younger people and to describe their respective contributions to the School would call for more space than this essay can provide. Some of them remained on the faculty for the rest of their careers, some went into private practice in Rochester, retaining part-time affiliation with the School. Others departed to accept posts elsewhere. One or two found Rochester's winters, or the climate (figuratively speaking) of the Medical School, not to their liking and left, though—it must be said—for worthy careers elsewhere. Details of the services of all the associate professors, assistant professors, and instructors of the earliest years are listed in the School's decennial publication, *The First Decade.*<sup>3</sup>

Those who especially shared the problems and the satisfactions of those years should be mentioned here: *Anatomy*—the late Alan F. Guttmacher, who became a leader in the international Planned Parenthood movement; Robert K. Burns, Jr., la-

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ter a member of the National Academy of Sciences. *Physiology* —Edward F. Adolph, who rendered lifelong service in the faculty, and who contributes a chapter to this book. *Vital Economics*—Henry A. Mattill, later professor at the University of Iowa; Harold B. Pierce; Estelle Hawley. *Biochemistry*—Charles P. Kimball; Warren M. Sperry, later professor at Columbia University. *Pathology*—Harry P. Smith, later successively professor at the University of Iowa and Columbia University; Frieda Robbins, Dr. Whipple's competent research associate. *Bacteriology*—Konrad Birkhaug; James A. Kennedy.

On the clinical side: *Medicine*—Roger R. Hannon; Lawrence A. Kohn, a lifelong part-time member of the faculty; Richard S. Lyman (neuropsychiatry), later professor at Duke University; Eric K. Clarke (psychiatry); John S. Lawrence, later professor at the University of California at Los Angeles; Stafford L. Warren, who became the first dean of the U.C.L.A. Medical School. *Surgery*—W. J. Merle Scott, who succeeded Morton as head of the department; David M. Davis (urology), later professor at Jefferson Medical College; R. Plato Schwartz (orthopedics); Clyde A. Heatly (otorhinolaryngology); W. W. Scott (urology); Herman E. Pearse, who came as a Rockefeller Fellow and stayed on; T. B. Jones. *Obstetrics and Gynecology*—Henry L. Darner; Robert N. Ritchie. *Pediatrics*—William L. Bradford, who succeeded Clausen as head of the department; Irvine McQuarrie, later professor at the University of Minnesota.

Besides the ten department heads and the younger men they brought from many other medical schools and hospitals, local physicians of high standing were called upon to help start the school. The two oldest and most influential in its affairs, Edward W. Mulligan and George W. Goler, could have been characters in a Dickens novel. Both had studied medicine in a time when a high school diploma was sufficient for admission to mediical studies; both had won their way, by moral strength and a powerful sense of duty, to leadership in Rochester's medical affairs—Dr. Mulligan as chief surgeon of Rochester General Hospital, Dr. Goler as municipal health officer. Each welcomed the advent of the University's School of Medicine and appreciated the opportunity to help add a new chapter to the annals of their beloved profession.

Dr. Mulligan was a close friend of George Eastman. He accepted a nominal place on the faculty with the title of lec-
turer in surgery, but his most effective consultations were those with Mr. Eastman and Dean Whipple on matters of local policy. He had a strong if amateurish interest in the history of anatomy and surgery; his generous gifts for the acquisition of books on medical history will be mentioned in another chapter of this book.

George Goler's sacrificial relinquishment of plans for a city infectious disease hospital under his own direction, in favor of the University-allied Municipal Hospital, has already been mentioned. In his early days as health officer he and his brother-inlaw Charles Wright Dodge, professor of biology at the University of Rochester, with bold enterprise prepared the first diphtheria antitoxin to be made in the United States outside of New York City. Goler had done his best to keep up with advancing medical science and saw that the new school would provide upto-date scientific information and support for his efforts on behalf of the citizens of Rochester. This hope was realized. He was enrolled in the medical faculty as lecturer in preventive medicine; his municipal public health laboratory was housed in Bayne-Jones's section of the School building, and the School furnished clinical laboratory facilities to the new Municipal Hospital. Dr. Goler's views were sometimes arbitrary. He had, for example, opposed the pasteurization of milk because he thought that if the milk was sterilized the dairymen would be careless about cleanliness in their cowbarns and in shipping milk. Bayne-Jones knew how to deal with this fiery and sometimes wrongheaded battler for the public good. His authoritative knowledge gently led Goler to be reasonable.

To this outstanding pair of local medical men, Mulligan and Goler, whose support strengthened the School's position in the city at the beginning, there must be added William R. J. Wallace, a skilled exodontist. His warm friendliness to the new school and wise counsel about the complex problems raised by the proposal to include dentistry in its program made him a welcome addition to the list of general consultants.

Local practitioners were of course to be added to the faculty as active visiting physicians and surgeons. There were some among the city's leading medical men who, remembering their own student days in schools manned by local doctors, expected to be offered professorships and were pained to find that new young men from the leading university schools were to be

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brought in to fill the clinical chairs. In the touchy business of finding city men who would accept the situation, Dr. Mulligan and Dr. Goler were valuable advisers. Goler, for example, put Whipple in touch with Albert D. Kaiser, a Harvard-trained pediatrician greatly respected in the city, who at one time had been Goler's aide in the Health Office. Kaiser became a very useful part-time member of Clausen's department, in both research and on matters of policy. Joseph Roby, Columbia-trained internist, was consultant in medicine. Albert C. Snell, a quietly able ophthalmologist, was made a consultant in that subject. Howard Prince, general surgeon, Ralph Fitch, the city's leading orthopedist, and Edward S. Ingersoll, otorhinolaryngologist, were attached to the Department of Surgery. William McCann, professor of medicine, recruited a dozen Rochester physicians to help in teaching the medical subspecialties, among them Clarence P. Thomas (cardiology), Alvah Strong Miller (gastroenterology), C. B. F. Gibbs (diabetes), Louis Baldwin and Stearns Bullen (allergy), Erastus Guller (hematology), and John J. Llovd, Ezra Bridge, and E. K. Richard (tuberculosis). William M. Brown and Joseph K. Ouigley became consultants in obstetrics and gynecology; and Charles E. Gibbs was consultant in psychiatry. Floyd S. Winslow, the Monroe County coroner's physician, was an associate in pathology.

A school of medicine, like every other multiplex human organization, must work out a way to govern itself. No one man, not even a leader as strong and experienced as George Whipple, can oversee the details of daily procedure. Responsibility must be delegated and vet there has to be a central focus of authority. In an institution made up of highly educated, highly individualistic people bearing heavy responsibility for their students, for the patients, and for research, autocratic governance would be unbearable and broadly democratic spread of authority unworkable. With the approval of President Rhees, Dean Whipple adopted a simple structure copied from the Johns Hopkins Medical School. The dean, the director of the Hospital, and the department heads formed an Advisory Board, presided over by the president of the University. At its monthly meetings all administrative affairs were discussed and voted on. The professors were each responsible for representing the views and needs of their respective junior staffs while sharing the corporate interests of the whole institution. From the standpoint of

the professors this was a democracy; from that of the junior staff and students it was an oligarchy; and in fact the system, especially in the earliest days, was not without an element of autocracy. Only the two eldest of the department heads, Whipple and Bloor, had previously administered departmental budgets. (Murlin had his own budget from the income of a special endowment.) The others had to learn that part of their duties; and meanwhile Dean Whipple firmly held the pursestrings in his own hands, strictly controlling the School's expenditures, which were hardly ever discussed by the Advisory Board.

The first year's budget of each department was handed down, rather fully itemized, by the dean, who in succeeding years dealt individually with each professor's request for the year. Little was to be gained by argument in these man-to-man conferences in the dean's office. To be sure, Dr. Whipple was a gentle autocrat. He once, for example, denied a professor's request for a thirty-five-dollar desk chair for an assistant, but of his own accord inserted an electric centrifuge costing \$150 which he knew was needed for the young man's research. Occasionally the dean was voted down by his board; once when he was disinclined for economy's sake to buy carpets for the cold concrete floors of the interns' rooms, Dr. Rhees, presiding over the debate, with obvious amusement noted a nine-to-one vote for the carpets.

In educational matters the dean was remarkably liberal, giving his professors a completely free hand as to the content of their courses, and welcoming pedagogical experiments. As chairman of the Admissions Committee he wanted to accept students whose college records, even if not showing brilliant marks, gave evidence of leadership or special competence in some particular field.

Another striking example of Dean Whipple's liberality was the absence of locks from laboratory doors. Staff and students alike were free to come at any time, day or night, as they wished. It was not uncommon to find people at work late into the night, or groups of students deep in conversation with a young instructor. Such freedom (doubtless impossible nowadays when the School is so much larger and the preclinical laboratories are scheduled to the minute for greater efficiency) made everyone feel that the laboratory was not only a place for the prescribed daily task, but an intellectual home, where students, instructors, and the professor at his microscope or physiological apparatus

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were all fellow students, intent upon the one aim of understanding the structure of man and his vital functions, studying his diseases, and learning to cure them.

Under this regime of encouragement for initiative, it was interesting to see how the professors adapted themselves individually to each other, to the University, and to the city. Dean Whipple, for example, had warned President Rhees that he (Whipple) must not be expected to give time to civic activities not related to the School; Bayne-Jones and McCann attended local medical meetings and otherwise made themselves agreeable to city doctors. Within the faculty, however, McCann was something of a gadfly, always speaking out when he saw something going on that was below his ideals for the School. When, as happened a couple of times, a colleague resented his criticisms, Whipple called in Bayne-Jones, the diplomat of the group, and the tiff was settled in Bayne-Jones's house over a round of highballs. Bayne-Jones, as already mentioned, worked hand in glove with the municipal Health Office. Morton made himself available to local colleagues for surgical consultations. Bloor became practically a vice dean, busy with applications for admission and for student loans. Corner, the most bookish of the senior staff, was made chairman of the Library Committee and was encouraged by the president to develop interest in the history of medicine among the students. When an important statement was to be issued the dean usually called upon Corner to draft it. Fenn had charge of keeping the large auditorium ready for visiting lecturers, and led the local chapter of Sigma Xi in organizing an annual children's lecture on a scientific topic. Thus the School of Medicine and Dentistry quickly found its place in a city notably ambitious for the welfare of its citizens and proud of the University now rapidly developing from the old, conservative small college.

Because the School was on the fringe of the city and availability of transportation facilities was poor, especially in winter (in a time when most of the students and many younger staff members did not own cars), and there was no television to hold people to their rooms at night, it was easy to draw audiences for evening meetings. A medical society, like that at Johns Hopkins, was promptly organized. Papers from all departments were read, and there were guest speakers. A medical history club, run—like the medical society—almost without officers and rules of procedure, met several times during the school year to hear papers and to discuss great medical books and achievements of the past.

To the writer of this essay, the companionship of his talented companions of the senior faculty was enhanced by the fact that the professors of clinical subjects were, at first, appointed on "strict full-time," salaried like their preclinical colleagues (though at a rate about 25 percent higher), and collecting no private fees. To a perhaps too idealistic preclinical laboratory man it seemed to deepen the brotherly spirit of the group to know that all the department heads were on a comparatively equal economic as well as professional level. In the second decade of the School's history this strict full-time plan, dear to Abraham Flexner's heart, was given up for reasons which most of the senior faculty thought compelling, and was replaced by what is called "geographic full-time," in which the clinical professors add to their income by collecting (under controlled conditions) fees from private patients they care for within the Hospital. It must be admitted that the change was not followed by any obvious decline in clinical teaching and research or in the friendly relations of preclinical and clinical professors.

As the author of this essay—one of the three still living members of the original faculty of the School of Medicine and Dentistry—looks back on those years in the 1920s, the passage of time has blurred his recollection of the inevitable limitations, the trials and errors of our new enterprise; and memory brings back a picture only of golden days when, as a band of brothers, we eagerly set out to lay the foundations of the great institution whose growth and achievements are recounted in the following chapters of this half-century record.

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# Perspectives of the First Faculty



# Edward F. Adolph, Ph.D.

Edward F. Adolph joined the University of Rochester faculty in 1925, at which time the first medical students were admitted to the School of Medicine and Dentistry. Before retirement in 1960 he taught physiology to 36 classes. He also conducted undergraduate courses and graduate student seminars. Numerous graduate students obtained the Ph.D. or M.S. degrees with his sponsorship; some medical students wrote theses for the degree M.D. with Honor.

Dr. Adolph continues to work at research in the same laboratory he occupied 50 years ago. He has published 4 booklength monographs and 140 journal papers on his researches, which especially concern physiological regulations, environmental adaptations, water requirements, and effects of heat and cold.

Dr. Adolph received the 1964 Gold Medal of the University's Medical Alumni Association, and a Presidential Certificate of Merit for wartime researches on man in hot deserts. He was president of the American Physiological Society in 1953; is a fellow of the American Academy of Arts and Sciences; and has participated in the triennial International Congresses of Physiology since 1920. **W**<sub>HAT</sub> did faculty members do and think forty to fifty years ago? Readers who were alive then may have forgotten by now how much their surroundings and their society have changed. By supposing that Rip Van Winkle slept for forty years, we can compare then and now.

A story illustrates how the mature man may feel. A graying citizen was pleased beyond measure when his associates congratulated him on the birth of his grandchild. But he swallowed hard when he suddenly realized that he was now married to a grandmother. The story suggests that a survivor put aside his nostalgia, and humbly describe the scene.

## Background

How did the world, and particularly Rochester, look in the decade 1920 to 1930, when the University of Rochester School of Medicine and Dentistry came into being?

The war of 1914–18 had catapulted the United States into world political affairs. Happenings in Europe and Asia could not be disregarded. An economic boom built up in America. Laborers asserted themselves; professors isolated themselves.

Material indicators of change were found in every family. Home radios could be purchased, with enough batteries (wet or dry) to energize them. Automobiles became available to those few who saved up enough money to buy them. Traffic lights were installed on main thoroughfares. Filling stations sold gasoline, often pumped by hand crank.

The chief means of transportation was the streetcar, powered electrically from overhead trolley wires. Two men operated the car; a motorman controlled speed and brakes, and a conductor collected fares and stoked the coal stove.

The only citizens who had flown in an airplane were either war pilots or paying guests at county fairs.

The only schoolteachers were young ladies who had graduated from the city's Normal School.

The only persons who went outdoors without hats were children at play.

The only motion pictures were silent, except for mood music furnished by an organist.

Home heating depended on coal furnaces, with their shoveled inputs and dusty outputs. Coal miners, however, were no longer

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in glut supply, for immigration of the underprivileged had been greatly slowed by new legal barriers, and the old hands in the coal fields could afford to strike. Oil burners were subsequently installed in most house-heating systems.

Lawnmowers were pushed with enough force to turn the blades as well as to move the carriage.

Nearly all children walked to school. One-room schools stood at many crossroads. Schools rarely operated buses even in towns with long distances to cover.

When snow fell, the city sidewalks were made passable by horse-drawn wooden plows. Streetcar tracks were cleared by special sweeper-cars operated by the transit company; other streets were usually uncleared. Some intersections were salted from a truck; a man stood on top of the salt load and with a shovel strewed the salt, which was mixed with cinders. Main Street was partially cleared by shovelers who loaded snow onto trucks; the trucks dumped their loads from a bridge onto the ice of the Genesee River.

Most food was purchased by telephone message from home to neighborhood grocer. The grocer's boy brought the purchases in a handcart or a small truck.

Refrigeration depended on daily delivery of a block of ice into an icebox that opened outdoors for filling and indoors for food storage. In summer a whole week's supply of food could not be installed at one time, since icebox temperatures were uncertain. Home freezers did not exist.

Social and economic evolution in the United States during the half century is vividly described in F. L. Allen's book *The Big Change* (1950).

Professors read the words of Albert Einstein: "The geometrical behavior of bodies and the motion of clocks depend on gravitational fields," but could not say what evidences favored this theory of relativity. Sigmund Freud's name was on many lips as an excuse for slips of the tongue and for flips of the curiosity.

A feature of faculty life in Rochester was represented by Mr. George Eastman's Sunday evenings. Professors and their spouses, along with representatives from the business community, were invited to his house on East Avenue for music and dinner—seventy to a hundred in attendance altogether. Wives wore subdued dinner dresses; husbands wore tuxedos with stiff shirt and black necktie. A string quartet, pianist, and organist were

engaged from the Eastman School faculty. After the music and dinner, the renowned paintings could be viewed.

When invited to dinner by a colleague, one "dressed" unless expressly requested to forego formal attire. Equal formality prevailed in addressing one's colleague as Jones, unless he were senior enough to be *Dr*. Jones. For students, first names would be used by fellow students, but not by faculty members.

This is, in part, how happy Rochesterians saw their surroundings in the rosy years 1925–28. For a majority of citizens, however, the outlook suddenly became bleak in 1929, when financial depression and unemployment began. The University of Rochester, through unique circumstances and exceptional management, weathered the period without retrenchment of either salaries or instruction.

# The New School

The School of Medicine and Dentistry and its two hospitals, Strong Memorial and Rochester Municipal, were at that time considered to be far from the city. An abandoned horse-racing track lay on one side, a vacant area of cemetery on another side; busy railroad tracks separated the School from the city park. When streetcars began to run past the hospitals, they terminated their course at a loop against the railroad, and from the loop a pedestrian tunnel allowed passengers access to the park.

Before the opening of the hospitals one could ride an electric trolley car on Mt. Hope Avenue to Elmwood Avenue, or one could ride on Genesee Street to the end of the line on the west side of the river at Elmwood Avenue. In either case there was a half-mile walk on what might be a snowy, blowy day. Mr. Warren Irwin, purchasing agent, sometimes drove his car to the Genesee terminal to pick up employees, bringing them to work or starting them homeward.

A few persons living at points south rode the train, choosing the Erie Railroad or the Lehigh Valley Railroad. They left or entered the train at the Elmwood Avenue station, adjacent to the University power plant. Elmwood station was then a grade crossing of these two railroads at the southwest corner of Mt. Hope Cemetery. A duck pond occupied the hollow between the railroads and River (now Wilson) Boulevard.

Would patients come all the way out to the new hospitals? The director of Strong Memorial, Dr. Nathaniel Faxon, had some

doubts, but the mounting flood of automobiles gradually superseded the irregular public transportation and answered the question.

Dr. George Whipple wrote an inside account of the planning and construction of the School and hospitals (1957). In 1925 the buildings were impressive in their stark isolation, but ivy plantings soon made them scenic. The workmen's shacks and piles of debris had scarcely been removed from adjacent areas when the Wassermann sheep began to graze on the expanse of lawn. Why a Wassermann sheep? The City of Rochester Health Bureau laboratories were located in the School's Department of Bacteriology, where Miss Hester Austin tested blood specimens for syphilis using sheep erythrocytes. Eventually, these laboratories were moved elsewhere.

Indoors there were long corridors of unfurnished rooms. For part of the Hospital the basic furniture and supplies had been ordered by Dr. Faxon and Miss Helen Wood, the head nurse. The surgical chief (Dr. John Morton) and the obstetrics chief (Dr. Karl Wilson) had foreseen what would be needed for operative procedures. Operating rooms then were without air-conditioning, and there were no fluorescent lights.

The first patients were admitted to the hospitals in January 1926 and July 1926, respectively.

Among the nonclinical departments, three were equipped early—anatomy, biochemistry, and physiology. Their staffs instructed medical students in 1925–26. These departments had their own problems with lighting, fume hoods, and D.C. current. In downtown Rochester only D.C. was available, and much purchasable equipment was designed for D.C. use. In the Medical School both A.C. and D.C. were needed, and the latter was generated in the new University power plant.

The Staff House was a center of Medical School life. Every member of the resident staff slept there, and phones rang at odd hours. In addition, some bachelor faculty members and some graduate students had rooms there. A large common room contained a radio and a Victrola. There was Saturday night poker. Once a year the house staff mounted a stage performance, for men only, showing how the faculty looked from the underside. The house was originally planned for 55 residents. This number was reached after three years of Hospital operation, when the

house was enlarged. Members of the house staff did not receive salaries.

In the thirties there was no such thing as hospital insurance. The patient either paid five dollars per day for board and bed, or went on the indigent list. Patient care was to some extent regarded as a charity, partly to be written off as a contribution to the teaching of medical students and resident staff. However, the low cost of care reflected the fact that much of present-day specialized equipment and service did not then exist.

In the early years most rooms in the School and hospitals had no locks on the doors. Losses by pilferage were much less than the projected cost, in time as well as money, for installation of locks on the 1,250 doors.

The Hospital elevators required operators, who worked a lever to start and stop the motor. Elevator men befriended visitors and saw to it that none got lost. Time-saving then was not the chief concern of either elevator operators or their employer.

Parking problems were not acute. The two dozen cars that appeared each day all remained within 50 yards of the rear door. The area was paved with cinders from the University power plant. After two years a wooden garage was built with individual stalls to accommodate a dozen cars; later the number of stalls doubled twice. Names of faculty members renting these stalls appeared on each. The stalls reminded one of the sheds at country churches in which the carriage horses champed oats and exchanged flies while their owners worshipped. In 1925 not all faculty members had cars, and rare indeed were the house staffers and medical students who had them.

In 1929 tennis courts were built near the Staff House, and in 1933 the Medical School gymnasium was built. A majority of persons in the School utilized the athletic facilities, and tournaments were annually scheduled in squash, handball, and tennis.

The Medical Library was operating before the first students arrived in 1925. Some books had been chosen by each member of the gathering faculty, and journal subscriptions had been started, even before laboratories were equipped. This early priority of the Library represented the initiative exerted by Dr. Whipple and his advisors. The presence of familiar books and journals welcomed newcomers to this workshop for scholars.

There were no departmental budgets in the first years of the School. Every item to be ordered received the scrutiny and sig-

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nature of the dean or his secretary. That was the brake that prevented expenditure of endowment, and set the standard of careful management that continued for many years.

The business arrangements at the School were simple. Mr. LeRoy Agne, the cashier, had the job of collecting payments from patients. He also kept certain accounts for both the Hospital and the Medical School, and obligingly cashed checks.

Salaried staff members were few in total number, and at the end of each month Mr. John Worden, the University bursar, stopped at the Medical School on his way home to deliver the salary checks. He carried the whole payroll in his jacket pocket. Before leaving his office at Prince Street he signed the checks with his vest-pocket fountain pen. That dates the operation.

The annual catalog of the School of Medicine and Dentistry gave a biographical summary for each faculty member. This format continued until 1970, when the record of the quality of the individual had of necessity to give way to the record of quantity of the mass.

There was no personnel department. When a typist or technician was needed, the department chairman concerned might advertise in Rochester's daily newspaper. Indeed, one chairman directed potential secretaries to his home, where his wife interviewed and selected applicants. Many of those selected eventually married medical students.

# Teaching

Early in 1925 the new Rochester School of Medicine and Dentistry was announced in quarter-page advertisements in *Science*, along with the customary announcements of the medical curricula at Yale, Johns Hopkins, Western Reserve, and other schools. The items mentioned by the School included: all facilities under one roof, opportunities for cooperation of School and Hospital, equality of men and women, and small classes.

Dr. Whipple noted that the most important thing he did was to participate in the selection of students. He and Drs. Bloor, Corner, and McCann constituted the first admissions committee. So far as possible, each student applicant met all of them, and the pattern of informal conversations between faculty members and prospective students was determined. By September 1925 some 22 students were admitted to the first year of the medical curriculum.

In the first decade it was considered important that a medical student be able to read German, French, and some Latin. Most of the historical medical literature was published in these languages, and prescription-writing required Latin. For some years the students who were deficient in German attended a weekly reading class conducted by Professor Ralph Helmkamp of the Chemistry Department. Gradually, the language requirement was partially relaxed.

From the first class of 22 medical students, the number admitted each year progressively increased, to 45 in 1935. Ten years later the number had risen to 65, partly in deference to the demand for physicians in wartime. Actually, the ratio of teachers to students also continuously increased; nevertheless, the intimacy between faculty members and students seriously diminished.

In 1925, it was anticipated that students who wished to enter dentistry would apply here; none, however, of graduate caliber appeared. Meanwhile, the faculty was selected partly with a view to giving instruction suitable to the profession of dentistry; one of the full-time members of the Department of Bacteriology (Dr. Phillip L. Jay) was a dentist and remained here for several years.

What did the new faculty of Medicine and Dentistry plan in 1925? All its members were anxious to experiment, to work out novel ideas in instruction. But all realized that the new School had to demonstrate its soundness and its capacity to educate capable physicians before it could justify radical notions about medical curricula; we must feel our way from recognized procedures to exploratory ones. The opportunities for innovations stemmed, of course, from the fact that no usages had been established, and that the first classes of students were small in number. No student could be shielded from daily interaction with faculty members.

Student time was apportioned amicably among departments. Each department made use of its portion of the hours available as its staff saw fit. Any similarity in treatment of students between one department and another was either accidental or was arrived at by uninhibited discussion among faculty members. In any event, there was general agreement that lectures would be largely avoided, and that laboratory activities were the core

of learning—even, to a considerable extent, in clinical departments.

That lectures were in poor repute was illustrated when an associate of another department told Dr. Walter Bloor that he would like to come to the biochemistry lectures. Said Dr. Bloor: "There are no lectures; here is a textbook you can read at your own pace." The associate asked what class meetings were held. Replied Dr. Bloor: "Twice a week the students gather with instructors to raise questions; when the questions have been discussed, we go home."

For laboratory areas, an outside contractor was given a priority list of rooms to be furnished with tables, shelves, and sink boards. Thereafter, each department, with help of the School's carpenter, installed equipment as needed. Instructors in physiology, for instance, took responsibility for certain laboratory exercises, making detailed lists of items to be built or to be ordered from the local apparatus company. Glassware, chemicals, and solutions were collected. Finally, animals (mostly frogs and a few cats) were purchased against the day they would be used in experiments.

Equipment could be economized by its assembly into units, each unit to be used successively by several groups of students in rotation. There were no laboratory outlines except in the mind of the instructor. Each laboratory period began with an oral preview of the day's experiment—objective, method, and equipment.

In physiology, the instructors took turns reviewing with the class single journal papers relevant to the topic at hand. This was a method with which faculty members were somewhat experienced—the seminar method, for arousal of questions and discussion.

Dr. Wallace Fenn and I, who constituted the physiology faculty, had been impressed with the British practice of talking with students in tutorial sessions. Accordingly, we invited the first-year students to meet weekly in groups of four or five, for discussion of preannounced topics. All came regularly.

Members of clinical departments periodically presented patients before the first-year class. They analyzed in depth the outstanding signs manifested by the patients.

Graduate students, candidates for Ph.D. degrees, were present in 1925 only in the Departments of Biochemistry and Vital Economics. Such students gradually arrived in other nonclin-

ical departments. They first did course work with the medical students, and in the following years assisted in responsible laboratory and conference assignments. Most of them lived in the Staff House and ate in the Hospital dining room with the resident physicians, and interacted with them.

The provision of free time was one of the features in the medical curriculum. In 1925 students, like most citizens, expected to work six days a week. Three half-days were unscheduled, and this free time, it was understood, would be used for studies selected on the students' initiative. This arrangement drew about half of the medical students into serious research activities in one department or another.

The results of student work sometimes proved worthy of journal publication, as is attested in the early volumes of collected departmental reprints. When students later applied for internships, inquiries came about their achievements in research from hospitals or departments to which they applied. So far as I recall, students liked being treated as graduate students, and used their free time in projects that challenged their powers of invention. Certain students, however, found that too many departments expected them to enter research, and declined the burgeoning opportunities.

Bedside teaching was developed, of course, by the clinical staff; the medical students were expected to ask most of the questions on rounds. The students did the clinical laboratory work and much of the patient history. The number of house officers depended upon the inpatient population and turnover. Only decades later did the tally of house officers come to depend on the outpatient load and on the varieties of subspecialties applying complex procedures in diagnosis and treatment.

Every department instructed students of nursing; some such students attended the shorter diploma course, while others obtained the bachelor's degree in five years. Laboratory work was undertaken by nursing students in all departments of the School. In addition, work for college students in general was offered by the Departments of Bacteriology and of Vital Economics.

## Research

The most common question about the past that is raised by today's colleagues is: how did you accomplish research when there were no federal grants? The answer is that every faculty mem-

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ber tacitly understood that research activities were part of his work, on a par with teaching and patient care, and that the School would do what it could to provide facilities for those activities.

Every department chairman set an example in research initiation, and Dean Whipple above all in that he transplanted his special dogs and his research associate (Mrs. Frieda Robbins) from the University of California. Every faculty member, I believe, was free of teaching some months of the year. The result was that all worked at and talked about research projects. Where equipment was required, teaching instruments could be employed. Supplies could often be drawn from stocks of chemicals and glassware in the department storeroom. Animals could be used in moderate numbers, but there was much inducement to employ "chronic" procedures instead of "sacrifice" procedures. Many a person experimented on himself and friends; borrowing of materials sometimes led to collaboration.

About 1929 Dean Whipple secured from a foundation a fluid research fund, to be expended annually. Small allotments, especially for interdepartmental projects, were made available by a faculty committee. In addition, modest special grants for research came to individual departments; early ones are listed in the booklet *The First Decade* (1936). Occasionally a "yearout" medical student and some graduate students received stipends from such a source; most were supported from departmental budgets, which had become autonomous. (Year-out medical students were those who were invited to join a department of the School for a period of research and teaching. There they interacted with faculty members and with fellow novices.)

Publications by faculty and students of the School were listed in the annual School catalog, starting in 1930. Persons outside a particular department could thus be made aware of the research reports. Those lists ended in the war year 1942. Periodically, departmental publications were bound into volumes; most of these volumes can be found in the Medical Library and in the respective departments.

The presentday reader will be impressed with the simplicity of the facilities for teaching and research as they existed in the first decade. These facilities are described with justified pride, nevertheless, by each of the departmental chairmen in the Rochester number of the Rockefeller Foundation's *Methods* and Problems of Medical Education, seventh series, 1927.

The spirit of the first faculty was expressed by Dr. Fenn when he wrote, in 1925: "The fascination about the place to me consists in getting in with a bunch of young men, most of us, like myself, with our reputations still to make, and trying to build up a new first class school."

# Interdepartmental Relations

In 1925 there were about twenty members in the faculty of the School. They filled two or three tables of the lunchroom. That was where they learned from one another and aired their varied opinions, and where the dean sampled prevalent views before each problem came to the Advisory Board for decision. The frequency of lunchroom conversations naturally led to easy social activities among faculty members and their families.

In 1925 no department had enough members to conduct a seminar; therefore, all joined in the Interdepartmental Seminar and the University Medical Society.

The seminar was originated by Dr. John Murlin and Dr. Fenn. The former had a going department, transplanted from the Arts and Science campus at Prince Street. The latter had a fund of fresh research critique that lightened the discussions. And, a luncheon kept the attendance regular; clinicians and chemists were equally at home in this seminar, and in turn were programmed there. In later years seminars proliferated in every department; eventually, however, the Interdepartmental Seminar ceased meeting.

The Medical Society held evening meetings once a month, and the entire faculty attended. Dr. William McCann was its first chairman. Usually, two prepared research papers were presented, plus a case history of a patient. The papers represented the whole range of faculty and student interests.

The Medical History Club began to meet in 1927, under the guidance of Dr. George Corner. The emphasis was on amateur interests of faculty and students in local and world deeds in bio-medicine.

There were other meetings, too. The National Society for Experimental Biology and Medicine approved the organization of the Western New York branch, beginning in 1922 from efforts of Drs. Murlin, Mattill, and Whipple. The branch met four or five times a year, once a year in Rochester, and facilitated acquaint-

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anceships with faculty members and advanced students in nearby universities.

The Rochester chapter of the Society of Sigma Xi was installed in 1930. The society thus recognized the entire University as being active in research. In 1932 the chapter members arranged a one-day exhibition of current scientific research on the new River Campus, at which 90 exhibits were staged from sixteen departments, half of the departments being from the medical faculty. Each exhibit was explained to the peripatetic visitors at scheduled times by the researcher. A public scientific lecture, directed at high-school students, was also given, and continued annually. The idea for the lecture was derived by Dr. Fenn, from the children's lectures held at the Royal Institution of London.

Lecturers from outside the University were invited to visit here, and several came each year. In 1933 a committee of the medical faculty was entrusted with the selection of Eastman Memorial Lecturers. By tradition, considerable distinction has attached to those so chosen. Lists of the lecturers may be found in *Quarter Century* (1950).

The earliest periodical, other than the annual catalog, was published in August 1929 as the *Bulletin of the Strong Memorial Hospital.* It was edited by Dr. Joseph Leone, who had just graduated with the first class of medical students and was now a junior assistant to Dr. Faxon. It first appeared monthly, in a typewritten format, from the Hospital's printshop, and listed programs of the University Medical Society, various seminars and lectures, publications by faculty members, appointments in the faculty, Hospital staff (including students and nurses), and patient statistics. Occasional articles were written by Dr. Faxon, Dr. George Goler (city health officer), and others. The *Bulletin* survived into a more ambitious format, entitled *Medical Center Bulletin*, now *Rochester Medical Review*.

Interdepartmental collaborations in research were frequent. For instance, I was privileged to work successively with Dr. Irvine McQuarrie, in writing a review for the "White House Conference on Child Health"; with Dr. Samuel Clausen, in a laboratory study of the evaporative water exchanges of children; and with Dr. Stanhope Bayne-Jones, in measuring growth and multiplication of single bacterial individuals.

About 1935 the University's first cyclotron went into operation, making certain isotopes available for collaborative use in

the Departments of Biochemistry and Physiology. Every batch of isotope required the personal attention of the chairman (Dr. DuBridge) of the Physics Department, and was brought from the River Campus by an instructor of that department.

However, in the 1920s there were few interactions with the other two faculties: arts and science, and music. The separation of the faculty of medicine and dentistry was inadvertently nurtured both geographically and intellectually; one said: I am going over to the University to attend a meeting, not, I am going to the arts campus.

Nevertheless, the arts and science faculty, at the urging of President Rhees, gradually developed interests in graduate instruction, research, and scholarly qualities. In 1930 the occupation of the River Campus by the arts faculty established interactions between the two faculties—interactions more intense than today because the numbers of persons in each faculty were much fewer than now. The music faculty shared in the drive toward creativity through the emphasis of its director, Dr. Howard Hanson, upon musical composition; only in the 1960s, though, did it receive professional titles.

#### Conclusion

These, so far as I can recall, represent the prominent outlooks of medical faculty members of a past generation. Value judgments made from hindsight are hardly appropriate; one had to be there to feel the challenge of the new school and the new times in which it unfolded. We were proud of being few in number, of having few students (whom we knew well), and of representing a generous slice of science or medicine. Wordsworth (*The Prelude*, book XI) expressed our feeling:

Bliss was it in that dawn to be alive But to be young was very Heaven!

No doubt there are many lessons that can be discovered from this history, by anyone searching for them. Perhaps, however, the main lesson is: either a person is swept along with unavoidable change, or he makes his own effort to fulfill his part in the ambition of the group. The varied 1925 ambitions underlie the 1975 School of Medicine and Dentistry.

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# Student Recollections 1925–1929

4.



Jacob D. Goldstein, M.D.

Jacob D. Goldstein, professor emeritus of medicine, was a member of the first class admitted to the University of Rochester Medical School. He served here as an intern in medicine, and after a year at Yale returned to Rochester as resident in medicine.

Dr. Goldstein's interests are in the areas of arthritis and infectious disease. He organized and directed the Arthritis Clinic at Strong Memorial Hospital and guided the formation of the Rochester chapter of the Arthritis and Rheumatism Society. He has served as associate professor of bacteriology, as laboratory chief of the 19th General Hospital in England and France, as director of the laboratories in Genesee Hospital, and as professor of medicine in the Downstate Medical School in Brooklyn.

In 1951, Dr. Goldstein was granted a Certificate of Merit by the Rochester Academy of Medicine. In June 1957, he received a University of Rochester Alumni Citation.

Dr. Goldstein continues to teach third-year students in the Department of Medicine.

**L**HIS essay is an attempt to recall the essence of the program which was offered to the first students who came to the new University of Rochester Medical School. The errors inherent in re-

## The Early Years — Goldstein

structuring from memory alone the events of fifty years ago preclude any eyewitness type of description of the program. What has survived for the early students is how they felt when they were in this School and how through the years they have continued to regard the School.

# The Students

Of the twenty men and two women in the first class, eight came from the University of Rochester, two from Colgate, two from Hobart, and one each from Acadia College, Nova Scotia, Alfred, Amherst, Harvard, Holy Cross, Johns Hopkins, Mt. Union, New York University, Washington University, and Lund Gymnasium in Sweden. Sixteen were residents of New York State, two of Massachusetts, and one each came from Missouri, Ohio, Pennsylvania, and Boras, Sweden.

Whether by chance or by design we were a good mix, and individually about as different as the colleges from which we had graduated. We came from widely different backgrounds and held very different expectations. What we had in common was a subdued apprehension.

We registered into the School on the morning of Thursday, September 17, 1925. After this brief event, we scattered in small groups for an unguided tour of the School and the Hospital. The empty and unpainted brick-walled halls and rooms did little to diminish our uneasiness. Even at this early exposure we wondered how a little paint on the walls would look. Olin Meeker, who was destined to be our class "betting maestro," summed up our questions and doubts by saying, "The trouble with this place is that there is no book on it. You can't make a decent bet on what will happen to us."

On September 21, 1925, we met with Dr. George Corner for our first class of the then traditional twenty-week course in anatomy. Our anxieties were quickly dispelled. Dr. Corner made a happy second home for us on the fifth floor. With Dr. Franklin Snyder and Dr. Wilfred Copenhaver, he gently and firmly guided our transition from undergraduate to graduate students. The answer to a question was rarely unaccompanied by a reference to the literature, by a borrowed reprint, or by a trip to the library, where we "looked it up together." How to use the library, and a constant little push to do so, was a major early contribution to our learning. The roster changes in the four-year span of the first class may be indicative of the academic performance expected from the students. One student withdrew from the School during the first year. One student was dismissed for academic reasons at the end of his second year. He knew, and his classmates knew, that this decision was inevitable. He was helped to return to a healthrelated career and has remained a friend of the Medical School family. Two students were dismissed from the class after they had completed their third year. One was from the original group; the other had joined our class after two years in another medical school. We did not understand this when it was announced in June. It seemed clear enough when we returned to school in September. It was surely of the greatest interest and concern to the next third-year class.

Three students were granted one-year student fellowships and, with one who lost a year to illness, graduated with the class of 1930. Four transfer students joined the class for the two years of clinical study. Thus, fifteen of those who entered in 1925, and three of the two-year transfer students, graduated as the first class in 1929.

Seven of the class of 1929 are living. They are: Elmer L. Du-Bois, Jacob D. Goldstein, Percy L. Harris, Augustus A. Hillman, Edith Emerson Martin, John Polansky, and Donald D. Possum. Several have contributed their recollections.

#### The Faculty

The January 1926 Bulletin of the University of Rochester School of Medicine and Dentistry listed a full-time faculty of 11 professors, 1 associate professor, 1 assistant professor, 4 instructors, and 5 assistants. The faculty was young, and the age gap between student and professor seemed then to be about as small as it ever could be. We soon learned that our young senior professors were the choice acquisitions from medical school departments headed by such giants of medical science as Walter Cannon, Herbert Evans, Otto Folin, Samuel Harvey, Warfield Longcope, William J. MacCallam, Franklin P. Mall, and others of similar stature. Before long the premedical student underground had the Rochester School of Medicine tagged as a small edition of the Johns Hopkins Medical School. This was no small compliment for a fledgling school and a morale lifter for us.

Our faculty had spent several student-free years in planning

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and putting together a new medical school. They were as yet unhampered by major administrative, community service, or private practice responsibilities. As a result they were free to be, and indeed were, our daily working teachers. In this unique setting of a family-sized school, a close association between students and teachers was possible and was fostered from the first days. From the students' viewpoint, the visible primary activity of the professor was in teaching and in providing us with various forms of guidance and support. This fortunate circumstance remained constant as we progressed through the various departments. In paraphrase of Dr. Wallace Fenn: The professor found inspiration in having the students to himself for a reasonable period of time; he became acquainted with them and imparted to them the philosophy, skills and the inspiration of his subject. The students found in the School all the ingredients for a happy and effective learning period. Wherever and whenever eager and reasonably able students are matched with teachers who have a sincere interest in each student's welfare, lasting bonds may develop among them. At this time, conditions were favorable in this School for all students to develop such bonds with several, even with all, their teachers. Whether they were bonds of friendship, of respect, or of affection, or all of these together, they remain the student's major tie to the School.

# Some "unforgettables" about some of our preclinical teachers

Dean George Whipple: He was the hub of the wheel. He had gathered the faculty. The School and the Hospital had been built under his close guidance. He brought with him an already famous research program. He taught pathology with evident pleasure. He always had time to go over a slide with a student, to talk about a research project, or to demonstrate how to bleed or catheterize a dog. His weekly conference with the students was not quite a quiz, but it accomplished the same purpose. We learned from them where more study was needed. He sensed the panic in a student and arranged to discuss and ease the problem, be it financial, personal, or academic.

It is also true that he soaked his blistered foot while reviewing an autopsy protocol with a student. He was THE DEAN.

Dr. George Corner: He was the magician who made anatomy palatable for the student who feared or disliked the subject, and

had it provide pleasure and a challenge for most of the class. To be exposed to his great knowledge, his genius in communicating his knowledge, his infectious enthusiasm, and his considerate and warm surveillance of our well-being, was a privileged experience. He was FRIEND and MENTOR to all.

Dr. Wallace Fenn: In his "Report from the Department of Physiology," which he delivered at the medical alumni meeting on October 4, 1957, Dr. Fenn said, "I do believe in lectures and I always have. Perhaps it is because they represent so much trouble for the teachers; hence they must be good for the students. It is not easy to deliver a good lecture and each one requires, for me at least, a lot of hard thinking."

We knew this about Dr. Fenn in 1926. His lectures were organized to most effectively share with the students the results of his "hard thinking." Although he was among the few who could avoid at least some of the hard work he put into a lecture, it was not in his character to do this. He was a shy and a modest man. He was respected, admired, held a little in awe for the breadth of his knowledge, and quietly beloved.

He was a great person.

Dr. Walter Bloor: He looked like the absent-minded professor, which he was not in 1925. His door was always open for any student to discuss any subject. In our clinical years we returned to talk about biochemical puzzlers. He was "Papa" Bloor.

Dr. Stanhope Bayne-Jones: We called him "The General" before he became one in World War II. His military carriage, his military haircut, and his brisk stride earned him this title before we came to his classes. His bacteriology course was very well organized and very closely supervised. We learned to appreciate the challenge and the usefulness of the "laboratory unknowns" quiz. A written examination was regularly followed by a conference with Dr. Bayne-Jones. Here we met the professor, who told you that your answer did not answer his question, but it was a good idea and should be researched. We then talked about how this might be done.

No nonsense. We were there to learn some bacteriology. He was there to teach bacteriology. He also shared with us a culture which converted an undistinguished wine into an excellent bubbling masterpiece.

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Dr. John R. Murlin: He was the older professor. His Department of Vital Economics, which was in the University since 1919, moved to the Medical School in 1925. He was responsible for teaching medical students the physiology of nutrition and endocrinology. On his staff as assistants in physiology were Estelle Hawley, Charles Morrison, and Vincent DuVigneaud. Every student had a course-related laboratory project with Estelle Hawley. The class learned about benzoic acid metabolism by way of my existing for seven days on just prunes. Others had even more exotic assignments.

There was a family atmosphere about this department, due to a large extent to Miss Hawley and the products of her kitchen laboratory. Many of us became her lifelong friends and admirers. Dr. Murlin and his associates were involved in a variety of research problems. There was an ongoing effort to involve us in the research opportunities which our studies invited.

He was—gung ho for research, and a friend.

Dr. Edward E. Adolph: He was the quiet man whose pointed question in response to your question often had you see the answer. He too always had a reference for you to look up, and later he was sure to ask you what you thought of the article. He was a research physiologist who was sincerely concerned with the education of the medical student. He had and has our respect, our admiration, and our thanks for his contributions in our behalf. We hoped that our performance was good enough to elicit his slow grin.

Dr. Harry P. Smith: He was Dean Whipple's senior associate before he left Rochester to head the Pathology Department at Iowa and later at Columbia. He lived in the Staff House and seemed ever-present for everything which related to the Pathology Department. He was a superb and a tireless teacher who expected the student to be just as tireless in his efforts. Perched on a stool opposite to the student who was to perform his first complete autopsy, he guided his victim through a review of his course in anatomy. A two-hour session was not unusual.

He was a prodigious worker. He asked a little of the same from his students. We counted ourselves as fortunate when the rotation list put us in his hands.

# About some of our clinical teachers

Dr. John J. Morton: He was not especially fond of ultra-speciali-

zation, perhaps because his own talents encompassed so many fields of medicine. He was a student and he taught surgery from a broad base of preclinical knowledge. He was a pathologist of such stature as to receive for his opinion the problem slides, which also circulated to Drs. Ewing, Warthin, and Mallory. When such slides arrived we could, in lieu of lunch, have 30 to 45 minutes with Dr. Morton and the slides. We recorded our diagnosis before we were told how he and the other consultants had read the slides. On surgical rounds he not infrequently elicited the history or uncovered the physical finding which led to a nonsurgical diagnosis and at times to no operation.

He was a student who enjoyed students. We had great respect and affection for him.

William S. McCann: He was a superb teacher. Our early noon clinics with him have, I think, never been surpassed. His bedside manner won over the reluctant or uncooperative patients others could not approach. Early on he won our respect and approval by showing that he knew how to lose. After carefully demonstrating the signs of cavitation at the apex of a lung, he then held up the x-ray, which revealed the cavity on the other side. Totally unflustered, he said, "This is a lesson in how difficult things can get for all of us."

He was the clinician many hoped to emulate.

*Dr. Samuel W. Clausen:* He was the quiet, soft-spoken, kind and gentle person who was the ideal pediatrician. He was an easily accessible encyclopedia of clinical information. His approach to problems was unhurried, logical, and firm. He taught medicine in the same manner.

No man in the School or Hospital was held in higher esteem.

Dr. Karl M. Wilson: His department grew less rapidly than did the other clinical departments. Robert Lewis, who graduated in 1930, recently wrote, "I did my first delivery in a home in Lima, New York, after having been on the sidelines for only six in the Strong Memorial Hospital. However, the basics must have been good as I continued to do deliveries until 1955 without getting into any serious problems." (After graduation, Dr. Lewis trained in pediatrics, before entering general practice).

The basics were good because of the continued efforts of Dr. Wilson, assisted by Drs. Robert Ritchie and Ward Ekas. Our clinical opportunities in gynecology were better than in obstetrics.

## The Early Years — Goldstein

Dr. Wilson was a stimulating teacher and a friend we returned to visit.

*Dr. Lawrence A. Kohn:* He came to Rochester as an instructor in medicine before the Hospital was open to receive patients. He worked with Dr. McCann to organize the medical service and the teaching program in medicine. He was unexcelled as a doctor and as a teacher. He helped many students in many ways.

Dr. William L. Bradford: He came to Rochester as an instructor in pediatrics to assist Dr. Clausen in opening his department to students and to patients. Like Dr. Kohn, in medicine, Dr. Bradford knew and taught every student in the early classes. He was the best midwestern story-teller in the School and as such was a favorite guest at student parties.

#### Research

It is axiomatic that medical schools will be involved in teaching, research, and certain aspects of patient care. The order of priority for these functions may vary in different schools, and at different times in the same school. This becomes important to the student in relation to his academic background and his career plans. Like most medical students, we were concerned first with the quality and the availability of the teaching function. For some the opportunities for research were of considerable importance. In our first two years an introduction to the research discipline was blended into each preclinical course. Students were encouraged (required), alone or in pairs, to undertake a small and usually course-related research project. The latter were not assigned; rather, they were permitted to evolve from student discussions or literature search. Student opinion varied as to the usefulness and the desirability of this program. For some it was too costly in time utilized away from the basic courses. For others it was the icing on the cake, the ideal opportunity for in-depth study with an individual faculty preceptor. This requirement was dropped from the program by the third year, but student research continued to have very strong encouragement and every type of support.

It is of interest that from the class of 22 students, 13 published their findings in a total of 12 papers. All the published projects were started during the two preclinical years. Six papers were published in a physiology journal, 3 in anatomy jour-

nals, and 4 in clinical journals. Several of the students were involved in more than one published project.

# Doctors in the Community

The arrival of the Medical School was not accepted as an unmixed blessing by all the physicians in the Rochester area. Many feared that they would lose patients from their offices and from their favored hospitals. Inevitably this did occur, and to some extent medical students contributed to the problem. Patients being in short supply, we were not always prompt in returning them to the doctor of record. The more interesting the patient or the problem, the more likely we were to delay their return.

The School was fortunate in having some very strong friends among the Rochester physicians. Some held part-time faculty appointments and participated in the clinical teaching. These men, warmly recalled as teachers and friends of the earliest classes, are: Dr. John Aikman, Dr. Paul W. Beaven, Dr. Stearns Bullen, Sr., Dr. Erastus Guller, Dr. David A. Haller, Dr. Albert D. Kaiser, Dr. John J. Lloyd, and Dr. Clarence P. Thomas.

Holding a very special place was Dr. George W. Goler, who gave us our first insight into the public health arena, where he flourished and contributed so much. Our Sunday walks with him as he talked medical history and medical lore were very special events.

# Nursing Staff

When the third-year students came to the clinical floors they met a new authority figure: the head nurse. Save for the duties which belonged to the physician, every patient-related occurrence in the ward was her responsibility. She represented experience, knowledge of the patients, and quality control, and she had the authority to deal with problems as they arose. We learned from her and not infrequently she saved us from creating problems for the patient and embarrassment for ourselves. It took but one experience to educate the entire class to the fact that when the obstetrical head nurse suggests that the patient is ready for the delivery room, one should follow her advice and not risk another hallway delivery. She knew the extent and the limits of the duties of the third-year student, and where patient-related problems arose she represented the patient. She monitored the housekeep-

#### The Early Years — Goldstein

ing from kitchen to lavatories and supervised the appearance, the conduct, and the activities of the ward personnel.

In this era, before the sulfonamides and the antibiotics were available, good nursing was often the most important factor in the treatment of many patients.

# Student Activities

Since the athletic building was not to be for many years, we turned to handball for our all-seasons indoor exercise. For this we used the students' locker room and the unfinished D5 Hospital wing. The exposed pipes and electrical fittings required some interesting adjustments in the rules and the technique of the game. As new classes arrived we lost the locker room court, and as more patients arrived we lost D5.

Our first student meeting in early 1926 was for the purpose of finding someplace where we could legally take an after-exercise shower. We had been dispossessed from several off-limits areas in the Hospital. A committee of two students proposed to Dean Whipple that the students would raise the sum needed to convert one locker room lavatory stall into one shower stall. The dean expressed sympathy for our need, but not for our plan. He promised to find another site and one which the School would finance. Within a very few weeks we had as our own a small, one-bulb, unpainted, cement cubicle in the Y-wing basement.

In 1927, the first two classes met together to discuss the formation of a student organization. It was voted down as being potentially divisive by students who felt they were in tune with their school environment and would risk no changes. Later we voted against having medical fraternities and for accepting the invitation to form a chapter of AOA.

In his address to the alumni on October 1, 1954, Dr. George Corner said, "In this atmosphere of youth and novelty and high ambition we all set our hands to the same task. We were not pedagogues and pupils, we were older and younger students of medical science. There was no rigid discipline for none was needed. Such authority as had to be wielded rested clearly on experience and knowledge, not on any difference of motivation or ideals." This actually was our relationship. It might be possible once again to gather together such a remarkable group of people. However, it is not likely that we will ever again see the

unique combination of circumstances which permitted our professors to build such a solid foundation for this School. They came to the right place at the right time. We were fortunate enough to be with them in those exciting early years. In 1959, Edith Hamilton wrote: "Genuine education is possible only when people realize that it has to do with persons, not with movements." In 1925 this was the philosophy which guided the program initiated in the School.

Inevitably, age and size, fiscal problems, several wars, and committees—all types of committees—have changed this School and its people. Some of us who knew it then, and know it now, like to think (to paraphrase Edith Hamilton): There is an everpresent past. There are permanent truths which are forever important for the present. Our professors made the "forever" type of contribution which still exists in this School.

# The Ongoing Years

# 5.

# The Climate for Inquiry

Research Education for Medical Students



# Elmer H. Stotz, Ph.D.

Elmer H. Stotz, professor and chairman of the Department of Biochemistry, assumed the chairmanship of the School's Honors Committee in 1952. This committee's original responsibility of evaluating student theses toward recommendation for the M.D. with Honor has grown into the general administration of student fellowship programs, other than those specifically directed by departments. In connection with the committee's work, Dr. Stotz has represented the School in the administration of the Medical Student Research Training Program funded by the National Institutes of Health, and in a variety of similar but less extensive programs.

The more rewarding part of his service has been to provide the opportunities for medical students to engage in summer research and the Year-Out Fellowship Program, most often their introduction to biomedical research. Because of his long period of contact with the student research program, sustaining and developing original objectives of the School, Dr. Stotz provides in his essay both data on the extent of the program and an account of its evolution and development.

 $I_{\rm N}$  THE first Bulletin of the School, dated 1925–26, even before a curriculum of study was devised there appears a policy state-

ment, and in retrospect a prophetic statement, as follows: "Therefore the schedule will provide for elective studies or independent work, and in all work, prescribed, elective and independent, the relations of teachers and students will be those which would naturally be expected in a graduate school of arts and sciences." Surely such a relation of students and teachers has found its fullest expression in the intimate contacts afforded by student research in faculty laboratories. These contacts have taken the form, perhaps in the order of increasing student commitment, of informally arranged experiences, electives, summer fellowships, and the year-out fellowship.

The favorable climate for student research has been a hallmark of the School from its inception, long before federal institutions recognized the pool of research potential in medical schools. The spirit of inquiry at Rochester has been a force in attracting students and faculty alike, and in view of the large number of students\* who engage in research with faculty members, the fellowship program is an important pedagogical instrument.

# THE YEAR-OUT FELLOWSHIP

*Evolution and Support.* The year-out concept was brought to Rochester by Dean George Whipple, and the first such fellowship was granted after only one year's operation of the School.

In the early years of the program the student was selected by a department and offered a fellowship, which was viewed as an honor. Later on, it was the privilege of the student to apply for a year-out fellowship in the department of his choice. At the outset stipends were minimal, but room, board, and laundry were provided. By 1945 there were 4 fellowships assigned to pathology, 2 to bacteriology, and 1 each to anatomy, biochemistry, and physiology. Stipends were \$1,500. Starting in 1957, and for the subsequent ten years, additional support was provided by the National Institutes of Health's medical student research training grant, and the stipend was increased to \$2,400. During this period also the funding mechanisms were placed under the Honors Committee, but the principle of the student seeking the faculty member or department of his choice remained. When special research

<sup>\*</sup>The author is indebted to Miss Harriet Purdy and Mrs. Marie Barnes of the Student Activities Office and to Mrs. Mabel Kraushaar of the Biochemistry Department for securing much of the data reported in this chapter.

## The Ongoing Years — Stotz

interests were best served outside of Rochester, students have spent their year (the first in 1960) in Glasgow, Cambridge, Paris, Frankfort, Brussels, London, Stockholm, Göteborg, Oxford, Vienna, Melbourne, and Nigeria, as well as centers in the United States other than Rochester. After 1967 the needed financial support came from the School's general research support grant (NIH), and in the last few years important support has been forthcoming from the medical alumni. The present stipend is \$3,200.

Size of the Program. Between the academic years 1926-27 and 1973-74 there have been 361 year-out fellows. For the period 1925 to 1950, 1.310 students were graduated, and 115 of these (9 percent) had elected a year-out fellowship; for the period 1951 to 1965, 989 students were graduated, and 179 (13 percent) were vear-out fellows. In the years since 1966, an average of 12 percent of the entering classes have chosen an extra year of study. The growth and fluctuations in the program are depicted in Figure I. The small number of fellows during World War II years and the peak years from 1958 to 1966 may be noted. In the past few years there have been 8 year-out fellows per year, which is the same number that can be supported at the present \$3,200 stipend. Thus, the support base is somewhat precarious if the number of year-out choices increases; on the other hand, in the writer's memory, since 1950 no student desiring a year-out fellowship has failed to be provided with financial support. The smaller number of year-out fellows in recent years must also be viewed in the light of increasing numbers of M.D.-Ph.D. candidates.

The distribution of past year-out fellows by sponsoring departments is shown in Table 1. Clearly, many departments have participated in the program, while pathology has had by far the greatest number. Research experience remains the principal thrust of the program, although in recent years some of the pathology student fellows have been engaged largely in advanced training.

#### TABLE 1

Distribution of Year-Out Fellows by Department of Study

Pathology	152	Biochemistry	15
Microbiology	47	Preventive Medicine	6
Physiology	41	Obstetrics	5
Anatomy	32	Psychiatry	5
Medicine	21	Radiology	5
Pediatrics	18	Pharmacology	3
		Others	11



Impact of Year-Out Program. Among the reasons frequently offered by students for electing a year-out fellowship are (a) to de-
#### The Ongoing Years — Stotz

termine one's inclination and ability in research, and (b) to gain first-hand experience as a junior faculty member toward the possibility of an academic career. In view of this, has the year-out fellowship program been responsible for a high proportion of Rochester graduates entering academic and research careers? It is well known from surveys conducted by the Association of American Medical Colleges that Rochester stands among the top few medical schools of the country in the high proportion of its graduates engaged in full-time academic careers.

The School has maintained contact through questionnaire reports of former year-out fellows. The first of these was conducted in 1954 and collected data on the careers of all graduates who had received degrees prior to 1953. The results were published by Dr. Leonard D. Fenninger in the *Journal of Medical Education* (Vol. 33, No. 3, March 1958) under the title "The Rochester Student Fellowship Program." It was reported that more than 12 percent of graduates who *did not* participate in the fellowship program had chosen careers in teaching and research on a fulltime basis. In contrast,  $2\frac{1}{2}$  times as many (some 30 percent) of those who had participated in the fellowship program were engaged in full-time academic and research careers. Fenninger concluded that "the opportunity to participate in research early in their professional careers was an important factor in their scientific achievement."

Subsequent surveys conducted by the School have been restricted to career choices of past year-out fellows. The 1964 study, directed toward year-out fellows graduated from 1953 to 1963, yielded 152 responses, and a 1972 followup study yielded an additional 93 responses. The results of these two surveys are recorded in Table 2.

#### TABLE 2

Career Choices of Year-Out Fellows Reported in the 1964 Study and 1972 Followup Study

	1964 Study	1972 Followup Study
Full-time academic work	46	45
Research	12	9
In practice	54	30
Hospital administration	3	1
In-service, training, other	37	8
TOTALS	152	93

While the data in Table 2 do not provide information on the career choices of those graduates who had not chosen a year-out fellowship, as provided for earlier years in the Fenninger report, the data support and extend the conclusion that year-out fellows tend strongly to choose careers in academic medicine and research. The 1964 study indicates that at least 50 percent of year-out fellow graduates chose full-time academic or research work, and the 1972 study indicates an even higher proportion, nearly 65 percent. While it is recognized that some who start may not remain in academic medicine over the years, the impact of Rochester's year-out fellowship program on choice of careers seems unmistakable.

Not to be overlooked in this prospectus, which emphasizes the influence of the year-out fellowship experience on the choice of an academic career, are the many year-out graduates who have not chosen an academic or research career. Presumably these were also aided by their year-out experience in making the choice to practice medicine rather than to engage in full-time academic work.

## SUMMER FELLOWSHIP PROGRAMS

Although summer fellowship experiences, both clinical and in research, were available in the first twenty-five years of the School, programs developed on a much larger scale after 1950. No hard data are available to determine the impact of these experiences on future careers, but numerous statements have been made by former students to indicate that summer experiences have directed career choices. For many students the summer research experience has been the stimulus for selecting a year-out fellowship.

The more organized summer fellowship programs have been in four categories, as follows, with data and statements made available by the individual programs.

*Psychiatry Program.* This began in 1947, when 1 student was assigned to a psychiatric inpatient service. Since then the program has grown steadily and there were as many as 15 to 20 students during one summer period. In addition to those from Rochester, students have come from most of the medical schools in this country, as well as from medical schools in London, Glasgow, Cardiff, Bristol, New Zealand, and Australia. Usually one-half to two-thirds of the summer fellows have had clinical assign-

## The Ongoing Years — Stotz

ments, and the remainder specific research assignments with senior investigators of the department. Research areas have been clinical, laboratory, social, and epidemiological. Support has been derived from United States Public Health Service training grants and from departmental funds. A number of these students returned later on as candidates for graduate residency training in psychiatry and in the Liaison Program.

Program in Preventive Medicine and Community Health. This department has placed considerable emphasis on student summer fellowships since 1960. Training and experience have been provided in epidemiologic and health services research and evaluation, health program planning and development, and rehabilitation and chronic disease, with emphasis on the health problems of poverty and minority groups in underdeveloped areas. The earliest summer fellowships were in rehabilitation medicine, which engaged 34 students between 1960 and 1973. Between 1965 and 1968, 12 summer fellowships were in connection with the migrant labor health clinic program, and since 1968 many fellowships have been in various aspects of health and social problems of inner-city residents. Fellowship programs in more distant places, sponsored by department faculty and supported by departmentally obtained funds, have included projects on specific diseases and health problems on the Navaho and Hopi Indian reservations in Arizona and New Mexico; an ongoing research and faculty-student exchange program with the University of Belgrade, in Yugoslavia, which has involved approximately 7 students per summer; and field projects in nutrition and health in Argentina and Colombia. A current result of the latter program is the six-week visit every spring of 3 to 5 Argentinian clinical medical students to our Medical School.

Other experiences available have been in connection with health services research and planning at the Kaiser-Permanente group practice program in Portland, Oregon, and in related projects in the Rochester vicinity, such as the Regional Medical Program, the Comprehensive Health Planning Agency, the Health Department, and the Family Medicine Program.

From 1960 to 1973 there were 152 medical student summer fellowships sponsored directly by the department either with federal traineeship or research moneys, department funds, or foundation grants. Since 1967 there have been between 13 and 24 fellowship awards per summer.

Summer Cancer Fellowship Program. This program started on an informal basis in the late 1950s to provide clinical experience. Since then the program has been expanded to include both research and clinical opportunities for medical students in each of the first three years. Fellowship periods have been spent in a variety of locations besides Rochester: for example, at the Children's Cancer Research Center, Boston; the University of California Cancer Research Institute; the National Cancer Institute of the National Institutes of Health; the Penrose Cancer Hospital; Addenbrooke's Hospital, Cambridge; Hammersmith, Middlesex, Royal Cancer, and St. Bartholomew's hospitals, London; Churchill Hospital, Oxford; and the Institute for Cancer Research, Vienna. Data are provided in Table 3 to indicate the numbers and distribution of fellowships in recent years. It is reported that over a third of the 1973 graduating class had participated in the Cancer Fellowship Program, and graduates have stated that they were motivated to work in oncology primarily as a result of experience in the fellowship program.

The principal financial support for these summer fellowships has been derived from the Dr. Glenn H. Leak Memorial Summer Fellowship Program of the American Cancer Society, the Monroe County Cancer and Leukemia Association, various pharmaceutical houses (Upjohn, Hoffman-LaRoche), and from the School's Division of Oncology.

## TABLE 3

## Summer Cancer Fellowships

	Total	Rochester	Institutions	Overseas	Research	Clinical
1970	55	21	13	21	14	41
1971	36	11	11	14	7	29
1972	52	20	21	11	22	30
1973	53	28	19	6	22	31
1974	34	18	13	3	14	20

Schoolwide Summer Fellowship Program. In contrast to these mission-oriented programs, the Honors Committee has had the responsibility of administering a schoolwide program, whose main objective is to provide a research experience. The medical student organizes a summer research project with a chosen faculty member. Prior to 1957 the program was rather informal,

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and students might or might not have received a stipend through the faculty member's resources. During the period 1957 to 1967 this program was richly supported by the NIH medical student research training grant, and also received valuable and unrestricted financial help from the National Science Foundation, Lederle Laboratories, and the Council for Tobacco Research (U.S.A.). During this period some 60 to 70 awards were made annually, providing summer research experiences for nearly onehalf of the first- and second-year classes.

Since 1967 the program has received support from the School's NIH general research support grant; the annual number of awards has been from 30 to 40. Any decrease in numbers has been more than compensated by the growth in the other summer fellowship programs, and may also reflect a changing interest of the medical student from "bench" research to more clinically oriented studies.

With the phasing out of federal support of training programs, all of the summer fellowship programs for medical students are unfortunately in serious financial jeopardy.

# **Recognition of Research Accomplishment**—

THE M.D. WITH HONOR AND M.D. WITH DISTINCTION IN RESEARCH In the earliest years of the School the master of science degree was commonly awarded in recognition of research accomplishment, particularly as a culmination of a year-out research fellowship. Starting in 1934, however, research accomplishment of the medical student was recognized by the degree M.D. with Honor. The 1933-34 Bulletin statement is as follows: "The degree Doctor of Medicine with Honor is awarded only to exceptional students. The requirements are (1) Excellence in Scholarship. (2) A serviceable reading knowledge of German and one other foreign language. (3) Preparation of an acceptable thesis based upon the results of original investigations." In subsequent years, the language requirement was tempered and in 1951 the Bulletin says, "In exceptional cases, this requirement can be waived." Another change was announced in the 1945-46 Bulletin in connection with the M.D. with Honor: "In exceptional cases, other scholarly achievements may be accepted in place of a thesis if they demonstrate an unusual degree of originality and intellectual ability."

It has been the responsibility of the Honors Committee from 1934 to the present to evaluate student research theses, and in

recent years this has included a defense of the thesis conducted by appropriate faculty members. The requirement of "excellence in scholarship" became more difficult to evaluate as course grades and class standing became less discriminating, and it was increasingly clear that many students achieved excellent academic work without having had the opportunity or inclination to engage in research and satisfy the thesis requirement for the M.D. with Honor. Hence in 1969 the requirements for the M.D. with Honor were split, the M.D. with Honor requiring uniformly excellent work throughout the four years, and the new degree M.D. with Distinction in Research requiring the demonstration of excellence in research as evidenced by a written thesis. In recent years it has therefore been possible for an exceptional student to be awarded both the M.D. with Honor and the M.D. with Distinction in Research, particularly since the M.D. with Honor has required truly exceptional performance in academic work. Table 4 records the numbers of these special degrees awarded over the years.

#### TABLE 4

#### Doctor of Medicine Degrees with Special Distinctions from 1934 to 1974

M.D.	With	h H	onor
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1934-1938	 14	1954-1958	 		 30
1939-1943	 29	1959-1963	 	 	 33
1944 - 1948	 8	1964-1968	 		 21
1949-1953	 15				
		Total			150

#### 1969-1974

	M.D. With Honor	M.D. With Distinc- tion in Research	M.D. With Honor and With Distinction in Research
1969	1	11	1
1970	1	12	3
1971	4	6	0
1972	2	5	3
1973	3	6	0
1974	3	4	2
Totals	14	44	9

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The Borden Award. For twenty-five years, starting in 1946, an annual monetary award of \$500 has been given to the graduating medical student who has demonstrated exceptional accomplishment in research. A bronze plaque containing the names of past recipients of this important award is located in the Student Lounge of the educational wing. The School is greatly indebted to the Borden Company for its long support of this program, but regrets that the Borden Award feature of the student research program was terminated in 1973.

# Research Opportunities for Physicians



# Robert I. Weed, M.D.

Robert I. Weed is professor of medicine and of radiation biology and biophysics and head, Hematology Unit, Department of Medicine.

Dr. Weed earned his B.S. and medical degrees at Yale University. He interned in medicine at Strong Memorial Hospital in 1952 and after two years in the U.S. Air Force Medical Corps and two years of medical residency training at the Yale-New Haven Medical Center, he returned to Rochester as a fellow in hematology in 1957. Since 1966, Dr. Weed has been director of the Clinical Investigator Training Program and since 1967 he has been head of the Hematology Unit.

Dr. Weed holds professional membership in the American Federation for Clinical Research, the American College of Physicians, the American Society of Hematology, the International Society of Hematology, the Association of American Physicians, the American Physiological Society, the Society of General Physiologists, the New York Academy of Science, the American Association for the Advancement of Science, and the American Society for Clinical Investigation.

Dr. Weed has authored or coauthored more than eighty scientific articles in the field of hematology, membrane physiology, and medical education. He is associate editor of Blood Cells and is on the editorial boards of Blood and the Nouvelle Revue Française d'Hématologie. He has been principal editor

of three books, Hematology for Internists, The Red Cell Membrane, and Red Cell Shape, and he has recently completed the English translation of M. Bessis' text Living Blood Cells and their Ultrastructure.

## I. INTRODUCTION

There are circumstances in which the split between scientific and practical medicine is so great that the learned physician can do nothing, while the practical physician knows nothing. Knowledge which is unable to support action is not genuine—and how unsure is activity without understanding: The split between science and practice is rather new; our century and our country have brought it into being."\*

The potential dichotomy between science and the art of medicine as articulated by Virchow certainly constituted a key feature of Abraham Flexner's remarkably perceptive insight into the necessity for increased emphasis on the scientific basis of medicine, a concept that was of fundamental importance in his recommendations that served as guidelines for the founding of the University of Rochester School of Medicine and Dentistry, in 1925.

In the early days of the Medical School, the major impact of these concepts was apparent in the composition of the faculty and the nature of the educational program offered to medical students, as described elsewhere in this history. Later, Flexner's ideas were to be implemented through postdoctoral (M.D.) training programs at Rochester and at other major medical schools, although significant development of these programs did not really begin until after World War II. The history of their evolution in the postwar years has been related in a very significant fashion to federal policy, for during this period there occurred simultaneously a great expansion in medical research programs funded primarily by the federal government, and an awareness of the increasing complexity of medicine and medical research.

# II. IMPACT OF FEDERAL POLICY RELATING TO MEDICAL RESEARCH

In a strict sense, as pointed out by Strickland (1972), federal funding for medical research probably can be dated to the year

<sup>\*</sup>From Rudolph Virchow (1821-1902), "Standpoints in Scientific Medicine," in Disease, Life and Man.

1878, when Congress enacted quarantine laws dealing with yellow fever and cholera and included in these laws provision of funds for investigation of the origin and causes of epidemics of these diseases. Until 1930, however, the federal government's rate was minimal and sporadic, and support for medical research was almost always considerably less than the funds appropriated for investigation of diseases in animals (perhaps because the economic benefits were more obvious). On May 26, 1930, the Ransdell Act, establishing the National Institutes of Health, was enacted and in July 1937 the National Cancer Institute was established with the authority to provide fellowship training. The support for these programs, though, was still quite modest in terms of our modern perspective. Until this time, the bulk of support for medical research and for young investigators being trained for medical research came from private foundations.

During the period before World War II a few physicians came to Rochester for varying periods of time, and combined clinical responsibilities with laboratory research. However, most of these individuals were identified as junior faculty rather than fellows or trainees. The advent of the war provided a strong impetus for the expansion and pursuit of directed research aimed towards medical problems associated with the war itself. Wartime contracts under the Committee for Medical Research and, in turn, under the Office of Scientific Research and Development led to a major expansion of governmental support for medical research. Toward the end of World War II, production of the atom bomb and the growth of radiation medicine and biology under the auspices of the Atomic Energy Commission provided an opportunity for selected types of postdoctoral training at a limited number of institutions throughout the country. The Atomic Energy Project at the University of Rochester was the first of these medical installations.

The Public Health Service Act of 1944 authorized the NIH to establish fellowships and training programs, and in 1947 the Division of Research Grants was created to administer extramural programs that included these awards. In 1948, the National Heart Institute and the National Institute of Dental Research were established and the following year the National Institute of Mental Health was created.\* In 1950, the National Institute of

<sup>\*</sup>The National Institute of Mental Health was separated from the National Institutes of Health to become a bureau within the Public Health Service in

Neurological Diseases and Blindness and the National Institute of Arthritis and Metabolic Diseases were established. The National Microbiological Institute became the National Institute of Allergy and Infectious Diseases in 1955. In 1950, the National Heart Institute initiated stipends for trainees, signaling a trend that led to a rapid expansion of training programs throughout the 1950s and 1960s. Expansion of governmental support for training programs was part of the major growth in federal support for medical research in general, encouraged in significant measure by individuals like Mrs. Mary Lasker, who exerted powerful influence on several presidents and important legislators, such as Representative John Fogarty and Senator Lister Hill.

At their outset, many of the NIH training programs included both opportunities for postdoctoral research training and advanced clinical training. By 1960, with the exception of the National Institute of Mental Health, it became clear that the need for training of future faculty and research scientists was dominant, and training programs without these capabilities began to be phased out. The categorical institutes concerned themselves particularly with post-M.D. training of physicians for academic medicine and clinical investigation while the National Institute of General Medical Sciences focused on predoctoral training in the basic biomedical sciences.

The Fountain Committee Report in 1961, which suggested that the NIH should provide a closer accounting for its expenditures, signaled the end of the period of continuing expansion of federal support for medical research. Following this congressional reevaluation of NIH expenditures, President Lyndon Johnson reopened the question of the utility of basic research and the expenditures necessary to sustain it. The NIH training and fellowship programs reached their peak dollar support level in 1969, and have been declining since. Most recently, through budgetary decisions emanating primarily from the office of Management and Budget in the Nixon administration, the decision was reached, and announced with the President's budget in January 1973, to phase out training programs and fellowship support. The ensuing protests from the medical scientific community resulted in partial restoration of NIH-supported research

January 1967, and subsequently it became part of the Health Services in Mental Health Administration.

fellowships (although the total number to be supported amounts to approximately one for every five positions previously supported through fellowships and training grants). Due in part to the antagonism between Congress and the administration, and the first real systematic lobbying effort by the medical scientific community, it seems that some form of training subsidy will be restored.

At Rochester, as at many independent medical schools across the country that have benefited from federal support for post-M.D. training, the evolution and expansion of training programs has resulted in a marked growth in the training opportunities within clinical departments, particularly in the Department of Medicine. An anomaly of this growth pattern was the fact that the programs of training in the surgical subspecialties traditionally supported from patient-care income as residency training came to be paralleled by the development of clinical traineeship programs in psychiatry as well as traineeships in various subspecialties of internal medicine that combined both clinical training and research training. The clinical training programs in the Department of Medicine, in effect, amounted to subspecialty residency training that was being supported by the federal government.

The pattern of subspecialization, of course, has evolved nationwide, but in state institutions and many private institutions with less strength in research and research training than Rochester, and less ability to attract training grants, clinical training in medical subspecialties has come to be designated as residency training and to be supported by patient income funds. For physicians who are training to become clinical investigators, the separation of clinical training from research training is artificial and, in the view of many, undesirable. Yet it seems likely that to whatever extent Congress restores federal support for training, such funds will be intended for research training rather than clinical training. The response to this crisis produced by changes in federal policy differs greatly across the country and, for perhaps the first time since the early growth of NIH-supported training programs, a variety of approaches to training and its support appear to be evolving.

Nonfederal support from foundations and charitable organizations such as the American Cancer Society, the American Heart Association, the Leukemia Society, the National Founda-

tion and many other disease-oriented private agencies has grown at Rochester and elsewhere very much in parallel with NIH-supported medical research and has included research fellowship training awards in the areas of interest of the particular association or foundation. However, the restricted capability of these organizations are being stressed to the limit at the present time. At this critical time the School of Medicine and Dentistry has committed itself to the continuation of postdoctoral subspecialty research training in the Department of Medicine in recognition of Rochester's responsibility to continue to train individuals who seek preparation for academic careers.

The increasing strength of the teaching and research activities in the University-affiliated hospitals has also added a new dimension to the types of postdoctoral research training available at Rochester, and the affiliated hospitals have also contributed to support of postdoctoral trainees. It can be anticipated that these types of interhospital training programs will grow with the growth of the affiliated hospitals program.

As the School of Medicine and Dentistry celebrates its fiftieth year, it is clear that the pattern of growth of post-M.D. research training at Rochester has indeed reflected the evolution of NIH support for training, with certain important and locally distinctive features such as the Atomic Energy Project, that has evolved into the Department of Radiation Biology and Biophysics. An additional strength has been the geography of the Medical Center, which encompasses preclinical and clinical departments all under one roof, enormously facilitating clinical-preclinical communication and training opportunities for post-M.D. trainees and fellows and for the faculty.

# III. DEPARTMENTAL TRAINING PROGRAMS FROM 1945 TO 1975

A historical perspective of post-M.D. training at Rochester is best provided by reviewing the history of such training in each of the departments, in order to emphasize the goals and accomplishments of each.

# A. Preclinical Departments

#### Department of Anatomy

Despite its basic science orientation, the Department of Anatomy has since its inception provided research and teaching experience

for physicians in several areas. The medical training and clinical perspective of the first chairman, Dr. George W. Corner, and his classic studies in human embryology and reproduction, provided a milieu attractive to a number of physicians seeking postdoctoral experience in these areas.

Under the chairmanship of Dr. Karl E. Mason, a number of resident physicians in orthopedic surgery and neurosurgery participated in teaching programs of the department as a formal part of their residency training. A number of fellows in pediatric neurology received training in the department under the supervision of Dr. Wilbur K. Smith. Several visiting professors participated in the research and teaching programs of the department during this period.

With the extensive program in neural sciences, under the chairmanship of Dr. Karl M. Knigge, a number of fellows have received research training and experience in this area.

With the establishment of the Division of Genetics, under the direction of Dr. Philip L. Townes, training and experience in genetic research and clinical genetics have been provided for a number of residents and fellows from clinical departments at the Medical Center, its affiliated hospitals, and other medical centers.

# Department of Biochemistry

One of the earliest NIH training grants in biochemistry was for postdoctoral training in biochemistry, with the objective of training physicians in research and teaching in biochemistry. This was awarded in 1957, and four young physicians spent a year or more in the Department of Biochemistry, participating fully in the department's activities in an area developed particularly for their use with the cooperation of the Department of Medicine.

# Department of Microbiology

Post-M.D. training in the Department of Microbiology has had the objective of providing medical graduates with an intensive experience in basic research so that these graduates could either enter an academic career in a clinical department with a background of fundamental knowledge and research techniques to study clinical problems or return to work in research and teaching basic medical sciences. During this time, 19 individuals have participated in the program and 12 are now in full-time academic

positions. A unique contribution has been made to medical education in Norway in that the professorial chairs in virology in the medical faculties of Oslo and Bergen are held respectively by Drs. M. Degre and G. Haukenes, who had their virology training here. A training grant in infectious diseases held jointly with the Department of Medicine provided support for several of these individuals.

# Department of Pathology

Between 1936 and 1955, when Dr. George Whipple was chairman of the department, he made it a matter of policy for pathology residents to take a year of research as part of their training. That policy was continued after Dr. Lowell Orbison came to Rochester in 1955 to assume the chairmanship. In 1957 the Department of Pathology was awarded its first NIH training grant and the policy of incorporating a research experience into pathology training continued.

With Dr. Patten's assumption of the chair in 1969 additional emphasis on the training of Ph.D. candidates in pathology has become part of the departmental program and the post-M.D. fellows have earned Ph.D.s in pathology in recent years.

### Department of Pharmacology

Post-M.D. training in the Department of Pharmacology and Toxicology began with the appointment of Dr. Lawrence G. Raisz in September 1961. The first trainee in clinical pharmacology, Dr. William Au, completed his training in July 1963 and went on to become the clinical pharmacologist for Rochester General Hospital. Additional post-M.D. fellows, including individuals from abroad, have worked with Dr. Raisz on his study of one-cell metabolism. In 1970, Dr. Louis Lasagna became chairman of the Department of Pharmacology and between 1970 and 1975 14 trainees have worked in clinical pharmacology in the Department of Pharmacology. These trainees have participated in ongoing research programs in analgesic testing, metabolism of Levodopa, digoxin kinetics, the therapy of hypertension, hypolipidemic drug efficacy, calcium metabolism, and studies of physician prescribing, as well as hospital and outpatient drug-use patterns.

## Department of Physiology

From the beginning, the Department of Physiology encouraged

both Ph.D. and M.D. holders to enter upon research and teaching activities. Dr. Fenn and Dr. Adolph had earlier profited by such activities in both the United States and Britain.

A year or even a summer of such postdoctoral work enabled incumbents to test their research interests and talents. Some did team work with faculty members, but most tackled independent projects. They perhaps learned most from graduate students and year-out medical students at work in the department. In teaching and research no distinction was made between those appointed for research and those of faculty status; all shared in class exercises, seminars, etc.

In 1946 and subsequent years, numerous postdoctoral individuals separated from the armed services and spent a year or two in rehabilitating themselves. Some of them subsequently entered clinical departments in various universities, full time or part time; others became full-time physiologists.

Sources of support varied. A few were given departmental funds, many received veterans' benefits, others held NIH fellowships, foundation fellowships, or dental research grants. A few acquired second doctoral degrees.

In 1950 Dr. Fenn stated that during the first twenty-five years of the department, 17 visiting workers had come from abroad, 31 postdoctoral fellows were here, and 5 dental fellows took Ph.D. degrees.

During the years (1959-67) that Dr. Lotspeich chaired the Department of Physiology, the valuable traditions and reputation of postdoctoral training established in the department were continued. This atmosphere was enhanced by the awarding of training grants and special postdoctoral fellowships from the United States Public Health Service and from the Rockefeller Foundation, the Life Insurance Medical Research Fund, and the American Heart Association. An additional activity of individual department members which contributed to postdoctoral training was their participation in the teaching of physiology at universities abroad. Dr. Nasset taught at the University of Lahore, in Pakistan, Drs. Lotspeich, Heggeness, Craig, and Ginsburg all participated in teaching at the newly founded medical school at the University of Lagos, in Nigeria. These activities later resulted in faculty members from these countries coming to Rochester for postdoctoral experiences-from Nigeria, India, Finland, Ghana, Mexico, Korea, France, and Colombia. During the same period,

there were a total of 17 postdoctoral fellows from the United States and abroad who spent at least one year training in the Department of Physiology.

Active postdoctoral training has continued since 1969, when Dr. P. Horowicz became chairman. United States Public Health Service training support has continued while a new program project grant and postdoctoral fellowship support from the Muscular Dystrophy Association of America have supplemented support for such fellows. This has permitted foreign fellows and visiting faculty to continue to come to Rochester from Argentina, Australia, Chile, Colombia, India, Italy, Japan, and Mexico. Six American postdoctoral fellows have participated in the program.

## Department of Radiation Biology and Biophysics

The University of Rochester Atomic Energy Project, which arose from the Manhattan District of the United States Army Corps of Engineers, had its beginnings in June 1943. In 1948, the Atomic Energy Commission initiated fellowship programs in health physics, and Rochester and Vanderbilt were selected as the two initial training schools. Under this program, training in radiation biology, radiological physics, industrial hygiene and toxicology, and statistics were offered. In 1950, the program in industrial medicine was developed in collaboration with physicians from Eastman Kodak Company.

Between 1963 and 1965, the department became a recipient of a biophysics training grant, and in 1965 the name of the department was changed to Radiation Biology and Biophysics to reflect the broadened fundamental interest of the research activities of the department.

In the early 1950s, the department offered basic training of physicians in preparation for assignment to nuclear-powered submarines and training of physicians and health physicists to deal with radiation health problems in the armed services. These programs were ultimately supplanted by the more basically researchoriented Ph.D. programs.

Between 1946 and 1961, 11 physicians received postdoctoral research training in the Atomic Energy Project's Flash Burn Unit. This unit was organized by Dr. Herman E. Pearse, to determine the pathologic effects of burns produced by radiant thermal energy and the effectiveness of various materials as protection against such burns.

Since 1960, 18 post-M.D. fellows have worked on research projects with various investigators within the Department of Radiation Biology and Biophysics. Nine of this number, over this period of time, have worked with staff members who have joint appointments in the Department of Medicine (Hematology). Others have come to work in the department through pharmacology and toxicology. All but 2 of these 18 post-M.D. fellows have gone on to full-time academic appointments in various departments at Rochester or elsewhere, and the 2 who are in the private practice of medicine have part-time academic affiliations. The breadth and depth of research interests in activities within the Department of Radiation Biology and Biophysics provided an ideal opportunity for interdepartmental research training over the years.

## B. Clinical Departments

## Department of Health Services

Although the Department of Health Services has no formal post-M.D. fellowships or training program, from the historical point of view it is important to mention that training in hospital administration under Drs. Faxon and MacLean during the period 1922 to 1954 was offered to physicians who later became distinguished hospital administrators in their own right. Among these early trainees were Dr. Albert Snoke, who became director of the Yale-New Haven Hospital; Dr. Lloyd Mussels, Peter Bent Brigham Hospital; Dr. Henry Clark, who became vice president for medical affairs at the University of North Carolina; and Dr. Gordon Meade, who became clinical director of the Miners Memorial Hospital of the United Mine Workers Welfare Fund.

#### Department of Medicine

Since World War II, the history of post-M.D. research training in the Department of Medicine has paralleled the general growth of the medical subspecialties in terms of new information and increasing scientific sophistication. The extension of categorical training programs in recent years has been accompanied by the establishment of certifying examinations in the various subspecialties by the American Board of Internal Medicine. The training programs in medicine have included a mix of clinical training and research training. Over the thirty-year period since the end of

World War II, half of the individuals who have taken post-M.D. training within the Department of Medicine have gone on into full-time careers in academic medicine.

Apart from categorical training grants, research training in the Department of Medicine has been sponsored by the NIH through its research fellowships and its Research Career Development Awards. Additional support has come from the American Heart Association, the American Cancer Society, the Arthritis Foundation, the Leukemia Society, and the Monroe County Cancer and Leukemia Association. The bequest of Mr. Ralph Hochstetter to the University of Rochester has had a significant influence on the evolving central role of scientist-clinicians within clinical departments at Rochester. The Buswell Fellowship Program has supported 28 members of the Department of Medicine for periods from one to three years since 1958. Twenty-three of these are now engaged in full-time academic careers.

The Arthritis Unit, which began as the Arthritis Clinic during the 1930s, under the direction of Dr. Jacob D. Goldstein, became identified as a unit after World War II, under the direction of Dr. Ralph Jacox, who has directed the unit until the present time. Between 1957 and 1970, individuals received training and were supported by a training grant from the National Institute of Arthritis and Metabolic Diseases, in addition to support for others from the Arthritis Foundation.

The Cardio-Pulmonary Unit existed on an informal basis, under the direction of Dr. William S. McCann, from the founding of the School of Medicine and Dentistry. Pulmonary disease received special emphasis in the 1930s under the direction of Drs. Nolan Kaltreider, Alberto Hurtado, and George R. Meneely, and later, after World War II, under the direction of Dr. Robert Bruce. In 1950, Dr. Paul Yu and Dr. Frank Lovejoy, Jr. worked together to further develop the Cardio-Pulmonary Unit and in 1957, Dr. Yu was named head of the unit. Postdoctoral training in the Cardio-Pulmonary Unit dates from 1954, when the first 4 trainees worked in the unit with NIH support. Between 1954 and 1962, 4 to 6 research trainees per year passed through the unit with support from the NIH, American Heart Association, American Thoracic Society, Genesee Valley Heart Association, and Buswell Fellowship.

In 1962, a postdoctoral training grant was awarded by the National Heart Institute for the training of 6 postdoctoral indi-

viduals per year; the number was increased to 8 per year in 1967.

Since 1972, 12 trainees per year (6 the first year, 6 the second year) have received training in the cardiology program through a combination of support from the National Heart and Lung Institute training grant (2 trainees per year), the Genesee Valley Heart Association, Rochester General and Genesee hospitals, and patient-care income. Since 1962, 96 postdoctoral trainees have received training in cardiology.

The Pulmonary Unit was created as a separate entity in 1968, with Dr. Nolan L. Kaltreider as the acting head until 1969, when, with grants from the American Thoracic Society and the New York State Tuberculosis Respiratory Disease Association, Richard Hyde became head of the unit. The Pulmonary Unit was awarded a training grant from the National Heart and Lung Institute beginning July 1973. Between 1970 and 1974, 12 trainees received training in the unit.

The Endocrinology Unit was under the joint direction of Dr. Henry T. Keutmann and Dr. Doran J. Stephens through the 1930s. In 1941, following Dr. Stephens' death, Dr. Keutmann became head of the unit and supervised its activities, along with Dr. Samuel H. Bassett. This unit was the recipient of the first postdoctoral training grant at Rochester, in 1953. Under Dr. Keutmann's direction, research training emphasized the study of excretory products of adrenal steroids, regulation of water excretion, and the nature of blood lipids. At least 5 outstanding trainees from the Endocrinology Unit during that period have gone on to become leaders in their respective fields of research. In 1962, Dr. Seymour Reichlin became head of the unit and the research emphasis shifted toward neuroendocrinology, specifically, the control of pituitary hormone secretion.

In 1969 Dr. William Peck succeeded Dr. Reichlin as head of endocrinology. Since then work in the Endocrine Unit has focused on parathyroid hormone, bone cell metabolism, studies of the effects of cortisol on amino-acid transport in normal and malignant leukocytes, lipid metabolism, and development of a radioimmunoassay for ACTH.

Between 1953 and 1974, 57 trainees received training in the Endocrine Unit; of these, 25 currently have positions in academic medicine and are engaged in active research. Ten have reached the rank of associate professor or higher, in medical

schools across the country. Nine out of 16 trainees who have participated in the program since 1966 are now in full-time academic medicine.

The Gastroenterology Unit, in the Department of Medicine at Rochester, began under the direction of Dr. Harry L. Segal in 1932 and became more formally identified as a unit in 1957, with activities both at Strong Memorial and Genesee. A training grant in gastroenterology was first awarded in 1959 by the National Institute of Arthritis and Metabolic Diseases (now the National Institute of Arthritis, Metabolic and Digestive Diseases). In 1965, Dr. Segal was appointed chief of medicine at Genesee, and from that time until the present, Dr. Michael D. Turner has been head of the Gastroenterology Unit.

General Medicine. In 1967, the Clinical Services Group of the Department of Medicine was organized to encourage scholarship in general medicine and in the delivery of health care within the University Medical Center as well as in the community and region. Three senior staff members have been appointed to serve as models of general internists and to conduct studies in innovative educational programs related to health care delivery and its assessment, with support by the Rochester Regional Medical Program, the medical nurse-practitioner training grant and by the Johnson Foundation.

The Hematology Unit of the Department of Medicine was formed in 1928. Dr. John S. Lawrence served as head until he left to become chairman of the Department of Medicine at UCLA in 1947. From January to July 1948, Dr. William N. Valentine and Dr. Lawrence E. Young directed the program jointly until Dr. Valentine left Rochester to join Dr. Lawrence at UCLA in July 1948, at which time Dr. Young became unit head. Dr. Young directed the Hematology Unit until 1957, when he became chairman of the Department of Medicine. Dr. Scott N. Swisher directed the Hematology Training Program from 1957 until 1967, when he left Rochester to become chairman of the Department of Medicine at Michigan State. Dr. Robert I. Weed succeeded Dr. Swisher as head of the Hematology Unit in 1967.

From 1958 through the present time, primary support for the Hematology Training Program has been provided by a training grant from the National Institute of Arthritis and Metabolic Diseases. In addition, however, several individual fellows and trainees have been supported by fellowship awards from the American

Cancer Society, the Leukemia Society of America, the Monroe County Cancer and Leukemia Association, the American Heart Association, and NIH postdoctoral research fellowships and Research Career Development Awards. Three Canadian trainees have passed through the program with support provided by the Canadian Cancer Society and the Medical Research Council of Canada.

Research emphasis has ranged from studies of hemolytic anemias, particularly hereditary spherocytosis and immunohematologic studies under Drs. Young and Swisher, to studies of membrane physiology of normal and pathologic red cells and white cells in more recent years.

Since 1967, the Hematology Training Program has included experience in coagulation at Rochester General. With the impending cutback in federal support, in July 1972 a new clinical training program in hematology was developed in conjunction with Highland Hospital (Dr. Bennett), St. Mary's Hospital (Dr. Smith), Rochester Red Cross (Dr. Nusbacher), and Rochester General Hospital (Drs. Troup and Breckenridge). Financing of this interhospital and Red Cross program by the affiliated institutions has been a vital element in preservation of the Hematology Training Program at Rochester.

Forty-eight individuals have passed through the Hematology Training Program since 1957, and of these, 33 have gone on to assume full-time academic positions; of the 14 in practice, 6 have part-time academic appointments. Since 1967, 80 percent of the trainees who have passed through the program have assumed academic positions. Thirteen trainees have reached the rank of associate professor or higher and 6 have become heads of hematology or other units in various medical schools.

Additional research training has involved studies of the control of oxygen dissociation, globin chain synthesis, cytogenetics, histochemical staining techniques, coagulation studies, including characterization of Factor VIII activity in hemophiliacs, red cell enzyme defects, and ultrastructure of cells, spleen, and bone marrow.

Immunology and Infectious Diseases. The Allergy Clinic was under the direction of Dr. Stearns Bullen, Sr. from the beginning of the Medical School until 1958, when Dr. John H. Vaughan joined the Department of Medicine and became head of the newly created Immunology Unit. Since 1970, when Dr. Vaughan moved

to California to the Scripps Clinic Research Foundation, Dr. John Leddy has been head of the Immunology Unit and Dr. John Condemi has directed the Allergy Clinic and is associate head of the Immunology Unit.

From 1936 to 1961, Dr. Howard B. Slavin was in charge of activities in infectious disease. He was succeeded by Dr. James M. Colville between 1962 and 1964. Until 1970, Dr. John Vaughan served as head of both Immunology and Infectious Diseases units, when he was succeeded by Dr. R. Gordon Douglas, Jr.

Primarily through support from an immunology and infectious diseases training grant from the National Institute of Allergy and Infectious Diseases, 6 trainees have received research training in infectious diseases since the establishment of the unit in 1970.

Immunology Unit. Through a training grant from the National Institute of Allergy and Infectious Diseases, 24 trainees have received training in immunology since 1959. Of these, 18 currently hold academic or teaching positions, 13 at the rank of associate professor or above.

Research emphasis has included the biological role and structure of rheumatoid factors, pathogenesis of joint inflammation, antinuclear antibodies, erythrocyte autoantibodies, drug-induced immune hemolytic anemia or lupus syndrome, immunohistologic correlates of bronchial asthma and immediate hypersensitivity reactions, cryoglobulinemia, structure-function relationships of immunoglobulins, and hereditary complement deficiency states and their functional implications.

The Metabolism Unit was under the direction of Dr. Samuel H. Bassett from 1928 until he left to join the faculty at UCLA in 1948. Under his successor, Dr. Christine Waterhouse, metabolism became formally established as a unit in the late 1950s. Since that time, the activities have been closely associated with the Clinical Research Unit under Dr. Waterhouse's direction. This unit was originally called the Metabolism Ward and was formally converted to a General Clinical Research Center in 1960. The major thrust of postdoctoral training has focused on clinical research involving patients in the Clinical Research Center, including studies of electrolyte metabolism in patients with heart failure or with cancer, studies of bone metabolism, plasma expanders, lipoprotein phosphatides in various disease states, chromatographic studies of separation of cholesterol esters, cortisol and

aldosterone metabolism, lactic acidosis parathyroid disease, and lipoprotein separation. Fourteen trainees or fellows have received training in the Metabolism Unit, and 5 of these have gone on to occupy positions of academic distinction.

Oncology Unit. Postdoctoral training in oncology can be dated to the formation during the 1950s of an interdisciplinary group concerned with teaching clinical aspects of neoplastic disease to residents and students. In 1966, the Clinical Cancer Training Committee was organized under Dr. Richard F. Bakemeier, and the Oncology Unit was established in the Department of Medicine. Since 1970, 15 postdoctoral trainees have received training in the Cancer Training Program, which has had a primary emphasis on clinical cancer training.

In the spring of 1974, a cancer education section was founded in the newly reorganized University of Rochester Cancer Center with responsibility for continuing education for physicians and nurses as well as postdoctoral residents with clinical training in oncology. Dr. Robert Cooper was designated as director of the Cancer Center and Dr. John Bennett as director of the Interdepartmental Division of Oncology.

The Medical-Psychiatric Liaison Unit. From beginnings in Colorado (1935-38), Boston (1938-42), and Cincinnati (1942-46), and with the initial support of William McCann, Samuel Clausen, and Karl Wilson, John Romano and George Engel were able to develop teaching programs for medical students and house officers on the floors and clinics of several services. George Engel had worked with John Romano toward these ends in Boston (1941-42) and Cincinnati (1942-46), and both were particularly ready to develop the liaison teaching programs. The major aim was to develop educational and research programs in the psychosocial aspects of illness. This training program, for physicians who have completed residency training in medicine, obstetrics-gynecology, pediatrics or psychiatry since 1946, has been under the direction of Dr. George Engel (until the present time), Dr. William A. Greene, who was associate director from 1964 through 1972, and Dr. Arthur Schmale, since 1972. Ninety-four fellows had completed training through July 1974. Distribution of these according to discipline has been as follows: Internal medicine—39; psychiatry—37; obstetrics-gynecology—10; pediatrics— 6; neurology—1; nursing—1.

Fifty of these trainees are in full-time academic positions in

the United States, Canada, Australia, Switzerland, and Brazil. Five are chairmen and one is the acting chairman of clinical departments, and 3 direct medical-psychiatric liaison programs in other medical schools. Psychosomatic research activities in which trainees have been involved include studies of: delirium. fainting, ulcerative colitis, leukemia, lymphoma, behavior and gastric secretion, hypertension, psychological settings of disease onset, conservation-withdrawal, rheumatoid arthritis, celiac disease, sprue, myocardial infarction, sudden death, open-heart surgery, stroke, multiple sclerosis, developmental consequences of infant trauma, cardiac pacemakers, psychoendocrine studies of cardiac catheterization, experimentally induced sadness, syndromes of depression, conversion reactions, psychogenic pain and proneness to pain, behavior modifications of psychosomatic symptoms, interviewing techniques, characterization of affective behavior, abortion, grief and grieving, death and dying, hemodialvsis and renal transplantation and postures, and gestures and facial expressions.

Nephrology Unit. Dr. John R. Jaenike became head of the Renal Disease Unit of the Department of Medicine in July 1965 and was joined by Dr. Richard B. Freeman, who assumed direction of clinical activities in 1967, when a formal teaching, referral, and research program was developed and the unit became known as the Nephrology Unit. In 1974, Dr. Freeman was designated unit head. With support from the New York State Kidney Institute and the Clinical Fund of the Nephrology Unit, 15 nephrology fellows have had training experience in the unit. Three of these fellows are currently senior faculty in the Nephrology Unit and 6 are engaged in the specialized practice of nephrology at other institutions in this country, while 3 are practicing nephrology at medical centers in other countries. Research activities within the Renal Unit have included micropuncture studies of experimental acute renal failure, studies of renal function in obstructive uropathy, intrarenal hemodynamic changes induced by angiotensin, and long-term clinical studies of patients with glomerulonephritis and hereditary renal disorders. The nephrology fellows have played a major role in the Rochester Regional Kidney Disease Program.

#### Department of Neurology

Neurology was a division of the Department of Medicine until

1966. In the early 1950s, formal fellowships were initiated by the National Institute of Neurological Disease and Blindness. The neurology training grant, as such, was initiated in the late 1950s under Dr. Paul Garvey, with the collaboration of Dr. Sandra Feldmahn, and subsequently was under the direction of Dr. Forbes Norris in 1963, after Dr. Garvey's retirement. In 1966, neurology became a separate department with expansion of the training program, so that there were 6 or 7 trainees at a time in the program. Since 1966, 11 trainees have completed the training program and 9 of these have gone into academic neurology, 7 with full-time appointments and 2 with part-time Medical School appointments.

Individual fellowships in pediatric neurology have been supervised by Dr. Wilber K. Smith.

## Department of Obstetrics and Gynecology

Postdoctoral (post-residency) training in the Department of Obstetrics and Gynecology dates to 1949, when Dr. John Donovan took a year of traineeship in the Psychiatric Liaison Program. Subsequently, 21 of 44 physicians who have completed the chief residency in obstetrics and gynecology between 1950 and July 1974 served as fellows or postdoctoral trainees. Eleven of these have trained since 1967, when the department received its first training grant—a grant that was renewed in 1972 but whose future rests with the future of all training grant programs.

Four of 9 postdoctoral fellows who took special training in psychiatry undertook research experiences, and of these 3 have assumed positions in academic obstetrics and gynecology or at the level of associate professor or professor.

Fifteen residents have taken a one-year research fellowship, and of these 10 have accepted full-time academic positions at Rochester, 3 other medical schools in this country, and the University of London. Two have public health careers involving administrative research activities concerned with the delivery of health care.

## Department of Pediatrics

The Department of Pediatrics has had a limited number of research fellows, beginning with 1 or 2 per year, dating back to the early 1950s. This pattern probably dates back to 1925, but no formal records are available. Most of these fellows have been

supported as research assistants, either from individual research grants or through awards from various private foundations. Within the department, the only formal research training grants have been infectious disease and hematology through participation in the joint medical-pediatric training grants with the Department of Medicine.

Beginning in 1969–70, fellowships have been offered in community ambulatory pediatrics and these have been supported in part from a clinical training grant from the Children's Bureau. Fellows in pediatric cardiology have been supported from patient income and the American Heart Association. Approximately two-thirds of the 90 fellows trained in the Department of Pediatrics between 1951 and 1974 have gone on to assume positions in academic pediatrics and 7 have become chairmen of departments of pediatrics.

## Department of Preventive Medicine and Community Health

When the Department of Preventive Medicine and Community Health was established in 1958, its mission was construed as promoting teaching and research in comprehensive health care, to include occupational medicine and rehabilitation.

A graduate program in occupational medicine had already existed within the Department of Radiation Biology and Biophysics as an outgrowth of the Manhattan project (see Radiation Biology and Biophysics), under Dr. Rufus Crane. This was a two-year program leading to a master of science degree, with 1 to 2 students per year. The program offered exposure to the expertise in radiation biology within the Atomic Energy Project, and exposure to the outstanding medical department at Eastman Kodak. However, as the emphasis in industry turned to medical specialties, the demand for industrial medicine specialists per se decreased, and this program was terminated in 1967.

Subsequent to that time, a graduate program in the organization, financing, and evaluation of health care services leading to the master's degree in community health has been offered for physicians and other interested graduate students. This program has been supported by training grants from the Health Services and Mental Health Administration and from the Bureau of Health Manpower of the NIH. This program has grown from 1 student in 1970 to 9 full-time students, including 3 postdoctoral students, in 1974. An important part of this program is participa-

tion in a research project on health delivery programs involving the use of epidemiologic techniques. These projects are designed to provide an experience requiring careful evaluation and critical thinking for those interested in health care work.

# Department of Psychiatry

Postdoctoral research programs in psychiatry are described elsewhere in this history.

## Department of Radiology

The only formal, post-M.D. fellowship training program within the Department of Radiology has been the program for training in radiation therapy, physics and biology within the Division of Radiation Therapy, under the direction of Dr. Philip Rubin, director, and Dr. George W. Casserett, research training director. This program has existed since 1962 with training grant support from the NIH. The intent of the program has been to develop research radiation therapists.

This objective has been achieved, in part, by collaboration with the Department of Radiation Biology and Biophysics in the training of 11 physicians who have worked toward the M.S. or Ph.D. degrees in radiation biology and biophysics. It has also provided training opportunities for individuals with their primary base in the Department of Radiation Biology and Biophysics. Effective in 1974, radiation therapy has become the Radiation Oncology Division of the University of Rochester Cancer Center.

Over the years, formal postdoctoral training has been offered to physicians or Ph.D.s engaged in various types of research activities through assistance from local sources such as Eastman Kodak Company, Picker Foundation, American Cancer Society, New York State Department of Health, NIH fellowships, the American Heart Association, the Segal Research Fund, and Buswell fellowships.

NIH support has made possible training and investigative experiences for 3 physicians in the Division of Diagnostic Radiology.

## Department of Surgery

During the period of growth between 1926 and 1951, research support in the Department of Surgery was obtained from the United States Public Health Service, the American Cancer Society, the Damon Runyon Memorial Fund, the Office of Naval

Research, the Department of the Army, the Forman Fund, the Buswell Fund, the Cancer Control Society of New York, E. R. Squibb and Son, and the state of New York. Between 1951 and 1958, the Laboratory of Experimental Surgery was established under the direction of Dr. W. Andrew Dale; he was succeeded by Dr. James A. DeWeese. Selected surgical residents spent time in the laboratory during this period, and NIH fellowships were awarded to assistant residents for their period in the Laboratory of Experimental Surgery. It was at this time that regular experiences for assistant residents in surgery came to include time spent in the Laboratory of Experimental Surgery. In January 1962, Dr. Schwartz became Director of the Surgical Research Laboratory and during this year the facility was remodeled with federal support. From July 1963 through June 1964, 10 senior residents spent periods of time ranging from six months to a year in the Surgical Research Laboratory. In 1965, an NIH training grant in academic surgery provided an opportunity for 3 residents per year to enter a training program aimed at producing future faculty in departments of surgery. From 1965 to 1974, 35 surgical residents have spent six months to a year, or more, of research training in the Surgical Research Laboratory, with training grant support from the National Institutes of Health and support from individual research grants including Dr. Schwartz's grant, the John A. Hartford Foundation, the Genesee Valley Heart Association and the Buswell Fellowship Fund. Six of the trainees during this period were from foreign countries. Of the 35 trainees who have had experience in the Surgical Research Laboratory between 1965 and 1974, several of these have gone on to assume academic positions in departments of surgery.

# Surgical Subspecialties

Between 1962 and 1964, 4 postdoctoral fellows worked on the problems of arthritis in the Division of Orthopedic Surgery.

Between 1961 and 1971, the Division of Urology offered a traineeship under a training grant award from the National Cancer Institute. This program was under the direction of Dr. Donald F. MacDonald, chairman of the Division of Urology, until 1969, when Dr. Irwin M. Frank became the director. Over this period, 13 trainees worked in the Urology Program, including Dr. Frank, who was an American Cancer Society fellow. These trainees took part in clinical research activities of the Division of Urology, in-

cluding studies of renovascular hypertension and carcinoma of the kidney, bladder and prostate, drug-therapy studies, renal transplantation work, renography, studies of urinary calculi and gram-negative sepsis. Of the 13 trainees, 3 presently have fulltime academic appointments in clinical urology, 3 have part-time university affiliations, 2 are still in training, and 4 are in full-time practice in urology.

# C. Special

# Clinical Investigator Training Program

By the early 1960s, when the growth in support for research and research training had begun to level off and the NIH and the grantee institutions were forced to examine the objectives of their programs more critically, it had become obvious that the traditional pattern for training of clinical investigators—i.e., four years of medical school, followed by an internship and three or more years of clinical residency, often interrupted by two additional clinical years of limited educational content while serving in the armed forces, with an ultimate return to the research laboratoryrepresented a very major passage of time before even the ablest individuals were able to really devote themselves to training to be a research scientist. For most physicians with this type of background it had become apparent that they were capable of making a contribution to society and of earning a good living, and that they could obtain personal satisfaction by applying their training to the practice of medicine. In fact, for most it was not at all clear that any meaningful future lay beyond a period of research training in a basic science laboratory, and for many physicians who had gone through specialty training in a clinical discipline entering a basic science laboratory amounted to starting all over again.

For these reasons, the Department of Medicine, under the direction of its chairman, Dr. Lawrence E. Young, developed a program of Training for Clinical Investigation (CIT), with Dr. Robert Weed as director. In 1968, Dr. Weed was joined in the active direction of the CIT Program by Dr. Paul LaCelle.

Although this program was formally a Department of Medicine program supported by a grant from the National Institute of Arthritis and Metabolic Diseases, the CIT had trainees working in all seven preclinical departments of the Medical School, in addition to their base in the Department of Medicine. An impor-

tant initial feature of the program was to provide a unique program combining staged residency training interspersed with periods of laboratory research. One of the 5 participants at this level went on to earn a Ph.D. in biophysics shortly after being certified by the American Board of Internal Medicine. In addition, from the outset the program included, and later came to emphasize, predoctoral M.D. training for clinical investigation, including M.D. work combined with one or two years of research (5 students have participated in this type of experience), and ioint M.D.-Ph.D. or M.D.-M.S. degree work (26 had participated in this type of program through 1975). The CIT Program was the first formal training program for joint M.D.-Ph.D. work within the School of Medicine and Dentistry. Finally, the CIT Program has sponsored college student summer research experiences designed to provide students with an understanding of the concept and the role of the clinical investigator by working in the laboratory of such an individual, as well as an opportunity to evaluate their own interest in clinical investigation as a career.

Each postdoctoral or predoctoral student in the CIT Program was assigned to both a preclinical and clinical sponsor to emphasize the need for moving back and forth between the basic science laboratory and the problems of clinical medicine. Between 1965 and 1975, of the 11 postdoctoral participants in the program 9 have subsequently assumed full-time academic positions and 2 have gone on to a full-time hospital appointment with university affiliations. Of the M.D. or M.D.-Ph.D. student graduates of the program, 6 have gone on to positions at one of the National Institutes of Health and all but 4 appear headed for academic careers. Forty-four publications have been produced by students in the CIT Program over this period. As has been the fate of many of the NIH training grants, not only at Rochester but across the country, the CIT training grant is being phased out and will terminate in 1977. Many of the predoctoral types of training opportunities offered by the CIT Program will be replaced by the Medical Scientist Training Program, under the direction of Dr. Frank Young (see the following chapter).

# IV. CURRENT TRENDS AND FUTURE RESEARCH TRAINING FOR PHYSICIANS

It is clear that as we move into the next fifty years the complexity of medical research and the need for skilled investigators and

highly informed faculty to train new generations of medical students mandates a continuation of the post-M.D. training patterns that have evolved. Yet, in the mid-1970s, in addition to the constriction of federal support for research training, another issue of great national concern that will have an inevitable impact on the future of research training is the increasing public concern over the delivery of health care. The inevitable enactment into law of some form of national health insurance will serve to heighten the public's awareness of the disproportionately low percentage of medical school graduates who settle in rural communities and concern themselves with the primary delivery of medical care. In fact, as Rogers (1975) has pointed out, there is considerable sentiment for the point of view that because the federal government has invested so heavily in supporting research and research training in the medical schools since the end of World War II, the medical schools now have the obligation to help solve this problem. Certainly, the future must include the initiation of various approaches to the problem of the delivery of health care, but not at the expense of training physicians for careers in research and teaching.

It is possible to make certain projections about the future in the light of how the medical-political turmoil of the period 1965 to 1975 has affected patterns of training for physicians either as clinical investigators or as teachers and researchers in preclinical departments. Nationally, the period of unrestricted growth in support for medical research and research training has ended and it almost certainly will not resume in the foreseeable future in the face of the overwhelming need for economy in national spending and solutions to potent and important problems such as the energy shortage. On the other hand, although it very nearly came too late, the medical scientific community has been aroused to impress upon Congress the importance of continuing support for medical research and training. These vital activities will surely continue and they will be supported substantially by the federal government, albeit with certain restrictions and definite modifications in the format. Outstanding research will find adequate support, but for at least three or four years beyond 1975, the numbers of young clinical investigators who have been trained in one program or another will probably exceed the numbers of available faculty positions that offer a major opportunity for research to physicians. This prediction seems likely in spite of the

fact that the base of support for research and research fellowships now extends well beyond NIH grants to include support from a wide variety of foundations, particularly those oriented toward specific disease categories. The corollary of a decrease in opportunities will certainly be an increase in the competition and a more critical self-selection of individuals for (or away from) research careers.

Individual fellowship support will continue, but at a much more modest level than previously, and the new types of NIH research training programs directed at the institutional level will evolve with more stringent distinctions between research training and specialty or subspecialty clinical training, the latter having to be financed by the hospitals from patient care income rather than being supported by NIH funds, as in the past. The sharper focus on the research aspects of NIH training programs will lead to placement of these programs at institutions like Rochester that have traditionally had major commitments to research and research training. In fact, the continuing commitment, in 1975, of the School of Medicine and Dentistry to strong programs in research and to the provision of research training is likely to prove critical, five to ten years hence, in having maintained Rochester's position as a leader in this regard. As time goes by, the course of events now in motion is likely to identify Rochester more sharply as an institution with a major emphasis on research training.

The future will be different, but by no means necessarily bleak, for able physicians who wish to enter upon careers involving a major commitment to research. The events that have taken place in the period immediately preceding the compilation of this fifty-year history of the Medical Center will surely encourage vigorous self-examination of goals on the part of medical schools, departments within medical schools, and individuals. The result may well be enhancement of the quality of research training and research itself, both at Rochester and throughout the nation.

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# Zealous Companions in Research

7

The Graduate Studies Program



# J. Newell Stannard, Ph.D.

Newell Stannard came to the University of Rochester Medical School from Harvard in 1935 as a member of the Department of Physiology, where he gained experience in teaching medical physiology. He spent the war years at the National Institute of Health and in the Navy, returning to Rochester in late 1947 to carry major responsibilities for the development of a graduate education program in the newly organized Department of Radiation Biology. He was responsible for working with the large and diversified faculty to produce a viable curriculum in this new field first at the master's, then at the doctoral, level. He also helped to develop and teach several of the new courses. Beginning in the 1950s he helped to teach the Medical School pharmacology course, although through this period he placed primary emphasis on research and graduate teaching. In the 1950s he also served as a member of the "Division II" (Biological Sciences) Committee of the Graduate School.

On the retirement of Dr. Wallace Fenn from his duties as

Although my original assignment was to write a paper on Ph.D. programs in the context of research education, as the work progressed it became increasingly clear that the entire graduate studies enterprise should be treated as an entity. Hence this paper is somewhat broader and longer than originally planned.

## The Ongoing Years — Stannard

chairman of physiology and associate dean for graduate studies under the new decentralized organization of graduate studies, Dr. Stannard assumed the latter position. He continued his direct day-by-day contact with the radiation biology students and as associate director for education of the Department of Radiation Biology and Biophysics (AEP). He also helped in the expansion of the biophysics program from primarily radiation biophysics into molecular biophysics and was for eight years program director for the biophysics training grant from the National Institutes of Health.

Attendant to these duties, Dr. Stannard has been a continuing member of the Steering Committee of the University Council on Graduate Studies as well as of the council itself, a member of the Advisory Board of the Medical School, and chairs the Medical School's Committee on Graduate Studies. More recently he assumed administrative responsibility for the combined M.D./Ph.D. and M.D./M.S. programs, became a member of the Academic Council of the University, took organizational responsibility for the interdepartmental graduate courses and became an ex officio member of the Medical Curriculum Committee. He has also served for several years on the regular Medical Admissions Committee, with special responsibilities for the combined-degree applicants.

## I. OVERVIEW

THE Society of the Sigma Xi, an honorary scientific research society for North America, has as its motto "Companions in Zealous Research" (Spoudon Xynones). In contemplating the role of our graduate programs (Ph.D. and M.S.) in the fifty-year history of the Medical School the most apt characterization seemed to be a modification of the Sigma Xi motto; hence the title for this essay: "Zealous Companions in Research." The dedication of the School, its students, and its faculty to the pursuit of new knowledge has been made amply clear in many chapters of this volume. Nearly everyone had some opportunity to experience the thrill of developing some sort of individual project. But for the graduate students it was their principal effort and objective. Thus, their zeal for research had to be in extra full measure and their place in the School and careers had to be that of "zealous companions" to all of those others in the School engaged in the pursuit of new knowledge.

The setting for graduate work can perhaps be summarized best by a quotation from the first official Bulletin of the School of Medicine and Dentistry: "...in all work, prescribed, elective and independent, the relations of teachers and students will be those which would naturally be expected in a graduate school of arts and sciences." This statement remained in all subsequent issues of the Bulletin until a new introductory chapter was written for the 1958–59 edition. This emphasized that the Medical School is "necessarily a center of research."

Thus, the atmosphere of the School fully nurtured such an enterprise. With a distinguished faculty in the basic science departments, and strong liaisons with biology, chemistry, and physics in the College of Arts and Science, small but high-quality Ph.D. and M.S. work began quite early. We will trace details later on.

The Medical School had a head start on graduate education by proxy through the presence of graduate students already in courses in the Department of Vital Economics, which began studies in nutrition in 1919 at the Prince Street campus. It moved en bloc to the new Medical School as soon as space was ready in 1925 and became part of its program even though officially still under the College of Arts and Science. Biochemistry was the first department of the Medical School to receive authorization to grant a Ph.D., and the first Ph.D.-indeed the first earned doctorate given by the University of Rochester-was awarded to Warren M. Sperry in 1925. The second, in vital economics, was awarded to Vincent du Vigneaud in 1927. Each of these recipients had distinguished careers, including the Nobel Prize to du Vigneaud in 1955, and both received honorary Doctor of Science degrees from their alma mater in 1965 (see Figure I). The program did indeed get off to a good start.

A seldom appreciated fact is that our Medical School has tended, except in the first decade, to have more students working for graduate degrees in relation to the number of medical students than almost any other comparable medical school in the United States. Furthermore, this ratio has moved steadily upward. Figure II shows the ratios of enrolled graduate students and of Ph.D. students to medical students at Rochester over the period 1925 to 1972.

A quantitative comparison with other medical schools having similar character and reputation is shown in Table 1. The ten


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The first Ph.D. degree recipients from the University of Rochester, Dr. Vincent du Vigneaud (far left) and Dr. Warren Sperry (far right), taken on the occasion of their receiving honorary degrees (1965). They are pictured with Chancellor Allen Wallis and Ambassador Kenneth B. Keating, just after the ceremonies. (*Rochester Review*, fall 1973).



Ratio of numbers of graduate students to medical students at the University of Rochester School of Medicine and Dentistry over the 1925–72 period. Closed circles represent total graduate students/medical students. Open circles represent Ph.D. students/medical students.

schools most likely to have an appreciable number of graduate students were chosen. The figures are again given as ratios for the sake of simplicity. Only the University of Chicago exceeds Rochester by this measure, and this may well represent the fact that at Chicago the basic medical science departments are included in a larger Division of Biological Sciences of the university.

#### TABLE 1

Ratio	of	Graduate	to	Medic	al	Students	at	Several
		Medical	Se	chools,	1	953-1971		

School	Mean	Range
Chicago	.66	.17 - 1.61
Rochester	.44	.2464
Yale	.24	.1036
Western Reserve	.21	.1130
Pennsylvania	.19	.1130
Cornell	.12	.0124
Columbia	.11	.0421
Northwestern	.11	.0716
Johns Hopkins	.09	.0120
New York University	.08	.0319

It will be noted that Table 1 begins with 1953. Data for the decades of the thirties and of World War II were sufficiently difficult to obtain, making a quantitative comparison among the schools not feasible. However, informal personal inquiries by the author indicate that Rochester may have regularly had as high or higher ratio of graduate to medical students than any comparable center except in the very earliest years (1926–30.) In the thirties, for example, when Rochester was registering from 25 to 35 graduate students in the preclinical sciences, the Harvard Medical School seems to have had fewer than 10.

Obviously, some of the schools named have larger medical classes than Rochester has had and this pushes their ratio down somewhat. But even in terms of absolute numbers of M.S. and Ph.D. candidates only the University of Chicago has exceeded Rochester with any consistency over these postwar years.

The absolute figures as well as the ratios are of considerable importance. Hence, the numbers of both types of doctoral students—M.D. and Ph.D.—at Rochester are gathered in Table 2 for the period 1931 to 1974. These reflect the same basic trends seen

in Figure II but permit more detailed analysis, including the decline in Ph.D. students during World War II and a rather "flat" period in Ph.D.s in the decade of the fifties, which contrasts to the increase in total graduate student enrollment during that period.

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University of Rochester School of Medicine and Dentistry numbers and ratio of Ph.D. students to medical students

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Year	Ph.D.	M.D.	Ratio	Year	Ph.D.	M.D.	Ratio
'31	16	148	.11	'53	69	275	.25
'32	21	172	.12	'54	59	280	.21
'33	20	174	.11	'55	64	274	.23
'34	21	181	.12	'56	56	273	.21
'35	14	169	.08	'57	45	279	.16
'36	17	168	.10	'58	48	283	.17
'37	21	168	.13	'59	61	262	.23
'38	23	177	.13	'60	45	276	.16
'39	24	188	.13	'61	58	284	.20
'40	34	200	.17	'62	77	277	.28
'41	32	202	.16	'63	88	268	.33
'42	21	228	.09	'64	85	274	.31
'43	18	243	.07	'65	92	281	.33
'44	12	258	.05	'66	93	274	.34
'45	24	257	.09	'67	111	275	.40
'46	27	258	.10	'68	123	290	.42
'47	35	269	.13	'69	116	308	.38
'48	52	269	.19	'70	144	296	.49
'49	66	268	.25		168	320	.53
'50	74	271	.27	'72	193	336	.57
'51	86	280	.31	'73	197	366	.54
'52	74	279	.26	'74	222	381	.58

It is tempting to link the upward trend of graduate enrollment seen in Figure II and Table 2 to the growth of financial support for research and research training, particularly to National Institutes of Health training grants. This undoubtedly played a major role in the post-World War II era. But the trend seems to have been well under way before the training grants or even the addition of the significant numbers of students via new programs.

The major reductions of federal support for research and research training in the last two years are expected to flatten out the trend seen in Figure II. But the number of graduate students

in the Medical School has not yet decreased (1974-75), although the ratio has dropped because of the increase in size of the medical class. Indeed, the numbers of Ph.D. students is currently higher than ever—as will be discussed in a subsequent section.

Thus a significant fraction of the total teaching effort has been going into graduate studies in the medical sciences at Rochester, at least as measured by relative numbers of students enrolled. This is made the more interesting by the fact that undergraduate student advisors around the country seemed not to know until very recently that medical schools offered work for degrees other than the M.D. (Alas, some still do not!) They tended instead to send students interested in further purely scientific training to the major centers of graduate education rather than to a medical center. Thus, the reputation of the Rochester school as a research center and the strong orientation of its highly competent basic science faculty to the even more basic disciplines of chemistry, physics, biology, and mathematics must have played an important role in the phenomena here.

# Degrees and Degree Programs

Over thirteen hundred M.S. and Ph.D. degrees have been given by the University through the various programs in the Medical School, from 1921 through 1973. The details by degree and department are shown in Table 3. While not large numbers by some standards, the fact that almost five hundred of these are Ph.D.s, who by and large have made careers of research and teaching in the medical sciences, bespeaks the total impact of the program.

A few features contained in Table 3 deserve special attention:

(1) The two oldest programs are biochemistry and physiology-vital economics. These account for 218 of the total Ph.D.s.

(2) Vital economics was a separate department for many years. On the retirement of Dr. John Murlin in the 1940s it was merged with physiology, and then was finally discontinued as a separate entity in 1954. All degrees in both departments are listed together in the table to avoid undue complexity. The two programs were really quite different, however. The vital economics program, which gave its first M.S. degree in 1921, was built around the biochemical and physiological problems of nutrition, while the emphasis in physiology was more what would today be labeled in a broad sense biophysics. For present purposes it is

TABLE 3

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Department	Period	Ph.D.	M.S.
Anatomy	1929-73	32	16
Biochemistry	1925-73	107	38
Biophysics	1936-73	54	4
Dentistry <sup>†</sup>	1953 - 73	+	97
Bacteriology/Microbiology	1931-73	38	48
Nursing Education	1954-73		179
Preventive Medicine	1964-73		7
Pathology	1934-73	26	7
Pharmacology	1948-73	46	29
Physiology and Vital Economics	1921-73	111	93
Radiation Biology	1951-73	74	296
Toxicology	1969-73	7	5
	Total	495	836

Graduate Degrees Granted in SMD by Field\*

\*The neuroscience degree and joint degrees in neurobiology and anatomy and physiology are not shown since most of them were given before the Center for Brain Research transferred to the Medical Center.

\*Includes "dental research" and "dental science" but not the dental fellows receiving Ph.D. degrees since these are counted according to the field of their doctoral degree.

sufficient to consider that the degrees given were about equally divided between the two.

(3) Note that several of the programs began only after World War II.

(4) The figures shown in dentistry represent only the M.S. degrees and thus only a fraction of the total effort and contribution from the dental research group. As detailed elsewhere, the dental research fellowship program has sponsored about one hundred dentists as Ph.D. candidates beginning in the 1930s, with very significant results. But since the dentists took their degrees in one of the regular basic medical science departments they are included in the rosters of these departments rather than under dentistry.

(5) A few of the M.S. programs are rather more like additional professional training than true research training. This will be discussed separately.

Not shown in Table 3 is the fairly large number of students who came to Rochester, particularly during the fifties, for in-

formal training in areas of atomic energy and other programs. Some of these were more like apprenticeships than conventional graduate education, but they met an urgent national need. This training program has now essentially ceased and nearly all of our enrollees are degree candidates.

One final general table (Table 4) shows the trends of graduate student enrollment in the Medical School as compared to the University as a whole, from 1931–32 to the present. Clearly, in the early years the Ph.D. enrollment in the Medical School constituted a large fraction of that in the University. Conversely, the master's degree was emphasized much less in a relative sense in the Medical School until the post-World War II era, whereas there were many part-time M.S. students in some of the graduate programs in other colleges of the University.

## TABLE 4

## Composition of Graduate Student Body 1931-1974

	Medical School*			University †			
Year	M.S.	Ph.D.	Total	M.S.	Ph.D.	Total	
1931-32	7	16	23	208	23	231	
1932-33	4	21	25	182	37	219	
1933-34	10	20	30	179	47	226	
1934-35	7	21	28	172	37	209	
1935-36	8	14	22	153	47	200	
1936-37	11	17	28	170	58	234	
1937-38	7	21	28	197	62	261	
1938-39	5	23	28	187	70	257	
1939-40	13	24	37	173	- 86	269	
1940-41	21	34	55	204	- 87 -	291	
1941-42	14	32	46	161	- 87	248	
1942-43	8	21	29	52	69	121	
1943-44	11	18	29	142	58	200	
1944-45	18	12	30	177	45	222	
1945-46	22	= 24	46	164	55	219	
1946-47	19	27	46	356	115	583	
1947-48	19	35	54	369	149	601	
1948-49	31	52	83	405	207	612	
1949-50	54	66	120	410	242	672	
1950-51	59	74	133	369	254	672	
1951-52	60	86	146	341	264	654	
1952-53				442	265	647	
1953-54				350	277	682	

	Mee	dical Sch	ool*	University <sup>+</sup>			
Year	M.S.	Ph.D.	Total	M.S.	Ph.D.	Total	
1954-55	57	64	121	442	274	742	
1955-56	33	56	89	546	267	845	
1956-57	35	45	105	455	231	834	
1957-58	43	48	91				
1958-59	62	-61	123	629	306	-999	
1959-60	55	45	128	701	340	1145	
1960-61	69	58	148	688	361	1157	
1961-62	84	77	182	710	437	1277	
1962-63	94	88	194	780	475	1348	
1963-64	92	85	205	755	575	1454	
1964-65	68	92	171	779	683	1566	
1965-66	61	93	169	890	748	1771	
1966-67	69	111	194	897	869	1919	
1967-68	84	123	244	833	914	1962	
1968-69	74	116	220	953	974	2105	
1969-70	67	149	231	909	915	1983	
1970-71	48	168	237	925	870	1930	
1971-72	48	193	258	801	901	1835	
1972-73	51	197	249	813	956	1911	
1973-74	38	206	254	888	962	1996	

\*Shows those here at some time during the year, including students finishing up before the end of the year. Where the total is greater than the sum of M.S. and Ph.D. it includes special students.

\*Those here at work. Does not include matriculated students not actually here and at work during the year. The total after 1945-46 includes "Special Students" and other nondegree categories, if any.

It may well be that this chapter is being written at the apogee of the numerical and financial development of graduate studies in this Medical School and most others, since financial support is being rapidly and drastically curtailed and research is being deemphasized in many quarters. But we intend to continue the programs at approximately their present level if at all possible, even though some changes in emphasis and financing may be needed.

## II. DETAILS OF THE EARLY YEARS—1921-1939

We will now examine some of the more personal, sometimes anecdotal, characteristics of the endeavor.

The early Ph.D. programs were largely unstructured and extremely informal. The student took the course in his subject given for medical students, sometimes one or two other Medical School courses, perhaps a needed course at the River Campus, a con-

tinuing seminar in the department to aid in preparation for the qualifying examination, and little else in the way of formal study. There was no structured curriculum and little of the present formality of registering for course credits, paying tuition, and other rituals. The major emphasis was on the research experience and in helping to teach the basic Medical School course in the subject. Everyone from chairman to graduate students in each preclinical department essentially dropped everything to teach while "The Course" was in progress; the students had the rest of the year for research. There was, however, close liaison within and between departments. Relationships to biology, chemistry and physics in the College of Arts and Science were unusually close, thanks to the wisdom of locating the Medical Center hard by the site for development of the River Campus and to the intellectual interests of the faculty. Graduate students as well as faculty crossed Elmwood Avenue frequently in quest of scientific collaboration and stimulation. Only one formal mechanism, the Interdepartmental Seminar, subserved this liaison. It was the highlight of the week for graduate students and the preclinical faculty alike, and it drew regular attendance from the College of Arts and Science as well.

The majority of graduate students were in physiology, biochemistry, or vital economics. Bacteriology (now microbiology) and pathology had smaller programs, which varied considerably in size from year to year. The number of students in anatomy was small but fairly constant.

Near the end of the prewar period a degree program was developed in biophysics as a first departure from the conventional departmental structure. It was sponsored by radiology, but, in keeping with the almost universal reluctance among graduate schools to authorize Ph.D. degrees in clinical subjects, the program was operated by a committee from physics, physiology, and radiology. It remained thus until taken over by the new Department of Radiation Biology in the early postwar years.

Organization of graduate studies was likewise relatively simple in those earlier years. The graduate students in the Medical School programs came under the jurisdiction of whatever central administration there was for graduate study. This was at first (1923-36) a standing committee called the Committee on Graduate Studies, which operated under the general University Council. Later (1937), a Division of Graduate Studies was or-

ganized but its governance remained with the Committee on Graduate Studies. Dean George Whipple and Professor Walter Bloor as associate dean were both members of this committee and the Medical School exerted considerable influence on all graduate studies affairs. This included the selection of researchoriented chairmen for the developing science departments of the College of Arts and Science. In 1942, the University adopted the name "Graduate School" to replace "Division of Graduate Studies." But this was largely to recognize the growing importance of graduate study and research. There has never been a separate graduate faculty or any formal separation of undergraduate from graduate, or graduate from professional, teaching staffs.

Thus, no direct responsibility for graduate studies resided in the governance structure of the Medical School. However, though centralized, the organization seems hardly to have been a cumbersome one. Indeed, it appears that frequently even the small chore of registering was neglected until almost time to submit a thesis! Nevertheless, the requirements for the Ph.D. were definite and rigorous. They usually included a series of oral and written examinations to qualify for Ph.D. candidacy, examinations in two foreign languages, and the usual defense of thesis examination. It was more around the trappings of academic credit and curricular organization (or the lack of it) where informality prevailed. This was one of the strengths of the School in those early years.

But the informality had to give way somewhat when the University was accepted into the prestigious Association of Graduate Schools in 1941, and had to keep more detailed records both to merit that membership and to satisfy the New York State Education Department that no one was getting away with anything.

Financial arrangements were spartan since support for research came largely from "hard money." The usual graduate student had almost no money of his own when he came to the School. Undoubtedly, in many cases these students had opted for graduate work because they could not afford even the then modest cost of going to medical school. The most common financial arrangement was "maintenance"—i.e., a room in the Staff House plus *four* good meals a day in the Strong Memorial Hospital dining room (table service with linen and silver at the evening meal!), and a few dollars of spending money. Those who

opted out of this received about fifty dollars per month, which kept them well fed in boardinghouses clustered close to the School. The research laboratory was frequently as much home as anywhere else; many laboratories contained cots and battered easy chairs—even a tattered strip of carpet in the more luxurious ones.

Many of the graduate students, along with the medical students, supplemented their University incomes with part-time jobs of great variety. Among these and always welcomed was a chance to be a subject for one of the special nutrition experiments being conducted in the Department of Vital Economics. This provided a chance for students to receive not only free meals but to be paid for eating them! On some of the diets such pay was clearly needed and justified.

With many medical students taking the "year-out" fellowships to do research and graduate students taking and teaching in the basic Medical School courses there was considerable opportunity for the two groups to know each other. Since the graduate students were by and large preparing to teach and do research in medical schools this close contact was clearly advantageous. But the prime orientation of the graduate student was to his or her field of scholarship, and to this they were true in keeping with their role as "zealous colleagues in research." It is likely that this mixing also aided in the medical student's appreciation for the methods and pitfalls of scientific inquiry.

While the surroundings and the emoluments may have been spartan in these early years the intellectual atmosphere was superb, and I believe the influence the graduates of these years have had on medical education and research has been likewise outstanding. There were enough of them to have a significant impact, and they carried with them a philosophy of cooperation and feeling for the unity of biomedical science which was uncommon even for those days.

## III. THE WORLD WAR II ERA

The direct effect of World War II on the Medical School's graduate program was a negative one. Graduate students were not deferred or exempted from the draft. Many had to interrupt their work toward an M.S., or not complete it at all. Enrollment of Ph.D.s dropped although the number of master's students increased somewhat as students apparently settled for what they

could get time to do. The M.D. program went on accelerated schedule and time for freelance research became scarce.

However, this period saw also the beginning of the large, federally sponsored research project, a marked contrast to the predominance of university and, to a lesser extent, private industry and foundation support for research. While these projects did not employ graduate students directly during the war years, the pattern was set for employment of students in them as soon as the threat of the draft abated. The two largest such projects were the Manhattan District work on biomedical aspects of nuclear energy and the respiratory physiology studies in the Department of Physiology. There were other sponsored projects (e.g., one on shock), but these two probably had the most impact on graduate education in the postwar era and were special to Rochester.

# IV. The Post World War II Era

A glance at Table 4 shows that the graduate student population in both the Medical School and the University grew quite steadily from 1948 onward. In the prewar years the doctoral students in the Medical School predominated. But now the growth was more pronounced in other parts of the University than in the Medical School, partly because during the waning years of the war major plans were laid by a select committee of the Board of Trustees for expansion of graduate work in the River Campus colleges and partly because the Medical School and Eastman School already had very significant graduate programs in operation. The largest single factor increasing graduate enrollment in the Medical Center was the Atomic Energy Project (AEP), which became the Department of Radiation Biology. It was recognized that this represented a very significant potential educational resource to the School and nation and is described in detail in William Neuman's chapter. The developments in these postwar years will be discussed around three headings: doctoral programs and research training, master's degree programs, and financial and organizational structures.

## A. Doctoral Programs and Research Training

The growth in Ph.D. doctoral programs in the Medical School in the post World War II era represents primarily the addition of new programs. In fact, the number of Ph.D. students in physi-

ology fell enough during the 1950s to cause Wallace Fenn to comment pessimistically on it in his delightful "Report from the Department of Physiology," given before the Medical Alumni Association in 1957.\* Nevertheless, in physiology the war-born "respiration group" continued along the many avenues opened by the war work. It attracted students and postdoctoral fellows and became one of the most distinguished centers in the world for research in fundamental respiration physiology; witness the publication of the volume Studies in Respiratory Physiology by W. O. Fenn, A. Otis and H. Rahn (technical report No. WADC 55-357 from the Aero Medical Laboratory, Wright Air Development Center), one of the key reference works in the field. By shared interests with the pharmacology group, whose studies in inhalation toxicology had led-as they always do-to work on basic mechanisms, interdepartmental cooperation in the respiration field was easy and fruitful. Much of this was terminated by Dr. Fenn's retirement and the departures of Drs. Rahn and Otis to other institutions. But it continues in a different way through the pulmonary laboratory of the Department of Medicine.

The Biochemistry Department had been deeply involved in the Manhattan District work and its early postwar students tended to pick up research growing from it. But this was relatively short lived.<sup>+</sup> Its staff and students soon embarked upon the fundamental biochemical research unfolding with such thrilling speed and beauty of concept in those years. It was biochemistry as a field which characteristically had the largest number of applicants per place for graduate students throughout the two decades immediately after World War II. As pointed out earlier, the School did not respond to this by much enlargement of the Biochemistry Department itself or its graduate programs, partly, it must be assumed, because the subject was also well represented in other programs<sup>‡</sup> which cost the School almost nothing to support. Nevertheless the Biochemistry Department continued to have a substantial cadre of about twenty graduate students in residence at any given time.

Microbiology (formerly bacteriology) grew somewhat and entered vigorously into the field of virology and those aspects

<sup>\*</sup>Published by the Medical Alumni Association, 1957.

ti.e., in the Biochemistry Department itself.

<sup>&</sup>lt;sup>‡</sup>Much of the postwar work in the AEP was strongly biochemical and was carried on by faculty with secondary appointments in biochemistry.

of molecular biology best studied with microorganisms. The total number of degrees given has not been as large as in some other departments because of space limitations. But these conditions seem now to have been alleviated and microbiology has a program quite comparable to the other departments, which had well developed graduate programs at the beginning of the postwar era.

Now for the new additions and modifications:

(1) A Ph.D. in pharmacology was authorized in 1948. All of the thesis research was conducted in the Division of Pharmacology of the Atomic Energy Project. All formal teaching of pharmacology to medical students was already being done by the Pharmacology Division of the Atomic Energy Project but the authorization of a separate Ph.D. degree ended the integration of this subject with biochemistry, which had held since the founding of the School. This arrangement continued until 1958, when a separate Department of Pharmacology was finally authorized, separating it administratively from radiation biology and biophysics and the Atomic Energy Project. Since that time the department has grown steadily, and has a strong graduate program.

(2) In 1951, after a short period of trying to give degrees in other fields to students in radiation biology, both the M.S. and the Ph.D. degree were authorized in radiation biology. This new degree covered all work done by the large group of students in the Atomic Energy Project except those aiming for the already established degree programs in pharmacology and biophysics. The term "radiation biology" was something of a misnomer since the research ranged from radiation biophysics to something akin to nuclear medicine. It was indeed a pioneering effort to offer the first doctoral degree program in the world in radiation biology, built upon Rochester's preeminence in research in the field and the tremendous demand for individuals with sophistication in the biomedical aspects of atomic energy. Our first graduate in the subject received the coveted Lawrence Award of the Atomic Energy Commission and heads a major laboratory, as do many others from the program.

(3) The biophysics degree was transferred in early 1948 from its committee sponsorship to the new Department of Radiation Biology. It remained relatively small until the explosion of knowledge in molecular biophysics, the marked strengthening of our staff capabilities in that area, and addition of an NIH training grant in biophysics. After the mid-sixties the number of degree students in it equaled and then exceeded those in radiation biology.

(4) In 1966 our long-standing expertise in toxicology was recognized by development of a separate degree program in it. It was organized as a joint operation of the Departments of Pharmacology and Toxicology and of Radiation Biology and Biophysics, and its research projects are resident in both of these as well as in the Toxicology Center. In view of the growing problems of pollution from our chemical civilization this program meets an imperative and special national need.

(5) Very recently (1970), the Center for Brain Research moved from the River Campus to the Medical School. While the center had already been authorized to award the Ph.D. in neuroscience, and joint degrees with anatomy and physiology, its transfer to the Medical Center added the final new doctorate to the Medical Center's roster as of this writing.

Thus, in the two and a half decades since World War II, the School has dropped one doctoral program (vital economics) and added four (pharmacology, radiation biology, toxicology, and neuroscience). Three of the new ones are to some degree unique to the Rochester scene, especially the radiation biology enterprise. While the latter has had no stated responsibilities in the teaching of medical students\* and its graduates have tended to go as much to the large governmental laboratories as to medical schools, its impact on the graduate program has been major. Many of its faculty have taught regularly in the preclinical courses and assumed other major roles in the operation of the School, partly through joint appointments.

Unfortunately, the dropping of vital economics signaled a considerable decrease in emphasis on training and research in nutrition. While this was probably part of a national trend which is only now beginning to be reversed, it is not consistent with the importance of nutrition in medicine, especially in other parts of the world.

Fortunately, the faculty increased in number too during these years, and the low student-faculty ratio could be continued despite the increase in student population. But inevitably the close liaisons of the prewar years began to change. The long-standing and beloved Interdepartmental Seminar faltered and then floundered because the talks became too specialized and preparing lunch for the increasing number of potential attendees became

<sup>\*</sup>Except for the pharmacology course, as described above.

impractical. (The retirement of "Mrs. Mac"\* did much to hasten that decision!) Individual departments now had as many doctoral students as the whole School had a decade earlier, and it was a sufficient task to establish liaison within departmental boundaries. The NIH training grants relieved the need for graduate students to earn their way as teaching assistants. While there were marked differences among departments, in general the amount of teaching done by the graduate students fell off, as did the close relationship with the medical students. This was particularly true of the radiation biology group, since they had no undergraduate medical course to teach and had more students than were needed to assist in their own graduate courses. Also, the River Campus science departments became fully engaged with their own graduate programs and that liaison became more difficult.

These changes were, of course, almost inevitable and are not to be decried. Fortunately, the quality of the doctoral programs remained high. But the research programs became more and more specialized. It is to the credit of the long-established spirit of the School that interdepartmental barriers, in both an administrative sense and in the willingness to share ideas and to collaborate, remained and still remain low.

## B. M.S. Programs

In the early years the master's degree was given little emphasis in the Medical School, although the majority of graduate students in the University as a whole were master's candidates, many of them part time. But in the postwar years the number of master's students in the Medical School grew markedly (Table 4), primarily by addition of new programs or areas. The largest number (Table 3) were in the programs in health physics and radiological health in the Department of Radiation Biology, the dental research and dental science programs, and the nursing education degree, which was transferred from the College of Education.

A large number and variety of students came to the Department of Radiation Biology for special training in the biomedical problems of nuclear energy (details are given in Dr. Neuman's essay). Many of these had to be satisfied with an M.S. degree or no degree at all, since they were sponsored in special programs

<sup>\*</sup>Mrs. Mary Maclauchlan, chief cook for the vital economics enterprise.

of limited duration. Rochester and Vanderbilt shared the first AEC fellowship program in health physics, which prepared a significant proportion of the nation's manpower in this field in the early fifties and into the sixties. Many students got their start in the health physics program but remained to complete doctoral degrees on seeing the beautiful basic research problems which the practically oriented work of the war years had uncovered. These students have become the laboratory and program directors of today, and Rochester can be proud of its role in educating them.

The radiological health program was populated largely by physicians and veterinarians who were sent by the armed services (Defense Atomic Support Agency) for the advanced course in nuclear science for medical officers. A total of about 100 officers went through an intensive calendar year program which resulted in the M.S. degree for most. They were in nearly the same program as the health physics students but with less physics and more biomedicine. Only a very few could arrange to stay for any research training or Ph.D. work. (A few medical officers, particularly from public health service and the Navy, were assigned here for Ph.D. work either after the above course or independently. Many of these have taken positions of great responsibility in the armed forces and public health service research laboratories in the atomic energy field.) These programs, while largely a special service to the nation, brought exposure to the scientific research environment to over 130 medical and paramedical officers.

During the decade of the fifties two dental research programs were authorized for the M.S. degree. (These are combined in Table 3). A distinction was made between students working primarily in the medical center group in dental research and those primarily at the Eastman Dental Clinic (dental science). All had a dental degree on entrance. These were, as stated earlier, in addition to the long-standing sponsorship of dentists as Ph.D. candidates in the basic science departments under the dental fellowship program. Very recently a new program has been initiated in which postgraduate clinical training in dentistry can be combined with work for the Ph.D. in one of the basic medical sciences. The impact of these dental programs on academic dentistry in this country has been far reaching and unique. (See the chapter by Dr. McHugh.)

Soon after the war, the AEC stimulated and sponsored a program to develop industrial physicians with some expertise in atomic energy matters. Rochester administered the program, which operated at four schools (Harvard, Cincinnati, Pittsburgh, and Rochester). It was headquartered at Rochester, first in radiation biology and later in the Department of Preventive Medicine and Community Health, and profited greatly from the help given by physicians and others from Eastman Kodak Company and other local industries and hospitals. The M.S. degree in occupational medicine was awarded, on completion of two years of post-M.D. and post-internship work, to a small number of students who have had a disproportionately large influence on the field.

More recently, the Department of Preventive Medicine and Community Health has begun an M.S. program in community health centered around the problems of health care delivery. This is intended primarily for physicians and in some respects replaces the occupational medicine program, which seems to have served its purpose. But it is open also to qualified students without medical training, and is occasionally combined with M.D. studies.

In 1954 the M.S. degree operation in nursing education was transferred from the College of Education to the Medical School. The total number of students is quite significant (Table 3). With time it has gradually shifted from emphasis on the training of teachers for nursing schools to more general areas, including some of the clinical specialties. Although the program, like the one in community health, has been set up for either Plan A (research thesis) or Plan B (essay and comprehensive examination), all candidates so far have chosen the latter.

While these more recent M.S. programs occupy an important place in the activities of the Medical Center, it is obvious that some of them consist largely of advanced professional activities. They should not be regarded primarily as research oriented, even though some projects are undertaken. (With the development of nursing as a college rather than a department in the Medical School, plans are being laid for doctoral training there, with more research involvement.)

## C. Financial and Organizational Structures

The decades between the end of World War II and the early

1970s saw unprecedented increases in support for graduate education, research, and research training. The NIH training grants, AEC, NSF, NDEA fellowship programs, and research grants grew, so that nearly every student who qualified for admission could expect financial support in the form of a stipend and either tuition remission or authorization to charge tuition against supporting funds. At their peak, these funds amounted to from \$700,000 to \$800,000 per year, not counting the indirect costs of the research, faculty supported from "hard money," and the like. Truly an astonishing change from the thirties! While this also occurred nationally, Rochester was perhaps especially blessed with being able to put some hard money with the soft and not become as totally dependent on federal largess as did some institutions. The departments no longer hired very many graduate students as teaching assistants, although we have held steadfastly to the requirement that all graduate students in Ph.D. programs get some teaching experience as part of their training. In practice, however, the presence of financial support and the large increase in student numbers broke down the pattern of having all graduate students learn much of their subject by helping to teach it to medical students. To the extent that our objective is to prepare faculty for medical schools this change is probably to be regretted. But not all the students have this objective and it is hard to see how it could have been met in full any longer anyway.

With the large increase in total numbers of students in graduate study in the University (Table 4), a much larger and more complex administrative structure perforce developed. Divisional committees in large subject matter areas such as natural sciences and humanities were developed to assist the graduate dean. In 1958, largely through the efforts of Wallace Fenn, in the Medical School, some faculty from the Eastman School, and with the helpful cooperation of the then graduate dean, Professor Lewis Beck, Rochester adopted a unique organization for graduate studies. This is still in operation. It is highly decentralized. Each college of the University assumes full responsibility for day-byday operation of its graduate programs and almost complete responsibility for master's degree operations. The University Council on Graduate Studies functions to scrutinize the policies, standards, and to some extent the facilities for the Ph.D. degree and decides which departments (or groups) should be authorized

to offer work for that degree. The University dean of graduate studies chairs this council and a steering committee made up of the deans and associate deans for graduate studies. Each college has an associate dean for graduate studies and a committee on graduate studies.

In the Medical School this reorganization brought graduate studies for the first time directly into Medical Center governance. The associate dean for graduate studies is a member of the Advisory Board and the Committee on Graduate Studies is an arm of it. The Graduate Studies Program was first described in detail in both the 1958–59 Medical School and Graduate School bulletins, after the decentralized plan began operation.

The first associate dean for graduate studies was Dr. Wallace Fenn, who was so closely identified with the development of the new organization. The second appointee, and present incumbent, is Dr. Newell Stannard, who had already spent several years as assistant and then associate director for education of the Atomic Energy Project, a position he held concurrently with the associate deanship for several more years, until the former duties were assumed by Dr. Irving Spar in 1969.

During the period of rapid expansion of graduate work and financial support for research this decentralized organization functioned extremely well. It still does for the Medical School, and brings the problems of graduate education into the same arena occupied by all of the other functions of the Medical Center. But it has some obvious disadvantages in that operations in the different colleges may be quite disparate.

The decade of the sixties will probably long be regarded as a golden era in the support of graduate education and research. It is now over. Federal support is waning, even though we are treated to occasional intervals of waxing. It seems unlikely that there will be any further increase in numbers of graduate students in the Medical School, and it is easy to argue that any further increase would probably be undesirable.

But an interesting phenomenon has been taking place. For example, as more and more schools developed programs in health physics and radiological health we decided, in the mid-sixties, to deemphasize the master's in these areas and concentrate on the doctorate, with full research training. In 1974–75 we have more Ph.D. candidates in the Medical School than ever before; this is not limited to any single department. The University of

Rochester now finds itself numerically and in most other ways (faculty, departmental quality, etc.) a major center for graduate education at a time when the market for the product is said to be slumping. We will no doubt see some retrenchment, but I fervently hope that these temporarily vexatious problems do not lead to undue reductions in the preparation of biomedical researchers—particularly as we enter the "Age of Biology"; nothing could be more shortsighted when we seem to be on the threshold of major advances in the understanding of life processes. Rochester should do everything possible to move ahead rather than lag at this time. Perhaps the Medical School can help lead the way, as it did in the early decades.

## V. COMBINED DEGREE STUDIES

## A. Combined M.D./Ph.D. Program

In a medical institution devoted to research and teaching it is not surprising that occasionally students have found a need to have both a professional and a research degree. At Rochester this was possible from the very beginning on an informal basis. Individuals with one degree already in hand worked toward the other and some worked toward both simultaneously, frequently while holding a staff position in a department of the Medical School. There was, however, no formal combined-degree program.

As plans for the Medical Center evolved in the 1960s, it was considered that offering a formal joint-degree program might further the maximal development of research and investigative skills along with clinical skills. While it was recognized that two doctoral degrees were far from necessary to do research it was also recognized that for some students and in certain situations adding the rigorous formal requirements of a Ph.D. degree to the M.D. program provided the best educational instrument. Also, many other schools with research orientation had flourishing M.D./Ph.D. programs, with federal support, and we were probably beginning to lose desirable potential medical research talent to these institutions.

In 1963 the School utilized the increased flexibility then introduced into the medical curriculum to propose a formal combined M.D./Ph.D. program. After considerable discussion the Advisory Board took steps for implementation in 1965–66. The first official combined-degree students began in the fall of 1968.

Several other students already in progress were assimilated into the program.

The program was planned to be small and highly selective, with no more than 5 to 7 students per medical class on the average. The total population has averaged about 25 at any given time. We have now graduated 15 M.D./Ph.D.s through this more formalized mechanism, in addition to the 11 previously graduated. (None who actually began the combined program as entering students have yet finished, since it requires six to seven years for completion.) Each graduate is fulfilling our expectations of quality and leadership.

Financial support for the combined M.D./Ph.D. program has been a problem, because we came "late to dinner." It took Rochester three attempts before we were approved and funded for an NIH grant under the medical scientist training program then only to have the funding for new appointments cut off after one year of operation by the general moratorium on training grants! Fortunately this program was reactivated in June 1974. There are limited University funds which can be devoted to this purpose and the graduate departments have been able to support some combined degree students for the Ph.D. phase. Fortunately, the clinical investigator training grant in the Department of Medicine, though not primarily for combined-degree students, has been able to support several M.D./Ph.D.s, but it is being phased out by NIH nationwide.

# B. Combined M.D./M.S. Program

It soon became apparent that medical students taking the "yearout" research fellowships frequently completed sufficient research to qualify for an M.S. degree. Those interested could advantageously be placed in a combined M.D./M.S. program and a few students have done this. Also, many medical students with interests in the problems of health care delivery wished some pertinent formal training not found in the M.D. program. Two have completed M.S. degrees in the Graduate School of Management (one is completing a Ph.D. in systems analysis) and several are combining their M.D. work with an M.S. in the new community health program, which provides specialized training in epidemiology, medical care administration, and health care.

One final observation is required. Unlike many of the combined-degree programs around the country, the Rochester pro-

gram stresses flexibility and informal structure. We thus are still following the philosophy which has characterized the graduate studies operation throughout the history of the School. It seems to be well liked by students and faculty. But it has its disadvantages too. It is more difficult to sell to potential supporters (What is unique about your program?). It requires individual administration, including an inordinate amount of legwork on the part of the student. Perhaps, most importantly, it does not contribute the sense of identity upon the participants which a more structured and "special" program confers. The attrition rate has been higher than is desirable because students are free to drop out without financial penalty (except in the MST operation), even though they may have received a significant amount of support to help them with the additional years of study needed. Many other schools insist on full commitment before financial support is offered. But despite this contrast to some other institutions, Rochester will probably cling to the policy of flexibility and individualized treatment. The "zealous companions in research" can find plenty to keep them organized intellectually and in reasonable liaison with each other without loss of the basic tenets of the School in allowing each to find his own best approach to his goals and ours.

Crossroads: The Story of the Medical Library



# Henry L. Lemkau, M.L.S.

Henry L. Lemkau has served as the medical librarian of the Edward G. Miner Library and assistant professor of medical bibliography at the University of Rochester School of Medicine and Dentistry since June 1, 1970. Under his supervision the Edward G. Miner Library has grown from a facility whose collections numbered 106,000 volumes in 1969 to over 130,000 volumes in 1973, with an annual operating budget now in excess of \$460,000. In addition to encouraging the development and growth of the Library's rare and historical materials, which now comprise one of the finest collections of its kind, Mr. Lemkau has played a major role in the development of online bibliographic services in his capacity as chairman of the Users' Task Force Committee of the SUNY Biomedical Communication Network. Also, the Edward G. Miner Library is the first medical library in New York State to install an Ohio College Library Center online display terminal onsite for the cataloging of medical books and monographs.

Mr. Lemkau, who was graduated with a B.A. degree in history from St. John's University in Jamaica, New York, in 1963, received his master's degree in library science from Pratt Insti-

tute in Brooklyn in 1967. He joined the library staff at Mount Sinai School of Medicine of the City University of New York in 1966 as head of circulation and reference assistant. He served as serials librarian from September 1966 until March 1968, when he was appointed branch librarian of the Basic Sciences Library.

Mr. Lemkau was named assistant professor in the Department of Medical Library Services in July 1969. From September 1963 until May 1966, he was a reference assistant at the New York Academy of Medicine Library, in New York City.

Mr. Lemkau has authored articles dealing with the automation of inhouse library control systems.

#### INTRODUCTION

As THE history and development of medical librarianship parallels and reflects that of the medical professions, so too does the growth and development of the Edward G. Miner Library reflect and parallel that of the institution which it serves. It is the bringing together of materials which illuminate and support clearly defined goals of teaching and research that constitute the development of a collection, not merely the accumulation of books. It is through a knowledge of the principles of collection development, combined with a happy blend of appreciation of the traditional with acceptance of the new and innovative, and a genuine dedication to service, that the highest standards of medical librarianship are set and practiced. It is to the vision and expertise of the early faculty and staff, to a host of benefactors and donors and to enlightened administration and library management, that the Edward G. Miner Library, the School of Medicine and Dentistry, and the University owe so much. In many ways it is this responsibility to those of the past as much as the present that will assure the continuance of a truly effective library.

The importance of medical literature was recognized by Hippocrates, who said, "The power, too, to study correctly what has been written I consider to be an important part of the art of medicine." However, the place now occupied by the medical library is a fairly recent development.

The study of medicine as a science rather than as an art began with the introduction of laboratory instruction in Germany. American students who studied abroad returned home with new concepts of medical education. It was under the leadership of

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President Gilman, of Johns Hopkins, and later, President Eliot, of Harvard, that scientific medicine was introduced in the United States. It was this transformation in American medical education that brought the emergence of the medical library to a position of marked educational significance. Another major factor was the establishment of full-time medical staffs, which did much to encourage research and publication. As Abraham Flexner noted, "It enabled many clinicians to devote their time and energy to painstaking study and experimentation, wide reading in many languages, discursive conversation, and leisurely reflection."1 It was these increased opportunities and incentives for the researcher and investigator that resulted in what has come to be known as the literature explosion. It was only a few years ago, at the opening of the Hall of Man exhibit at the American Museum of Natural History, that I heard Dr. Harry Shapiro remark that 80 percent of the scientific knowledge of today has been discovered since he completed his formal schooling. A natural corollary of the great expansion of medical literature and the higher standards of medical education has been the establishment and growth of medical libraries.

According to the 1940 edition of the American Medical Directory, in the period from 1920 to 1929 sixty medical libraries were established in the United States and Canada. The Edward G. Miner Library of the University of Rochester School of Medicine and Dentistry was one of these.

## EARLY YEARS

The problem in 1923, simply put, was to establish an excellent collection in the medical sciences from scratch. To that end much is owed to the administrative talents of Dr. George Hoyt Whipple, the founding dean, who insisted upon a strong central library resource and consequently discouraged funding of departmental library collections. Further evidence of Dr. Whipple's administrative acumen was his early recognition that the library served the entire medical facility. Consequently, its permanent physical location is in the center of the medical complex. With wise administrative support, Dr. Corner, his colleagues on the Library Committee, and Mr. Donald Gilchrist, the University librarian, set about developing a medical collection. To build a truly excellent medical library one first has to have a very clear idea of the purpose and function of such a facility.

Medical libraries are the recorded experiences of mankind in its attempt to study and take action on the problems of health and disease. Their purpose is to bring the information gathered in the past to bear on the questions of the present and the future. This understanding was essential if the solution to the problem was to flow from the terms inherent in it. The first component of the library's purpose is the bringing together or gathering of information.

To this end Mr. James F. Ballard, then director of the Boston Medical Library, was commissioned to prepare a model list of periodicals which in his estimation formed the basis of a working collection. These titles were then evaluated in terms of the research and educational programs of the School. They were then designated Essential, Important, or Desirable and were either approved or rejected by the University librarian, by Dr. Corner, and by the heads of departments. Mr. Ballard was then authorized to purchase complete sets, partial sets, or single volumes as he was able, and was aided materially by the low rate of exchange favorable to this country at that time. Again, Dr. Corner contributed substantially to the development of the collections by personally buying monographs and periodical sets while abroad. One of Dr. Corner's most significant purchases-which today is one of the most valuable assets of the Library's collections-was a complete set of the Philosophical Transactions of the Royal Society, 1665-1923. Added to these purchases were volumes transferred from the arts college library (Sibley Library) pertaining to medicine and related sciences and a large portion of the library of the Department of Vital Economics. Many gifts were received, notably from the Boston Medical Library, the Grosvenor Library of Buffalo, the New York Academy of Medicine, and Princeton. An outstanding gift was one of 4,000 volumes presented by the Reynolds Library of the Academy of Medicine, the forerunner of the present Rochester Academy of Medicine. This gift was arranged through the late Dr. Charles A. Dewey, a trustee of the Reynolds Library.

The purchase of books, as opposed to journals, was under the supervision of the University librarian, Mr. Gilchrist, the Library Committee, Dr. Corner, Dr. Clausen, Dr. Bayne-Jones, and the heads of departments. The results of these combined efforts were remarkable. In 1926, three years after the Library was begun, Dr. Corner was able to report to Mr. Miner, chairman of the Uni-

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versity Library Committee, that the Library was receiving 365 current periodical subscriptions and that the periodical collection represented 1,100 titles, comprising 30,000 volumes in all. In addition, the monographic or book portion of the Library's collections numbered about 3,000 volumes. Dr. Corner felt that a reasonable working collection would number at least 15,000 volumes and could be expanded indefinitely. However, Dr. Corner knew where the priorities lay, as he so accurately stated in 1926. "The backbone of the collection is necessarily formed by the completed files of scientific and professional journals as they form a repository of the original work upon which current practice and investigation are based, and constitute an essential tool for the advance of science."<sup>2</sup>

In addition to retrospective periodical sets, current periodical subscriptions, and monographic acquisitions, the fourth aspect of collection development very much on the mind of Dr. Corner was the history and older literature of medicine.

In the academic year 1923–24, Dr. Corner went to London to study physiology with Dr. Ernest M. Starling, and it was then that he met the famous medical historian Charles Singer, who encouraged Dr. Corner's researches into early medieval anatomy which he had begun while still at Johns Hopkins.

With the collections of the medical library fairly well established, the decision was made by Dr. Corner and the Library Committee to go ahead with the formation of a good history of medicine collection. Dr. Corner noted in his autobiography that the committee "enthusiastically selected the outstanding classics of medical history."<sup>3</sup>

## HISTORY COLLECTIONS

Dr. Edward W. Mulligan, chief of surgery at Rochester General Hospital and personal physician to Mr. George Eastman, was very much interested in the great Renaissance surgeon Ambroise Paré. On one occasion Dr. Mulligan expressed to Dr. Corner his hope that the history of medicine was not being forgotten by those who were building the library collections. Dr. Mulligan said that the Library should get English translations of all the great books of early medicine so that a busy doctor like himself, who knew only English, could read them all. Dr. Corner explained that only a small fraction of the early medical classics had been translated into English and those that had been were quite expensive.

Not long after this, President Rush Rhees received a check from Dr. Mulligan for \$5,000, with a note saying that Dr. Corner was to spend it for books on the history of medicine, and particularly books on anatomy and surgery. In the following two years, Dr. Mulligan sent checks in the same amount and he would undoubtedly have continued his support of the Library but for his illness in 1929 and his death in January 1930.

The Library Committee decided that Dr. Mulligan's intentions could best be fulfilled by bringing together a working collection of good editions of medical classics rather than a show collection of expensive rarities. English versions of medical classics were acquired whenever possible, as were the great illustrated books on anatomy and surgery. Among the books so purchased were some of the earliest books printed in color, and today the Library has a splendid collection of the great landmarks in the history of medical illustration.

In 1927 a portion of the library on obstetrics and gynecology formed by Dr. Philip Dymoch Turner, a British obstetrician, was purchased. This acquisition gave the Library considerable strength in this area and it has been further strengthened by additions made more recently, notably in 1968, when Dr. Karl Wilson, first professor of obstetrics and successor to Dr. Bayne-Jones on the Library Committee, presented his own collection to the Library. When the Mulligan Fund was exhausted in the midthirties, the rare book collection had grown to some 1,100 volumes.

Other benefactors and events contributed significantly to the continued growth and development of the historical collections.

Mr. Edward G. Miner, a trustee of the University, after whom the Library is named and who was for many years chairman of the University Library Committee, took a keen interest in the growth of the new Medical Library. In May 1927, Mr. Miner gave the Medical Library a collection of 41 early works on yellow fever; he continued to add to this collection until his death in October 1958. At Dr. Corner's suggestion, Mr. Miner expanded his collecting interests to include other communicable diseases. Today the collection contains nearly 300 volumes on yellow fever, over 400 volumes and pamphlets on cholera, and an undetermined number of books on other communicable dis-

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eases. The yellow fever and cholera collections are probably among the most extensive in the United States.

It was not until late 1964, when the Dr. Walter Wile Hamburger Memorial Fund was established, that the Library received the first substantial sum of money for the purchase of rare books since the last gift of Dr. Mulligan in 1928. Dr. John Romano, in addition to giving the Library 45 books on psychiatry, was most responsible for the decision to use the fund for the acquisition of early historical books on psychiatry and psychoanalysis.

In January 1965, the Library Committee recommended to the Advisory Board that the history of medicine program of the School of Medicine be expanded and that the appointment of a professor of the history of medicine should eventually be made. These recommendations were approved in April 1965. This was an exciting example of the School being stimulated to expand its educational program by the Library and its collections: surely, a tribute to the vision of Dr. Corner. To support these activities the Josiah Macy, Jr., Foundation gave the University of Rochester a sizable sum of money to establish a history of medicine and biological sciences program for three years, the program to be administered jointly by the School of Medicine and Dentistry and the Department of History in the College of Arts and Science.

In April 1967, a substantial bequest for the history of medicine collections was made to the Library by Dr. Thomas Lamont, son-in-law of Mr. Edward G. Miner. In September 1969, Dr. George Hoyt Whipple directed that the living trust which he gave the University of Rochester in 1963 be used to support the history of medicine section. One-half of the income from the trust has been used to support the section. These two gifts have assured the continued support of the rare and historical collections in perpetuity.

In addition to this great monetary support the Library has continued to benefit from the gifts of so many individuals and institutions that it is simply impossible to list them all. However, a few of the most important must be mentioned. In July 1969, the Rochester Academy of Medicine gave 270 rare books, of which 50 were printed in America before 1821. In the late summer of 1971, the Clifton Springs Hospital and Clinic donated 195 titles to the Library, mostly nineteenth-century American books from the library of Dr. Henry Foster, founder of the hospi-

tal. These two donations were largely as a result of the interest and efforts of Dr. Lawrence A. Kohn, clinical professor of medicine emeritus and first resident in medicine at the Strong Memorial Hospital.

In August 1973, the Division of Orthopedic Surgery, through the interest of Dr. Louis A. Goldstein and Mrs. R. Plato Schwartz, gave the Library nearly 300 early works on orthopedic surgery, mostly from the collection of the late Dr. R. Plato Schwartz, first chairman of the division. A number of books in this collection originally came from the library of the great British orthopedic surgeon Sir Robert Jones.

In describing the formation, growth, and development of the historical collections it is obvious that interest in medical libraries is not confined to those privileged to work in them. Interest of dedicated individuals can make a library great, but greater still is the responsibility and interest of the library. When gifts stay packed in cartons or stored on closet shelves for long periods, donors look elsewhere. It is the library's prime responsibility to assure its benefactors and friends, as well as its users, of the care of the collection and the means of making it easily available.

## WORKING COLLECTIONS

As the historical and rare collections grew, so too, at even a faster pace, did the working collections of the Library. As the School expanded its educational and research programs in and to psychiatry, brain research, atomic energy, nursing, pharmacology, and radiation biology and biophysics, the Library expanded the coverage and scope of its collections to support them. From a total collection in 1926 of 34,000 volumes the resources of the Library today number well over 135,000 bound volumes, and the Library maintains current subscriptions to over 2,500 periodical titles.

Of great importance to the growth of the Library's collections was a Resources Grant Award from the National Library of Medicine of \$86,693, spread over a five-year period—1967-68 to 1971-72—in decreasing amounts. The purpose of the award was to strengthen the collections of the Edward G. Miner Library so that it would be better equipped to serve the faculty, students, and staff of the Medical Center as well as the members of the health-related professions in our community. Over the five-year period of the grant many individual additions to

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the collection were made. Essentially, all three components of the Library's resources, namely, reference tools, journal holdings and books, were built up. In the first year of the grant the number of books and periodical volumes purchased increased 100 percent over the previous year. Because of the purchases we were able to make with grant funds, the Library's support to the programs of the Medical Center and services to the health community outside the Medical Center were greatly improved. As grant funds decreased the institution assumed the responsibility of increasing its support of the growth and viability of the Library's collections. The School's budgetary support for books and journals increased from \$43,335 in 1967-68 to \$77,900 in 1971-72. The strengthened medical literature resources of the Edward G. Miner Library, and consequently of the greater Rochester area, provide a continuing invaluable asset to the health and health-related community. This development was the direct result of the grant funds received from the National Library of Medicine and the continued, increased support of the School for library collections.

Surely the hopes for collection development have been realized. These hopes were expressed in 1926 by Dr. Corner when he said, "Although the administration of the School does not feel it wise at present to expend general funds in the purchase of expensive special collections or subjects not actively represented here, our staff and student body and the local profession include many persons of scholarly interests upon whom the richest library would not be wasted; the presence of many important books on the shelf stimulates wider reading, and the mere fact of access to large collections is one of the things which sets off great universities and great cities from the lesser."

As noted earlier, there are two primary components in describing the purpose of a medical library facility: gathering the recorded experiences, and bringing them to bear on the problems. The first half of this paper dealt with the gathering of recorded experiences—collection development. The second half will deal with the solutions developed through which information of the past could be brought to bear on the questions of the present and the future. Of equal importance to the building of a collection is its organization, care, and accessibility. The single most important factor in the utilization and arrangement of collections is staff.

## LIBRARY STAFF

In the early years the duties and responsibilities of professional librarians were met through the utilization of the talent and expertise of the faculty who comprised the Library Committee, namely, Dr. Corner (chairman), Dr. Samuel W. Clausen, and Dr. Stanhope Bayne-Jones, and with the general supervision, guidance, and advice of Mr. Donald Gilchrist, University librarian. With the exception of Dr. Bayne-Jones, whose place was filled by Dr. Wilson, the personnel of the Library Committee remained unchanged up through 1940. The first medical librarian was Miss Hester Hopkins (Mrs. C. P. Cochrane), who was succeeded in 1923 by Miss Olga Schaeffer (Mrs. Hawley B. Nell). From 1929 to 1963 the Library was under the management of Miss Mildred Walter.

The administrative management of the Library, in the early years, and to some extent as recently as 1963, was largely the responsibility of the Library Committee and the University librarian. However, as collections grew, staff increased, and medical librarianship grew in stature as a profession, the situation changed. It changed in large part because the School met the challenge of attracting capable staff. This was done by bringing the librarians into the scientific and educational stream, by demanding as good a quality of thinking from their librarians as from their other faculty, and by encouraging and supporting experimentation in scientific communication in their Library as much as experimentation in the subject areas of other departments of the School. As Mildred Walter, the medical librarian for more than thirty years, provided and supervised those services so essential to the mission of the School, more and more of the administrative responsibilities carried by the Library Committee and the University librarian evolved upon her and consequently on the medical librarian. It was the work of Miss Walter and her successors, Mr. Stanley D. Truelson, Jr., and Mr. Willis E. Bridegam, Jr., that brought about the true appreciation of the fact that of equal importance to the content of the Library's collections is the caliber of the library staff. Given ability in the chief librarian and his assistants, most other desirable ends follow, because in general a good staff obtains financial support for the library, as good quarters as outside school conditions permit, and the acknowledgement of individual intellectual stature, making for understanding, equal consultation, and mutual appreci-

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ation. That these ends have indeed been accomplished at the University of Rochester School of Medicine and Dentistry is demonstrated by the fact that today the Library is run under the direction of a chief librarian with 7 full-time professional and 16 fulltime clerical assistants. It is run with the active and strong support of a viable Library Committee, now chaired by Dr. Leon Miller, whose advice is actively sought on matters of policy and collection development. Presently, the medical librarian is administratively responsible directly to the dean, as the Library's support comes directly from the Medical Center, and looks to the University librarian and the Library Committee for professional support and advice.

## Organization of Collections

It is a truism that a library's collections are of no value unless they are catalogued and arranged in an organized way so that they are made easily available to the faculty, staff, and student body who use them. The first arrangement of the monographs on the shelves was in a single alphabetical author file, with the catalogue consisting of an author card for each title. Because of the user's need for access to the collections for information on particular subjects and the continued growth of the number of volumes in the Library, the decision was made to catalogue the Library's collections. The Boston Medical Library system of classification was adopted in 1926, but as the number of books and borrowers increased it became obvious that a more elaborate system of classification was needed.

Realizing that a cataloging system should not put barriers between library materials and their users, and should avoid delays between time of arrival of an item and its availability for use, the Library of Congress Classification system was adopted. The actual work was begun in 1930 and was completed in 1934. This system of organization was used up until 1968.

As the literature of medicine grew and became increasingly more specialized the need for a standardized medical classification system developed. This need was filled by the National Library of Medicine. To avail ourselves of the services provided by the National Library of Medicine the Edward G. Miner Library switched to its classification system in 1968. As we look to the future the Library staff is planning for the implementation of the Ohio College Library Center's computer-based online catalog-

ing network, which will greatly facilitate the processing of library materials.

# **RENOVATION OF PHYSICAL FACILITIES**

As organization and classification of collections can enhance or retard library service, so too can the design of the physical quarters occupied by the Library.

The first home of the Medical Library was in quarters on the second floor of the animal house, where it was located from 1923 to 1925. In 1925, when the Medical School building was ready for occupancy, the Library was among the first to move into its present location on the first floor of Division E, with stack space on the ground floor. The librarian's office and workroom, the reading room with a seating capacity of 48, cases for current periodicals, and stack space for 15,000 monographs were on the first floor. Five carrels on this floor and 15 on the ground floor provided individual study areas for the Library's patrons. The two-deck steel stack levels were designed to accommodate approximately 100,000 volumes.

The impact of the millions of dollars of federal, foundational, state, and local governmental funds which poured into medical research, hospital construction, expanded facilities of medical centers, and the establishment of new schools of medicine and dentistry since World War II has been enormous. That impact on the School, described in other essays in this volume, had a direct effect on the Medical Library. As the scope and size of the Library's collections expanded, reflecting the School's expanded educational programs, so too did the size of the Library's clientele increase, reflecting the exponential growth of the School's faculty, staff, and student body. By the end of the 1950s the need for expanded library facilities was imperative. Recognizing that the Library already occupied an ideal physical location in the center of the medical complex, the decision was made to expand and renovate its existing facilities. With the aid and support of the faculty, staff, students, and alumni, as well as \$100,000 from the Markle Foundation, work was begun.

The year 1961–62—the period of building and renovation will long be remembered. The noise of the digger, the hammering, sawing, the dust and dirt, and temperatures in the eighties made for difficulties in studying and working. With the coming

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of fall and winter the problem of high temperatures remained, despite the fact that the Library had no heating facilities. Windows were boarded up to keep as much of the dust out as possible while the new extension was in the process of construction. The Library was completely boxed in. Twelve electric fans were turned on during library hours to stir the air and give the illusion of a breeze. On completion of the extension, work of renovating the old library quarters began. Building the elevator shaft posed a problem on the two stack floors. It was necessary to remove all periodicals in those two locations to the lowest level of the section by way of the stairway. The second move was a major one into the new section. The workroom, the librarian's office, the card catalog, the reference shelves and periodical cases, the reading-room tables and chairs were moved into the new reading room. Clearing everything from the first-floor original library gave way to extensive changes. The original rear entrance was closed and a new doorway cut; the old stairway was removed and another replaced it; partitions for the workroom and librarian's office were constructed. The original main entrance was closed and a new attractive entrance constructed. The result of all this activity was, in fact, a new library, which was dedicated on October 12, 1962, with appropriate ceremonies in Whipple Auditorium. Dr. Anderson presided and the guest speakers were the president of the University, W. Allen Wallis, Mr. John M. Russell, president of the John and Mary Markle Foundation, Dr. George W. Corner, Dr. Willard Allen, professor of obstetrics and gynecology, Washington University School of Medicine and a member of the class of 1932, and Mr. Frederick Kilgour, librarian of Yale University School of Medicine.

With the advantage of the new facilities and expansion of Library staff, the activities of ordering and cataloging were transferred from the University Library to the Edward G. Miner Library and placed under the direction of the medical librarian. The need for adequate space and the proper utilization of existing facilities is a constant, but by no means peculiar, concern of library administration. As recently as 1972, thanks to a gift from the Medical School alumni, the old student locker room, which comprised 800 square feet of space contiguous to existing library facilities, was renovated. This provided the Library with a functional, bright, and completely refurbished room, designed to house the acquisitions, cataloging, and serials sections.

# THE LIBRARY TODAY

Presently the Edward G. Miner Library provides direct library service—loan of books and journals, reference assistance, literature searching, photocopying, and interlibrary loan service—to all faculty, staff, students, and employees of the Medical Center. The Library also makes available reference service and direct loan of books and journals to faculty members, graduate students, and employees of the University of Rochester, including the Eastman School of Music and the Memorial Art Gallery. Undergraduate students of the University of Rochester and Eastman School of Music are accorded reference service and direct loan of books; however, journals may not be borrowed by undergraduates. In addition, direct borrowing privileges are granted to teaching faculty, residents, and interns of the institutions associated with the teaching programs of the University of Rochester School of Medicine and Dentistry and the School of Nursing.

All health personnel in an eleven-county area may look to the Edward G. Miner Library as a resource for medical literature and information. Reference and interlibrary loan services are provided to all libraries in the eleven-county area. Physicians, dentists, nurses, therapists, and other persons in health-related professions who have no medical library facilities are offered privileges by the Edward G. Miner Library. Also, scientists and persons in industry working on health-related projects are offered use of the Library's collections.

The Edward G. Miner Library was one of the original members of the SUNY Biomedical Communication Network, an online information retrieval system. Consequently, beginning in October 1968, the Library was able to offer a valuable bibliographic service impossible with conventional manual techniques. In providing a bibliography, searches on several combinations of subjects can be run. For example, to find information on drug abuse and drug addiction in the adolescent, it was necessary to run searches on specific drugs-cannabis, mescaline, LSD, barbiturates, amphetamines-and drug addiction or abuse in the adolescent. The drug topics were also combined with the subjects abnormalities, criminal psychology, and genetics to locate additional material. In all, twenty-one searches were run to complete this one request for recent literature. With ever-advancing technology and vastly improved hard and softwareequipment and programming language-the quality and quantity
# The Ongoing Years — Lemkau

of this service has been improved. Up to October 1973, utilizing an IBM 2740 terminal with a printing capacity of 10 characters per second, the Library was producing an average of 90 demand bibliographies per month for its users from the MEDLARS (Index Medicus) data base. Since November 1973 a UNIVAC DCT 500 terminal has been in use. This terminal has a printing capacity of 30 characters per second. In addition, the improved programming language increased the ability to manipulate the data. Also, since October 1973 additional data bases have been added. These include ERIC (Educational Resources Information Center) and Psychological Abstracts. As a consequence of these improvements the Library has been providing over 300 demand bibliographies per month to its clientele since October 1974. Through these services and environment, the Library provides guidance and instruction. The student or investigator is then able to function in a world in which the store of knowledge relevant to his activities and responsibilities is constantly growing and in which information is constantly being generated, validated, and incorporated into new syntheses or relegated to past records.

Thus, the Library not only justifies its existence but discharges part of its debt to those of the past and present who are responsible for its being. The other part of the debt requires that those of us presently charged with the responsibilities for library operations and services build upon past accomplishments and do all in our power to develop the Edward G. Miner Library so that it will not only be as good as it is but will be as good as it can be. To accomplish this goal, one must be aware of some of the more important factors which will effect the continued development of the Edward G. Miner Library in the next fifty years. as the potential growth and expansion of library services is directly related to the goals of the institution. The areas of future development which must be examined are: first, increased size of the Library's clientele and its implications for collection development and physical facilities; second, automated procedures and machine retrieval system networks and the philosophical and real impact of the network concept in the growth of the Edward G. Miner Library; third, the influence and impact of nonbook instructional and informational materials.

#### THE FUTURE

One of the most immediate factors influencing both the long-

and short-term growth of the Library is its increasing clientele and the consequent expansion of the educational programs of the Medical Center. The faculty and class size of the School of Medicine and Dentistry have greatly increased, as have educational efforts in the areas of brain research, dentistry, community and social medicine, and nursing. This increase in the growth of collections and clientele necessitates a constant examination of the utilization of Library space.

In regard to automated procedures and machine informationretrieval system networks, the following factors are of the utmost importance. The daily operational expenses for services, collection, and staff of medical libraries have been and are continuing to increase at a tremendous rate. Only through true library cooperation and participation in library networks can libraries survive without drastic cuts in services and collections in the future. Participation in networks, however, must be examined from the viewpoints of (1) need, (2) availability of the necessary technology, and (3) affordability. Network participation will mean increased cost in the short run but, if it is well thought out and planned in a truly cooperative manner, it will keep the long-range expenses of library services within manageable limits.

The extent to which the Medical Library should be organized and operated as a self-instructional and communication resource center will depend on the policies of the Medical Center. New developments in the electronic storage and transmission of information and new instructional concepts of technologies using machines, computers, television, and other media are forcing medical librarians to reanalyze the role and scope of the Library in the teaching program of the Medical School and Center. Any form of communication which serves the goals of this institution is potentially a responsibility of the Library. The decision to centralize or decentralize the storage and utilization of instructional materials and equipment should be based on whether the services are generally required by many departments of the Medical Center or whether they are specially used by a limited group in the institution. The Library should be concerned with those teaching and informational materials which are used by its community at large, rather than those used by a few individuals in special areas.

The Library is primarily a place for individual learning. This

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will no doubt remain the Library's principal role. The Library may undertake to provide space and facilities, jointly used for formal instruction, so that the new "vehicles for information" can be made available to students and faculty as efficiently as are printed materials.

It is how we address ourselves to these problems which will determine whether our successors fifty years hence will be able to say of us, as we can now say of our predecessors of fifty years ago: first, they were men of courage; second, they were men of judgment; third, they were men of integrity. But above all they were men of dedication.

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Where's the Dental School?



# William D. McHugh, D.D.S.

William D. McHugh, associate dean for dental affairs, professor of clinical dentistry and of dental research, and director of Eastman Dental Center, has a long-standing interest in dental education, especially at the postdoctoral level. After his early dental training at St. Andrews University in Dundee, Scotland, he undertook advanced training in research and in the specialty of periodontology at dental schools in Malmö, Sweden, and in London and Birmingham, in England. Returning to Dundee, he became chairman of a new Department of Dental Health and worked to integrate the various clinical dental specialties and to develop the utilization of preventive measures.

Dr. McHugh spent a sabbatical year in Rochester in 1963, and returned in 1970 to the appointments which he now holds. Since then, his main concerns have been the development and integration of dental programs in Rochester, especially the educational and research programs at Eastman Dental Center and in the School of Medicine and Dentistry. His research interests continue to be the study of gingival epithelium and its role in periodontal (gum) disease, and the nature and control of dental plaque.

**L** HAVE often been asked, "Why is it called the School of Medicine and Dentistry when there isn't a dental school?" Many

Rochesterians, and not a few who are on the faculty of the School, know little about the dental part of the School and what its achievements are. This is a pity, for, while its role is unusual, Rochester has contributed greatly to dental science and education and these contributions are much better known and appreciated nationally and internationally than they are locally.

This account of the dental programs will start before the School was created, for events that took place in the two decades preceding its founding were of vital importance in determining its character and, indeed, in deciding that it be founded.

Even at the turn of the century, Rochester had an unusually enlightened dental profession. The first free dental clinic in the United States was established here in 1901 in the City Hospital. This lapsed after two years but was restarted in No. 14 School in 1904, with the objective of providing free dental care for those who were unable to pay for the services of a private practitioner. The leading dentists of the day donated their services and funds for instruments and supplies were provided by Captain Henry Lomb, a local industrialist and one of the founders of the Bausch and Lomb Company.

Children were sent to the clinic from the different schools in the city. If dental services were found to be needed, the child was advised to consult his dentist; if he could not afford to do so, treatment was provided at the clinic. The value of this clinic soon became recognized and similar one was set up in School 26 for the children in that area. Funds for establishing this clinic were provided by Captain Lomb, William Bausch and, as a presage of future philanthropy, by George Eastman.

While there has been much speculation as to what sparked George Eastman's interest in dentistry, it seems clear that he was much influenced by the views of his close friend William Bausch, who had been an active supporter of the dental clinics set up by the Rochester Dental Society. Eastman supported these clinics with annual contributions from 1909 and became impressed with their value and with the great need for the services they provided.

In 1914 he was visited by Nelson Curtis, a friend from Boston, who told him of the Forsyth Dental Infirmary in that city and of its work in providing dental care and preventive services for children. Eastman was intrigued by this story and, after ob-

taining further information, he traveled to Boston to visit the Forsyth Dental Infirmary, without revealing his identity or the reasons for his interest.

William Bausch, in consultation with members of the Rochester Dental Society, had developed plans for the establishment of a series of dental clinics throughout the city, and presented these plans to George Eastman in 1915. An exchange of views followed and Eastman's ideas crystallized as he expressed them to Bausch in a letter of July 6, 1915.

Dental health education was another pioneering program, and thousands of educational pamphlets in English, Italian, Yiddish, and Polish (Rochester's languages of the day!) were printed and circulated to parents. These pamphlets urged that children should be taken to the Dispensary as soon as the first tooth appeared, and it was planned to retain the child as a patient until age 16. The value of this pattern soon became established and was later accepted as a basic tenet of dental care for children throughout the world.

The educational advantages to dentists working in the Dispensary were substantial, since the dental schools of the time were in a similar state to the medical schools when the Flexner Survey was made, and children's dentistry was not part of the dental school curriculum. These advantages greatly facilitated recruitment of staff dentists and many young dental school graduates worked in the Dispensary for a year or two before setting up their own practice.

Within a few years, most city children under the age of 16 whose parents were unable to provide for preventive dentistry for them were being cared for by the Dispensary, and the enlightened mixture of preventive services and skillful treatment had done much to abolish from the children's minds the old association between pain, fear, and dentistry. As Carl Ackerman, George Eastman's biographer, wrote: "To the children of Rochester, dentistry is akin to play. They frolic to and from the institution as if they were on an outing."

Concerning the Dental Hospital project, I should not care to have anything to do with this affair unless a scheme can be devised which will cover the whole field and do the work thoroughly and completely, and in the best manner. Basing my opinion on all the information that has come to me up to the present time, I do not think that the work of treating the children's teeth, outside of the

prophylactic work to be done by the hygienists, can be satisfactorily done and supervised at centers distributed over the city...

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Eastman went on to propose the formation of a dental dispensary in a central location in the city and offered to build and equip the facility and to provide some funds for operating expenses. These proposals were quickly accepted and a board of trustees was appointed, a director selected, and a start made on the building. The Dispensary was opened at 800 Main Street East in October 1917, equipped with 37 operating units specially designed by the Ritter Company, which served as prototypes for units used subsequently in dental offices throughout the country.

Children were examined and given dental prophylaxes in the Rochester schools when necessary, and children who could not afford the costs of dental care in private offices were brought by bus to the Dispensary for treatment. In addition, the Dispensary had two programs which, though common today, were innovative for that time. A school for dental hygienists was set up in the Dispensary and more than 30 young women were trained each year for this new vocation. This was the first legally established school for dental hygienists in the state. Some hygienists subsequently went into private practice, but many joined the Dispensary's "prophylactic squads," which made the rounds of city schools twice a year.

These were, however, the days of "focal sepsis," when it was believed that chronic infection in one part of the body could cause a variety of diseases in distant parts and organs. As a consequence, parts and organs which were not essential to life and which were thought to be involved in any infection, however lowgrade, were removed in great numbers. Teeth and tonsils were the most common candidates for this type of "therapy." Dr. Albert Kaiser, a Rochester physician, had been very influential in promoting the removal of tonsils and adenoids. Large numbers of teeth were extracted at the Dispensary and, in 1920, a special tonsil and adenoid clinic was set up there with 18 beds and appropriate operating facilities. In addition to the tonsillectomies performed at the Dental Dispensary and the city's hospitals, a special clinic, paid for by George Eastman, was held in the Convention Hall annex in the summer of 1921. Approximately 9,000 tonsil-adenoid operations were performed in this clinic in two months

During the first two decades of its existence, the Dental Dispensary remained George Eastman's favorite project. This was not only because it was his first major philanthropy, but also because of his perception that he had played a major part in developing and demonstrating a new concept which had national and even international application. He visited the Dispensary at least once a week and frequently took out-of-town visitors with him. Partly as a result of such visits, similar institutions were later set up in New York and Chicago. Eastman became interested in extending the example to other countries and offered to build Rochester-type dispensaries in European capitals, if local boards of trustees were set up for each dispensary and if they undertook to provide operating funds for a minimum of ten years. This offer was readily accepted and, in the 30s, "Eastman Dental Dispensaries" were built in Stockholm, London, Brussels, Paris, and Rome. Each of these institutions remains in active existence to the present and, although the evolutionary pattern of each has differed from the others, they all continue to play important roles.

### The Founding of the School of Medicine and Dentistry

The decision by the John D. Rockefeller Foundation to set aside \$100 million "for the betterment of medical education" was the spur that led to the founding of the School, following as it did on the recommendations in the Flexner Report to the Carnegie Foundation, in 1910. Mr. Abraham Flexner, who was then secretary of the General Education Board, visited Rochester on February 5, 1920, met President Rush Rhees of the University of Rochester, and George Eastman, and with them visited the Dental Dispensary. In their discussions on the possibility of founding a medical school, Eastman urged that it be a school of dentistry as well as medicine. Dr. Harvey Burkhardt, the director of the Dental Dispensary, proposed that the preclinical courses in the first two years should be the same for both medical and dental students. The clinical instruction of the medical students could then take place in the Municipal Hospital while dental students would do their clinical work at the Dental Dispensary. Thus, when the plan to develop a school of medicine and dentistry in Rochester was publicly announced in 1920, Flexner made the following statement:

In one very important respect the medical department of the Uni-

versity of Rochester will try to make a novel contribution to education. We have come to see in the last few years that dentistry is a branch of medicine of the same dignity and importance as pediatrics, obstetrics, gynecology, and any other specialty. Mr. Eastman has recognized its importance by endowing the Rochester Dental Dispensary, to the support of which the city of Rochester and many of its citizens are already making important contributions. Meanwhile training in dentistry in this country has been less highly developed than training in medicine and surgery. The new school of medicine will, it is hoped, undertake to place training in dentistry on the same academic and scientific level as training in medicine and surgery and, to this end, it will seek the cooperation of the Trustees of the Dental Dispensary and the practicing dental profession in the city.

Eastman's views on the matter were outlined in a letter he wrote to the trustees of the Dental Dispensary on June 25, 1920:

When the Dispensary was founded I did not foresee that it might have an opportunity to become a part of a great project for a higher grade of dental education than had before been attempted. Since the opening of the Dispensary, I have, on several occasions, discussed with our director, Dr. Burkhart, the growing necessity for such dental education, but neither of us could see clearly any way of bringing it about. When the plan to establish a great Medical School in connection with the University of Rochester came up I welcomed the opportunity which it furnished for an alliance to accomplish the much desired object.

I feel that an alliance of this sort can be effected in such a way that it will not interfere with the present work of the Dispensary and will, at the same time, enable it to accomplish a much larger work than we had in mind when it was founded. The carrying out of such an alliance will call for a very high degree of cooperation between the trustees of the Dispensary and the trustees of the University, and under present conditions I have no fear of any lack of such cooperation, but new conditions may arise which will render it more difficult. It is in view of this that I should like to put on record my wishes as far as they can be formulated.

While the idea of joint preclinical training was a good one which has subsequently been put into practice at Harvard University, the University of Connecticut, and elsewhere, it was far ahead of its time in 1925. Premedical students took at least three years of college before entering medical school, whereas predental students with only two years of college could gain admittance to the most prestigious dental schools of the day. Thus,

competition for places in the novel and untried dental program in Rochester was far from keen, and by 1929 only one "qualified" candidate had applied for training in dentistry. Thus, the D.D.S. program was dropped.

# The Dental Fellowship Program

In the mid-twenties, other voices spoke from time to time in high places for reforms in dental education. Dr. William J. Gies, biochemist at Columbia University and a protagonist for dental research and for dental education, interested the Carnegie Foundation for the Advancement of Teaching in the opportunity to lift dental schools (many proprietary and devoted far too heavily, albeit successfully, to exquisite perfection in technical restorations) into scholarly academic counterparts of medical schools. Gies's 1926 survey called specifically on Rochester's School of Medicine and Dentistry to help fulfill dentistry's pressing needs. Lee Johnson, an orthodontist of intuition, gained renown by calling attention to genetic factors in oral health. He carefully recorded the problems of dental occlusion, vividly illustrated in the predictable oddities and misfits of mandibles and maxillas of pups when big and little dogs, sharp-nosed and pug-nosed dogs, were mated by Charles R. Stockard. Lee Johnson had a dream of the dentistry of the future. Dental practitioners no longer would limit their practice to unexcelled techniques of repair but would become specialists in oral medicine able to care for their patients' oral health problems with an understanding like that of the specialists in ophthalmology, in nose and throat, or in hearing.

One stormy winter morning in 1929, Dr. Johnson and Howard Savage, secretary of the Rockefeller Foundation, traveled together on the commuter train from Scarsdale to New York. They disembarked at the elevated station and started down the long and icy steps to street level. Dr. Johnson had in his briefcase a partially completed manuscript on his dog studies. He spoke feelingly of the needs of dental research. Dr. Savage became interested. Soon thereafter, the Rockefeller Foundation set aside \$250,000 to provide fellowships for dentists; Yale and the University of Rochester were to share equally. Dr. Whipple, who served on the board of the Foundation, scrupulously absented himself when this proposal was under consideration. The purposes of the grant were a) to support dental research, and b) to

train teachers, investigators, and practitioners in the fundamental biological background underlying the problems of dental health. It was with these objectives that Rochester's Dental Fellowship Program was started in 1930.

The dental fellows who came to Rochester were offered access to any preclinic courses in the medical curriculum, or any undergraduate or graduate course on the River Campus that they found important to their interests. All already held the D.D.S. degree and no further degree work was required. No barrier other than those facing any graduate student was imposed, with the exception that dental fellows were not eligible for the M.D. degree. Dr. Whipple remarked tersely, "If they get an M.D., they'll practice medicine," a prophesy adequately borne out in the careers of the Yale-trained dental fellows. In the congenial atmosphere of the School of Medicine and Dentistry, the little group of 1930–31 dental fellows and their successors fulfilled the aspirations of the powerful men who had set the stage for them.

The first fellows were Basil Bibby, Jobe Sedwick, Edward Dobbs, Grant Van Huysen, Wilbur Davis and, a year later, Harold Hodge, William Davis, and Holmes Knighton. They were uncertain, without curriculum, without program, without tradition, and without specific guidance. In spite of those uncertainties, they did know the broad purpose of the program and they soon found great opportunities for development, especially in long hours of exchanging ideas with other dental fellows, sharing nuggets of current research findings dug from the library, and developing a curiosity about a specific question which was so nagging and so persistent that the fellow might seek an opportunity to answer it in a laboratory of what appeared to be an appropriate department. There, he would soon find himself immersed in a scholarly environment, often drawn into the intellectual orbit of one of the distinguished "founding professors," swept into the delights and torments of research, accepted without question into the academic family, and aware that he, like every other young scientist, was confidently expected to join in the pursuit of new knowledge and the dissemination of learning.

The dental fellows attended seminars in the departments to which they were attached and soon organized their own dental seminar program. These seminars proved to be a great source of inspiration. No less unforgettable was the pervasive New En-

gland atmosphere of economy. Money was limited, stipends were \$1,200 to \$1,800 a year, and every dollar spent had first been successfully defended as a worthy investment.

This, then, was the basis of a unique program which has proved to have an influence on dental education out of all proportion to its size. While the early dental fellows were encouraged by George Whipple's confidence in a bright future for dental research, there was little evidence of interest on the part of dental schools in hiring the fellows. Faculty appointments at that time were based almost entirely on clinical or technical skills and there was little interest in, and no enthusiasm for, research ability. After a few years some of the early dental fellows did receive dental school appointments but, to their great disappointment, these brought no opportunity for research.

Time and the tide of events did, however, bring changes. By the early forties, the published papers of the Rochester dental group were beginning to attract attention and dental schools were showing increasing interest in having Rochester-trained men on their faculties. These early problems did, therefore, have some beneficial effects, for the early isolation from the mainstream of dental education fostered a sense of purpose and of group identity which continue today as one of the program's most valuable assets.

Financial support for the program caused some difficulties, but fortunately, when the Rockefeller grant ended in 1935, support was obtained from the Markle Foundation and the Carnegie Foundation, which continued through 1945. Then, for nine years, the program was supported by funds from the Dental Dispensary endowment. In 1957, substantial federal support was obtained in the form of a training grant from the National Institute of Dental Research, which has continued to the present day. Most regrettably, the future of federal support for research training now seems bleak, and this may have a catastrophic effect on the future of the program. Industry has also been supportive; since 1955, fellowships have been provided by the Colgate Palmolive Company, the American Chicle Company, the Procter and Gamble Company, and other enlightened commercial sources.

The pattern set in the early days of the program has continued to the present. Fellows are initially given appointments in the Department of Dental Research. During their first year, they are

encouraged to take graduate courses in basic sciences which are of interest to them and to attend the weekly seminars and discussion groups in the department. From this background, they select an area of research which they find interesting and challenging. A research advisor is chosen and the fellow seeks formal admission as a graduate student in the appropriate department, which can be anatomy, biochemistry, microbiology, pathology, pharmacology, physiology, or radiation biology. In recent years virtually all fellows have been candidates for advanced degrees: the majority for the Ph.D. degrees, and some for the M.S. in dental science.

The basic objective of the program remains, as it always has been, the development of independent investigators. Each individual has a program which is designed to suit his particular interests and aspirations, and which will suitably supplement his previous academic experience. The proper atmosphere for scientific growth is provided in the basic science department in which the fellow receives his training and conducts his research. The research projects chosen by the fellows cover a wide spectrum, each reflecting an amalgam of the man's interests and the investigative opportunities which are available to him. Most deal with fundamental studies, and approximately half of these bear some relationship to dental problems.

What, then, are the achievements of this program and how can they be measured? The research projects carried out by the fellows and the papers they have published while in Rochester are impressive evidence of accomplishment, yet they show only part of the picture. As with all training programs, the best indicators of success are in the subsequent productivity and attainments of the trainees. The scientific publications of former Rochester fellows now number in the thousands, range over a rich variety of scientific fields, and have had a profound influence on the development of dentistry.

Another means for measuring the program's success is to survey the subsequent careers of the fellows. Here, too, the record is impressive. Over 90 percent have continued in academic and/ or research careers—2 have become university presidents, 12, deans of dental schools, and 4, directors of research institutes. These are no mean achievements for a program that started in 1930 and has graduated only 100 fellows. Many of the other former fellows are department chairmen or hold other high aca-

demic offices, and indubitably many of the more recent graduates will achieve such distinctions in the years to come. Rochester can justly be very proud of this small but very bright star in its firmament.

# Clinical Programs at Strong

A dental clinic was opened in Strong Memorial Hospital in 1926. It consisted of a single dental chair and unit and was staffed by Dr. William J. Wallace, an oral surgeon who had a private practice in the city and who was also on the attending staff of Eastman Dental Dispensary. In these early days the clinic was only open for two hours each morning and only emergency care was provided.

In 1931, the first full-time dental intern was appointed and the service expanded. There were apparently no other attending staff, however, and the clinic continued to be staffed only by an intern and by Dr. Wallace on a part-time basis, until 1942.

In 1942, when Dr. Wallace died, Dr. Elmer Pammenter, the chief of clinics at Eastman Dental Dispensary, was appointed to succeed him. Dr. Pammenter immediately pressed for improved facilities and staffing to deal with the substantial unmet demand for dental care. Two years later, an expanded dental clinic with four operatories was opened in the basement of H-Wing, where it remained until 1975. Most of the equipment for this new clinic was generously donated by the Ritter Company, a Rochester company which was, and is, one of the world leaders in the design and manufacture of dental equipment. Staffing of the clinic was increased by the addition of another intern rotating from the Dental Dispensary, and the two interns and Dr. Pammenter then began to provide routine restorative care in addition to the surgical and emergency care which had been provided previously. A dental hygienist was added to the staff in 1945 to further expand the services available.

During these years the dental clinic became increasingly busy and fiscally self-supporting, and an intern in oral surgery was appointed in 1948 in addition to the two interns in general dentistry. An oral surgery training program was gradually developed in the succeeding years as rotations were arranged with anesthesiology and other services, and additional attending staff were appointed. It remained, however, a clinical residency experience for those who had their internship and didactic requirements

elsewhere. Finally, in 1968, a formal oral surgery program extending over three years was developed jointly with Genesee Hospital. This provided the necessary didactic and clinical training and was approved by the American Dental Association in 1969 as fulfilling the specialty board requirements. Additional course work and research are frequently combined with the oral surgery training and can lead to the Ph.D. or M.S. degrees.

Substantial improvements in the training available to general dental interns were also made with the appointment of significant numbers of attending staff, both generalists and specialists, and by arranging seminar series and rotations through other services. The training program in general dentistry was formally approved by the American Dental Association in 1974.

With these developments and the steady increase in the amount of treatment provided, the dental clinic became increasingly crowded. Two additional dental operatories were added in 1972, and in 1975 a very fine and entirely new clinic became available in the new Strong Memorial Hospital. This latest clinic has nine dental operatories, a large procedure room equipped for general anesthesia, and laboratories, offices, a seminar room, and related facilities. Much of the equipment for the new clinic was provided through the generosity of F. Ritter Shumway, members of his family, and Sybron Corporation.

#### The Development of Dental Departments

From its inception, the dental group depended for its existence on the good will of established departments and the spirit of its members, without benefit of organizational status. With the development of the dental fellowship program and the clinical programs, the situation was formalized in 1955 with the creation of the Department of Dentistry and Dental Research under the chairmanship of Erling Johansen, himself a former dental fellow. This remained the only University dental department until 1972, when it was renamed the Department of Dental Research and a new Department of Clinical Dentistry was created. A permanent chairman of this new department has not yet been appointed.1 The Department of Dental Research now has responsibility for fundamental dental research, for the dental fellowship training program in the basic sciences, and for courses in basic sciences related to dentistry. The Department of Clinical Dentistry, as its name indicates, has responsibility for the clin-

ical programs and activities in Strong Memorial Hospital, and also offers a number of graduate level courses and seminars on the scientific bases of dentistry, many of which are given in conjunction with Eastman Dental Center.

# Affiliated Programs

A dental service existed in Genesee Hospital for many years on a very limited basis until, in the late fifties, an informal arrangement was made with the Dental Dispensary whereby interns from the Dispensary rotated through Genesee. This led to substantial development of Genesee's dental services and to the creation of separate internships, which were given formal approval by the American Dental Association in 1962. Close collaboration with the clinical dental staff at Strong led to the development of a joint oral surgery training program in which residents divide their time between the two hospitals; this three-year program received ADA approval in 1968. Formal affiliation between the Dental Department of Genesee Hospital and the School of Medicine and Dentistry took place in 1969, and a similar formal association between Genesee Hospital and Eastman Dental Center (the name was changed from Eastman Dental Dispensary in 1965) was approved in 1973. In the same year, Genesee Hospital appointed its first full-time chief of dentistry, who, under the terms of affiliation, was selected by a joint Genesee/ University committee, and holds a full-time faculty position in the School of Medicine and Dentistry.

The development of neighborhood health centers in Rochester under the patronage of the federal office of Economic Opportunity has been described elsewhere in this volume. Very properly, dental services formed an important part of these centers from their inception. The first center, then called the Rochester Neighborhood Health Center, was opened under University auspices in Hanover Houses in 1968 with three dentists on its staff. They simultaneously held appointments at Eastman Dental Center or the University, which also accepted responsibility for the recruitment and continued training of professional staff. The early success of the centers, and the great need for care which they helped to meet, led to the formation of the Rochester Health Network and the establishment of further centers. Major centers were set up in 1972 at the Jordan Health Center, Genesee Hospital, and at three locations operated by Westside

Health Services. From that time they became administratively independent, although the dental director and medical director of the Jordan Health Center continue to hold academic appointments in the School of Medicine and Dentistry. The centers employ substantial numbers of dentists, both full time and part time, and provide a large amount of care primarily, but not exclusively, for the economically underprivileged who live in the area in which each center is located.

The relationship of these various programs to the School of Medicine and Dentistry is complex and confusing, as it has changed with the development of each program. A substantial strength in these relationships, however, has been the joint appointment of senior staff and the high degree of cooperation which has ensued. These programs will continue only as long as they are of benefit to all parties. That they have increased so substantially in recent years is evidence enough of their value.

# Developing Relationships with Eastman Dental Center

The close relationship between the Dental Dispensary and the School of Medicine and Dentistry which had been visualized in the early planning failed to materialize. No doubt, the failure of the Rochester D.D.S. program was a factor, but, in his biography of George Whipple, George W. Corner attributed much of it to the concern of Harvey Burkhardt (the Dispensary's director from 1916 to 1946) that the Dispensary would lose its independence and that it had little to gain by research. Whatever the reasons, there was little cooperation between the Dispensary and the University during Harvey Burkhardt's directorship.

After Harvey Burkhardt died in 1946, at the age of 81, Basil G. Bibby was appointed director of the Dental Dispensary. A New Zealander by birth, Bibby had received his dental training at the University of Otago and had been one of the first group of dental fellows in Rochester, where he obtained the Ph.D. degree in bacteriology. He had been dean of Tufts College Dental School in Boston before returning to Rochester. Under his leadership the Dental Dispensary's philosophy changed and research and educational activities were given increasing encouragement and support. Bibby recruited a number of able researchers to the Dispensary and he and they embarked on a substantial research program. Young dentists working in the Dispensary were encouraged to participate in these research activities and to expand

their scientific horizons. Special seminars were held and from these developed formal courses in the scientific bases of dentistry.

The significance of Basil Bibby's contributions to Rochester and to dentistry are substantial and unique. Under his enlightened and vigorous leadership, the Dental Dispensary developed from a patient-care institution of largely local impact and fame to an internationally renowned center of advanced dental education, care, and research. It has trained a remarkable number of educators and researchers, and in its special area has established a reputation for excellence which closely parallels that of the School of Medicine and Dentistry.

A new program leading to the Master of Science degree in Dental Science was established in 1950, with the cooperation of the School of Medicine and Dentistry, to encourage research by the trainees in the clinical programs at the Dental Dispensary and to provide a degree as a visible indication of achievement.

This program was patterned on those offered by the Psychology and Sociology Departments of the University. It required the taking of a major scientific course at the University, participation with the University's dental fellows in the weekly dental research seminars, course work and seminars at the Dispensary, and research. It was the intention that the program be centered round the research rather than the course activity.

The program developed steadily, having many parallels with the original dental fellowship program. In each case the trainee took course work and participated in seminars which were designed to develop a broad scientific base. The conduct of original research was the core element in both programs. The differences were, and are, that in the fellowship program trainees spend the bulk of their time in one of the basic science departments of the School of Medicine and Dentistry and tend to carry out very basic research which is often not directly relevant to dentistry, whereas the trainees in the M.S. program spend most of their time with dental researchers, mostly at the Eastman Dental Center, and usually work on problems which have some direct application to dentistry.

The M.S. program has produced slightly more graduates than the Ph.D. program, although it was started twenty years later. It has had similar followup success, as the great majority (about 90 percent) of its graduates have continued an academic and/ or research career. A noticeable difference has been that almost

all have become teachers of clinical subjects, whereas many of the graduates of the Ph.D. program have become teachers of basic sciences. The research productivity of the two groups is similarly impressive, and although the younger M.S. program has not yet launched quite as many holders of very high academic office, it already has produced 3 deans of dental schools, 2 directors of research institutes, and a large number of department chairmen.

The fifties and sixties saw the evolution of very substantial educational and research activities at the Eastman Dental Dispensary. The early clinical programs for the care of children were developed into carefully planned training programs in orthodontics and pedodontics, which combined clinical training and practice in these dental specialties and related areas with seminars and course work in relevant fundamental sciences. Research became a required part of these programs and was frequently extended to form the substance of a thesis which could be submitted to the University of Rochester for the M.S. or Ph.D. degrees.

Similar specialty training programs in periodontics (the study and care of the gums, bone and other supporting tissues of the teeth) and in prosthodontics (the provision of replacements for missing teeth) were later developed as the Dispensary extended its care to include adults. All of these specialty training programs are evaluated periodically by the ADA and each has been approved as fulfilling the appropriate specialty board requirements.

During the fifties, a number of distinguished scientists and clinicians were recruited to the Dispensary's staff to develop these programs, and most were given senior faculty appointments in the University's School of Medicine and Dentistry. These appointments, and the increasing number of trainees at the Dispensary who were taking graduate level courses at the School, led to closer cooperation between the two institutions. Cooperation was not complete, however, and attempts to initiate a joint application for federal funds to set up a dental research institute in Rochester were not successful.

In the late sixties, however, the potential value of closer cooperation between the School of Medicine and Dentistry and the Eastman Dental Center became apparent to many of the trustees and senior faculty of both institutions. A series of discussions initiated by Lowell Orbison, the dean of the School, finally led to agreement that, when Basil Bibby retired from the directorship of Eastman Dental Center, his successor should be appointed to a new University post of associate dean for dental affairs as well as to the directorship of the Center. It was to this joint position that the writer of this essay was appointed in 1970.

It was but a short step from the joint appointment of a senior administrator to the formalization in 1971 of the affiliation between the University and Eastman Dental Center "...for the joint development of programs of advanced dental education and research."

A joint clinical teacher training program was initiated in the same year, with the objective of training the highest quality of dental teachers and researchers. In this program, training in one of the dental specialty areas is integrated with studies and research in an appropriate basic science leading to the Ph.D. degree. It involves close cooperation between clinical faculty, most of whom are based at Eastman Dental Center, and basic science faculty, who are mostly based at the Medical Center. A variety of program combinations are possible and have included periodontology/microbiology, oral surgery/pathology, periodontology/biochemistry, and pedodontics/pathology. The numbers in this program will probably remain limited and about the same as those in the traditional dental fellowship program. Its impact on dental education, practice, and research should, however, be substantial.

A careful and critical appraisal of facilities at Eastman Dental Center was carried out in 1972 and it was concluded that major remodeling or rebuilding was needed. While it was determined that remodeling would be feasible, less expensive, and have certain benefits, the potential advantages of locating a new facility in close proximity to the Medical Center were seen to be substantial. After careful local investigation of the advantages and disadvantages of such a move, a distinguished external committee was invited to Rochester to give their views of future developments. This committee consisted of Sevmour Kreshover, director of the National Institute of Dental Research; Paul Goldhaber, dean of Harvard University Dental School, and Edward Dreyfus, commissioner of health and hospitals for Denver. It affirmed the wisdom of Eastman Dental Center continuing its activities in graduate dental education, research, and patient care, and recommended that the Dental Center relocate on a site

close to the Medical Center, although continuing to maintain its independence and autonomy.

Discussions with University authorities led to the offer of a suitable site, and finally to the decision by the Board of Trustees of Eastman Dental Center to build a new center close to the Medical Center. Planning for this new facility is well advanced and it is expected that it will be completed and ready for occupancy in 1977.

#### Retrospect and Prospect

The future depends on what is developed from what we have now. Two major Rochester institutions have had substantial influence upon dental practice, and especially upon dental education and research the world over. Their programs and activities were initially separate and independent of one another although they have become more integrated in recent years. The organizational framework for much closer collaboration has now been established, and when close physical proximity becomes a reality within the next few years, the scene will be set and the players assembled. While what develops will depend greatly on the will and abilities of individuals, the opportunities are immense. The essential and important role of dentistry in health care has been recognized, and the value of scientific research in dentistry has been demonstrated. Rochester has a proud tradition of educating leaders in dental education and research; I am confident that the future will add luster to that heritage.

#### REFERENCE

1. Fred G. Emmings, D.D.S., Ph.D., was appointed chairman, clinical dentistry, April 1, 1975.

# 10.

# Coming of Age: A School in Fact as Well as in Name



# Eleanor Abell Hall, R.N., M.A.

Eleanor A. Hall, professor of nursing, served as chairman of the Department of Nursing of the School of Medicine and Dentistry from 1957 to 1971. Committed to the education of nurses for professional responsibility, Miss Hall came to Rochester from the Yale University School of Nursing, where she had been assistant dean. Prior to accepting a faculty appointment at Yale in 1948, Miss Hall's professional career included staff nurse, head nurse, faculty, and administrative positions at Presbyterian Hospital in San Juan, Puerto Rico; the Department of Nursing of the Faculty of Medicine of the College of Physicians and Surgeons of Columbia University; the School of Nursing of the Women's Medical College Hospital in Philadelphia; and the Johns Hopkins Hospital School of Nursing. She earned the diploma in nursing from Presbyterian Hospital School of Nursing in New York City in 1936 and pursued undergraduate and advanced study at Teachers College, Columbia University.

Miss Hall has devoted her administration at Rochester to developing an educational unit whose standards are commensurate with the University's standards for undergraduate and graduate professional education.

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**T**<sub>HE</sub> Strong Memorial Hospital, in cooperation with the School of Medicine, will conduct a School of Nursing which will receive its first candidates in September of the next academic year." (President Rush Rhees, in the *Annual Report of the President 1924–25*, p. 27).

"Tonight the School of Nursing formally takes its place as the eighth college of the University of Rochester." (Chancellor W. Allen Wallis, in his opening remarks on the occasion of the inauguration of the School of Nursing. *Proceedings*, University of Rochester, December 8, 1972, p. 1).

In the forty-seven-year period encompassed by these pronouncements the transition of nursing to the status of autonomous professional school in the University has been a gradual process.

Like other professional schools and colleges (education, engineering, management) which have achieved autonomy through an evolutionary process, the School of Nursing is now in a favorable position to share responsibly in fulfilling the social purposes for which the University exists.

Philosophic and economic constraints on the realization of objectives and the growing desire to overcome a sense of isolation from the mainstream of the University's work were among the factors which impelled the move toward independence. Paradoxically, the challenge to the school in the future will be to avoid isolation—particularly from those parts of the University with which a high degree of interdependence is essential if the University is to contribute to meeting society's need for professional competence in the health field.

The School of Nursing, to which President Rhees referred, was established as part of the Medical School-teaching hospital complex, which comprised a major expansion of the University in 1920–25. In 1922–23 the designation of Helen Wood, R.N., A.B., as superintendent of nurses was noted among staff appointments. It was stated that Miss Wood was at that time superintendent of nurses at Barnes Hospital in St. Louis. Reference was not made to her additional appointment as director of the training school for nurses at Washington University. Miss Wood actually came to Rochester in September 1924, after spending the previous year at Teachers College, Columbia University, where she completed study for the master's degree.

In reports prior to 1924-25, President Rhees had alluded

twice to nursing in the plans for the establishment of the School of Medicine and Dentistry and the Strong Memorial and Municipal hospitals. In 1923–24 he wrote: "The foundations are in and the contract for the concrete skeleton has been let for our dormitory for nurses south of the Strong Memorial Hospital across Crittenden Boulevard. This will provide residence facilities for the nursing staff-graduate and pupil nurses-for our hospital and for the Municipal Hospital." Reference to "pupil nurses" implied some type of instructional enterprise, but the main emphasis was on staffing the hospitals.

President Rhees' full account of the decision to establish a school of nursing, which was included in his 1924–25 Annual Report, was as follows: "The Strong Memorial Hospital, in cooperation with the School of Medicine, will conduct a School of Nursing which will receive its first candidates in September of the next academic year. This School of Nursing offers two courses: one of two years and four months, the work of which will be wholly in the hospital and medical school; another a five year course leading to the college degree, Bachelor of Science in Nursing, three years being spent in the College for Women and two years plus six weeks in each of two summer vacations in the School of Nursing."

The University of Rochester was actually in the vanguard of a small but growing number of colleges and universities which were becoming directly involved in nursing education. By 1923, there were less than 20 universities and colleges in which programs of study had been developed, combining general and professional education and leading to eligibility for the licensing examination for registered nurses and to the baccalaureate degree. In 1972 there were programs in 305 senior colleges and universities. The general situation throughout the country in 1920 was that nursing schools controlled by hospitals continued to proliferate and the number of graduates increased rapidly. (In the city of Rochester, every hospital<sup>1</sup> conducted a school of nursing.) The opposite trend obtained in relation to numbers of medical schools and medical graduates.

The United States 1920 census report showed an 83-percent increase in trained registered nurses—from 82,327 in 1910 to 149,128 in 1920. Relatively small numbers were engaged in hospital nursing (11,000) and public health nursing (11,000); the remainder (over 120,000) were listed as available for private duty

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Medical and Nursing Schools and Graduates 1900-26<sup>2</sup>

	Medical Schools	Nursing Schools	Medical Graduates	Nursing Graduates
1900	160	432	5,214	3,456
1910	131	1,129	4,440	8,140
1920	85	1,775	3,047	14,980
1926	79	2,155	3,962	17,522

nursing or as inactive. The small proportion of graduate nurses on the staffs of hospitals reflected the dependence of hospitals on student service or, in the case of hospitals which did not conduct schools, on the service of workers trained on the job. A belief then prevalent emphasized that the only way to secure good nursing was for the hospital to establish a school and for the students to staff the hospital. With rare exceptions, there were, in the clinical settings, insufficient numbers of competent practitioners of nursing to guide the learning of students by precept or by example.

The resurgence of emphasis on public health following World War I was a positive influence in stimulating a review of the system of nursing education and in promoting reform. Nurses who had come through the typical hospital school were inadequately prepared for the kinds of positions which were being created, particularly outside the general hospital.

Roberts refers to the unprecedented demand for public health nurses resulting from the greatly expanded programs of official and private agencies: "Nursing was closely bound to traditional medicine, but nursing leaders were constantly under pressure to broaden the base of nursing education by those nurses who were associated with the leaders in the fields of public health and preventive medicine."<sup>3</sup>

After 1917 postgraduate courses in public health nursing began to be developed by colleges and universities in collaboration with community nursing agencies. These offerings supplanted the agency-directed courses, which had been established earlier to meet the specific needs of the service organizations.

In 1919 and 1920, at the University of Rochester, a course, Family and Community Standards for Workers in the Public Health Field, was offered through the Division of Extension Teaching. Listed in the bulletin of the division under social work,

this course was taught by Belle Boyson, Ph.B., social worker, and Mary Laird, R.N., public health nurse and was planned, the first year, for: "Persons desiring—social training for public health nursing,—training as professional social or family case workers, —training as volunteer social workers and broader knowledge of social problems of the community."

In 1920 the course was listed as "open only to registered nurses" and dealt with principles and techniques of public health nursing, nutrition, and family case work. In both years field work was arranged with the newly established Rochester Public Health Nursing Association, and certificates were awarded to individuals completing a minimum of two months' supervised experience.

Nationally, the Committee for the Study of Public Health Nursing Education, created and supported in 1919 by the Rockefeller Foundation, in 1920 changed its name to the Winslow-Goldmark Committee and widened its scope to encompass "the entire subject of nursing education."<sup>4</sup>

Helen Wood joined the committee at that time and served until 1923, when its work was completed. The committee's deliberations and many of its conclusions dealt with the upgrading of educational standards, the need for adequate financing of schools separate from the financing of hospital nursing services, the development of educational opportunities beyond the basic course, and the establishment of independent university schools.

The committee visualized schools established in a few university centers as "experiment stations:—pathfinders of a disinterested professional education for nurses."<sup>5</sup> It assumed that the primary function of the university in relation to nursing, as to other professions, was the education of individuals who could provide leadership in practice, in education, and in the administration of nursing services in hospitals and other community agencies. It emphasized the standardizing influence of the university school on the hospital and it also visualized the school's increasing involvement in experimentation in practice and education. The inference was made that the university could develop offerings on a continuum that encompassed liberal studies in the arts and sciences followed by general hospital training, and culminating in postgraduate specialization in public health nursing, institutional supervision, or nursing education.

The committee recognized that essential standards would remain unattainable unless there was a major change in the tradi-

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tional pattern of support of nursing education, and in its report viewed the "very heart of the problem as the nature of the training school itself, its dual character as educational institution and provider of nursing service for the hospital."

The report concluded: "Until the general public by taxation for public institutions, by endowments and gifts for those privately supported, makes the hospital independent of the school for its permanent nursing staff, the hospital must continue its paradoxical attempt to maintain a school without means; the school in its turn must remain in part at least crippled by work in excess of any possible educational program."<sup>6</sup>

The Winslow-Goldmark Committee's recommendations represented goals to be striven for which, in their attainment, would change drastically the practices of the time. It is probably true that, for a number of years, it was not possible to find a university school of nursing in which the recommendations had been fully implemented.

There is no indication that outside funding was sought for the establishment of a professional school of nursing at Rochester. The support in 1923 of the new school of nursing at Yale University by the Rockefeller Foundation, and in the same year of the school at Western Reserve University by Frances Pavne Bolton, may not have gone unnoticed. However, preoccupation with the plans for the new Medical School and its teaching hospital, and with the magnitude of the financial support required to launch this major expansion, is reflected in the reports of President Rhees during the period 1920-25. Nursing was regarded first as an essential hospital service and the appointment of Helen Wood to give leadership to it as superintendent of nurses was one of the early recommendations made by Dr. Nathaniel Faxon after his appointment in 1922 as medical director of Strong Memorial Hospital. Miss Wood and Dr. Faxon had worked together at the Massachusetts General Hospital, where each had held an administrative post. They shared a commitment to exemplary patient care and to high standards in the education of students of nursing and medicine. The opportunity to participate in the development and operation of a teaching hospital which was established directly under University auspices must have had special appeal to them.

In the plan of organization the superintendent of nurses, the assistant superintendent of nurses, and the supervisor of the Out-

patient Department were designated as administrative officers of the Hospital. For these administrative positions, and for the position of associate in education, the following experienced, able candidates were recruited by Miss Wood: Leone Ivers, assistant superintendent of nurses; Hanna Peterson, supervisor of the Outpatient Department; and Grace Reid, supervisor of instruction.

Except for a three-year period (1928-31) which Miss Reid spent, at the request of the Rockefeller Foundation, in giving direction to the reorganization of the School of Nursing at St. Luke's International Hospital in Tokyo, Japan, these women continued in their positions until their retirement—Miss Reid in 1949 and Miss Ivers and Miss Peterson in 1950-51.

Miss Wood was successful in securing positions on the nursing staff for over 100 graduate nurses, as supervisors, head nurses, and general staff nurses. This was a particularly significant achievement at a time when provision for a staff of graduate nurses to give direct care to patients was not common in hospitals. A survey<sup>7</sup> made in 1927 revealed that 73 percent of the hospitals with schools did not employ a single graduate nurse for bedside nursing. Miss Wood emphasized the educational value of providing students the opportunity to participate with staff in direct patient care, as well as the benefits which accrued to patients from this arrangement.

In an address to the American Hospital Association in Buffalo, N.Y., in October 1924, Miss Wood expanded on her perception of the interrelationship of education and service:

"Some...would claim that, for the best interests of all concerned, the hospital should provide a nursing service allowing the school to supplement this service to such a degree as shall be of educational value to its students. I cannot take just this view. I should always want my position as director of a school of nursing to imply that I am by appointment also superintendent of the nursing service of the hospital. I should want to have the staff of the school given the privilege of the responsibility of the nursing service with enough funds available to employ graduates, orderlies, porters, ward maids, or helpers, to supplement the work of the student nurse and thus maintain the efficient education of the nurse as well as the adequate care of the patient."<sup>8</sup>

Plans for nursing education at Rochester were formulated by Miss Wood in 1924-25. Correspondence with President Rhees

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in October 1924 reflects Miss Wood's concern about a number of matters. In relation to the name of the school she wrote: "Shall we call it the School of Nursing of the University of Rochester? The alternative would be to designate it as the School of Nursing of the Strong Memorial Hospital. To indicate some connection with the University would show that we are paying attention to the educational features of the school. Logically, connection with the Hospital would mean the same thing, but, generally, connection with a hospital alone would not indicate that we had any better facilities for teaching than have the majority of hospital schools. The hospital schools that cannot offer any special educational advantages are not attracting the greatest number or the best type of applicant today."

She proposed that the title of the chief executive of the school should be, director of the school of nursing and superintendent of nurses. She explained that the title "superintendent of nurses" designated that person's supervisory function in relation to the nursing service of the Hospital but "is not broad enough to indicate the education function." However, she wrote President Rhees (somewhat reassuringly) that the term "superintendent of nurses" would be "all that would be used locally."

The "regular" course of study which Miss Wood proposed was 28 months long. High school graduation was required for admission (a prerequisite not universally adopted at that time); the preferred age was 20 years or older; living accommodations were provided; a fee of \$25 was proposed for the preliminary course (4 months). Miss Wood pointed out that "this fee does not cover the expense of the student to the Hospital as she gives practically no service during this period." However, in recommending it, she indicated that charging such a fee was the practice of the "foremost schools of our country." She ruled out a monthly monetary allowance, commonly given students after the preliminary term, suggesting that this money (representing the partial value of the student's service to the Hospital) could be used instead to provide books, keep uniforms in repair, increase educational facilities, and provide financial assistance to students in need.

Miss Wood recommended that a five-year course leading to the baccalaureate degree be conducted in "connection with the 28-month course." Her rationale is expressed in the following excerpt from the same letter (to President Rhees):

"Although it may seem wise not to start such a course at pres-

ent, I should like very much to have it done if possible as we shall have such unusual advantages here and it is the type of course that is being desired very frequently by many applicants. We can in five years give the nurse her college course and her professional training."

Miss Wood predicted that the five-year students would probably never exceed 10 percent of the entire enrollment.

The program, which was developed with the College for Women, was described in the 1925-26 Bulletin of the College of Arts and Science as being conducted by that college in cooperation with the School of Nursing. Admission requirements at the college were the same as those for students planning to qualify for the Bachelor of Arts degree. The course extended for five years and led to the degree of bachelor of science in nursing and to a diploma in nursing. Three academic years, at full tuition, were spent in the college, where the curriculum was essentially a premedical sequence. Except for a requirement in physics, it met the current admission standards of the School of Medicine and Dentistry. Twenty-four months were devoted to "work and study in the School of Nursing." Included in the latter were two six-week summer terms. "The student will be maintained by the hospital-living in the Nurses Dormitory during the summer terms, as well as during the last two years. There will be no expense for this part of the course beyond the initial cost of uniforms."

The initial fiscal arrangements rendered the school totally dependent on Strong Memorial Hospital for the support of its educational offerings. The Hospital, in turn, was dependent on the School of Nursing for all nursing services, except in those instances where private duty nurses cared for patients. The school, as a Hospital department comprising the entire graduate staff and student body, also provided the nursing services needed in Rochester Municipal Hospital. Strong Memorial Hospital was reimbursed at cost for these services. These arrangements insured, on the one hand, that the school would have responsibility for the standards of nursing practice as well as for teaching in both hospitals; on the other hand, they placed the school in a vulnerable position in relation to the kinds of demands which could be made upon the students and the teaching staff in times of financial or staffing exigencies.

In the educational programs, didactic and clinical instruction was given by the teaching and supervisory staff. Head nurses car-

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ried major responsibilities for guiding the students' learning. The faculty of the School of Medicine and Dentistry provided formal teaching in some basic sciences and in the major branches of medicine. Patient care rounds conducted by medical faculty and by senior house staff were vital parts of the instructional program in nursing. The directors of the dietary and social service departments of the Hospital and the director of the Public Health Nursing Association taught regularly. A small section of the residence hall was designed for educational purposes and included a demonstration-practice laboratory for the teaching of nursing, a small reference library, and offices for the full-time instructional staff. The laboratories and classrooms of the Medical School and the Medical Library were made available to the school.

Organized as it was as a service department of the teaching hospital, the school was excluded from direct representation in groups or councils which were created to deal primarily with academic matters. The director of the school related, administratively, to the director of the Hospital. He in turn referred matters to his administrative staff, to the Executive Hospital Committee, to the Advisory Board of the School of Medicine and Dentistry (which controlled the Hospital), or, directly to the president and trustees of the University. The director of Strong Memorial Hospital, who held a professorial appointment in the medical faculty, had been granted "the right to confer with the Trustees on hospital questions and co-equal authority with the Dean of the School of Medicine and Dentistry in administering teaching activities in the hospital."9 The arrangement was perceived as conferring on all departments of the Hospital-including the School of Nursing-University standing. However, Miss Wood recognized the need to create an advisory committee for the new school and, in 1927, Dr. Faxon relayed to the Executive Committee of the Board of Trustees "the suggestion of Miss Helen Wood that a committee of women be appointed to serve as a conference group in connection with certain problems which arise from time to time in the administration of the School of Nursing." This was approved and an Advisory Committee was created. Compliance with the request that the committee be composed of women ruled out direct membership from the trustees, all of whom were men. The original members, appointed by President Rhees, were: Mrs. Rose Alling, wife of Joseph T. Alling, trustee;

Miss Emma Case, interested Rochester resident; Mrs. Augusta Hoeing, wife of Charles Hoeing, dean of the College for Men; Mrs. Helen Miner, wife of Edward Miner, trustee; and Miss Annette G. Munro, dean of the College for Women.

The committee served with minimal membership changes for 18 years, meeting at the request of the director of the school. The interest of these women in the affairs of the new school was a strong force in promoting its welfare. The committee dealt with some of the "pressures inherent in placing an educational institution subsidiary to a non-academic institution."<sup>10</sup>

From the beginning the administrative arrangements which were established to enable a student to pursue study in both liberal arts and sciences and in nursing reflected ambivalence regarding nursing as an academic discipline. It was the faculty in the College of Arts and Science which recommended to the Board of Trustees the student in the five-year program as a candidate for the baccalaureate degree in nursing. This was done without applying the usual standards to the control of the major. No evidence has been found that the college recommended that academic appointments should be extended to the teaching staff in the School of Nursing. The college apparently did not use a means to evaluate the professional portion of the curriculum, such as course review or examination of standards for the promotion of students. It appears to have been acceptable at the time to have the college control the admission of the student and recommend the student for the degree in nursing, and to have the school control the selection and appointment of teachers and the instruction offered in the professional major.

This practice continued until 1960, when the School of Medicine and Dentistry, within which a Department of Nursing had been created in 1957, was authorized by the trustees to recommend the student majoring in nursing for the baccalaureate degree. This was a particularly critical development since it not only vested the responsibility appropriately in the school in which the major was offered, but it also permitted the admission of applicants who had completed equivalent prerequisite study in general education at other approved colleges and universities. Prior to this, students who had completed two or more years of study in another college—including college graduates—were obliged to study a minimum of one year in the College of Arts and Science to satisfy the residence requirement, before enter-

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ing the School of Nursing, if they wished to qualify for the baccalaureate degree in nursing, for which they were then recommended by the college. Very few did this and the enrollment in the program leading to the degree remained small. Increasing numbers of well qualified applicants from other colleges sought admission subsequent to 1960 and the enrollment grew steadily as a result.

Further evidence of the ambiguous position of the school within the University was apparent as the first students approached graduation. Participation by the graduates of the 28-month program in the University's formal commencement exercises became an issue. In a letter dated May 4, 1928, Miss Wood wrote to a member of that class, who had completed the 28-month program in January: "It has just been announced on Saturday that we would not receive our diplomas at the University graduation. On Tuesday, the invitation came from the other hospitals<sup>11</sup> in the city to join them in the community graduation on May 29." Until 1940, the School of Nursing continued to take part in the community graduation, arranged by the four participating nursing schools. Subsequently, graduates in nursing participated in the University's commencement exercises.

In her final report to Dr. Faxon before she left Rochester. in 1931, Miss Wood cited a number of strengths, as well as areas deserving of study and modification. She referred to continued efforts to utilize the "case study" method of teaching and to provide increased individualized instruction of students. Citing difficulty in "covering the curriculum as outlined," she recommended lengthening of the 28-month course to 30 months. In relation to the five-year course, which she described as "past the experimental stage," she indicated that it showed "many weaknesses. It is unfortunate that the five-year students, after three years of college, take up their clinical courses with a less satisfactory foundation than is true of the diploma students. This is due to the fact that, while in college, the degree students, because the group is small, must take the science courses as planned for college students in general; and these courses frequently being of the academic rather than the vocational type, leave much to be desired as preparation for nursing."

In the teaching of laboratory sciences in the 28-month program there were problems of a different kind: "As the medical school grows, laboratory space for the use of student nurses be-

comes more of a problem. This past year we have had considerable difficulty in keeping our chemistry laboratory equipment for desk space had to be assigned to medical students, and the keeping of our students' supplies in pasteboard boxes is not satisfactory. We need locked cupboards in a convenient locality."

Miss Wood's leadership was a positive force in the formative years of the School of Nursing. She set high standards for nursing in both education and in practice. She promoted active interest and involvement in the affairs of the school on the part of alumni. One of the plans she was unable to implement while she was at the University involved the provision of advanced education for practicing nurses, which she viewed as a proper function of the School of Nursing. In the first two bulletins of the school (1925 and 1926), reference was made to the intent to offer postgraduate instruction in public health, obstetric, and operating room nursing, and in social work. (The proposal appears not to have been considered feasible by Clare Dennison when she succeeded Miss Wood, although Miss Dennison recognized the need for advanced study-particularly for teachers, head nurses and supervisors—and eventually supported efforts to develop related courses elsewhere in the University.)

Miss Wood was succeeded in 1931 by Clare Dennison, who had held instructional and administrative positions at Massachusetts General Hospital School of Nursing, from which she had graduated in 1918. Miss Dennison's appointment as superintendent of nurses was changed to director of nursing service in 1947, and she continued to direct the School of Nursing until her retirement in 1951.

In her first year (1931–32), Miss Dennison wrote: "The school as a whole is not growing rapidly but we believe we are producing rather fine people. Although nursing is a much overcrowded profession for the mediocre, the opportunities are as great as ever for the young woman properly prepared and equipped. The position and facilities of this school should give that background."

Nationally, warnings about overproduction of nurses had been sounded in a number of quarters—particularly by the Committee on the Grading of Nursing Schools, which had been organized in 1926. This autonomous national body, of which Helen Wood was a member, promoted studies of supply and demand of nursing service, job analyses, and the grading of nursing schools.

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The committee's work extended over the eight-year period (1926 -34) in which the country experienced both unprecedented prosperity and severe economic depression. An analysis revealed that at the height of economic prosperity there were nurses who could not find employment, while at the same time there were unfilled positions with specific requirements for which there were too few applicants. In the decade 1930–40 approximately 400 hospitals and 600 schools of nursing were closed. The enrollment of students nationally was reduced by 20 percent during the most acute period of the Depression.

At Rochester, the school remained small. In the first 10 years 174 students completed the program leading to the diploma and 12 earned the bachelor of science degree. Admission was restricted to single women, and classes in the diploma program usually began twice a year. Through 1942 the school's bulletin stated: "Nursing is distinctly a woman's profession....The study of nursing is an excellent preparation for marriage and motherhood." Applications from married women were not accepted until 1944, when candidates were "considered if their husbands are in foreign service." Until World War II students who married while in the school were obliged to withdraw. For a number of years thereafter there continued to be stipulations regarding the timing of a student's marriage in relation to graduation. Gradually, less emphasis was placed on age, sex, and marital status in determining eligibility for admission. The first men to complete the study of nursing graduated in 1968, although admission ceased being restricted to women in 1960.

During the 30s Miss Dennison's annual reports and the minutes of the Advisory Committee to the School of Nursing reflect concern regarding growing costs of nursing service in the hospitals and cite efforts to combat the increase.

The year 1934 appears to have been particularly critical. The diploma program, which had been increased to 30 months in 1932, was increased to 36 months "with provision for a two months affiliation with the Public Health Nursing Association and some experience in the psychiatric division."

Miss Dennison wrote that "both these services are essential to a fundamental knowledge of nursing.—The three year course will also limit the output from the School and produce a more mature and better prepared young woman."

Reference was not made to the effect this extension of the

program would have on instructional time nor to the increased contribution the student would be making to the Hospital in the four months beyond the two months in public health nursing.

Adjustments were not made in the length of the program leading to the baccalaureate degree. A clinical course in public health nursing was first included in that curriculum in 1946.

In 1934 salaries for graduate staff nurses were reduced. The range was \$70-75 per month, plus full maintenance. Hours per week totaled 52 in the daytime and 72 at night, with a weekly salary differential of \$5 for straight nights. Minutes of the Advisory Committee meeting in June 1934 state: "It was reported that the University did not feel it could finance us, even to the extent of \$1,000 in our endeavor to abolish the 12 hour night."

Miss Dennison was convinced that the increasing costs of nursing service reflected the growing proportion of the time of graduates and of nursing students which was devoted to facilitating medical education and research. She invited Blanche Pfefferkorn, director of the Department of Studies of the National League for Nursing Education, to study "the disposition of nursing time given to medical education and research in the Strong Memorial Hospital and Rochester Municipal Hospital." While for "financial and other reasons" the study could not be prolonged, Miss Dennison cited it as a valuable gauge of existing conditions. She wrote in her annual report (1934) to Dr. Faxon: "It is obvious that a School of Nursing and a nursing staff benefit greatly through association with a teaching hospital by reason of the wide variety of patients admitted and the high standards of medical practice. It is also true that the demands on the nursing service are much greater in a hospital where a medical school operates. To adjust the nursing service to a program of medical education and, at the same time, maintain good nursing standards is a difficult procedure. It is also expensive since it is impossible to make an adequate adjustment with an inadequate staff."

The time devoted by students weekly to classwork (5-6 hours), to clinical practice (48 hours), and to study was viewed by Miss Dennison as excessive. In 1936, she pointed to an increase in the incidence of illness among students, suggesting a relationship between this and student work load. Support for this point of view came from external examiners and from the Advisory Committee. In 1937, the committee prepared a reso-
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lution for the trustees stating that "student nurses who worked 48 hours a week and carried from 5 to 6 hours of classwork beyond this were spending too much time in work and study and that this excess of time resulted in illness and poor classwork." It was recommended that at least four more graduate nurses be employed in order that 48 hours—including classwork—would be the maximum week for students.

Between 1938 and 1941 there was a 50-percent increase in the number of students (91–137) and an 18-percent reduction in the number of graduates (191–155). Staff resignations accelerated as the need for nurses in the military services grew with the United States involvement in World War II. Participation by the School of Nursing in the United States Cadet Nurse Corps resulted in an increase in students and an expansion of education and housing facilities. Enrollment in the school reached 325 in 1945. A shortage of instructional and supervisory staff continued to be a serious problem, with students providing 45 percent of the nursing hours devoted to patient care.

The School of Nursing cooperated with the American Red Cross in training volunteer nurses' aides. Miss Dennison referred to the "splendid group of volunteer nurses' aides as a source of much help and of comfort and inspiration."

In 1941, in response to growing pressures from registered nurses, from the professional nursing organization, and from community agencies, the College of Arts and Science created a Department of Nursing Education within its Department of Education and began to offer courses for registered nurses. Initially, emphasis was on ward management and teaching. Augusta Patton was the first faculty member. She was succeeded in 1944 by Esther Thompson. Additional faculty were appointed and a program for registered nurses was developed leading to the degree bachelor of science, with a major in nursing education. In 1947 this department received support in implementing the objectives of the experiment supported by the Commonwealth Fund to improve hospital, medical, and nursing care in the Rochester region. Study opportunities in public health, obstetric, and operating room nursing were developed. Short, noncredit courses, institutes, and workshops were offered, and consultation services were extended to regional health agencies.

In 1951 the department was reorganized and became a division in the University School of Liberal and Applied Studies.

Provision was made for a major in psychiatric nursing at the undergraduate level and for a program of advanced study leading to the degree master of science, with a major in nursing education. In 1958 the division became a department in the newly established College of Education, and then merged with the Department of Nursing of the School of Medicine and Dentistry in 1961. Miss Thompson continued to serve as director of graduate studies in nursing until her retirement in 1968.

By 1946 the graduate staff had fallen to 85, while the daily average census in the Hospital rose and students and auxiliary personnel continued to provide a major portion of direct patient care.

With the termination of the war there was a decline in the number of students admitted. However, staff appointments were not made at the rate proposed to achieve the staff-to-student ratio considered desirable for patient care and student education. Attention turned again to the recruitment of more students.

Scientific advances, technological developments, and the acceleration of specialization in medicine, which gained momentum during the 40s and 50s, had a direct effect on the practice of nursing and on the nurse:physician:patient relationship. Within the Hospital, though nurses continued to provide direct care to patients in the "nursing division," patients themselves spent greater amounts of time away from the division for diagnostic and therapeutic procedures. Medical specialists in increasing numbers became involved in the study and treatment of patients. Technical personnel associated with medical specialization increased in number and they, too, performed special tests and treatments necessitating preparation, interpretation, surveillance, and support. Communications between nurses and physicians became more complex. Grouping of patients for care of a highly technical nature, which gained favor with the creation of the surgical recovery room, stimulated the need for the further specialized training of nurses. This was accomplished primarily through inservice education. The School of Nursing adhered to the premise that the purpose of the basic formal education of the nurse was to acquire the knowledge, skills, and attitudes essential for generalized beginning practice.

So long as the School of Nursing was a department of Strong Memorial Hospital, it was in a weak position from which to insist that the University's academic standards should apply to the

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school's efforts—that the school should adopt regulations governing the tenure and privileges of its faculty; that it should control its own admissions, whether immediately post-high school or following prescribed study in the arts and sciences; and that its faculty should adopt standards for promotion and graduation and recommend its own students as candidates for degrees in the nursing major. The faculty structure which was developed reflected the educational unit's orientation to nonacademic departmental status within the Hospital rather than to nursing's presence as an academic discipline within the University. The generic title "instructor" was used to designate each member of the staff of the School of Nursing who had specific teaching assignments.

The matter of faculty status for the instructional staff of the school became an issue. Miss Dennison cited it as one of the factors which prevented the school from meriting full membership in the Association of Collegiate Schools of Nursing, which was established in 1932. The school was one of the first to apply to join this new organization and was granted associate membership, without voting privileges. While not an accrediting agency in the strictest sense, the A.C.S.N. had a standard-setting function. Rochester did not meet the criteria established for full membership and continued to hold associate membership until the A.C.S.N. merged with other organizations to become the National League for Nursing in 1951.

In 1950 Miss Dennison approached President Alan Valentine regarding the matter of academic rank for the nursing instructional staff. She emphasized, in her letter of April 26, 1950, "I am not thinking of autonomy for the School or a change in our organizational status although I know that the position of the School complicates the consideration of the request. If, however, some concessions would be made for us we should find them advantageous: in our competition for students; in the appointments of instructors and administrators; and in the matter of accreditation.

"The question of academic rank for nursing school instructors has been asked me by various accrediting agencies for the last fifteen years and I have always sidestepped it. First, because we do not have sufficient staff with degrees beyond the baccalaureate and because I saw the difficulty which would arise in pro-

posing this to the University. I feel that the time has now come when the question should be considered."

Miss Dennison's proposal, presented in greater detail in a letter to President Valentine dated May 12, 1950, related academic rank to administrative position or to area of teaching:

director	— professor
first assistant director	- associate professor
second assistant director	- assistant professor
instructor in nursing arts	- assistant professor
appointee in psychiatric nursing	- assistant professor
all other faculty	<ul> <li>instructors</li> </ul>

President Valentine replied on May 15, advising Miss Dennison of his decision not to pursue the matter further at the time: "You agreed that it would be unwise to take the proposed steps now, unless they would be accepted without strong protest by those members of the Medical School staff (or some of them) with whom you and your nurses must work closely.

"Not only have I discussed the proposals with Dean Whipple, but because I knew that such acceptance and cooperation would be essential, I secured discussion of the proposals at a recent meeting of the Medical School Board.

"It is convincingly clear to me that to act now to create academic rank for nursing instructors, as proposed, would do more harm than good to the School of Nursing in particular, and to the essential smooth operation of our Medical Center in general. In this connection Dr. Whipple emphatically agrees."

President Valentine proposed that Dean Whipple appoint a committee "to study the issues underlying the future provision, organization, direction and nature of nursing care by schools of nursing balanced with and against the education of nurses within these schools." He expressed the hope that such a group would be "determined to find a solution of the ancient controversy between the service and educational aspects of student nursing program."

In her annual report for 1949–50, Miss Dennison's account of the effort to achieve some academic recognition for faculty is briefly stated: "A request for academic rank was made to the President of the University who was interested and expressed a willingness to grant it if suitable relationships could be established. The President brought the request to the Advisory Committee (Medical) where it met violent opposition from the medi-

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cal members, particularly the Professor of Medicine who, again, presented the time-worn and already disproved theory that too much emphasis was being put on education for nurses. He was supported by some others who believed that student nurses spend too much time in classes. The matter has been shelved for the present but will be introduced again with the strong support of Dr. Basil MacLean, Director of Strong Memorial Hospital and Dr. John Romano, Professor of Psychiatry."

There is no record of the establishment by Dean Whipple of a committee but the matter was apparently reconsidered, and on March 13, 1951, Dean Whipple transmitted to Provost Donald Gilbert the following recommendation from the Advisory Board to the trustees: "That the rank of Professor of Nursing, Associate Professor of Nursing and Assistant Professor of Nursing be given to the top three members of the faculty of the School of Nursing; That they not be attached to any other faculty of the University; and That the appointments be made without tenure; That other nurses who teach in the School of Nursing and who now carry the title of Instructor in the Bulletin of the School of Nursing would have their title also carried as Instructors in the University Catalogue."

This proposal was adopted and, in July 1951, President Cornelis de Kiewiet wrote letters to the members of the instructional staff in nursing confirming the trustees' action.

While it is unlikely that there was a precedent for this interpretation of academic status for faculty in this University, the significance of the action lay in the revelation that sharp differences in the perception of nursing as a developing academic discipline emanated primarily from medicine, and that the Medical School's sanction was necessary before any changes could be introduced which would affect the status of nursing in the University.

As Miss Dennison approached her retirement in 1951, she wrote: "Despite nursing shortages, impending war and the myriad and inevitable headaches in the administration of any nursing service or nursing school, I know of no administrator with this dual responsibility and fewer troubles or more pleasures."

Miss Dennison's efforts to uphold high standards of education and of patient care were untiring. With her associates, Grace Reid and Leone Ivers, a climate was fostered in the school and Hospital in which interest and concern for the individual

were pervasive. Students were generally enthusiastic about their education; as the number of alumni grew, their professional activities reflected significant contributions to health services in this country and abroad.

The decade of the fifties was a period of major change in the School of Nursing and in the University. A university-wide educational development program initiated at the instigation of President de Kiewiet in 1951 had an important effect on the University's commitment to nursing education. The merger in 1955 of the College for Women, which had remained on the Prince Street campus, with the College for Men on the River Campus, brought the full resources of the College of Arts and Science in close proximity to the medical campus. The relocation, in that year, of the University School from Prince Street to the River Campus brought the faculty in nursing education and the programs for registered nurses to that campus, facilitating communication with the faculty of the School of Nursing. The feasibility of establishing new professional schools or colleges began to be considered within the University.

Ruth Miller, alumna in nursing and education and assistant director of the school and of nursing service, became director of the School of Nursing and of nursing service in 1951, following Miss Dennison's retirement. She carried forward the effort to achieve high standards in education and service, and identified critical areas which required strengthening and development.

Nationally, steps were being taken to raise the standards of nursing education through voluntary accreditation. Both the degree and diploma programs had appeared on the National League of Nursing Education's published list of approved schools since 1938. However, beginning in 1952, the National League for Nursing accrediting service identified aspects of the school's programs—particularly the program leading to the baccalaureate degree—which it regarded as in need of review and modification. The league's judgment was based on reports submitted by the school. In 1954, at the league's request, a survey visit was made. Recommendations made in 1952 and 1953 were reiterated following the visit and the University was informed that the baccalaureate program could not continue to be approved beyond 1956 if it did not meet the standards of university education.

At the Medical Center, Dr. Donald Anderson succeeded Dr. Whipple as dean of the School of Medicine and Dentistry and di-

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rector of the Medical Center in 1953. He took an active interest in the School of Nursing and became directly involved in the consideration of the objectives, programs, and support of nursing education and of nursing service in the hospitals and clinics.

Beatrice Stanley, assistant director of nursing service, succeeded Ruth (Miller) Brody as director of the School of Nursing and of nursing service in 1954.

Dr. Margaret Bridgman, consultant on the staff of the National League for Nursing and dean emeritus of Skidmore College, was invited to visit the University in April 1955. Her recommendations reflected the assumption that the University's standards for undergraduate and graduate professional education would be applied to nursing in the same way as to any other professional major. This coincided with the University's decision to study the desirability of establishing one or more professional colleges on the River Campus.

Steps were taken to begin to provide separate instruction in nursing for students who were degree candidates, and academic credit was assigned to courses in nursing. The National League for Nursing's Board of Review postponed action on the status of this program in May 1956. During that year administrative decisions were reached which resulted in the creation of a Department of Nursing in the School of Medicine and Dentistry to accommodate the professional portion of the baccalaureate program and the diploma program in nursing. Nursing service remained administratively within Strong Memorial Hospital.

The separation of administrative responsibility for education and service was favored by Miss Stanley and her associates in nursing. However, there was considerable uneasiness on their part and among alumni in placing nursing education under the aegis of the Medical School.

President de Kiewiet had identified five possible alternatives for the program leading to the baccalaureate degree: abandonment of the program; creation of an autonomous school of nursing; continuation of the program within the College of Arts and Science; establishment of the program in University School; or placement of the program under the control of the Medical Center.

He viewed the need for a decision as urgent and, while suggesting that the collegiate program would likely have a good chance of being academically successful if it were placed in the Medical Center, he cautioned that such an arrangement should be reviewed as temporary until a number of central issues had been resolved.<sup>12</sup>

In April 1957 the University was informed by the National League for Nursing that accreditation of the baccalaureate program had been withdrawn. I accepted the appointment as chairman of the Department of Nursing of the School of Medicine and Dentistry in February 1957 and actually moved to Rochester on July 1, 1957.

The creation of a department within the School of Medicine and Dentistry proved to be an especially significant development, for it confirmed the medical faculty's acknowledgement of nursing as a developing discipline in its own right. Membership on the Advisory Board—the policy-making body of the School of Medicine and Dentistry—enabled the chairman of the Department of Nursing to participate in board deliberations and in the making of decisions regarding policies, programs, and resources. Through this process the dean and the other department chairmen became informed about the status of nursing education, and the chairman of the Department of Nursing learned at first hand about the matters with which the Medical School was concerned.

To provide appropriate representation from the academic and administrative sections of the University which were directly involved with nursing education and service, an ad hoc Joint Advisory Committee was established by the president in 1957. Its purpose was "to provide assistance to the Department of Nursing in developing and strengthening the program leading to the Bachelor of Science Degree with a Major in Nursing." Initially, committee members were:

Donald Anderson, M.D., dean, School of Medicine and Dentistry; Babette Coleman, Ph.D., assistant professor of botany, representative from the College of Arts and Science;

- Emory Cowen, Ph.D., associate professor of psychology, representative from the Educational Policies Committee, College of Arts and Science:
- Eleanor Hall, R.N., M.A., professor and chairman, Department of Nursing;
- McCrea Hazlett, Ph.D., dean of students, College of Arts and Science;
- Karl Mason, Ph.D., professor and chairman of the Department of Anatomy, School of Medicine and Dentistry;

Henry Mills, Ed.D., vice president;

- Albert Noyes, Ph.D., acting dean, College of Arts and Science, and chairman of the committee;
- John Romano, M.D., professor and chairman of the Department of Psychiatry, School of Medicine and Dentistry;
- Beatrice Stanley, R.N., M.A., director of nursing service, Strong Memorial Hospital; and
- Esther Thompson, R.N., M.A., chairman of the Division of Nursing Education of the University School of Liberal and Applied Arts.

This committee met through 1959, and went on record in support of the "educational desirability of establishing the degree program as the single program in basic nursing education at the University."

In 1958 the Board of Trustees had approved the establishment of the Colleges of Education and Engineering and the School of Business Administration. Each of these new colleges was given control of its own bachelor's, master's, and professional degree programs, and the Division of Nursing Education became a unit in the College of Education.

In 1959, as part of the accreditation review of the University, the Middle States Association of Colleges and Secondary Schools recommended that "all nursing education programs be brought together in one unit under one head and one faculty, and this unit be given sufficient autonomy to plan and conduct such nursing programs as the University determines it requires to fulfill its objectives."

The Board of Trustees of the University in 1960 acted to clear the way for the consolidation of the separate units in nursing which had evolved over the years and which then existed in the College of Education and the School of Medicine and Dentistry. It proposed the discontinuation of the three-year diploma program with the admission of the last class in 1960, and the support of the existing undergraduate and graduate programs. It designated the Department of Nursing in the School of Medicine and Dentistry as the administrative unit which would accommodate the programs to be retained. In conclusion, the trustees proposed that "the University look to the day when the enrollment, financing and academic programs in nursing will have matured to the point at which the Department of Nursing will become an independent School or College within the University." Between 1957 and 1960, candidates for an expanded faculty were recruited; regulations for faculty appointment, promotion, and tenure were adopted; educational objectives were clarified; intensive curriculum study and revision was undertaken; recruitment efforts were intensified; standards for admission, promotion, and graduation were enunciated; and educational facilities in Helen Wood Hall were enlarged and modernized. The small reference library was closed, and the Edward G. Miner Medical Library became the repository for the expanding nursing collection. A memorial lectureship honoring Clare Dennison was established in 1959 through the generosity of Mrs. Augusta Hoeing. This enabled the Department of Nursing to invite individuals distinguished in nursing or related fields to come to the University each year.

Board and room charges were instituted for students living in Helen Wood Hall and tuition charges began to be increased regularly. The quality of academic and clinical performance was emphasized and faculty worked with students in care settings in hospitals, clinics, and community nursing agencies. The planned educational program precluded the frequent adjustment of students' clinical time and locus to fill staffing needs throughout the Hospital—a practice which had become increasingly common in the face of chronic staff shortages.

The National League for Nursing resurveyed the Department of Nursing in 1960 and granted accreditation to the program leading to the bachelor of science degree with a major in nursing, for the preparation of professional practitioners of nursing—including public health nursing. In the fall of 1961 the unification of the separate units was accomplished. The Department of Nursing of the School of Medicine and Dentistry then controlled its bachelor's, master's, and continuing education programs. This was a significant development, in effect at no prior time at the University.

The united faculty began to plan for undergraduate and graduate education as a continuum rather than as inarticulated entities, as had been the case when offered in separate parts of the University. Opportunity for credit by examination and for advanced placement in the undergraduate major was provided registered nurses, who met the admission standards as candidates for the baccalaureate degree.

Pressures to give greater attention to meeting the nation's

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need for health services were felt increasingly as the sixties progressed. At Rochester the essential interdependence of nursing and medicine was apparent as demonstration projects focusing on innovative health care services were launched, and as some implications for the training of nurses and physicians were recognized. Dean Anderson and Dr. J. Lowell Orbison, who succeeded him in 1966 as dean of the School of Medicine and Dentistry and director of the Medical Center, supported the continuing review of the status and direction of nursing education, of nursing service, and of nursing's involvement in the investigation of its own practice and in collaborative research with medicine. Support for the concept of an autonomous school or college of nursing was reaffirmed in 1966 by an ad hoc committee appointed by President Wallis and chaired by associate provost Robert France. This committee's recommendations were approved by the Advisory Board of the School of Medicine and by the Board of Trustees. The need for financial support to implement the recommendations was given high priority. President W. Allen Wallis' appointment as president of the National Commission on Nursing Education in 1966 enabled him to gain a comprehensive understanding of the status, problems, and potential of nursing in the United States.

In February 1968 Dr. Orbison appointed an ad hoc committee on nursing "to review our nursing programs at the Medical Center...with the aim of establishing the goals of the program in nursing education and the goals of the program in nursing service and the direction which the relationships between these two programs should take."

Members included:

- Allan Anderson, M.H.A., executive director of Strong Memorial Hospital
- Josephine Craytor, R.N., M.S., associate professor of nursing
- Samuel Davidson, assistant to the medical director, Strong Memorial Hospital, secretary of the committee
- George Engel, M.D., professor of psychiatry and medicine
- Robert France, Ph.D., associate provost
- Robert Haggerty, M.D., professor and chairman of the Department of Pediatrics
- Marilyn McClellan, R.N., M.S., assistant director of nursing service for staff development

Barbara Bates, M.D., professor of medicine, chairman of the committee

Ex Officio

- James Bartlett, M.D., medical director of Strong Memorial Hospital and associate dean of the School of Medicine and Dentistry
- Betty Deffenbaugh, B.S., R.N., acting director of nursing service, Strong Memorial Hospital
- Eleanor Hall, R.N., M.A., professor and chairman, Department of Nursing
- J. Lowell Orbison, M.D., dean of the School of Medicine and Dentistry and director of the Medical Center

Advocating the unification of education and service and the strengthening of the academic base in nursing, the committee's report concluded: "Many disciplines make up the mosaic of patient care. Its quality depends upon the luster and form of each fragment and upon the design with which they are put together. A single piece, poorly shaped or positioned, detracts from the whole. Patient care requires the clear delineation of nursing values and their expression in practice; the knowledge and viewpoint of nursing are essential components in the understanding of human health and illness. To fashion our pattern of care and learning is a challenge for us all."<sup>13</sup>

In 1969, the school was resurveyed for accreditation. The program leading to the master's degree was granted initial accreditation and approval of the undergraduate program was continued by the National League for Nursing. Impetus was given to the Department of Nursing's offerings in continuing education by participation in the Rochester Regional Medical Program in 1967–72. In collaboration with other departments of the School of Medicine and Dentistry, the nursing faculty engaged in a variety of educational activities designed to assist in upgrading the knowledge and skills of practitioners of nursing and medicine in a ten-county region. Short-term courses offered at the Medical Center, as well as consultative services and educational efforts based in hospitals and health agencies throughout the region, served to strengthen ties between the community and the University.

Throughout 1969–70 a joint committee, chaired by Dr. Virginia Brantl, director of graduate studies in nursing, and with equal representation from faculty and staff in nursing, developed a "Master Plan for Nursing at the University of Rochester." As the objectives for the future direction of nursing at the University became clearer, the commitment of the Medical School and

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of the University to support them and to cooperate in their fulfillment was confirmed. Financial support for a five-year period was provided by the W. K. Kellogg Foundation in 1971, enabling the University to take steps to implement the decision to establish a School of Nursing. The general enthusiasm of alumni for the changes then being made was a positive force as the transition progressed; generous alumni contributions were especially helpful in augmenting the University's resources for financial assistance to students.

In 1971 Helen McNerney, assistant professor of nursing, accepted the appointment of acting chairman of the Department of Nursing and served until Dr. Loretta Ford was appointed dean of the School of Nursing and director of nursing at the Medical Center. On the occasion of her installation as dean of the new school in the fall of 1972, Dr. Ford called for "a new order of things—a new order for nursing's direction in education, research and practice with the University of Rochester School of Nursing in the forefront as a national trend setter for improving the delivery of health care."

The development of a single organizational structure for nursing encompassing education (undergraduate, graduate, continuing), research, and service is now evolving at the Medical Center. This reflects the school's commitment to the belief that "the integration of teaching, research, and practice strengthens all three components. Teaching is vitalized by delivering care to people and by the spirit of scientific inquiry. Such inquiry is encouraged by experience in nursing practice and by the questioning of students and practitioners. Nursing practice in turn benefits from the latest findings through scientific inquiry and from the challenge to staff members to serve as models of high quality practice for students."<sup>14</sup>

This represents an extension of the hopes and dreams of Helen Wood and her associates. Since 1925, over 2,500 individuals have completed educational programs in nursing at the University. To the extent that they and successive generations of students contribute to the provision of health care "sensitively and humanely dispensed,"<sup>15</sup> they uphold the values to which University nursing has been and continues to be committed.

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11.

# X-Ray Motion Picture Development



# James Sibley Watson, Jr., M.D.

James S. Watson, Jr., consultant in medicine and research professor of radiology, has devoted much of his time to medical uses of still and motion photography. After graduating in 1921 from New York University and Bellevue Hospital Medical College (as it was then called), he was able to make improved motion pictures of surgical operations by using the new Eastman panchromatic negative film in conjunction with enclosed incandescent lighting. Some of these films were shown at Strong Memorial Hospital in 1926. Later he became interested in intragastric photography and, after some conspicuous failures, worked successfully with others at making color pictures of the gastric and duodenal mucosa through flexible gastroscopes.

From 1942 to 1945 Dr. Watson was permitted to take the Department of Radiology's three-year resident's course, and in 1947 joined other members of the department in developing equipment for the taking of x-ray motion pictures by photographing the image formed by x-rays on a fluorographic screen —a process now generally referred to as "cinefluorography." Since 1945 he has practiced diagnostic radiology, first in a private office shared with other physicians, then in Genesee Hospital's Department of Radiology.

Dr. Watson is a trustee of the Segal Medical Research Fund, which has contributed for years to the support of research in gastroenterology and, more recently, in pediatric radiology and ultrasonics.



Sydney A. Weinberg

Sydney A. Weinberg, research associate in radiology (retired), first became involved with medical research in the late 1930s, when Dr. James Sibley Watson called on him for help in the development of a gastroscope capable of photographing stomach mucosa. This work was interrupted for almost three years while Mr. Weinberg served as an Air Force pilot and instructor. Upon returning to Rochester he resumed this work and in collaboration with Dr. Watson and Dr. Harry Segal, they succeeded in modifying a 56-lens gastroscope system; with a specially designed camera and light source, they were successful in making the first endoscopic color photographs of the stomach.

In 1946 Mr. Weinberg was appointed a research associate in radiology, and under the guidance of the late Dr. George Ramsey, he and Dr. Watson set up a program for the development of x-ray motion picture apparatus. Dr. Watson had already attained a reputation as a producer of motion picture films, with particular knowledge in the field of optics and photographic chemistry; Mr. Weinberg's prior experience had included developmental work in electronics, optics, and motion picture equipment. Within a year, equipment was completed which enabled the department to embark on an extensive clinical and research program which, in the ensuing years up to Mr. Weinberg's retirement in 1972, resulted in the recording of over 10,000 cinefluorographic examinations.

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Mr. Weinberg's pioneering efforts during those years produced many improvements of the first-generation apparatus, as well as the design and production of special viewing, projection, and processing equipment. He has contributed to several textbooks as well as to technical and radiological journals. His retirement interests include continued activity as a consultant. In particular, he has extended his interest in sculpturing, a lifelong interest and a field in which he has won several awards.



# Stanley M. Rogoff, M.D.

Stanley M. Rogoff, professor and chief of the Division of Diagnostic Radiology, came from the City College of New York to Rochester as a first-year medical student in the spring of 1943. After graduation, he interned in medicine and pathology at Bellevue Hospital, then in pulmonary disease at a tuberculosis hospital in Michigan. Returning to Rochester in 1948 as a resident in radiology, he has been on the full-time radiology faculty continuously except for two years in military service.

Dr. Rogoff has written and lectured on angiography, particularly phlebography, in the diagnosis and management of deep venous thrombosis (work done in collaboration with Dr. James A. DeWeese of the Department of Surgery). He is past president of the Association of University Radiologists and has been long active in the affairs of the American College of Radiology.

Dr. Rogoff's work in the Medical School and Hospital has been weighted variously during different eras: teaching medical and technological students and house officers; clinical research; high-volume clinical practice; and administration and

planning for his division. In that last-named role, he worked with Watson, Weinberg, and Gramiak in organizing several of the Rochester symposia on cinefluorography.



# Raymond Gramiak, M.D.

Dr. Raymond Gramiak graduated from the University of Rochester School of Medicine in 1949. He entered the United States Army that same year—the first year as a rotating intern at Baltimore City Hospital, and then, from 1950 to 1952, with the United States Army of Occupation in Germany. In 1952 he returned to the University of Rochester and became a full-time fellow in cineradiology, remaining at the University for radiology residency and instructorship.

After eight years of private practice, from 1957 to 1965, Dr. Gramiak returned to the University to concentrate on research. At the present time, as professor of diagnostic radiology, he is a recognized authority in the field of cardiac ultrasonography—lecturing worldwide and serving on committees and organizations such as the National Institutes of Health Radiation Study Section, the Radiological Society of North America, the American Institute of Ultrasound in Medicine, the Council on Cardiovascular Radiology of the American Heart Association, and many others.

Dr. Gramiak is a member of several editorial boards and has published widely.

#### THE EARLY YEARS

James Sibley Watson, Jr., M.D., and Sydney A. Weinberg

A TTEMPTS at making x-ray motion pictures in our Department of Radiology began in 1929 when Professor Stafford Warren and his ingenious master of many skills, Francis Bishop, collaborated with Rex Wilsey and Harold Sherwood of Eastman Kodak Company in a series of tests and experiments that were to last three years. Sixteen-millimeter film had just been introduced by Kodak, and it was natural that this size film should have been used in some of the test runs, especially as the 16-millimeter Ciné Kodak was equipped with a relatively fast lens. Faster films were available in the 35-millimeter size, but the 35-millimeter camera selected for the work was a spring-driven, hand-held DeVry fitted with a relatively slow 3.5 lens.

It may be wondered why this distinguished research team didn't acquire one of the really good 35-millimeter cameras then on the market. But this was in the early years of the Depression, long before federal money began pouring into all sorts of medical and scientific projects, as it did in the forties and fifties.

Although their work was unsuccessful, the procedures, as reported by the late Dr. George H. R. Ramsey in *Cinefluorog-raphy*,\* were so remarkably arduous that I am quoting excerpts from his eyewitness description.

"The x-ray source was a 1,000 MA water-cooled x-ray tube having a 6-millimeter focal spot. Initially the tube was mounted in a lead glass bowl, later it was housed in a lead box. A cooling tower was constructed by spiraling 100 feet of garden hose on a wooden frame....A special switch was built by Mr. Bishop to interrupt the primary circuit of the x-ray transformer while the film was moving in the camera....Three hours were needed to set up the equipment and another three hours to take it down. All the work was done at night.

"Finally in 1932 three runs were made at one month intervals using mice and rabbits as experimental animals....About 50 feet of x-ray motion pictures were obtained, but the images were so grainy that the mouse and rabbit hearts, as Dr. Warren describes them, 'appeared like shadows on a gravel bed.'

<sup>\*</sup>Cinefluorography. Ramsey, G. H. S., Watson, J. S. Jr., Tristan, T. A., Weinberg, S., and Cornwell, W. S. (Springfield, Illinois: Charles C. Thomas, 1960).

"Despite the fact that the x-ray controls were located behind a lead shield, scattered radiation proved to be a troublesome problem to personnel....Mr. Bishop described the whole affair as 'film underexposed, operators overexposed.'"

In the 1930s fairly successful x-ray motion pictures were made in the Department of Radiology with the ingenious, four-lens camera engineered by B. E. Luboshez, Kodak's representative in Paris. Again, in 1937, J. L. Boone, of Kodak, remodeled a Ciné Kodak to accommodate a Zeiss 0.85 lens. The camera was shutterless and had a very short pull-down time. This same camera was borrowed in 1946 and used by Dr. Theodore B. Steinhausen, a radiology resident, to make motion picture studies of the hearts of infants. Unfortunately, the motion studies made with this outfit on 16-millimeter reversal film were of poor contrast and lacked sharpness.

It so happened that I\* had seen, in a newsreel, x-ray motion pictures of startling clarity made on a 35-millimeter film by Professor Robert Janker of Bonn. I had used film of this size in photographing motion pictures, some made for Eastman Kodak and some for Bausch and Lomb. Over the years I had managed to acquire several 35-millimeter cameras and a 35-millimeter optical printer that I thought could be adapted for use in x-ray motion photography. Furthermore I knew just the man to do the adapting, a "boffin" named Sydney Weinberg, who was already working with Dr. Harry Segal and myself on the taking of color films of the mucosa of the stomach and duodenum through a flexible gastroscope. I hastened to tell him about this new project, and he agreed to give it his attention. With welcome encouragement from radiology professor Dr. George H. S. Ramsey, then head of the department, and with a continuing grant from the National Institutes of Health, we began assembling and testing our equipment in 1947.

The first unit consisted of a 16-inch-square fluorescent screen of the type used in fluoroscopy; a Bell & Howell 35-millimeter camera of the sort used in Hollywood in the twenties. The shuttle had been lightened so that it could run at sound speed, 24 frames/ second. The lens was a Zeiss Biotar 0.85 of about 50 millimeters focal length and a somewhat curved field, but it was fast and we felt we were lucky to get it. The camera was operated by a variable speed motor, and the lack of synchronization with the x-ray

\*When the first person singular pronoun is used, Dr. Watson is the referent.

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pulses resulted in uneven exposure of the successive film frames.

A speed movement was installed in place of the regular shuttle, permitting our first really successful motion studies to be made with the camera running at 60 frames/second in synchronization with the 60-cycle current of the transformer primary circuit. Some of our best films were taken with this setup, but there was a certain awkwardness about its use. Weinberg has described the awkwardness as follows: "Synchronization of the camera and the x-rays had to be achieved by visual reference to a signal on an oscilloscope. The signal came up either negative or positive as unpredictably as heads and tails when tossing a coin. If it came up positive, that was fine; the components were in phase and the examination proceeded. However, if the signal came up negative, this required some adroit juggling by the technician to get the apparatus in positive phase, followed by his triumphant exclamation, 'OK!' I can still see Dr. John Thompson standing near the x-ray tube anxiously awaiting the OK that would let him start the action. Later, synchronization was made consistently positive and a gear box in the camera drive mechanism provided camera speeds of 15, 30 and 60 frames/second."

A number of unorthodox procedures were used to improve the quality of our pictures. For example, the speed and contrast of the negatives were increased by developing them at temperatures between 85 and 90° F. Such processing was then something of a novelty. At first Weinberg did the developing, in a small hot room which he shared with about 100 white rats. "I got accustomed to the odor," he said, "but their scurrying and nibbling at their biscuits made it difficult to concentrate on how many turns I was giving to the Morse developing tank cranks." Later, a film-developing machine was designed and built, the final version of which is still giving good service after years of constant use. It can run at a rate of up to 40 feet of film/minute and will handle 35-millimeter, 16-millimeter and 8-millimeter film, positive or negative, with equal facility and without foulups.

As our films of normal and abnormal movement in different parts of the body increased in number we assembled short teaching films on 16-millimeter film that came to be used not only in medical schools but as aids in the teaching of anatomy in high schools. A one-reel silent film, *The Mechanism of Swallowing*, had a particularly wide circulation, and is still much in demand after twenty years. As more and more people became aware of

what could be done with our equipment, the department began to receive requests for our services in elucidating theories and explanations about which there was disagreement. For example, Dr. Oliver, the curator of reptiles at the Bronx Zoo, came in one day carrying a briefcase full of venomous snakes and proceeded to have us make x-ray motion studies in closeup of their mode of locomotion. According to the usual explanation, snakes moved forward or backward by a rippling movement of their ribs, called "rib walking." The films, however, showed conclusively that the ribs didn't move and that it was the skin segments, or "skutes," of the snake's belly that did the walking. Dr. Oliver also produced a sidewinder (famous in western stories) to show a quite different type of progression.

Again, the professor of veterinary medicine from a neighboring college of agriculture had us take a series of motion picture scenes of the esophagus and multiple stomachs of sheep to illustrate the problem of eructation.

Neither domestic nor wild animals were welcome in the department's patient areas, but our quarters were separated from the rest by a double door and a corridor, so that it was considered all right for us to handle both patients and animals, though not at the same time. Thus, on occasion, there could be heard in our corridor the voices of calves, monkeys, sheep and domestic fowl, accompanied by their several smells.

Side by side with these diversions the search for technical improvements continued. In 1949 a 75-millimeter 0.75 lens designed and made for us by optical experts of Eastman Kodak replaced the original Zeiss lens, necessitating a longer camera-toscreen distance. Finally, two years later, a more compact unit was assembled round a 60-millimeter 0.71 lens of English manufacture. Six replicas of this unit were constructed by General Electric X-Ray Corporation and sold to customers.

In 1951 a 70-millimeter camera with a  $2\frac{1}{4}$  by  $2\frac{1}{4}$ -inch picture aperture was designed and built, together with a 70-millimeter optical printer for making reduction prints from the 70-millimeter negatives. It should be noted that 70-millimeter-wide film cameras had already been in use by the film industry, but in these the vertical dimension of the frame was much reduced. Our new camera could be driven at 15 or  $7\frac{1}{2}$  frames/second. Unfortunately, it was less useful than we had hoped because a really fast lens for it couldn't be found.

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In 1952 the first of four generations of what we called "analytical 16-millimeter projectors" was introduced to help the interpretation of x-ray motion pictures. By 1955 the final version was sufficiently reliable and versatile to warrant its distribution on a commercial scale. The Picker X-Ray Corporation was the principal supplier to radiologists and others interested in motion study. Their projector could run the film at slow speeds without flicker, forward and reverse, stopping on any desired frame for close inspection. A lecturer standing below a screen could operate the projector by remote control in all modes of its speed and direction. Not all users were radiologists by any means. Some projectors were found helpful by football coaches for Monday morning quarterbacking, while others found their way into Hollywood studios. One track coach claimed that film studies with the projector enabled his best pole vaulter to better his previous record by 15 inches in three weeks!

In 1953, largely by accident, we came upon a way of obtaining stereoscopic effects by slowly rotating the subject on a turntable. The negative was printed as usual on 16-millimeter film and the print was run in a special projector having two picture apertures arranged in tandem. Conventional polarization was used in fusing the right and left eye images, and so long as rotation continued the slight discrepancy between the images was scarcely noticed. Of course, if rotation stopped the stereo effect also stopped. Furthermore, if vertical movement occurred as when the subject was given a swallow of barium the right and left eyes would see nonmatching phases of the descending bolus at the same instant, a thoroughly disconcerting experience.

From the beginning of the project until his death in 1971, Boyd Thomas was our printing technician. The optical printer was too bulky to be set up in our limited space and it remained in a studio four miles away, where it had been since its completion in 1929. Boyd took our 35-millimeter negatives as fast as they were developed and returned with the 16-millimeter prints, often on the same day. Besides operating the printer Boyd canned and stacked the negatives at the studio since there wasn't room for them in the Radiology Department. The cans were numbered and catalogued so that scenes made in previous years could be retrieved when fresh prints of them were ordered. The negatives of more than 13,000 examinations used over 200 feet of shelf space.

In 1962 Boyd's work was lightened by the construction of a

small tabletop printer for use in the Radiology Department. It was much simpler to operate than the original printer, and turned out prints at a rate of eight frames/second, four times as fast as the older machine.

But let us return to the year 1953. It was at this point that the early stage of our project can be said to have ended. The work of supervising and interpreting our diagnostic examinations was being gradually and most ably taken over by the late Dr. Frank Campeti and by Dr. Raymond Gramiak. In the matter of apparatus, the big manufacturers of x-ray equipment were already working on image tube ciné units and would shortly dominate the field.

#### Acknowledgements

Grateful acknowledgements are due to those who worked with us; and in this connection we cannot do better than to quote from Dr. Ramsey's article. "Dr. Edwin S. Olsan, an internist, was an active clinical associate during our initial efforts with cine-angiocardiography. When Dr. Olsan joined the armed forces, Dr. Richard S. Meltzer, a pediatrician, referred many heart cases to us for analysis. Among the x-ray technicians who have been assigned to cinefluorography, Mr. Frank Dreisinger, when he was a member of our Department, was most helpful."

Dr. Ramsey also acknowledged "with gratitude the expert advice and assistance we have received through the years from various industrial companies concerning x-ray tubes, fluorescent screens, image intensifiers, films, and lenses. These organizations include Eastman Kodak Company, General Electric X-Ray Corporation, North American Philips Company, and Westinghouse Electric Corporation, to mention only a few."

Individuals we want particularly to thank are: from Kodak, Mr. George Struck, Dr. Rudolph Kingslake, Dr. B. E. Luboshez, Mr. Royal Tobey, Mr. George Corney, and Mr. William Cornwell; from General Electric, Mr. George Happy and Mr. Francis Vanderlinden; from Picker X-Ray, Mr. Jim Raines.

#### THE LATER YEARS

# Stanley M. Rogoff, M.D. and Raymond Gramiak, M.D.

IN THE early years, Watson and Weinberg were being assisted by various individuals already acknowledged. Charles E. Sher-

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wood, M.D., also helped in the clinical work for some years during and following his residency. In 1952, Dr. Raymond Gramiak became probably the first full-time fellow in cineradiology anywhere in the world, followed later by Dr. Jack Levene and Dr. Frederick Joint. All these men became clinical radiologists, Gramiak continuing research in this area until his more recent immersion in ultrasonography.

In early 1954, Dr. Frank L. Campeti was recruited from Italy to spend full time in the cine research area, helping to apply the new ciné technology in the study of various pathophysiologic research problems for which the equipment, and he, proved to be particularly well suited. Before his untimely death in 1963, he had been collaborating on clinical and basic scientific projects with personnel from other medical and veterinary schools and from at least the following areas of this Medical School: urology. dental research. Eastman Dental Center, plastic surgery, cardiology, gastroenterology, and gynecology. He proved to be a remarkably gifted and energetic scientist. We recall that, at the International Congress of Radiology in Montreal in 1962, he, with Watson, Weinberg and several transdisciplinary coworkers, was represented in eight scientific papers and exhibits in the following areas: angiocardiography, cystourethrography, esophagogastric junction, gastric antrum, dynamics of temperomandibular ioints.

In the fifties and sixties, many thousands of patients were referred to our ciné sections for detailed analysis of gastrointestinal or urological problems, notably from the clinical practices of Dr. Harry Segal, Dr. John Benjamin, Dr. Curtis Lund, and their various colleagues in medicine, urology and gynecology. Within radiology, Drs. Theodore A. Tristan and Elliot O. Lipchik worked intensively in the performance and analysis of these studies, in addition to Dr. Campeti.

Throughout Dr. Campeti's career here, he had the invaluable assistance of Ms. Vivian Palladoro in all aspects of his work. Radiologic technologists prominent in the entire group effort over a span of almost twenty years were Karl Sutter, Raymond Sweredoski, and John Campbell, for varying intervals.

The medical image intensifier fluoroscope became available in about 1956 as a result of mass production by many manufacturers throughout the world. This device eventually made x-ray motion pictures widely available at relatively modest price for a

variety of clinical and research activities. During this phase of rapid expansion, our laboratory continued to maintain a position of acknowledged leadership for some years, thanks to the unique technical and clinical experience of our group. The Department of Radiology in the Medical School sponsored six international symposia on cineradiology, which were held in Rochester between 1958 and 1968. Each was attended by about 250 experts and/or neophytes and served to stimulate the exchange of technical, clinical, and research concepts involved in this new method of x-ray examination. Many local personalities contributed to the success of these pioneering specialty symposia. Outstanding among them was a young staff radiologist and expert cinefluorographer, Dr. Theodore A. Tristan. Valuable aid was rendered by Mr. William S. Cornwell of Eastman Kodak Company, and as a result the proceedings of the 1958 symposium were published and formed the first text on cinefluorography.

X-ray motion picture recording on film continues to be a valuable research tool in laboratory investigations of many organ systems, and is fairly universally available and applied. Its application in routine clinical x-ray examinations has been distilledfrom the early days when we recorded any part of the body which moved and could be x-rayed, to fairly obligatory use in many angiocardiographic and coronary arteriographic studies. Other routine fluoroscopic x-ray studies, which benefit from a recording and analysis of motion, are now more cheaply and conveniently recorded on videotape, with less radiation exposure to the patient than is involved in filming despite the inferior image obtained on tape. These include, largely, barium studies of the gastrointestinal tract, voiding cystourethrograms, and studies of joint mechanics. Most hospital x-ray departments and cardiology laboratories now have both motion picture and videotape recording capability, and indeed, so do many private offices of practicing radiologists.

# 12.

# Administration

A Means to an End



# J. Lowell Orbison, M.D.

J. Lowell Orbison, dean of the School of Medicine and Dentistry, director of the Medical Center, and George Hoyt Whipple Professor of Pathology, has throughout his career been interested in academic medicine and its many ramifications. After receiving a master's degree in biochemistry at Michigan State University, he obtained his M.D. degree from Northwestern University and his residency training in pathology at Western Reserve University. He became a member of the faculty at Western Reserve and participated in the development and initiation of the integrated educational program of that school. Early administrative experience was gained through the responsibilities accompanying his appointment as coordinator of Phase II in the implementation of that educational experiment.

In 1955 Dr. Orbison was appointed chairman of the Department of Pathology and George Hoyt Whipple Professor of Pathology at the University of Rochester School of Medicine and Dentistry. In 1966 he became acting dean of the School and acting director of the Medical Center, and dean and director in 1967.

In addition to the administrative experience he obtained in his positions at Western Reserve and Rochester, Dr. Orbison has been president of the International Academy of Pathology

and of the American Association of Pathologists and Bacteriologists. He has served two terms on the Scientific Advisory Board of the Armed Forces Institute of Pathology and on the Pathology Committee of the National Academy of Sciences— National Research Council. In the National Institutes of Health he has served as chairman of the Pathology Training Grant Committee of the Institute of General Medical Sciences, and of the Research Centers Review Committee of the National Cancer Institute.



# James W. Bartlett, M.D.

James W. Bartlett, associate dean of the School of Medicine and Dentistry and medical director of Strong Memorial Hospital, has served since 1958 in several administrative roles in the Medical Center. That year he was appointed assistant dean of the Medical School and chairman of the Medical School Admissions Committee. In 1966, shortly after J. Lowell Orbison became acting dean of the Medical School, and following the departure of Dr. Leonard D. Fenninger to a post with the federal government, Dr. Bartlett became acting medical director of Strong Memorial Hospital and a year later accepted the post on a permanent basis. These assignments have kept him intimately involved over the last fifteen years with most of the major administrative endeavors in the Medical Center.

Dr. Bartlett came to Rochester in 1952 as a two-year rotating intern at Strong Memorial and Rochester Municipal hospitals. He then followed this with a three-year psychiatric residency in the Department of Psychiatry. Following his residency he participated in the psychoanalytic program at the

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Downstate Medical Center in Brooklyn, New York, and is a graduate of that program. In addition to his continuing interest in the practice of clinical psychiatry, Dr. Bartlett has pursued interests in the selection and development of medical students, and, more recently, hospital economics. He also holds an academic appointment in the School of Medicine and Dentistry as professor and chairman of the Department of Health Services and professor of psychiatry.

THE numerous publications describing the University of Rochester Medical Center have recorded remarkably little about its organizational and administrative features. In the more than fifty years since the idea of the School took form, the passage of time has deprived us of some sources of information and blurred the clarity of others, thus hampering the study of the development of the administrative structure. The records of the Advisory Board, the Executive Hospital Committee, the reports of the first decade and the first quarter century, and a partially completed history of the University have all been helpful, but still it has frequently been necessary to deduce the administrative structure from the functions served and the discussions reported. This endeavor has been especially aided by discussions with the first dean of the School, Dr. George H. Whipple; the second dean, Dr. Donald G. Anderson: the School's executive secretary for many years, Miss Hilda DeBrine; and the executive secretary for Strong Memorial Hospital until 1964, Miss Dorothy Widner. Obscure points have been clarified by each of these, who were intimately involved with the administration of the Medical Center, and we are indebted to them for their help.

## EARLY INFLUENCES

Three men worked together to establish the University of Rochester School of Medicine and Dentistry. They were Mr. Abraham Flexner, of the General Education Board of the Rockefeller Foundation, President Rush Rhees, of the University of Rochester, and Mr. George Eastman, of Eastman Kodak Company. The ideas and the resources which they used to build the Medical School are still evident today in its function and structure.

The 1910 Flexner Report on medical education in the United States and Canada, prepared under the aegis of the Carnegie Foundation, arose out of the ferment for improved medical edu-

cation that had begun in the United States in the latter half of the nineteenth century. The founding of the Medical Center at Rochester, under the guidance of the General Education Board and with Mr. Flexner's special interest, insured that the new Center would be integrated into the structure of the University and that the goal of high academic achievement would be firmly established. President Rhees fully endorsed these goals and established the Medical Center with close administrative relationships to the University and to its officers and trustees. Mr. Eastman's personal interest in the establishment of the Medical Center helped to insure its financial support and to foster a cooperative spirit between the Center and the Rochester community.

President Rhees, with the personal advice of Mr. Flexner, others at the Rockefeller Foundation, and professional leaders throughout the country, made the search for the dean of the School, seeking an individual with high academic and personal standards and a belief in the value of intimate ties to the parent University. His search was outstandingly successful, for he was able to persuade Dr. George H. Whipple to leave his position as dean of the School of Medicine and director of the Hooper Foundation at the University of California in San Francisco and come to Rochester. The appointment of Dr. Whipple as dean of the new School was the most important single event in determining the direction of the School and the administrative pattern that developed. Dr. Whipple brought to this position a high, perhaps stern, integrity, modulated by personal warmth and kindness and a pragmatic approach to the solution of problems. He brought, too, superior academic accomplishment and a belief that academic values would be fostered by close relationships with the University. The source of these strong personal qualities can only be surmised, but his New Hampshire upbringing, education at Yale. experiences as an athlete, medical training at Johns Hopkins, appointment to the faculty in pathology at Hopkins under William Henry ("Popsy") Welch, and his responsibilities as dean of the medical school at the University of California must all have played a part in his acquisition of these qualities and beliefs.

The relationship between the Medical Center and the University was quickly and easily established by the mutual respect between President Rhees and Dean Whipple and by their common goals. High priority was given to the selection of the department chairmen, and the two men worked closely together in this effort.

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As each new chairman was appointed, he promptly became involved in the planning of the School and in the selection of additional chairmen. In this way each added his experience and judgment and a well knit team, all intimately concerned with the building of the new School and Hospital, was created.

Since the new Hospital was to be an integral part of the University and the Medical Center—a truly Flexnerian institution, where education and highest standards of patient care would reinforce each other—the selection of Dr. Nathaniel Faxon as director of Strong Memorial Hospital was of special significance. Dr. Faxon, with his background in medical practice, service in World War I, and experience as assistant director of Massachusetts General Hospital, was in full accord with this concept of the University hospital and its integration within the Medical School and University. Under his direction the Hospital was planned and operated to achieve excellence in patient care while responding fully to the educational needs of medical and nursing students and interns and residents.

The inclusion of a dental program in the new School is further evidence of Mr. George Eastman's interest and influence. Early in the planning, his interest in dental disease led to plans for a dental school in the Medical Center, and thus arose the title "School of Medicine and Dentistry." Though the program for dental education as then planned never came into being, postdoctoral dental education was later established and has been an important function in the Medical Center and has had an impact nationally and internationally, which continues and grows even today.

Another member of the Rochester community, Dr. George W. Goler, health officer for the city of Rochester, fundamentally influenced the Medical Center. After years of dealing with epidemics of infectious disease from makeshift facilities, Dr. Goler had just received approval from the city of Rochester for the construction of a new municipal hospital. When he learned of the plans for the new Medical School, Dr. Goler, setting aside his own ambitions and the organizational autonomy that a separate hospital would have meant for him, asked to have the new municipal hospital built as a contiguous part of the Medical Center. He was convinced that the needs of the community would be best served by full professional integration with the School of Medicine and Dentistry, and especially with the clinical departments.

When Dr. Faxon joined Dr. Whipple, they had offices together on the old downtown campus of the University, adjacent to the office of President Rhees. Shortly thereafter, Dr. Faxon recruited Miss Helen Wood to join them as director of the School of Nursing, with the responsibility for both patient care and nursing education in Strong Memorial Hospital. After her arrival, Miss Wood shared the office with Dr. Faxon, and during the construction and opening of the Hospital a close working relationship was well established. Thus, from an educational as well as a clinical point of view, the nursing programs became a part of the Hospital. This commitment to nursing education and nursing care has remained strong over the years, even though the organizational and administrative arrangements have gone through several changes.

The goal that these men and women set for the Medical Center—the achievement of high academic accomplishment—brought together a faculty carefully selected for their strong interest in research and education. In the basic science departments graduate students were attracted even before the Center was completed. Research training in the basic science disciplines was thus the first activity of these departments, and has continued as one of their principal academic efforts to this day. Similarly, the academic accomplishments of the faculty of the clinical departments attracted interns and residents interested in the academic approach to clinical problems, so that research and education became established as an important part of all clinical activities.

## EARLY ORGANIZATION

The scarcity of reports on the early organizational structure at the Medical Center suggests that administration was not a primary consideration and was probably viewed as of little importance in itself; "as a means to an end, not an end in itself." Further, the administrative structure seems to have grown informally to meet the operating needs of the School as they developed. Meetings between Dean Whipple, President Rhees and later the department chairmen were effective and focused on specific problems but were unemcumbered by the formalities of set dates and procedures. Conversations with Miss DeBrine and Miss Widner confirm these impressions, and there are minutes of the meetings of President Rhees, Dean Whipple, Dr. Faxon, and department chairmen beginning in 1922; yet these meetings were not

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formalized by the title of "Advisory Board" until 1925. Even then many of the decisions required for the operation of the Center were made as the result of informal discussions between the relevant department chairman and the dean. Only when problems arose which required participation by most or all of the department chairmen were meetings of the Advisory Board called.

The choice of the title "Advisory Board" for the executive faculty of the Medical Center illustrates the influence of the "Hopkins Model" on the administrative structure. But the model was modified to include the dean as well as the hospital director, thereby emphasizing the integration of these two essential elements of the Center. The board, by its composition of the dean, medical director and the department chairmen, and presided over by the president, recognized these men as the principal administrative officers of the Center. It also established the close relationship to the University, which has been an enduring feature.

The distinguished academicians Dean Whipple found to join him in Rochester were each given the responsibility for a department according to the then recognized scientific disciplines. Originally there were six preclinical departments: anatomy, biochemistry, physiology, bacteriology, pathology, and vital economics; and four clinical departments: medicine, surgery, pediatrics, and obstetrics and gynecology. Each department chairman had the responsibility for the organization of his department and for the activities of his faculty in education, research, and patient care. The chairman, in turn, reported to the dean. At that time several activities now justifying separate departmental status were included under the umbrella of other departments; thus, pharmacology was included in biochemistry; anesthesiology and orthopedics in surgery; and psychiatry, radiology and neurology in medicine. In the Center the Hospital was treated very much as a department, but was recognized as much more complicated and extensive. Thus, the numerous hospital units-outpatient, emergency, admitting, dietetics, social service, maintenance, housekeeping, laundry, pharmacy, record room, physiotherapy and occupational therapy, information and communication, patients' library, volunteer groups, and the chaplains-were all the responsibility of the Hospital director. In fact, the personnel requirements for the Hospital were so numerous that Dr. Faxon and Miss Widner functioned as a de facto personnel department in recruiting the original Hospital staff.

From the very beginning, it was recognized that the Medical School and the Hospital must operate as a unit if the best in education, research, and patient care were to be obtained. Dr. Faxon not only had the prerogatives of an academic department chairman and the responsibility for the many Hospital service units, but he also served as the coordinator of the clinical activities of the clinical departments. At the time of his appointment, he insisted on the additional prerogative of reporting directly to the president and University trustees if he felt it necessary. Because of the recognized importance of the Hospital, this stipulation was accepted by Dr. Whipple and President Rhees. Yet, so far as it has been possible to find, this prerogative was never exercised. During the time Dr. Faxon served as director of the Hospital, he and Dr. Whipple worked so closely together that the operations of the Medical School and the Hospital were fully coordinated.

The establishment of the Hospital as a wholly owned part of the University and a geographic part of the University Medical Center has had many beneficial effects for both education and patient care. The relatively greater distance of the University trustees from the operation of the Hospital, as compared to most hospitals, placed considerable autonomy-accompanied by responsibility and accountability-on the Hospital director and the chairmen of the clinical departments for the Hospital's operation. That distance has also meant that the Hospital has had less direct contact with the community and has not had the effective spokesmen and advocates which hospital boards of trustees frequently provide. Similarly, the opportunities for the Hospital to attract financial support from the community have been contained within the general University fund raising. In retrospect, however, the benefits of the integration with the University and coordination of education with care of patients have clearly outweighed the limitations.

## Executive Hospital Committee

It was recognized very early that the clinical operation of the Hospital required the close attention of the chairmen of the several clinical departments. An Executive Hospital Committee was therefore established as a subcommittee of the Advisory Board. Composed originally of the chairmen of the clinical departments, including pathology, and chaired by the director of the Hospital, it was responsible for advising the director on policy

# The Ongoing Years — Orbison, Bartlett

and operations and for recommending changes in policy to the Advisory Board, and through it to the president and Board of Trustees. By this mechanism the clinical chairmen were given a structure through which they could accept and discharge the unique responsibility for the Hospital which fell especially to them because of the lack of a Hospital board of trustees. This structure and related functions continue to be effective today even though committee membership has been enlarged by the addition of chairmen of new departments and of representatives from nursing, social work and the Emergency Department. Because of the complexity of Hospital operations, a weekly luncheon of clinical chairmen was instituted in the early 1960s by Dr. Fenninger to expedite their handling of the growing numbers of problems involved. This added opportunity for consideration of problems has proven to be of great value.

#### The Rochester Municipal Hospital

Physically, the Rochester Municipal Hospital occupied two wings attached at all levels to the floors of Strong Memorial Hospital. The medical responsibilities for both hospitals were carried by the clinical faculty, with equal devotion and accountability for the patients in both institutions. The Municipal Hospital purchased numerous services from Strong and the rest of the Medical Center, and thereby eliminated the necessity of duplicating many facilities. The Municipal Hospital did nevertheless have its own administrator and maintenance department, and these were directly responsible to the city government through the Commissioner of Public Safety. Though such an arrangement might well have led to conflict, the fact that cordial, cooperative, and effective relationships were maintained throughout the long period during which these arrangements were in effect speaks for the concerned dedication of all those responsible for providing quality care for the indigent sick and injured.

The administrators during this long period were: J. Ward Thompson, 1926–33; George J. Dash, 1933–49; William B. Woods, 1950–58; and Charles W. Nordwall, 1958–63.

## Health Bureau Laboratories

Dr. Goler, using the same concepts which led to the association of the Municipal Hospital with the Medical Center, was instrumental in having the Health Bureau laboratories established in

the Department of Bacteriology. From this arrangement the Health Bureau gained dependable results and the most expert consultation, and the Medical Center gained a valuable resource for its educational and research programs. This relationship has been shifted from city to county jurisdiction, it is still operating with great success today.

# Nursing Education

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As previously noted, both nursing care and nursing education were under Hospital jurisdiction. This insured the coordination of care and education and enhanced the image of nursing as a service profession. In 1927 President Rhees, with the approval of the University trustees, appointed a "group of ladies" to serve as an advisory committee to the School of Nursing. Throughout these early years there was a close working relationship with the Women's College of the University, the advisory committee, and the Board of Trustees, illustrating the integration of the School of Nursing with the University and also providing an example of the administrative flexibility which allowed the School of Nursing, even though within the Hospital, to have direct and easy access to a separate advisory committee.

# Dental Education

The plan to have undergraduate dental students enrolled simultaneously with the first medical class was never achieved. The faculty had decided to require equal standards of admission for dental and medical students and to have both groups educated together in the basic science curriculum. Since other dental schools were requiring significantly less preparation for admission, applicants were apparently unwilling to gain adequate preparation for the program at Rochester and therefore matriculated elsewhere. After five years it was decided to establish a postdoctoral fellowship program in which graduate dentists would work toward a Ph.D. degree in one or another of the basic science departments. The general administration of this program was lodged in the dean's office, under the particular supervision of Miss DeBrine. The educational responsibilities and the day-today supervision of each student was assigned to the appropriate basic science department in which the student was receiving his principal education. Thus, a relatively simple administrative ar-
rangement was achieved for a program that has been exceptionally productive of outstanding graduates.

# Graduate Studies

As noted before, graduate students were attracted to the basic science departments even before the Medical School accepted its first class of medical students, and thus Ph.D. candidates were the first students in the Medical Center. Mainly, they were attracted by the scientific prominence already attained by the newly assembled faculty. Responsibility for graduate student education and supervision was delegated to the department chairman concerned—again a simple and expeditious method of accomplishing the necessary administration.

The establishment of guidelines and procedures for granting the Ph.D. degree was a bit more complex. The responsibility for dealing with the problem was assigned to the University Council, a body formed to deal with the problems arising from the increased numbers of schools that had recently been formed within the University. The council appointed a committee, including members of the Medical School faculty, to formulate the standards and procedures governing the Ph.D. degree. When that committee completed its task it was converted into a standing committee to control and oversee the graduate work in all parts of the University. The development of this administrative organization for graduate studies illustrates again the close working relationship between the Medical School and its parent University. It also recognized the fact that graduate education varies greatly in content in its many fields, and established a pattern of decentralized administration of graduate studies that is recognized as an important concept and persists throughout the University even now.

#### Subsequent Changes

After the initial organization was established there were a few administrative changes. As members of the original group changed, shifts in function began to appear. Dr. Faxon returned to the Massachusetts General Hospital to become its general director in 1935 and was succeeded at Rochester by Dr. Basil Mac-Lean. By this time a visiting committee from the trustees to the Medical Center was functioning and it may have been that this avenue of communication with the trustees satisfied Dr. Mac-

Lean. However that may be, the administrative arrangement was made for Dr. MacLean to report directly and only to Dr. Whipple as dean and director. Dr. Faxon, from his new vantage point in Massachusetts, was concerned about the change, which left the director without a direct approach to the president and University trustees, even though he himself had never exercised the prerogative. It is evident, however, that Dr. MacLean accepted the revised relationship when he agreed to be director of the Hospital.

Dr. Whipple, throughout his remaining years as dean of the School of Medicine and Dentistry, retained his responsibility for the Hospital as well as the other parts of the Medical Center, yet there developed over the years a tacit autonomy in the Hospital operation as the administrative relationships between the Medical School and the Hospital became less intertwined. Such a change was not surprising, since Dr. MacLean was a newcomer in a group of men who had worked together intimately from the very beginning of the new School and Hospital, and the School and Hospital had both grown in complexity. Thus, the earlier, simpler organization became more structured and less intimate, but all continued to recognize that the maximum effectiveness of the programs depended upon carefully coordinated operation of the two major facilities in the Medical Center.

Shortly after his appointment, Dr. MacLean established the Associate Hospital Committee, on which each clinical department was represented by a part-time faculty member. The importance to the new School and Hospital of the physicians in the community had been recognized by the dean and department chairmen even before the doors of the new Center were open. As anticipated, these men became members of the parttime faculty and brought their patients to the Hospital for care and their expertise to the teaching of students and house staff. Yet, they encountered certain problems in the Hospital in the care of their patients and in their relationships with the staff. Therefore, in 1936 Dr. MacLean had recommended formation of the Associate Hospital Committee, which would receive advice, improve communication, and respond to the problems of these faculty. The chairman of the Associate Hospital Committee sat on the Executive Hospital Committee, and through this administrative mechanism the Associate Hospital Com-

mittee fulfilled its functions. Over the years, and especially after World War II, the increasing size of the full-time faculty and the lessened availability of hospital beds for the part-time faculty led to less participation by them in the activities of the Hospital, and the committee was abolished in 1966.

# WORLD WAR II YEARS

The war increased the tempo of the School, through the scheduling of classes the year round and through the loss of many faculty members to the armed forces, so that the load on those who remained was doubly heavy. The necessity of dealing with governmental programs, most notably the V-12 and ASTP programs for students and the Manhattan project of the Department of Defense, produced an increased administrative load on the School. Even so, there was little change in the fundamental administrative pattern. Dr. William McCann, chairman of medicine, and Dr. Stafford Warren, chairman of radiology, were called to military service, but all of the other major administrative personnel of the School and Hospital remained. Dr. George Packer Berry, who had followed Dr. Stanhope Bayne-Jones as chairman of microbiology when the latter became dean of the Yale Medical School, accepted additional responsibilities as assistant dean in 1941 and associate dean in 1947. Throughout the war he personally managed many of the complex administrative problems that arose in response to governmental demands. He and Dr. William Bradford also assisted Dr. Whipple with admissions and student affairs. Dr. Berry's success in these efforts was no doubt an important factor in his selection shortly after the war as dean of the Harvard Medical School.

The establishment of the Rochester University Atomic Energy Project in 1943 was a direct indication of the high regard in which Dr. Stafford Warren, chairman of the Department of Radiology, was held by his colleagues in the field of radiation. Dr. Warren first took the administrative responsibilities for this new venture, and then upon his induction into the Army, Dr. Andrew Dowdy assumed the responsibility for both the Radiology Department and the project. Later, Dr. Warren became the founding dean of the new medical school at the University of California at Los Angeles and Dr. Dowdy soon joined him there as chairman of the Department of Radiology.

# Post World War II Years

As in all medical centers, the thirty years since World War II have been characterized by fantastic expansion-an expansion which includes budgets, space, faculty, staff, students, research, education, and complexity and intensity of patient care. In addition to this growth, there has been added numerous extramural contacts and responsibilities. Though the Medical Center always had close relationships with the community, these became not only more numerous but more formalized and more extensive. During this period, too, contact with federal and state agencies progressively increased. In the face of all these changes, adherence to the principle of administration as a means to an end was strained but maintained. As in all centers, it has been necessary to increase personnel in the dean's office to respond to the needs created by these changes. The larger student bodies-medical, graduate and nursing-and more complex curricula have required more deans to discharge the academic administrative functions. Similarly, the larger and more complex fiscal and operational problems have required a further increase in staff. Yet, organization still is planned to follow function, and the administrative effort is kept as small as is consistent with increased responsibilities, broadened communication, and complexity of relationships. As an example of the change required by the greater growth, it is no longer reasonable to expect department chairmen to administer what are now large and complex departments and at the same time to assume the additional responsibilities of assistant or associate dean, an arrangement which was common in the early days of the School. The concept of combining faculty and administrative functions, however, is still maintained. Though department chairmen no longer serve as assistant or associate deans, the faculty who do serve these functions are expected to retain active participation in their faculty roles in their respective departments.

#### INTRAMURAL ADMINISTRATION

# Relationships with the University

Over the years the relationships between the chief administrative officers of the Medical Center and the University have varied from time to time and have served to demonstrate how

essential for the Medical Center this relationship is. When Dr. Valentine succeeded Dr. Rhees as president of the University, the same cordial relationship was established that had characterized Dr. Rhees' tenure. But in the early 1950s, when Dr. Cornelis de Kiewiet became president and was involved in the problems of consolidating the University activities on the River Campus, this relationship became distant and the Medical Center suffered from lessened University interest. During this same time, too, the Visiting Committee of the trustees to the Medical Center was discontinued, so that all communication was seriously curtailed. Fortunately, Dr. Donald Anderson, who had succeeded Dr. Whipple as dean, and Mr. LaRoy Thompson. vice president and treasurer, established a bridge of communication that spanned the gap and served the needs of both the University and the Medical Center. Following Dr. de Kiewiet's resignation in 1961, Dr. Howard Anderson and Dr. McCrea Hazlett served successively as acting presidents and took a greater interest in the Medical Center, yet the well established line of communication between Dean Anderson and Vice President Thompson continued to be the principal route of exchange.

The appointment of Mr. Allen Wallis as president in 1963 continued the full interest for the Medical Center in the office of the chief executive officer, and the Visiting Committee of the trustees was reinstated. Throughout the remainder of Mr. Wallis' years as chief executive officer, first as president and later as chancellor, he maintained a close personal and administrative interest in the Medical Center, and his support was unwavering.

The Visiting Committee of the Board of Trustees warrants special mention, for it has contributed greatly to the welfare of the Medical Center. Ever since its establishment in 1932, except for its discontinuance in the 1950s and early 60s, its members have become knowledgeable about the Medical Center and transmitted that knowledge to the remainder of the Board of Trustees. They have acted as spokesmen and advocates for the Medical Center in the community and have contributed in many ways to solving Medical Center problems. Under Mr. Clarence Wynd's chairmanship, since 1970, the committee has been especially effective and, due to his interest, it has recently grown in size and activity—a development of great potential value. From the Visiting Committee also has come the

recent establishment of the Board of Overseers for the Strong Memorial Hospital. It is anticipated this board will fill a longfelt need, for the members will become knowledgeable of the Hospital—its functions and its problems—so that its members can advise the Hospital directors and act as informed spokesmen and advocates for the Hospital in the community.

# Administration of the Medical School and Hospital

The principal administrative structure of the School has remained essentially unchanged over the years. The executive body continues to be the Advisory Board, chaired by the chief executive officer of the University and composed of the department chairmen, the medical director of the Hospital, the dean and associate deans. As the Medical Center has grown, the board has increased in size. Since the war the activities of the board have become more structured and formal. Dean Anderson, in the early 1950s, recognized the need for regular meetings for communication, discussion, and decisions, and established monthly meetings of the board, with agendas circulated in advance. This change has proven valuable with use and is continued today. The Executive Hospital Committee, though larger, continues to serve as the subcommittee of the Advisory Board, with responsibility to advise the medical director and executive director of the Hospital and, with the directors, to establish operating policy. In these administrative arrangements the department chairmen have played a key role. Not only have they administered their own departments, an essential activity in itself, but they have provided counsel and, as members of administrative bodies, have taken actions which have set the course and made possible the accomplishments of the Medical Center.

# Medical Faculty Council

As the Medical Center has grown, the need for more involvement of the faculty in the consideration of the problems of the Center was recognized and the need for improved communication between the administration and faculty was appreciated. At the same time, the traditional mechanism of faculty meetings was only sporadically effective, and the Advisory Board therefore asked an ad hoc committee, under the chairmanship of Dr. John Romano, to study the needs and propose how faculty participation in the Medical Center might be im-

proved. The committee's report recommended the establishment of a Medical Faculty Council as a committee of the Advisory Board, in which each department and each affiliated hospital and the house staff of Strong Memorial Hospital would have one elected representative. Department chairmen were excluded from serving on the council. The chairman of the Medical Faculty Council would serve as a member of the Medical Center Advisory Board. This council, established in 1969, has helped significantly in the assessment and resolution of problems in the Medical Center, and has served as a line of communication between administration and faculty parallel to, and augmenting, the communication through the department chairmen. It has served, too, as the agenda committee for faculty meetings.

# Interdepartmental Organization

Informal interdepartmental collaborative efforts in research, education, and patient care have been encouraged and frequent throughout the history of the School and have been an attractive and productive feature of its academic and administrative style. The great emphasis on research in the 1950s and 1960s increased knowledge about specific diseases, and this, combined with the organization of the National Institutes of Health by disease categories, resulted in pressures to realign the formal administrative organization in the Medical Center to recognize these new emphases and relationships. While there can be no doubt that organization of departments by these new categories might enhance communication between investigators with related interests, it is also recognized that the original organization provides a rational framework for education in medicine and for the care of patients. Therefore, the decision has been made to retain the classical organization because of its applicability to education and patient care. To retain the administrative stability of this departmental organization and at the same time to recognize the need to encourage and formalize interdepartmental categorical relationships, especially in research, two principal interdepartmental administrative arrangements have been made: interdepartmental centers such as the Cancer Center and the Center for Brain Research have been established in which faculty from several disciplines join together into a functioning unit and administratively report to the dean; while

similar interdepartmental divisions and centers, such as the Toxicology Center and the Immunology Division, report to the chairman of one of the cooperating departments. There have been problems and successes with each arrangement. The most important principle continues to be to have administrative organization follow the function and provide enough administrative flexibility to modify the organization to implement change.

# Changes in Relationships of the Hospital within the Medical Center

From the beginning, the School of Medicine and Dentistry, Strong Memorial Hospital, the Rochester Municipal Hospital, and the Rochester Health Bureau Laboratory were recognized as parts of a single operation having as their raison d'etre education in medicine and related fields. In today's terminology Dr. Whipple, as dean of the School of Medicine and Dentistry, served as chief executive officer of this complex. Still, with the passage of time, increased complexity of the Center, the stresses of the war years, and new personnel, Dr. Whipple gradually decreased his responsibilities; as previously noted, the degree of autonomy of the Hospital increased. In fact, when Dr. Donald G. Anderson succeeded to the deanship upon the retirement of Dr. Whipple, his appointment as dean of the School of Medicine and Dentistry and director of the Medical Center was, in reality, reestablishing the original concept. Yet, this restatement of the concept of the unity of the Medical Center caused difficulties of adjustment. Occurring as it did at a time when the remainder of the University was rapidly growing and consolidating its various activities on the River Campus, there was less time available to University officers to participate in working these problems through. The relative autonomy of the Hospital seemed compromised and its mission neglected, and Dr. MacLean decided to leave to accept the post of commissioner of hospitals of New York City.

Mr. Milo Anderson was appointed as administrator of the Hospital, but it became clear that it was not enough to operate Strong Memorial Hospital as an effective patient-care facility; it was essential also that the goals of medical education be kept in the forefront of every decision about Hospital operation. Therefore, the post of medical director of the Hospital, serving

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both as executive officer of the Hospital and associate dean of the Medical School, was established. Dr. Robert Berg, chairman of the new Department of Preventive Medicine and Community Health, effectively filled this role as acting director until 1962. In 1962 Dr. Leonard D. Fenninger, already associate dean of the Medical School, was appointed to this post. It also became clear that the extensive problems of the day-to-day operation of the Hospital required a professionally trained and experienced administrator to work closely with the medical director. With the appointment of Dr. James W. Bartlett as medical director in 1967 and Mr. Allan Anderson as executive director in 1968, a two-man team was established to provide the balanced point of view essential to the efficient and educationally oriented operation of the Hospital within the Medical Center, and also to support the dean and director of the Medical Center in his overall administration of the institution.

# Rochester Municipal Hospital

For several decades the administrative relationships between the Rochester Municipal Hospital and the University Medical Center remained unchanged, providing a basis for the excellent care of the community's indigent patients and for research and educational opportunities for the students and house staff at the Medical Center. With each succeeding year, especially beginning in the 1950s, the cost of operating the Rochester Municipal Hospital increased. By 1962 the city concluded that it could not remain in the business of supporting a hospital for indigent patients. Dr. Fenninger, in his role as medical director of Strong Memorial Hospital, recognized the great opportunity the city's decision had for the future development of the Medical Center. It was his foresight and effective presentation of his perception of the opportunity that played a dominant role in the University's decision to purchase the Municipal Hospital. As a result, both the X and Y wings, which comprised the Rochester Municipal Hospital, and the land that had originally been acquired from the University by the city, some 13 acres extending eastward from the rest of the Medical Center, were sold by the city of Rochester to the University. When this transaction was completed, the administrative responsibility for maintenance, housekeeping, and admissions in the Municipal Hospital was transferred to Strong Memorial Hospital. All of the responsibility-medical, operating, and fiscal—now rested with the University. Even though these changes created a shift in responsibility and increased work-loads for some individuals, the transition was made without difficulty and with an actual decrease in administrative personnel.

Of special note is the importance of the land that was purchased by the University at the time of the transfer of the Rochester Municipal Hospital. This land provided the site for the construction of the completely new Strong Memorial Hospital to the east of the original structures, thus allowing the original Hospital to function fully throughout the construction phase of the new. The importance of this fact cannot be overemphasized, since it made possible the uninterrupted care of patients and the education of medical students, interns, and residents in the old hospital during the five years when the new was under construction. The land has also provided the space for the construction of an apartment building, the Dr. George W. Goler House, to provide housing for hospital employees, house staff, and students; and for the proposed new Eastman Dental Center, that will move from its location downtown to the campus of the Medical Center.

Thus, the transfer of the Rochester Municipal Hospital from the city to the University had only a modest impact on the administrative functioning of the Center, but it provided extremely valuable opportunities for expansion of hospital facilities and will improve coordination of programs with the Eastman Dental Center.

# School of Nursing

The organization of the School of Nursing in the Hospital served well for many years, but as nursing education became more diverse and more involved in both undergraduate and graduate programs, the relationships of nursing practice to nursing education changed. As a result, the administrative relationship was no longer serving the needs of nursing.

In 1954 nursing was divided into two parts. The first part was comprised of a Department of Nursing Service at Strong Memorial Hospital, headed first by Beatrice Stanley, from 1954 to 1961, then by Ann Rosenberg and Marion Nichols as acting directors, from 1961 to 1963, followed by Claire O'Neil, from 1963 to 1968. Betty Deffenbaugh served as acting director from 1968 until the appointment of Loretta Ford as dean and director; the director was primarily responsible for the nursing care of patients. The second part was comprised of a Department of

Nursing in the School of Medicine and Dentistry, with Miss Eleanor Hall as professor and chairman. The director of nursing service then took the nursing post on the Executive Hospital Committee, while the chairman of the Department of Nursing became a member of the Advisory Board. This division of responsibility allowed clarification and improvement of the educational programs, but by diminishing the communication between those responsible for nursing care and those responsible for nursing education there was a loss of coordination between the programs to the detriment of both. A subsequent series of studies recommended bringing all of nursing together into a school whose dean and director would have the responsibility for both the nursing care of patients in Strong Memorial Hospital and the educational programs in the new School of Nursing. The new school was founded in 1972 and Dr. Loretta Ford appointed as its first dean. The administrative relationships between nursing and the rest of the Medical Center are probably best summarized by noting that Dean Ford has her office adjacent to those of the dean and director of the Medical Center and the medical and executive directors of Strong Memorial Hospital.

Now within the University, nursing has become an independent and autonomous school with its own voice in the cabinet of deans and in the University administration. In the Medical Center, nursing has clearly taken its share of responsibility in patient care, education, and research as a part of the overall Medical Center administrative organization headed by the director of the Center.

# Administration of Internships, Residencies, and Postdoctoral Fellows

While the selection of house officers and the planning of their principal clinical assignments and educational experiences have been the responsibility of the departments, routine administrative matters such as stipends and benefits have been handled by the directors' office, and overall policy has been set by the Executive Hospital Committee. Most of the internships and residencies offered at the Hospital have been within single departments, even where brief rotations have occurred from one department to another. A noteworthy exception was the two-year rotating internship established in 1949 and discontinued in 1961.

There have often been substantial assignments of Strong Me-

morial Hospital house staff to other hospitals, both within the city of Rochester and elsewhere. Generally, these arrangements have been made by the physicians in both hospitals, the house officer retaining his identity as a Strong Memorial Hospital intern or resident, even during his rotation elsewhere. With the development of community programs, especially in pediatrics and surgery, there has been a broadening of the identification of some house officers with both the affiliated community hospitals and Strong Memorial Hospital. Still, there remains an identifiable group of interns and residents appointed by the Executive Hospital Committee and serving their postgraduate training under the aegis of Strong Memorial Hospital.

The Medical Center has been uniformly successful in attracting outstanding new graduates to its house staff. These men and women have gone on to outstanding posts in American medicine, a large percentage into academic medicine. They have made the name of Strong Memorial Hospital well known across the country.

The administration of the activities of postdoctoral fellows and trainees, whether in clinical or preclinical departments, has been delegated almost entirely to the relevant departments.

# EXTRAMURAL RELATIONSHIPS

#### Affiliated Hospitals

One of the first examples of expanding relationships in the community after World War II was the agreement in 1946 between the University of Rochester and Genesee Hospital to establish an affiliation. The impetus for Genesee Hospital affiliation came from its medical staff, though the Strong Hospital administration and the Hospital board responded promptly and enthusiastically. The agreement subsequently approved by the boards of both institutions was notable for the fact that it was a gentleman's agreement, through which each institution agreed to share with the other its staff and facilities for the benefit of the education of medical students and interns and residents and for the improvement of medical care in the community. Attention is called especially to a paragraph emphasizing the commitment of the leadership of the two institutions to the success of the project. It is stated that "though this is not a formal agreement, the leadership of both institutions assume the responsibility of making this project successful." With slight modifications similar agreements

have been used in affiliations with Highland Hospital in 1956, Rochester General Hospital in 1956, and St. Mary's Hospital in 1968. True to the original expectations, problems have occurred, and they have been "solved by the friendly, determined, and cooperative efforts" of the leaders of the institutions involved.

Since the educational programs of departments in the Medical School varied from one to another and the educational contributions that could be made by the affiliated hospitals varied from hospital to hospital and from department to department, the implementation of the affiliation agreements has, in fact, been carried out at the departmental level. Thus, over the years it has not been necessary to establish a central administrative organization in the Medical Center to implement the affiliation agreements. Instead, the heads of the various departments in the affiliated hospitals have reported directly to the chairman of the corresponding department in the Medical School. More recently, the administrators of the affiliated hospitals and Strong Memorial Hospital and the director of the Medical Center have been meeting to resolve questions about general operating relationships between the institutions. Additionally, the president and president-elect of each of the hospital boards of the affiliated hospitals and two members of the Board of Trustees of the University have met quarterly to identify and discuss problems at the broad policy level. These mechanisms have added support to the departmental implementation of educational and service programs but have not replaced, nor should they, the direct relationship between those having responsibility for education and patient care.

#### Monroe Community Hospital

In 1967 the University agreed to accept, through the Medical Center, the responsibility for medical care at what had previously been known as the Monroe County Infirmary. For several years preceding the agreement, community committees had studied the problem of providing better care for the chronically ill in the community. From these studies came the request that the University accept the responsibility for care of the patients in the infirmary. Though recognizing the large commitment involved, the University, through its Medical Center, accepted the responsibility—and at the same time the opportunity—to study the needs of the chronically ill and to educate students and house staff more successfully in chronic care.

Through a contract between the county and the University, the county infirmary was renamed Monroe Community Hospital and the University agreed to supply the medical care for patients there, while the county agreed to reimburse the University at cost. The medical director for the new institution. Dr. T. Franklin Williams, was named and Dr. Anthony Izzo became associate medical director. They reported administratively directly to the director of the University Medical Center; Dr. Williams, as medical director of Monroe Community Hospital, also had a seat on the Advisory Board of the Medical School, so that direct administrative relationships and communications between the Medical School and Monroe Community Hospital were assured. Each fulltime clinician appointed to the staff of Monroe Community Hospital has simultaneously been appointed as a full-time faculty member of the relevant clinical department in the Medical School, so that there is also a direct professional relationship and sharing of responsibility between those faculty members at Monroe Community Hospital and the departmental chairmen in the Medical School.

Also established at Monroe Community Hospital was a Medical Advisory Board, composed of a representative from each of the community hospitals and representatives from each of the clinical departments in the Medical School. This board has served as a professional advisory body to the board of the Community Hospital, to its medical director, and the dean, and has provided a clear relationship to the remainder of the medical and hospital community. By this means the needs of the community hospitals and the professional community have been recognized and represented in the policies and procedures of the Monroe Community Hospital.

# GOVERNMENTAL AND OTHER AGENCIES

#### Atomic Energy Commission

Although the Atomic Energy Project came to an end with World War II, the newly created Atomic Energy Commission saw the Rochester program as an ongoing asset and so arranged for its continuing support. The decision to continue the project in the University setting after the close of the war raised several questions: How was a highly classified activity to be included in an open University setting? What organizational pattern should be established and how should personnel for the project be incorpo-

rated into the School? With some reservation the decision was made to establish a Department of Radiation Biology and to give the professional staff faculty appointments, albeit these to be contingent upon continued financial support from the AEC. Over the years the classified activity has disappeared, the faculty commingled, and the financial contingency has been removed. Except for the uniqueness of its funding and its double reporting to the School and the AEC, the department now functions much as any other basic science department except that its responsibilities to graduate students and to research are greater than to medical students.

### Other Federal Agencies

The presence of the biological arm of the Atomic Energy Project gave the Medical School and the University early experience in relating to a federal agency. Mr. Henry Meadows and Mr. LaRoy Thompson were especially active in developing these early administrative relationships. Mr. Meadows transferred to Harvard with Dr. Berry when the latter went as dean of the Harvard Medical School. Mr. Thompson, now senior vice president and treasurer of the University, remained, and through his experience with the Atomic Energy Project and later with the National Institutes of Health, the National Science Foundation, and others, was appointed director of the University Office of Research Administration, a position subsequently held by Mr. David McBride. This office has facilitated the relationships between investigators throughout the University and the federal agencies and has relieved the Medical Center of the need to enlarge its administrative staff for this purpose. What administrative needs remained within the Medical Center in this regard were distributed among individual investigators and the general administrative staff of the Medical Center.

One other agency, the Veterans' Administration, is worthy of special mention. For many years there has functioned a dean's committee for two of the VA hospitals in the region, Canandaigua and Batavia. More recently the VA hospital at Bath has been included. Though distance has placed limitations on the relationships that have been possible, faculty members have provided consultation and aided in the educational programs of the hospitals; Canandaigua and Batavia, more than Bath, have provided experience for students and residents.

The federal government's involvement in health care planning and delivery, which became prominent in the latter half of the sixties, brought with it the need to evolve additional administrative mechanisms to handle the wide variety of programs initiated. In several instances programs were developed and administered through departments and under the authority and responsibility of department heads. Examples of this include the Migrant Laborer Health Program and the neighborhood health center under Dr. Haggerty, in the Department of Pediatrics; the Regional Medical Program under the guidance of Dr. Lawrence Young, even though the program was not specifically in the Department of Medicine: the development of the Community Mental Health Center under the direction of Dr. John Romano, in the Department of Psychiatry; and the Community Minority Health Program under Dr. Robert Berg, in the Department of Preventive Medicine and Community Health. In these efforts the policy of the Medical Center has been to lend its support and assistance to the exploration and development of community service programs, and the Medical Center has gained opportunities for education of faculty, house staff, and students from these experiences. Further, the policy of the Medical Center has been to turn the responsibility for the continuing operation over to the community once the program has been tested and firmly established. Only the programs that have been developed as a part of Strong Memorial Hospital have been retained by the Medical Center.

By 1970 these and the many other extramural programs had become so numerous that Dr. Ernest Saward was appointed associate dean for extramural affairs, to discharge the administrative responsibility and to maintain communication between the Medical Center and these extramural activities. Mr. George Rumsey, associate director of the Medical Center, has been assigned the responsibility of acting as a contract officer for any contracts which include patient care, whether national, state, or local, but which are not directly a part of the Hospital.

#### State Agencies

The government of New York State acted much like the federal government in encouraging the establishment of programs in health care delivery, for example, drug abuse, mental retardation, and muscular dystrophy. In addition, it has requested professional consultation to such state agencies as the courts and men-

tal hospitals. Many of the administrative responsibilities added to the Medical Center by these programs have been discharged by the relevant department chairmen. As indicated previously, however, Dr. Saward and Mr. Rumsey have supplied administrative support and coordination for many of these efforts.

During the 1960s New York State, through the office of the governor, the state department of education, the state department of health, as well as the legislature, increased its interest and involvement in medical education. With the aim of increasing the production of physicians by the private medical schools in New York, thereby diminishing the need for building more state medical schools, the state government made available to the private schools capitation and construction funds in return for enlargement of class size. Since then, all parts of the state government related to medical education have shown a growing interest in medical school programs. These activities by the state government and the many problems of relating the private medical schools to governmental agencies have led to a natural community of interest among these schools, which has been formalized by the formation of the Associated Medical Schools of New York and New Jersey in 1967. The office of the dean of the Medical School has been intimately involved in this organization since its inception, and it has been a valuable aid in maintaining relationships with the state government and avoiding some of the restrictive legislation that has from time to time been proposed.

### **County** Agencies

The major administrative relationship with the Monroe County government has focused principally on the professional responsibility which the Medical School and the University accepted for the care of patients at Monroe Community Hospital. Most of these activities, as previously described, are discharged by the medical director of the Monroe Community Hospital, with the support of the office of the dean as necessary.

#### City Agencies

Administrative relationships with the city government since its relinquishment of Rochester Municipal Hospital have been limited principally to the School Health Program in the Department of Pediatrics, where the administrative responsibility has been delegated.

# Monroe County Medical Society

The relationships between the Monroe County Medical Society and the Medical Center have been and are amicable, and characterized by considerable understanding of each for the other. Many of the faculty of the School have contributed to the society as officers and by service on its committees. Since the mid-50s a liaison committee composed of members of the society and faculty and administrators of the School has met regularly to consult on common problems and discuss and resolve differences. More recently, a formal representative of Strong Memorial Hospital is a member of the Board of Governors of the society. With these many points of contact and interest the relationship has been to the benefit of both and to the community of which both are a part. The relationships between the Medical Center and the district branch of the state medical society have been much less formal, but have been maintained by faculty participation in its organization. In recent years a representative of the Medical Center has, upon invitation, been sitting in the assembly of the state medical society.

#### Regional Programs

The Medical Center, through the activities of its professional and administrative staffs, has demonstrated for many years its interest in and responsibility to the medical activities of the region.

Planning and cooperation among medical institutions, professional groups, and community agencies has been a feature of the Genesee region since the 1930s. Dr. Nathaniel Faxon, first director of Strong Memorial Hospital, played a prominent role in the establishment of Blue Cross in Rochester and his successor, Dr. Basil MacLean, was active in its development. Also during the thirties, explorations and discussions were begun by Dr. Albert Snoke (assistant director) and others, which later led to the establishment of the Rochester Regional Hospital Council to provide an administrative mechanism through which hospitals could cooperate to improve hospital operations and provide opportunities for the continuing education of physicians on their staffs. The Commonwealth Fund recognized the potential value of this activity and provided support to strengthen and expand its programs. Throughout the years, administrative staff of the Medical Center, and especially those responsible for the operation of

Strong Memorial Hospital, have played important roles as advisors and directors of the organization. With the establishment of the Patient Care Planning Council in 1960, Rochester again demonstrated its unusual characteristic as a cooperative community. When the federal government later established local planning agencies, the council, with modifications, became the Monroe County Health Planning Council and then, by modification and extension, the Genesee Regional Health Planning Council. Through all these transitions and the accompanying activities, members of both staff and administration of the Medical Center played important roles through participation on boards, councils, and committees of the organization.

When the federal government established the regional medical programs, the Medical Center and the University, largely through the urging of the Monroe County Medical Society, accepted the responsibility for establishing and developing the Rochester Regional Medical Program (RRMP). The history of the RRMP has been fraught with changing guidelines, uncertain and rapidly altered direction, and greatly varying philosophical and fiscal support. In spite of these discouraging aspects, the University has continued to act as the responsible agency for the program. Dr. Saward, as associate dean for extramural affairs, has been delegated the responsibility for guiding and monitoring the University's relationship to the RRMP. Though the future of RRMP is uncertain at this time, it seems likely that its activities will continue under some aegis and that the University, through its Medical Center, will continue to have an interest in and contribute to its activities.

The Medical Center recognized that problems of health care delivery were important concerns in several parts of the Genesee region and proceeded to study the ways in which it might contribute most effectively toward the solution of those problems. It was clear that the Medical Center could not accept a significantly greater responsibility for direct delivery of care than it already had in the programs of Strong Memorial Hospital and the many community projects. Thus, it was decided to focus effort on the identification of need for and education of allied health personnel. Through the Manpower Committee of the Genesee Region Health Planning Council, the Genesee Region Educational Alliance for Health Personnel was established, with a voluntary membership of many of the education and health care delivery

institutions and agencies in the region. The alliance is establishing itself as an organization to study the needs of allied health manpower, to coordinate present educational programs, and to encourage the development of new programs as they are needed. Through participation in this organization, the Medical Center contributes to the process of change and improvement of health care in the region.

# Professional Administrative Organizations

Throughout the existence of the School, the relationships between the administrative staff and such organizations as the Association of American Medical Colleges, the American Medical Association, and the American Hospital Association have been relatively small. Notable exceptions have been Dr. Faxon's presidency of the American Hospital Association, Dean Anderson's presidency of the Association of American Medical Colleges, and Dr. Saward's acting chairmanship of the Health Insurance Benefit Advisory Council and his chairmanship of the Professional Services Review Organization, committees established by the federal government.

# CONSTRUCTION ACTIVITY—

# UNIVERSITY OF ROCHESTER MEDICAL CENTER

After a lull of almost twenty years following the completion of the original Medical Center, there has been a steady flow of construction. Many of these additions such as Q Wing, Wing R, W Wing, the Atomic Energy Project, and the building for ambulatory care and rehabilitation (U Wing) have been documented in previous historical reports. In the last ten years, however, there has been an increase of 250 percent in the net square feet in the Medical Center. The story of this construction activity demands a report.

In the mid-1950s Dean Donald G. Anderson initiated a study of the need for additional facilities in the Medical Center. The result was documentation of the need for space to house a larger student body, new teaching programs, expanded research, and modern patient care. From both the community and the federal government came increasing demands for the expansion of programs in all of these areas. Funds for the expansion were made available through a community hospital drive, a University capital campaign, from federal grants for the expansion of medical

research and education, and from foundations and numerous private gifts. Yet, in spite of these many resources, the need exceeded the available funds and a bond issue from the New York State Dormitory Authority was also required.

Early in the consideration of additional construction it was decided that every effort should be made to maintain the geographic integrity of the Medical Center; that is, to see that all of the new facilities for teaching, research, and patient care were connected at all possible sites and levels with the existing complex.

Several preliminary studies were undertaken in the late fifties. A planning firm, Wood and Tower, proposed that the expansion take place by widening the existing wings and utilizing the courtvard spaces. While this proposal retained much of the compactness of the Medical Center, the new construction would have caused major disruption and even complete cessation of some of the activities of the Medical Center and resulted in a very high construction expense. Further planning explored the possibility of building new hospital facilities to the northwest of the Medical Center near the intersections of Lattimore Road and Elmwood Avenue behind Wing R and on the site of the old playing field for student-faculty baseball games. A survey of architectural firms resulted in Ellerbe Architects, of St. Paul, Minnesota, being retained by the University for the planning and design of the new facilities. Ellerbe, a firm with both architectural and engineering capabilities, had been involved in the planning and construction of several new medical centers, including the University of Kentucky at Lexington and the University of Florida at Gainesville. At this time the city of Rochester decided to give up Rochester Municipal Hospital and the University bought it and the land to the east, which had originally been transferred to the city when the Municipal Hospital was built in the mid-1920s. The acquisition of this structure and this land made it possible to consider new hospital construction to the east of the Medical Center.

Planning proceeded at a rapid rate with the decision to build a major educational, research, and animal facility on the site of the old animal house, but extending beyond it both to the north and west and as close as possible to the River Campus colleges. As a second stage in construction, it was planned to replace the clinical facilities except for Wing R of Strong Memorial Hospital to the east.

The old animal house, the first building constructed at the Medical Center, was torn down in 1965 to make room for the extension northward of G Wing (GG Wing) to house research and animal-care facilities. At the same time, a westward extension from O Wing (OO Wing) was under construction to provide additional space for the Department of Radiation Biology and Biophysics by connecting O Wing to GG Wing (the G Wing extension). This construction was planned in the late fifties in response to rapidly growing research activity stimulated by funds from the federal government. Sophisticated research laboratories and animal facilities were planned and built. The laboratories were fully utilized almost immediately even though federal funds were much less readily available by the time the building was completed. This immediate use reflected the serious crowding that had occurred in the Medical Center over the preceding years. The animal facilities were not fully required for animal care when the building was completed and many rooms were assigned as laboratories to provide space needed beyond that provided by the laboratory portion of the building. It is planned to reassign this space as it becomes needed for animal care and as space for laboratories is available in the old hospital following the opening of the new. But now it seems probable that it will be several years before the need will be that great and that other laboratory space will be available.

In 1966, the large addition for education and research, the S Wing, was built onto the west side of GG Wing, facing to the west, but with its access from Elmwood Avenue. Planning of this large structure occurred, as did the GG Wing and OO Wing, at a time when there was great commitment and support for medical research and basic science education of medical students. As in the GG and OO wings, the space for faculty offices and laboratories was quickly filled, including space for transfer of the Center for Brain Research from the River Campus, though parts of three floors were left unfinished. The two floors of multidisciplinary laboratories and the two lecture halls for medical and graduate students provided excellent facilities for the teaching of basic science disciplines. But as the emphasis on sophisticated laboratory instruction has waned, there was not a need for the space planned for the most complex of laboratory equipment. Subsequently, however, increase in class size and especially the growth of classes in nursing makes it necessary to

seek means of using this space effectively for other educational purposes. Space we now need for programs is quite different from those for which it was planned. Completion of these structures provided exceptional facilities for basic science research and education, for expansion of the basic science departments, and to a lesser extent for the laboratory research of the clinical departments.

The original plans for building the new hospital consisted of two stages: the initial stage, with operating rooms, radiology, and other supporting services and a few beds, to be followed by a second stage, containing the principal inpatient and ambulatory care facilities. It became evident that such staging would involve both serious delay and a very difficult period of two operations split between the new and old facilities. Therefore, the University, with the encouragement of the trustees, especially that of Mr. Marion Folsom and Mr. Joseph Wilson, made the decision to proceed with the construction of the entire hospital as rapidly as possible.

As a first step in preparation for the new Strong Memorial Hospital, an addition to Wing R, Wing R North, was planned and constructed. These new facilities made possible the transfer of psychiatric inpatients from Y-2 and thereby removed them from what would become a major communicating wing between the old and new hospital. In addition, Wing R North provided an increase of 25 inpatient beds in anticipation of the increase in size of the Medical School classes. Further, as support for the federal government's plan to establish community mental health centers, the basement and ground floors of Wing R North were planned to house this program and thereby more closely bind the needs of the community with the provision of care in the Medical Center.

Further preparation for the new hospital included removal of the tennis courts from in front of the Staff House and construction of new courts elsewhere. The Staff House itself was partially razed by removal of its wings, including the Staff House lounge. Ground was broken for the foundation of the new hospital in 1969. During the succeeding year, excavation of the basement and pouring of foundations, basement walls, and the floor of the ground level were completed by the contractor, Conforti & Eisele, while the architects (Ellerbe and Company) completed the final drawings of the remainder of the structure.

With the completion of the foundations, bids were invited for the remainder of the building. The bid period, however, was concurrent with an extended strike in the Rochester construction trades and return of bids was delayed for several months. When they were received they were substantially higher than estimated and beyond the resources available. Therefore, all bids had to be rejected and a period of detailed reconsideration of the entire plans followed. With some reduction in the size of the new hospital and some redesign, especially of mechanical systems, a contract of manageable size was negotiated with Huber, Hunt and Nichols, General Contractors (Indianapolis) and awarded in May 1971.

The planning, constructing, equipping, moving, and development of programs to make these major construction projects fully productive has had a considerable impact on the Medical Center administration over the past ten years. It has been necessary to develop additional staff in engineering and in planning. In spite of the great contributions made by these staff, it needs to be noted that the medical faculty played a major role in the planning and implementation of these building programs. Numerous faculty study groups developed the basic programs from which the architect planned the new structures. Thus, the decision to build multidisciplinary laboratories for education, the central design for the new inpatient facilities, and many of the other features of the new buildings were the result of planning by the medical faculty. A series of committees for each of the buildings worked closely with the architects until the final plans were determined, and planning committees and steering committees continued their work through the development of all the projects. While this has required untold hours of faculty administrative effort, it has brought to the new facilities the most realistic concepts for their actual use. The planning effort has been one of the features over the last decade that has drawn together faculty from many departments. Leadership has come from throughout the faculty, although special note should be taken of Dean Anderson's initiative and perseverance in beginning, organizing, and sustaining the planning effort. Dr. Frank McKee, associate dean, Dr. Leonard Fenninger, medical director, and Dr. Herbert Morgan, professor of microbiology, have all played major roles in the building project.

In summary, the work required over the last ten years has

been carried out in substantial part through the efforts of staff, faculty, and administrators working together. The result has been a drawing together of all involved and a commitment of time and effort beyond their usual duties and responsibilities.

#### SUMMARY AND PROJECTIONS

From its conception the Medical Center has functioned as a unit to accomplish its goals of education, research, and the care of patients. The Medical Center has also been developed as an integral part of the University. The administrative structure of the Center has been consistent with these goals and has had only infrequent and limited modifications. There is good evidence that administration has been viewed usually as a means to an end and not as an end in itself.

To insure the functional unity with the University, the Board of Trustees of the University has served as the board for the Medical Center, including the Hospital. The administrative officers of the Medical Center have reported to the trustees through the chief executive officer of the University; and the chief executive officer of the University has chaired the Advisory Board, the executive faculty group of the Medical Center. Integration within the Medical Center has been attained by having the dean of the School of Medicine and Dentistry also carry the executive responsibility as director of the whole Medical Center. Thus, the medical director of the Hospital reports to the director, and the dean of nursing, who also carries the responsibility as director of nursing service, reports to the director of the Medical Center as well as to the chief executive officer of the University. With the Medical Center's growth and complexity and with the increased extramural responsibilities and greater impact of extramural agencies. the administrative organization has required expansion and modification. Wherever possible, new or modified administrative responsibilities have been assigned to departmental chairmen, for the departmental organization of the School by disciplines is the primary administrative organization. The need to respond effectively to outside agencies with special interests in specific diseases has led to the establishment of interdepartmental units, divisions, and programs either with administrative leadership under a particular department or with a direct relationship to the office of the dean. The need for closer contact with community and governmental agencies at all levels has been met by

creating an associate deanship for extramural affairs. But in spite of this growth, the original concept has always been followed: administration should serve to expedite the functions of the Medical Center and respond flexibly to needs as they arise.

The future of the administrative organization of the Medical Center is impossible to predict with any accuracy. It seems probable that the Medical Center will be under increasing surveillance from many agencies in the society and subject to greater control from external sources. If this is true, there will inevitably follow a growth in the numbers of administrative staff and the complexity of administrative structure. For no matter how sincerely one strives for administrative simplicity, a greater number and complexity of relationships require more administrative time and greater numbers of personnel. This in turn increases the complexity of communication and the time involved in discharging responsibilities. It seems probable that medical centers will be looked upon even more in the future as having broad regional responsibilities and these added responsibilities will demand added administrative capacities to respond. Even though administration continues in the future to follow function, it will grow in size and complexity as function becomes larger and more intricate. Short of catastrophic reduction in the support and function of the medical centers in this country, administrative organization is going to become increasingly complex.

# World War II

# 13.

# The Years of War



# Gordon M. Meade, M.D.

Gordon M. Meade is special assistant to the dean for development; executive secretary, Medical Center Alumni Association; and clinical associate professor of medicine. He received his B.A. (1928) and M.D. (1935) from Rochester. His medical studies were interrupted by one year as a student fellow in pathology and one "curing" for tuberculosis at Trudeau Sanatorium. An internship in medicine at Strong Memorial Hospital followed graduation; then came another eighteen months of tuberculosis "curing," again at Trudeau. After returning to Rochester, he served five years as assistant director of Strong Memorial Hospital, under Dr. Basil MacLean.

In 1943 he returned to the Department of Medicine on special assignment to the student health service to study the problem of tuberculosis incidence in medical students—an average of twelve percent of each class were developing the disease. After three years of quarterly tuberculin testing and chest xraying of all students, it became clear the infections were occurring in the autopsy rooms. From then on participation by students in tuberculosis autopsies was forbidden and a program of BCG vaccination instituted. With these actions the epidemic stopped abruptly.

From 1947 to 1955 Dr. Meade was at Trudeau Sanatorium as associate medical director and medical director. When that institution closed following the discovery of effective antituberculosis drugs, he became clinical director for the ten hospitals of the United Mine Workers Welfare Fund in Appalachia, serving in that capacity until 1963. The next eight years were spent as medical director of the American Thoracic Society in New York. Retirement in 1971 from that position brought him back to Rochester to his present duties.

An early interest in natural history led Dr. Meade to the study of medicine. Ornithology has remained a lifelong hobby and has taken him to almost every state to gather a lifetime list of 613 United States bird species.

#### THE PLUNGE

THERE was a trace of snow in the air of the gray, just-belowfreezing morning, but by noon the skies cleared to let through a desultory sun. Early after Sunday dinner on that December 7 the resident staff, relaxing, snoozing, playing cards and listening to the New York Philharmonic concert on the radio in the Staff House lounge, were brought to stunned alert by the interruption of a special bulletin: "This morning at about 7:45 A.M. (1:15 P.M. EST) Japanese war planes attacked Pearl Harbor."

Within moments the Medical Center buzzed and boiled with rumor and speculation, which continued through the afternoon in Staff House rooms, patient floors, and laboratories. The tempo of rumor and talk increased as house staff personnel took their places at the white linen-covered tables in the dining room, where student waitresses served them dinner. It was still a time of gracious amenities—a linened table, personal service, and leisure for conversation. But from that afternoon on these comforts were fated to be casualties of war, never to return; their going was to become symbolic of the disruption of a way of life.

To Hermann Rahn, a young assistant in physiology—working quietly with frogs on an endocrinological problem—the suggestion was made on December 8 by his chief, Dr. Wallace Fenn, that it would now be possible for Rahn to do some research useful to the prosecution of the war. Within 24 hours Rahn's entire life effort shifted from performing low-key, shoestring-financed, basic, unapplied research on lower animals to involvement with high-pressure, abundantly government-financed, immediate and goal-directed research using man as the experimental ani-

#### World War II — Meade

mal. This turnabout proved symbolic of the changes the advent of war made in the lives of most research scientists—changes which grew steadily in accent and which have never been entirely reversed.

# THE COMING SHADOWS

The plunge into war on December 7, 1941, while as shocking as an ice-water bath, had been casting premonitory shadows for many months.

The reality of war in Europe and its effects on civilian life was brought forcibly home to the Medical Center on August 24, 1940. On that day, on a railroad siding in the Goodman Street vards of the New York Central Railroad, 42 children, ages 5 to 14, reached the end of a long and frightening journey from their homes in England. They were the children of employees of Kodak in Britain and had been sent to be the guests of Kodak families here when the Battle of Britain (August 8-mid-September, 1940) was devastating England's cities. As these solemn and apprehensive youngsters arrived at Helen Wood Hall, they were welcomed by an eager group of members of the Aide Services, and Hospital and nursing personnel. At their first breakfast in the student cafeteria some children were baffled by how to eat such unfamiliar food as bananas, which apparently they'd never seen. While waiting for arrangements for their placement to be completed, they were housed in Helen Wood Hall, but spent much of each day at the Harley School. By September 1 all children had gone to their foster families to stay until the end of the war. Some of them remained here permanently, some later returned to go to school and, to the best of our knowledge, a few have made their lives here.

By September 1940 some medical and nursing graduates and former resident staff were already in the European theater of war in such units as the American Hospital in Britain. From one of them, Dr. Norman Egel (Rochester, 1935), came letters vividly describing the awesome bombing of London during the Battle of Britain, as he saw from rooftops of the city.

In November 1940 the Strong Memorial Hospital nursing staff gave twenty volunteers a Red Cross course, Home Hygiene and Care of the Sick, with the express understanding that the students "would be willing to help the Nursing Service in case of a national emergency."

In that same month 10 Hospital aides assisted a special registration board, set up in the Hospital lobby, to register 413 staff and faculty eligible for the Selective Service draft. The University adopted a policy on benefits and re-employment for its employees who might be called to duty in the National Guard or by the Selective Service.

In March 1941 the first On Active Duty with the Armed Forces list appeared in the Hospital Bulletin—the nine names included one physician. Donations of \$1,750 from staff and personnel purchased an ambulance which was sent to the British-American Ambulance Corps.

By November 1941 our dietitians were teaching evening classes in nutrition under a program of "Training for Defense of Home and Community."

#### A SHORTAGE OF SHORTAGES

The thought of war conjures up pictures of deprivation and hardship from shortages of food, material, and other necessities. Undoubtedly, there were serious shortages in many sectors of our society during World War II. Apparent to all was the universal rationing of gasoline and food. But within the Medical Center the problem of shortages was apparently relatively minor. Repeated probing for memory of short supplies has evoked little.

Beginning in April 1943, certain food items—such as meat, butter, cheese, shortening, cooking oil and miscellaneous, less used but strategic products—were placed under control of a federal rationing plan. The dietary department received an allotment of ration points which provided for all employees and patients on a basis of equity with the population at large. To conserve ration points such economies as a meatless day each week and reduction of the quantity of butter served were instituted.

The bookkeeping of ration points (0.6 points per person per meal for processed foods) was simplified by establishment of a ration-point account in the Lincoln-Alliance Bank. The rationing board allotments were deposited in the account and then withdrawals were made by a request similar to a check. Ration points were spent for rationed processed foods as they became available on the market and for items for special diets. Ration pointfree fresh fruits and vegetables were used to fill out the menus, which remained generally variable and adequate. There were some substitutions, but they were not unpalatable or irksome.

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More than 100 members of staff and faculty supplemented their personal food supplies by planting  $2\frac{1}{2}$  acres of victory gardens in fields just north of the present Graduate Living Center and on the grounds of the old Ellwanger & Barry nursery back of the present University president's home on Mt. Hope Avenue. In their enthusiasm the inexperienced gardeners planted dozens of tomato plants and became engulfed, like the Sorcerer's Apprentice did in water, with the ruby flood of "Love Apples" they ate, they canned, they gave and they threw away.

Staff members who remained here through the war recall very little of any shortages in medications and equipment. Dr. Earle Mahoney remembers that white cotton suture material had to be substituted for regular sutures because there was no silk and only a limited amount of catgut. Visualizing the cotton proved difficult so it was dyed black. This seemed to be satisfactory until, a few months after surgery, patients began to develop small granulomatous nodules around suture residuals. Investigation disclosed the black dye was the offender; a return to white cotton solved the problem.

Penicillin was just becoming available as the war began and would have been scarce in any event. The military had first claim on the production. The small amount allotted to civilian use was rigidly controlled and allocated by a national controller, Dr. Chester Keefer, of Boston. No penicillin could be obtained without his approval. He, in turn, depended on the recommendations of local arbiters. Here, Dr. Howard B. Slavin, with a joint appointment in medicine and bacteriology, considered all requests for penicillin and passed his recommendations to Dr. Keefer. This involved some wrenching, soul-searching decisions.

Understandably, quinine was in short supply due to the need of the armed services for the basic materials for antimalarials.

There was a chronic shortage of bed linens on the floors, not because of an actual lack but due to the fact that the laundry the Hospital had its own—was shorthanded and operating with many inexperienced and temporary hands.

In those days the present plethora of plastic and other types of disposables had not yet been conceived. Syringes were made of glass and were constantly cleaned, sterilized, and used again and again. So it was with much of what we now use once and throw away. The Central Supply Service had become a very vital and essential part of the Hospital's and School's operations. Be-

sides preparing glassware and instruments for reuse, they sharpened needles (some senior staff kept their own supply of needles and sharpened them themselves), made all intravenous fluids, and prepared and sterilized surgical dressings. So the pressure of replacements was nowhere nearly as great as it would be today. Nonetheless, there was an ongoing, continuous emphasis on being careful to avoid breakage, to repair, to find substitutes -patient's bedside paper bags were made of folded newspapers and volunteers repeatedly mended the tears and holes in surgical gloves-to find ways of doing without this and that. In July 1942 a Conservation Committee was formed with members from various Hospital departments to find ways to effect savings to meet the problems of wartime shortages. The result was that there were no shortages of such severity that they seriously curtailed operations or left lasting impressions. The only shortage of magnitude was in hands, minds and talent as the war drained off employees, staff and faculty. But even this was met.

# FILLING THE BREACH

Even before December 7, 1941, the buildup of the armed forces, the lure of higher wages in burgeoning, war-preparation industries was drawing away employees and making the securing of replacements increasingly difficult. The tempo and degree of this drainage increased quickly and markedly with the declaration of war. Manpower was the great shortage but the lack was overcome in varied ways.

Mrs. Clara Stimson, the one-woman personnel department of those days, vividly recalls going every morning to Front Street—Rochester's skid row, where the Genesee Crossroads Plaza is now—to recruit its denizens for work by the day for cleaning, laundry, kitchen work, etc. They came with good intentions and a desire to help but their stamina was short lived. They loved Mrs. Stimson because she paid them at the end of the day and they could then return to the flophouses and cheap wine in some affluence. By no means an ideal way to run a railroad, but there was no choice; it was a matter of getting bodies and hands as best one could.

In the service departments prison parolees were put to work. By special dispensation permission was obtained to hire high school students as young as 14 who acted as orderlies—transport-

#### World War II — Meade

ing patients, delivering bed pans. Medical students were paid to work at such tasks as washing dishes.

From an unusual source came some of the most reliable and competent wartime help. To assist as farm hands a group of Jamaicans was brought into western New York. After a time it was the Hospital's good fortune to secure about a score of them for work as orderlies, kitchen help, and the like. They proved to be delightful people of melodic speech, courtly courtesy, and reliable work habits. They were housed in St. Joseph's House of Hospitality, on South Avenue. During the winter, when the time came to leave for work, they watched intently for the bus to appear, and would then rush out in a body to get aboard without having to wait outdoors in our "polar" climate. On one occasion a staff member was consoling one of them, who was operating the elevator, by explaining that this was a very unusual winterthe worst for 30 years. "It won't be nearly so severe after the war -we seem to have extremely cold winters whenever there's a great war." In astonishment and disbelief came the response, in a delightful Oxonian accent, "But, Madame, you don't mean to say that anyone will stay here after the war!" But some of them did and one of them, Ivan Rudlass, is still here in the kitchen and will soon retire. They were of inestimable help.

Among the regular, steady employees there was a deep sense of responsibility and extraordinary morale. One late afternoon an older housekeeping employee, with tired, swollen legs, was heading for home when someone in the elevator remarked how glad she must be that she could put her feet up and rest that evening. She replied, "Oh, but I can't. I'm coming back tonight. If I don't there'll be nobody to look after my people (the patients on her floor)." At times of necessity top-level executives and department heads jumped in to push food trucks and perform similar jobs to keep the institution running.

Despite these "make-dos," operation would still have been well-nigh impossible had it not been for the host of volunteers who came in from all walks and levels of life in the community to help. There had been a volunteer service before the war—from 1927—which began with providing library services, then expanded to make surgical dressings and supplies, to help in the clinics as receptionists, secretaries, and clerks, to provide recreational craft services, and to beautify the Hospital with plants and vines. With the advent of the war, many new duties were

undertaken and the numbers of volunteers vastly increased. Seven hundred fifty volunteers gave over 30,000 hours of service during a single year. One hundred fifty of these were Red Cross nurses' aides trained by nursing staff to do bedside nursing. Seventy-five were professionals and businessmen recruited by the University Alumni Association, the Junior Chamber of Commerce, and friend by friend. There were over 30 groups that met in churches and homes to make dressings and such.

Wherever one went in the Hospital, and at all hours, these unselfish and dedicated people could be seen delivering flowers, helping at the information desk, running the elevators, working in the division kitchens, blood bank, post office, and dietary department, making beds, giving baths and back rubs to patients, taking temperatures, passing bedpans, keeping division stocks in order, as well as a host of other chores supportive of nursing, dietary, and other undermanned services. Of course, for those duties concerned with patient care, volunteers were first given a course of instruction and continuing supervision as they worked by the nursing staff.

A warm and close esprit de corps developed as these generous people worked with each other and with Hospital personnel. A feeling of being one big family with a common objective became strong. Some gained such satisfaction that they continued as volunteers after the war.

In talking now with those who were here during the war years, the repeated message is—without those wonderful volunteers, the wheels would have ground to a halt.

# IN CASE OF EMERGENCY

While the possibility of actual invasion or air raids was really remote, the mood of concern was such that there was a compulsion to prepare for such an eventuality. During the first year of the war, this apprehension had its most concrete expression when, under directions from the Office of Civil Defense, practice blackouts (dark window shades and most lights out), tin hats, sand buckets, and dummy casualties became part of the every day (and night) scene. The present author can recall personally preparing gruesome-looking wounds with putty, graphite dust, rouge sticks, and ketchup on nurses and medical students who acted as the "casualties" in air raid drills held at various points of the city. The staging of these holocausts was elaborate, from

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the placing of the alert, through evacuation of the victims, to their reception and treatment in emergency departments. Employees and staff staged drills for evacuation of patients.

In March 1942, to ensure their safety, the most valuable volumes of the Mulligan History of Medicine Collection and the Miner Yellow Fever Collection were transferred from the Medical Library to the vaults in Rush Rhees Library on River Campus for the duration.

Elaborate emergency kits were prepared and stocked—in an extreme disaster they would have enabled a laparotomy to be performed in the middle of Main Street. The fixation on the idea of the bombing of the city was strongly abetted by the feeling that manufactories vital to the war, such as Bausch & Lomb, Kodak, and several others, were a natural target for the enemy, not only through aerial bombing but by internal explosive sabotage. Fortunately, none of this came to pass. The Hospital administration was startled to learn later on that there existed a plan to evacuate all patients to the Clifton Springs Sanitarium in case of need.

Miss Grace Reid, at that time an associate director of the School of Nursing, recalls that when the signal came for a blackout practice, it was her duty to empty Helen Wood Hall and send all the girls into the Hospital while she stayed behind, presumably to guard the premises against prowlers. She always wondered why the girls would be any safer in the Hospital during an air raid than they would be in Helen Wood Hall.

As time went on and the nature of the conflict became clearer, such plans began to seem rather ludicrous and gradually were modified or honored in the breach.

# STUDENTS OUT OF MUFTI

War soon profoundly affected the life of the medical student. In July 1942 Rochester, in common with other medical schools, went on an accelerated program of nine-month academic years with two-week vacations between them. Under this system the last accelerated class entered in September 1944, the last summer session was in 1945, with the first regular postwar class entering in September 1945. Thus in the six years between 1942 and 1948 there were seven graduating classes.

When this new program began, all students who could qualify were commissioned either as second lieutenants MA-AUS or en-
signs H-V(P), USNR, but continued their studies on inactive duty status.

Then in June 1943 at a student assembly they were told of the opportunity to join either the Army Specialized Training Program (ASTP) or the United States Naval Training Unit (V-12) Program. The response to the question, "Who wants to join?" was an enthusiastic rising of all but one, who stuck to his conscientious objections through the rest of his education.

The second lieutenants resigned their commissions, to then be inducted as privates in the ASTP at Fort Dix before returning to Rochester. The ensigns resigned their commissions and were sworn in on the River Campus as apprentice seamen (V-12)S. Our eligible students were about equally divided between the two programs. There were also a number of women students and 4-F (physically disqualified) males not embraced in these programs.

Most students welcomed the opportunity to thus participate in the war effort. Psychologically, it gave a feeling of truly belonging to the nation's drive for victory, and it relieved the embarrassment many suffered from the thoughtless, who, on seeing students out of uniform, chastised them verbally in public places. Dr. Alvin Ureles, now chief of medicine at Genesee Hospital, relates how, when busing from his home to school, he would carry his Gray's *Anatomy* so the title was obviously displayed. Dr. Ralph Prince, now an internist in Rochester, recalls how he was tongue-lashed in Sibley's by a woman as being a slacker. To these, and others, the wearing of a uniform came as a welcome relief; now they could move around in the community without stigma.

And there came a pleasurable and welcome affluence as the government paid tuition, provided medical equipment, textbooks, uniforms, and a munificent base pay of \$2.75 per day plus dependents' allotment. These were the days when Spiegel's, the bar and grill on Mt. Hope Avenue where the shopping plaza now stands, flourished as a popular student hofbrauhaus.

However, there was an attempt at military control and discipline, albeit rather loose in accomplishment. Uniforms were required at all times except when working with patients; many simply wore white coats over their "issue" shirts and trousers. Tuesday and Thursday afternoons Army trainees drilled in the

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field in back of the athletic building, or attended orientation classes. Navy trainees had swimming exercises Tuesdays and drilled on Thursdays on the River Campus. Survivors of those rigors recall that they were dreadful at drilling, and the despair of their regular service officers. They (the ASTPs) were so sloppy at drill that the colonel in charge appointed as the drill sergeant a medical student who had attended a military school—"We were a bunch of slobs compared to the V-12 boys." Several times they were called upon to represent "the military" by marching in downtown parades. To leave the city for any period required a written pass from faculty member Dr. George Berry, professor of bacteriology and associate dean, who kept liaison between the School and the service programs. He soon learned where the favorite girlfriends and fiancees lived. The newfound prosperity plus the emotional pressures of wartime began to break down the School's traditional opposition to marriage of medical students. Some students were housed with their families in Quonset huts erected where the visitors' parking lot is presently located.

Dr. Anthony Izzo, now associate medical director of Monroe Community Hospital, recalls that for some behavioral infraction he was assigned to wash Hospital windows on a floor where he had patient assignments. Great was his dismay and his patient's puzzlement when the doctor of that morning appeared that afternoon as a window washer!

The qualifications for admission to the School remained unchanged. There were interviews and reviews by the Admissions Committee, which worked closely with an Army and Navy committee on student selection on which our School was represented.

Many students, despite their pride and enthusiasm in being part of a national effort of cooperation and dedication, feel in looking back that this was a very disruptive time in their lives, full of uncertainty and anxiety about the future. The atmosphere was one of euphoria—"Let's live it up; tomorrow we'll be sweating it out in a battalion aid station." The time was not conducive to serious scholarship. On the other hand, they agree that because of the shortages of faculty and staff, they were given much more responsibility for patient care, were treated as mature individuals, and learned more of actual practice as a result than they would have in peacetime. Third-year students were often the first and only assistant on major surgery; clinical clerks

learned practicalities by making patients' beds, changing dressings, and being on call at night.

As the classes came off the educational belt line they received commissions as first lieutenants MC-AUS or lieutenants (j.g.), MC-V(G), USNR, and then went directly into nine-month internships on inactive status, then assignment to active duty.

An unusual international cooperative effort in medical education, under the sponsorship of the Rockefeller Foundation, took place during the war. Because of the bombing of their hospitals and schools, arrangements were made for English medical students to complete their education in certain American schools. To Rochester there came four very competent and popular ones— James Sharp, George Mavor, Jeffrey Morris, and Kenneth Holt who graduated with the classes of March 1943, December 1943, June 1945, and March 1947, respectively. Mavor returned to take postgraduate surgical training here.

When the war officially ended, in July 1947, some 900 students had graduated since 1929. Of these, 438 served as medical officers in the armed forces—150 of them in the ASTP and V-12 programs. Three of our alumni died in service in the Pacific theater in 1944—Gordon K. Lambert, '35, Robert Douglas McKenzie, '35, and Joseph A. Morton, '42.

# MEDICAL FACULTY AND STAFF

By 1941 the original resident staff roster of 37 had grown to 70. Under Selective Service rules this shrank to 50. The periods of training for men in the specialties were shortened and there was telescoping into a rigid speedup system to produce as many doctors as possible in the shortest time—from 1942 to 1946 there was a continuous round of hurry. In surgery, for example, two general surgical residents were turned out every year, surgical specialty residents were reduced in numbers, and as many residents as possible were pushed through on nine-month shifts so the entire surgical training came down to 27 months instead of five years.

In general surgery the full-time senior staff was reduced to 4, although all subspecialty chiefs remained but one. Senior staff were on call for emergencies every other night and weekend. They had essentially no vacations or holidays, made rounds three times a day, and often returned at night. Dr. Earle Mahoney recalls holding noon surgical clinic on Memorial Day and teaching

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rounds on the Fourth of July. They often started the IVs on their patients themselves. The load was heavy and everyone was chronically tired. At times the only assistant in major surgery would be a third-year medical student. Students enjoyed and profited from the greater responsibility; yet, at the same time, they were deprived of the amount and variety of faculty teaching available in peacetime. Occasionally the weight of responsibility became amusingly overwhelming. One evening, soon after Dr. Mahoney reached home for dinner at the end of a twelve-hour day of duty, he received a phone call from a thirdyear clerk. "Doctor, the patient, Mrs. Smith, wants to have a bowel movement. Is it all right?"

With the reduced staff numbers and the spreading of the teaching and patient care loads, research in clinical fields was markedly reduced, and its direction tended to become oriented toward military and civilian defense-related problems, such as the physiological nature, effects, and management of shock, and the development of systems for collection and preservation of blood and its components. One of the staff, Dr. Herbert R. Brown, Jr., who was deeply interested in problems of blood grouping and transfusion, later was placed in charge of the enormous blood distribution center established by the Navy in the Pacific theater.

The drain of faculty into wartime services affected all categories and levels, from chairmen of departments to interns. The Department of Medicine was reduced to six full-time people, ably assisted by many part-time staff. This small group made rounds nine months of the year, presented clinics, and acted as consultants. Some of them, after attending a course in Cincinnati, gave talks to physicians throughout western New York on the effects of war gases.

Several years before the war, in anticipation of what seemed inevitable, the surgeon-general of the Navy made arrangements for the setting up of a group at Rochester, to be known as the Strong Naval Unit. Very soon after Pearl Harbor, the unit was called to duty to staff the hospital at the U.S. Naval Academy in Annapolis. It consisted of seven full- and part-time Strong Hospital staff members: two internists (Drs. Charles Boller and William S. McCann), a surgeon (Dr. Samuel Stabins), a radiologist (Dr. Gordon Ide), a urologist (Dr. Hugh Warren), a psychiatrist (Dr. William Matthews), and a pathologist (Dr. Arthur Vorwald).

It was planned that later they would staff a hospital ship, but because of delay in preparation of the ship the unit was broken up and the members went different ways—to ships at sea, to naval hospitals, to remain at Annapolis, and to the Office of Scientific Research and Development.

In July 1942 several full- and part-time members of the Strong Hospital staff left to join the 19th General Hospital Unit. This consisted of about 40 Rochester area physicians under Dr. Edward T. Wentworth, the chief of orthopedics at Rochester General Hospital. A hospital was first set up in the Midlands of England. After D-Day they followed the invasion forward through France.

Beginning in November 1942 a publication entitled *The Strong Military Herald* was sent to everyone known to be in service—medical, nursing and lay. It contained news, gleaned largely from their letters, of the whereabouts, duties, and activities of former students and staff while on war duty. Between 1929 and 1950 over 800 physicians were members of the resident staff and it is known that at least 168 of them served in the armed forces. Three of them—Marvin Cooke, J. Thomas Farris, and William Matthews—are known to have been killed in action.

The return to normality was heralded by the first Staff Members Returned From Service listing in the November 1945 issue of the Hospital Bulletin. The familiar faces were coming back in a flood, eager to see old friends, scenes and families, to get to work making their careers, and to resume their education.

# THE WAR AND RESEARCH

Almost instantly, entry into the war had profound effects on research activities in both the preclinical and clinical departments, especially the former.

The most obvious change was one which moved research objectives quickly toward the solution of problems confronted by the military—the seeking of knowledge which could be directly applied in improved military technology and tactics. With this came government research financing, much of it through the Office of Scientific Research and Development (OSRD), and a considerably increased use of humans as the research animals.

Germany, as it developed its air power before and during the war, had foreseen the need for understanding the physiologic problems of high-altitude flying and had moved far ahead of us

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in securing that knowledge. With our entry into aerial combat, the necessity for our planes to move higher than the enemy while the flyers remained alert and functioning became urgent we had to move rapidly beyond the Third Reich.

Within a few days after Pearl Harbor our Department of Physiology, under Dr. Wallace Fenn, began to shift its research endeavor from muscle physiology and electrolyte studies into investigation of the functioning of the respiratory system at high altitudes. Using themselves, medical students, military personnel, and later, conscientious objectors as subjects and monitors, the department proceeded into uncharted areas, to determine the elastic properties of the human thorax and pressures it could endure. The work began with a \$500 federal grant. The earliest determinations were made without a pressure chamber, but soon a Drinker body respirator was utilized. Later a high-altitude chamber was contrived from an old, glass-lined, beer-brewing tank (wheedled from the Pfaudler Co.), to which was attached the University's tree-spraying pump with the valves reversed to exhaust the chamber. (The University grounds keepers had to be persuaded the pump would serve a more worthwhile purpose than as a sprayer.)

One at a time, two men would enter the tank through a small manhole. Then, as one breathed oxygen to keep him at groundlevel status, watch was kept through two portholes on the second man's psychological and motor performance as the air was gradually withdrawn. The tank was equipped with a hand-made mercury manometer and a crude communications system. Exhaustion would continue at times until the anoxic subject would pass out.

On one memorable occasion Dr. Fenn was himself the subject. (He was always the first subject in any new experiment.) Just as he passed out from anoxia, Dr. George Whipple entered the laboratory. The response was an immediate, absolutely firm, unmistakable, and colorfully expressed order to the subject for the day to cease and desist. Never again was Dr. Fenn in the chamber.

The results of this work were reported about every three months to the Air Force laboratories at Wright Field, where it was translated into the technology of breathing masks, etc., which would enable the flyer to maintain normal respiratory balance at high altitudes (up to 50,000 feet). Thus was laid the

basis for present high-altitude flying, for our sophisticated modern techniques of therapeutic positive pressure breathing, and for vital and fundamental observations of pulmonary gas exchange and respiratory mechanics—cornerstones of modern respiratory physiology. This new interest of the department continued after the war and moved on into problems presented by the pressures of space and the ocean depths—how does pressure per se change the process of biological reactions?

Corollary to the respiratory studies of high altitude was one on the relation between various kinds of food and the formation of intestinal gases, especially at high altitudes.

At the same time an interest of the Physiology Department in water exchange in animals such as frogs and rats was applied to studies of the water requirements of man in the desert. With desert warfare playing a crucial role in such places as Africa, our military needed to know such things as: how fast does a water deficit build up in man; how could it be avoided; what are the facts regarding the body salt depletion? With financing from OSRD, a small group of six or seven, under the leadership of Dr. Edward Adolph, went to our southwestern desert to study these questions.

In the Department of Vital Economics (merged with physiology in 1944), detailed and extensive studies to determine the nutritional values of food, particularly the vitamin content of dehydrated foods going into army rations, were carried out by Dr. John R. Murlin and his staff, with themselves, students, and conscientious objectors acting as the dietary subjects.

Many other research contributions were made to the war effort by various departments, especially by the Department of Radiology in its collaboration with the Manhattan District of the United States Army in work related to the atomic bomb. This story is presented in the next chapter. The above examples, however, serve merely to epitomize the involvement of the School in, and the contributions of our research men to, the prosecution of the war.

All during the war the relationship between the armed services and research workers was one of frequent contact and constant cooperation. Some of our faculty were stationed in positions in Washington and in the armed services in which they could discern the needs of the military and thus be helpful in suggesting problems that required investigation. Another fruit-

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ful route of contact was through armed forces suggestions to the National Research Council, which then relayed ideas to those best able to pursue them. There was no atmosphere of supervision and control by the military over the research topics and methods of investigators.

### NURSING

No group of Hospital personnel had greater responsibility and work load placed on them and responded more magnificently than did the nursing staff, and many of its clinical and teaching members left to serve the armed forces. Key people were thus lost. Replacements were well nigh impossible to come by.

To continue high-quality care, nurses at all levels worked long and extra shifts. Head nurses frequently were on duty before 7:00 A.M.—to get breakfast started, to get patients washed, and to prepare special diets. Many graduate nurses who had left practice to marry and raise families came back on duty to help. Student nurses were given considerably greater responsibility, and more experienced ones were sometimes put in charge of a floor.

Nurses played a principal role in the training and supervision of the Red Cross nurses' aides and the men volunteers.

It can be truly said that the hard work and dedication of the nurses were a major factor in keeping the Hospital open during the war.

Prior to 1940, the enrollment in the School of Nursing had grown slowly. With the declaration of hostilities growth was stimulated, but was not significant until, in June 1943, federal funds became available to underwrite basic training for students. Thus, the United States Cadet Nurse Corps came into being. It provided for a thirty-month course of training plus six months of work in the Hospital. The first students under this program were admitted in September 1943, with the government providing tuition, books, uniforms, and a small allowance. The applicants were required to meet the same standards as all other students. There were as many as 100 in a class.

In July of 1942 the five-year degree course had been accelerated for the duration to enable students to complete their work in a little over four years.

This speedup, plus the large number of cadet nurses, led to a peak enrollment of 325 students in the spring of 1945. To ac-

commodate everyone an addition, financed by federal funds, was added to Helen Wood Hall to house 33 students, and two floors in the Q Wing were converted to dormitories.

Of the 500 alumnae graduated by 1945, there were 79 who joined the Nurse Corps of the Army, Navy, or Air Force and served in all theaters of the war. One achieved the rank of lieutenant colonel.

## WHEN THE WAR WAS OVER

Even before the war ended physicians still in service began seeking postwar training in all fields. Recognizing that there would be a flood of returning veterans wanting to resume and complete their education, the Medical Center began planning late in 1944 for their return. In cooperation with other hospitals of the city, plans were made to increase the number of residencies and fellowships in the Rochester area from 70 to over 140. Within the Medical Center the projected increase was from a prewar 50 to 97.

The plan included the furnishing of room, board, and laundry plus a stipend of \$500 (!) per year for all assistant residents and fellows. Preference was to be extended to Rochester graduates and former resident staff in the order in which they had previously served; every possible effort was to be made to take care of the "official family."

This large influx of trainees came on top of the increased number of physicians graduated during the war. As a result it became necessary, particularly in surgery, to find places for them in other hospitals. In 1945 the Genesee Hospital sought affiliation with the Medical Center. This proposal came at a very propitious time. Other affiliations were made with hospitals outside of Rochester, such as Bradford Hospital (Pa.), Tompkins County Hospital, Ithaca, Clifton Springs Sanitarium, and Iola Tuberculosis Sanitarium.

Additionally, a program of veteran postgraduate fellowships was instituted with financing of tuition from benefits granted by the Veterans' Administration. Under this program 247 individuals received training in both preclinical and clinical departments, some in both. While this program posed a heavy load for the institution, it provided a much needed and an often first opportunity for contact with investigative work for many of these vet-

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erans. Most of them continued their careers in academic institutions.

This expansion of postgraduate training after the war laid the groundwork for the almost explosive growth that followed in the succeeding years.

Similarly, there was a proportionate increase in the number of applicants for admission to the School, many of them men up to 30 years of age, who were married and had families.

In retrospect, the years of the war were a period of trial and challenge to which the response by all was one of determination, cooperation, and confidence in the outcome. Despite the difficulties, ways were found to overcome them. When the end came, there was an enthusiastic determination to move forward into new fields and new ways. There seems little doubt that in many respects the war was the stimulant for the enhanced growth which has continued unabated for almost thirty years.

In addition to those persons mentioned in the text I would like to express appreciation to the following who reminisced and contributed to a re-creation of the "Years of War" at the Medical Center.

William Bradford, M.D., Grace Carden, Hilda DeBrine, Virginia DeWald, Augusta Dustan, Paul Garvey, M.D., Jane Ladd Gilman, Jacob Goldstein, M.D., Estelle Hawley, Harold Hodge, Ph.D., Mrs. Nat Jacobs, Nolan Kaltreider, M.D., John J. Morton, Jr., M.D., Louise Roderick, Harry Segal, M.D., Mrs. F. Ritter Shumway, George Swalbach, M.D., Bert A. Van Horn, and Dorothy Widner.

# An Horatio Alger Story: From War Work Orphan to Academic Heavyweight in Three Decades

The Story of Radiation Biology and Biophysics



# William F. Neuman, Ph.D.

William F. Neuman, Wilson professor and chairman of the Department of Radiation Biology and Biophysics, has long been interested in calcium homeostasis and its hormonal controls. Trained as a chemist, he received his Ph.D. in biochemistry at the University of Rochester in 1943.

During the war years his assigned research on the metabolism of uranium led him to explore the mechanisms underlying its deposition in the skeleton. This in turn led to his study of a number of "bone-seeking" radionuclides including strontium-90. Exploration of calcification mechanisms, calcium homeostasis, and the mechanisms of action of parathyroid hormone followed. These researches have been recognized by a number of awards, including the Eli Lilly Award in Biological Chemistry and the Mineralization Award of the International Association for Dental Research.

Dr. Neuman has participated widely in University activities, serving on many committees of singular importance to the institution, including among others, advisory groups to desig-

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nate departmental chairmen and the dean of the Medical Center, to review the dean's activity, and to select the chief executive of the University. He also served as the first chairman of the University's Research Policy Committee.

Dr. Neuman is spending a sabbatical during 1975-76 in Bern, Switzerland, pursuing his research interests.

# I. WARTIME BEGINNINGS

**D**<sub>URING</sub> the year 1939 the existence of the process of nuclear fission was well established and by 1940 it was realized, both here and abroad, that a practical fission bomb could probably be made for military purposes. After much discussion of feasibility among the allied powers, a decision was made to proceed in the United States. Therefore, in June 1942 a new district, the Manhattan District of the United States Army Corps of Engineers, was authorized, under the direction of Colonel (later Brigadier General) J. C. Marshall, to organize a program of atomic bomb development. In September 1942 Brigadier General (later Lieutenant General) Leslie Groves was placed in charge of all army activities devoted to the bomb.

In December 1942 the first self-sustaining chain-reacting pile using natural uranium was demonstrated at the University of Chicago. This not only showed that a chain reaction such as that required to produce a bomb explosion would occur under proper conditions, but it also showed the feasibility of manufacturing plutonium-239, which could be used as an alternative to uranium-235 as an explosive material.

Meanwhile, in September 1942 the Manhattan District purchased a 58,000-acre site at Oak Ridge, Tennessee, which soon became a vast industrial complex employing up to 45,000 personnel, engaged for the most part in the separation of fissionable uranium-235 from natural uranium. Shortly afterward another large site of 420,000 acres was purchased at Hanford, Washington, where construction of facilities for production of plutonium was started in April 1943.

It became evident during these developments that hitherto inconceivable amounts of radioactive materials would soon be produced. It was well known that their radiations would be very hazardous to health but it was not known how well they could be controlled. Furthermore, atomic bomb production, from the processing of uranium ore onward, would involve the use of large quantities of chemical materials with potentially toxic properties which had not been well studied.

Clearly a large medical program was required involving not only hospitals for the new atomic cities but also facilities for the surveillance of plants and the protection of personnel. In addition, research programs to determine potential dangers of the new materials were urgently needed.

Rochester first became involved in this medical program in the middle of February 1943 when Dr. Albert K. Chapman, then vice president and general manager of Eastman Kodak Co., invited Dr. Stafford L. Warren, then professor of radiology at the Medical School, to luncheon at the Rochester Club. At the luncheon Dr. Warren was introduced to General Groves and Colonel Marshall, who queried him on his experience with radiation and radioactive materials.

Following the luncheon, Dr. Chapman left, after advising Dr. Warren to do whatever the officers requested. Then, according to Dr. Warren's account, the officers took him to a private room where, after locking the door, closing the transom, and examining a closet, they asked him if he would consider working on a medical program of great importance to the government but which involved the utmost secrecy.

Following consultation with President Valentine and Dean Whipple, on March 2, 1943 Dr. Warren accepted an appointment as civilian consultant to the Manhattan District.

In April 1943 Dr. Warren and Major H. L. Friedell of the Manhattan District planned an initial research program at Rochester. On June 2, 1943, the present B Wing of what is now called the Annex was started on the north side of Elmwood Avenue and was rushed to completion by September 1943. This building, along with the adjoining, preexisting A Wing of the Annex, which had been built the previous year by the Radiology Department and equipped with a million-volt x-ray machine to examine castings for the armed forces, provided a center for the new program. Additional space was provided by other departments, notably biology, physics, biochemistry, and radiology.

Although some medical research for the bomb program had been initiated the previous fall at the University of Chicago Metallurgical Project, it will be seen from the dates above that the Rochester program was developed quite early, along with two large production sites at Oak Ridge and Hanford.

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The primary reasons for choosing Rochester as a research center were that Drs. George Whipple and Stafford Warren had done pioneer work on the injurious effects of x-rays in dogs some 15 years previously and that early applications of cyclotron-produced radioactive isotopes to biological problems had been made in the Medical School, especially through the efforts of Dr. William Bale, who had developed the necessary instrumentation.

The new program in Rochester was called the Manhattan Project, a name designed to conceal its mission, which was very highly classified in those days, and a name already adopted by the Manhattan District for the same reason.

The original staff of the project consisted of Dr. Warren, Dr. Andrew Dowdy, Dr. William Bale, Dr. Luville Steadman, Mr. Francis Bishop, and Miss Susan Glover, all from the Radiology Department, and Dr. Harold Hodge, from the Department of Biochemistry and Pharmacology. Recruitment of staff proceeded rapidly during the summer and fall of 1943 and later until the total number of personnel during the war reached about 350, some of whom were on military assignment.

Dr. Warren directed the local program, in addition to advising the Manhattan District on its overall medical development, until November 3, 1943, when he was commissioned colonel and appointed chief of the Medical Section of the Manhattan District, with headquarters in Oak Ridge, Tennessee. In this capacity he was responsible for all the health and medical activities of the Manhattan District and its contractors. Dr. Dowdy succeeded Dr. Warren as chairman of the Radiology Department and director of the local project.

During the period of the war the Rochester project had two broad undertakings, one consisting of practical technical services and the other research.

In its service function the Rochester group analyzed the periodic reports on medical examinations of personnel in the Manhattan District plants all over the country. It also advised these plants on how to protect their employees, by: (a) determining tolerance standards for exposure to radiation and toxic chemicals; (b) developing instruments to measure exposure; (c) measuring intensities of radiation and concentrations of toxic dusts in plants; and (d) suggesting measures to make operations safer.

Work at Rochester was coordinated through Dr. Warren's of-

fice with that of laboratories at the Universities of Chicago, California, and Columbia, which had also undertaken Manhattan District assignments, and with medical and industrial hygiene workers at the production plants. The combined efforts of these groups, together with the effective cooperation of the operating staffs, made possible the excellent health record of the Manhattan District.

The wartime work, being new to almost everyone involved, led on occasion to unexpected or amusing situations, as the following example amply illustrates.

Because there was some possibility that the Germans might be producing, in atomic piles, radioactive isotopes which could be spread on the ground to deny safe access to troops, an experiment was planned to obtain some data on how the exposure to personnel would be related to the amounts of dispersed radioactive material.

A curie of radioactive sodium of short half-life was shipped by air by Dr. Robley Evans of MIT for the experiment. Drs. Warren, Bale, and Hodge met the shipment at the airport with a flat-bed truck piled high with concrete blocks for shielding the container, which they thought might be emitting radiation because a curie was a colossal amount of radioactivity in those days. Also, they took with them a long pole with which the container could be carried at safe distance from the bearers. The truck was parked near the plane, the pilot in the cabin waiting to resume flight. When the pilot saw the container being borne on the pole and being carefully shielded after deposition on the truck, he opened the window and shouted, "My God! What's that? I have been sitting over it all the way from Syracuse."

Actually, Robley Evans, being an old hand even in those days, no doubt shipped the material with adequate shielding, but the pilot was so alarmed that, after failing to receive answers for security reasons from the Rochester group on what he had been sitting over, he traced the shipment. His report to the authorities resulted in suspension of air shipment of radioactive materials for some months until a federal code was established.

To maximize secrecy during the war years, the project was structured as a line organization, very much along army principles. Thus the director presumably knew everything, the division chief knew only a third of the total, the section chief knew even less, and, finally, the individual scientist-investi-

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gator knew only that which he was told about his own program. There can be no doubt that this system did in fact inhibit the exchange of information. But, to the credit of academic scientists, the army system did not prevent the interchange of data and gossip. Only the lazy and disinterested were unaware of the basic nature of the war work despite the code names, the guards with guns, and the complicated system of logging confidential memoranda and reports.

In fact, the line organization was sufficiently adaptable to have survived until 1965, long after the disappearance of the supposed need for secrecy, when it was disbanded in favor of a more conventional academic system of independent, free scholarship.

# II. THE POSTWAR CONVERSION TO CIVILIAN OPERATION

On January 1, 1947, the newly formed United States Atomic Energy Commission took over all contracts and facilities of the Manhattan District, including the local program, which was renamed the University of Rochester Atomic Energy Project.

When Dr. Dowdy resigned in December 1947 to become chairman of the new Department of Radiology at the Medical School of the University of California at Los Angeles, where Dr. Warren had been appointed dean after the war, it was decided to form, at Rochester, a new preclinical department of the Medical School, the Department of Radiation Biology, to administer the contract with the Commission. Dr. Henry Blair was appointed chairman of the new department and director of the Atomic Energy Project in January 1948, and he occupied these positions until he retired in June 1965.

The reasons for forming a new preclinical department were that very few of the project staff were clinicians and that it was expected, when wartime security restrictions lifted, that integration of the activities of the project with those of the rest of the Medical School would be largely at the indicated preclinical level.

When the Commission assumed jurisdiction in 1947, it established a new organization, the Health and Safety Laboratory in New York City, which took over all the service functions of the project, leaving only research and consultation. To these were soon added an educational program and the administration of a fellowship program in industrial medicine. The overall mission of the project remained, as before, to develop information and to provide instruction on the biomedical problems of nuclear energy development.

Meanwhile, the security classification of research topics in biology and medicine was lifted rapidly until, by 1950, virtually all of the local programs were unclassified. This permitted, for the first time, free exchange of information with the rest of the Medical School and free access to the laboratories by those other than employees with clearances. Other important effects of declassification were that the accumulated wartime research results could be published in the open literature and an educational program open to both foreign and domestic students could be undertaken.

Most of the research during the war and some time afterward was devoted to answering urgent questions raised in atomic energy production facilities on the toxicity of materials and the biological effects of radiation. Associated development of instrumentation was undertaken as it was required. When publication was permitted, a large portion of this work was reported in six volumes of the National Nuclear Energy series, printed by Mc-Graw-Hill in the early 1950s. Four of these volumes were entitled *Pharmacology and Toxicology of Uranium Compounds*. Another was *Biological Studies with Polonium, Radium and Plutonium*, and the sixth was titled *Biological Effects of External Radiation*. The material in these volumes has been used extensively to provide guidelines for the protection of workers at the many installations involved in atomic energy development.

Subsequent studies in these fields were reported as individual papers except that later work on polonium was published in 1964 as a supplement of some 400 pages to the journal *Radiation Research*, under the title "Metabolism and Biological Effects of an Alpha Particle Emitter Polonium-210." This serves as a prototype of the study required to evaluate the effects of an alphaemitting radioactive material.

Until the Department of Radiation Biology was formed, the principal medical teaching responsibility of the project was in pharmacology, although various individuals took part in some other courses, particularly biochemistry. Graduate work in pharmacology and biophysics was carried on, but at a very low level because of the classification of thesis research and the paucity of candidates during the war. However, only a small part of the

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project staff was involved in teaching and when the Department of Radiation Biology was formed, there was considerable enthusiasm for starting greatly expanded graduate teaching programs in the biomedical fields of interest to the Commission.

In 1948 the Commission inaugurated a fellowship program in health physics. Vanderbilt and Rochester were selected as the initial training schools and Oak Ridge National Laboratory and Brookhaven National Laboratory were chosen to supply practical experience to the fellows in the summer following the academic year.

The department developed, in 1948–49, a curriculum for these fellows in radiation biology, radiological physics, industrial hygiene and toxicology, and statistics. A general course in tracer chemistry was begun at that time.

The following year a program in industrial medicine was developed in collaboration with Eastman Kodak Company physicians and representatives of other industrial organizations. This was to accommodate holders of a new fellowship in industrial medicine, first offered by the Atomic Energy Commission in 1950.

During the academic year 1950–51 the expanded graduate program was well underway with 57 students in various specialties in health physics, radiological health, industrial medicine, radiation biology, biophysics, and pharmacology.

Since the expanded graduate program was begun in 1950 it has undergone considerable evolution, both because of widening interests of the faculty and because of various requests for training in the nuclear energy field. One of these requests was for basic training of physicians in preparation for assignment to nuclear-powered submarines. Another came from the Defense Atomic Support Agency, for training of physicians and health physicists to deal with radiation health problems in the armed services. Considerable demand came from foreign nationals whose countries were planning atomic energy development.

Most of these special training programs were of one-year duration and were largely didactic. Consequently, although the faculty appreciated the need for rapid increase of specialists in radiation health, they looked forward to a decrease in this type of short-term instruction in favor of an increase in Ph.D. programs with concomitant emphasis on research. This change gradually took place, partly because numerous programs for radia-

tion health specialists were developed in other schools and partly because more good candidates for advanced training became available.

# III. THE ACADEMIC EVOLUTION

Stripped of the restraints of wartime secrecy and of externally imposed targeted research goals, the department's intellectual climate rapidly blossomed. Self-initiated research goals inspired by fundamental physical and biological questions replaced the targets demanded by pragmatic problems of an industrial or political character. As a consequence, the very nature of the faculty underwent a marked transformation. Compromise with longterm academic or educational goals became a rare rather than a commonplace event. Faculty turnover both resulted from and contributed to the academic transformation.

As a consequence of its large size and growing intellectual strengths, the department had a deep impact on the Medical School's growth and development during the rather explosive fifties and sixties. This impact was chiefly but not exclusively centered in four areas: radiation biology, biophysics, pharmacology, and biochemistry.

Out of the wartime emphasis, the maturation of radiation biology as a discipline was a very natural development. The department, of course, was the first in the world (in 1950) to offer a Ph.D. degree program in the subject area, and its graduates of these pioneering programs have gone on to leadership roles in universities, governmental agencies, and industry throughout the world. The department had no monopoly on research in radiation biology, but contributed more than its fair share to the developing concepts in this relatively new field. Emphasis shifted from early acute effects of ionizing radiation to the more mechanistic events underlying radiation damage. This ranged from the tissue level (the role of microcirculation in aging) to the cellular (membrane events) and molecular levels (codon shifts, DNA repair mechanisms, and free radical mechanisms of DNA damage). As a consequence, at the University of Rochester, molecular biology is currently very strongly represented at a nationally recognized level.

The University of Rochester was one of the earliest institutions to recognize the emergence of biophysics as a new discipline, awarding its first Ph.D. in this subject to Dr. William F.

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Bale, in 1938. Through the ensuing years a small number of degrees were awarded in this subject area by means of ad hoc committees comprised of members of the faculties of both the Medical Center and the Physics Department. After 1950, this custom was abandoned and the new Department of Radiation Biology continued a small but viable training program in the more specialized area of radiation biophysics.

Gradually, with the turnover of staff and progam interests, there was increasing emphasis in cellular and molecular biophysics. In recognition of this development, the name of the department was changed to the Department of Radiation Biology and Biophysics. In 1963 the department was awarded a training grant in biophysics by the NIH, and in 1965 the entire curriculum was revised to provide a variety of specialized courses in biophysics.

Initially, the newness and glamor of the atomic age attracted a large body of applicants to the department's graduate programs. However, as other institutions initiated training programs and as the bomb became an accepted fact of life, the number and quality of applicants began to slowly decrease. Fortunately, the growing recognition of the department's research and training in biophysics more than offset this trend. More recently, the curtailment of research in the physical sciences and the appeal of the relevance of biology has greatly increased the size and quality of the department's applicant pool. Consequently, at the present time the department enjoys the distinction of having research programs and training programs in biophysics which in size, breadth, diversity, and quality are second to none.

At the Medical School's inception, pharmacology was only emerging as a disciplinary entity. At most medical centers it was a highly empirical offshoot of physiology. At some (Hopkins, for example) it was essentially a branch of biochemistry. The School's founding dean—a Hopkins graduate—therefore did not afford pharmacology departmental status, but relegated it instead as a secondary responsibility of the Biochemistry Department. The biochemistry chairman, Dr. Walter Bloor, was not himself at all interested in "drugs" and delegated the responsibility for pharmacology teaching to whomever was resident in his department and willing to assume the responsibility.

In 1943 this person was Dr. Harold Hodge, who had been trained as a physical chemist. He was engaged in fundamental

research related to dentistry and, as a consequence of his teaching responsibility, was only in the process of learning biology in general and pharmacology specifically. It was in this rather unusual context that the responsibility for the teaching of pharmacology to medical students was rather casually transferred to the wartime project when Professor Hodge shifted his research activities from the Department of Biochemistry and Pharmacology to the secret war research. By personal persuasion and example, Dr. Hodge recruited from the project a motley faculty of biologists, chemists, biochemists, and physiologists to present annually a conglomerate course in pharmacology. Fortunately, there were always present two or more bona fide pharmacologists, and by the mechanism of many long and tedious "planning sessions," the course was given with some coherence and professionalism. This "temporary" arrangement, born of wartime necessity, survived for fifteen years! In the end, pressures from accrediting committees, who could not fully appreciate such an unconventional approach to the execution of an otherwise conventional curriculum, forced the University to create a new Department of Pharmacology and Toxicology in 1958. Dr. Hodge was selected as its founding chairman and, except for one new faculty appointment from outside, the entire faculty and staff of the new department was drawn from the Department of Radiation Biology. It can be argued on the one hand that the wartime project made possible the development de novo of a small but accredited new Department of Pharmacology. It can also be argued that the project inhibited the growth of pharmacology by providing for many years a very inexpensive, pragmatic alternative which gave the University a comfortable option to the commitment of its own hard-pressed resources to the growth of pharmacology as a discipline.

Similar arguments can be raised with respect to biochemistry. Within the broad disciplinary range of research interests in the project, there were always several programs properly classified as biochemistry. Consequently, there were always present on the project staff four or five biochemists of national and international reputation. This had the effect of doubling the institution's staff devoted to biochemistry as a discipline. On the other hand, there can be no doubt that this arrangement markedly reduced pressures on the Medical School to expand the activities of the Biochemistry Department itself. With the postwar explo-

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sion of biochemical knowledge and technology, almost all sister institutions throughout the country greatly expanded their departments of biochemistry, a phenomenon postponed at Rochester until late sixties and early seventies.

# IV. CHANGING FACULTY STATUS

In the early postwar years, the recruitment of first-class faculty was very difficult for two reasons: lack of identity and lack of tenure.

In the early 1950s, the subject of radiation biology was so new that replacement faculty had to be recruited from older, more conventional disciplines. There was a real reluctance on the part of such new faculty to relinquish their identity by accepting an academic title in the unestablished subject area of radiation biology. Consequently, it was necessary, with the concurrence of the other basic science departments of the Medical School, to offer joint appointments in order to attract quality staff. With the growth of the department's reputation in biophysics and the common acceptance of radiation biology as a discipline, this practice gradually became unnecessary. The custom of multiple, joint appointments, however, persists. No longer an arbitrary recruiting device, the joint appointment is now employed to signify that the faculty member is engaged in some collaborative program in education or research involving two or more departments. Such arrangements are flexible, numerous, and frequently temporary. The departments most often sharing appointments and programs have been medicine, pediatrics and radiology in the clinical areas, and biology, biochemistry, chemistry, microbiology, pathology and pharmacology in the preclinical areas. Currently, joint appointments number 20 of a total faculty of about 50.

The matter of tenure created a problem which only time was able to resolve. While the University recognized the importance of offering tenure, it was very apprehensive about the fiscal liability entailed in enlarging its tenure responsibility to some 40 individuals whose salaries were derived entirely from non-University sources. As the years passed, however, more and more federally supported programs provided salaries for tenured faculty outside the department, and the very stability of the AEC and its local support encouraged the University to reconsider its stance. Although still reluctant, The University proceeded in

two stages. It initially offered tenure to departmental faculty contingent upon continuance of the AEC's fiscal support. By the mid-sixties, however, it was clear to all that the continued welfare of the department's activities was so vital to the well-being of the Medical School as a whole that the remaining vestiges of second-class citizenship were removed and full unqualified tenure was extended to all departmental faculty able to meet the usual academic standards of the University.

# V. CURRENT AND FUTURE STATUS

At its inception, the department was designed at the request of the Atomic Energy Commission to engage heavily in education. However, the commitment of the AEC to education receded in importance with the passing years, and it was for this reason that the department began to seek other funding to maintain and diversify its educational programs. Until 1963, with the awarding of the biophysics training grant, the department's entire activities had been funded through its contract with the AEC. Since that time, there has been a steady growth in the diversification of the department's financial support. At the present time a full third of the research and educational activities is supported from non-AEC, non-University sources, principally through grants from NIH and NSF. The growth of this funding is all the more remarkable in that it took place during a period of contraction of funding of research by the federal government.

Over the last decade, 50 staff have left or retired. Such a large turnover facilitated the evolution of the department's research programs. However, the traditional interest areas have in fact been well preserved: aerosols, inhalation physiology, membrane biophysics, mineral metabolism, cancer immunology, internal emitters, and general radiobiology. There has been an erosion of the large-animal programs designed to detect chronic effects of low-level radiation. This area of important research has been transferred by the AEC in large measure to institutions in more favorable physical climates as a means of cost reduction. In the place of these rather expensive programs, the staff in molecular genetics and cellular radiobiology have been greatly strengthened. In addition, new programs have been initiated in x-ray crystallography, electron spin resonance, nuclear magnetic resonance, theoretical biology and modeling, computing technology, and behavioral science. The resulting conglomerate

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staff, with the important, inevitable interdisciplinary interactions, had led to a high productivity of distinguished academic quality and of real importance to the sponsoring agencies, principally AEC.

The very breadth of these programs underlie not only radiation problems but also problems related to environmental pollution and the special difficulties imposed by the energy crisis. The department is thus well equipped to contribute at the national and international level in the solution of biological problems related to modern technology. A prime example in very recent times has been the ability of our staff to respond to the widespread exposures of world populations to mercury. While unable to undo the events that had occurred, they were able to provide expertise technology, and to gain information which will help to prevent such disasters in the future.

The department regards a flow of talented graduate students and postdoctorals as vital to its continued scientific viability. At the same time, it has provided a cadre of highly trained specialists who have assumed major positions of responsibility in the nation, in universities, government laboratories, and industry. At present, the incoming students are even more highly qualified than ever. Thus, while the numbers undergoing training have declined somewhat, the quality is still improving.

In recognition of the excitement and achievement of its research and training programs, the department entertains an unusual number of visiting scientists from foreign countries. In recent years this has averaged over 90 per year, representing 13 different countries. In addition, the department has sponsored an annual International Conference on Environmental Toxicity, which draws participants from all over the world.

# After the War

# 15.

# Within Bareheaded Distance

The Story of Wing R 1945-1975



# John Romano, M.D.

John Romano, a graduate of Marquette University, obtained further clinical experience in medicine, neurology, and psychiatry at Yale, Colorado, and Harvard before being appointed professor and chairman at the University of Cincinnati in 1941. As founding chairman of the Department of Psychiatry at Rochester (1946-71), he supervised the building of Wing R, which has served throughout the world as a model of a psychiatric unit in a university hospital. He was a founding member of the Council of the United States National Institute of Mental Health, chaired its first Research Study Section, and later the committee chosen to select career research scientists in the field. His major commitment has been to the teaching of medical students and other career professionals in medicine, psychology, and psychiatry. His own research interests have included studies of delirium, several psychosomatic illnesses, and most particularly the schizophrenic patient and his family. He was appointed Distinguished University Professor in 1968, an award held by only five persons in the University, and since his retirement as department chairman has been engaged in clinical research, in teaching, and in writing.

Long active in faculty affairs at Rochester, Dr. Romano was chairman (1962-63) of the Faculty Committee to advise the

University's trustees in the selection of a new president, a founding member of the University Senate in 1963, and chairman of the senate's Steering Committee (1964–65). He has served on most of the major policy-making committees of the Medical School faculty, including chairing the committee which launched the establishment of the Medical Faculty Council.

In 1971 Dr. Romano received the Gold Medal Award of the Alumni Association of the University of Rochester School of Medicine. He was awarded the Gold-Headed Cane from the School of Medicine of the University of California in 1972, the William C. Menninger Award of the American College of Physicians in 1973, and the Albert David Kaiser Award for 1973 from the Rochester Academy of Medicine. He was awarded the honorary degree Doctor of Science from the Medical College of Wisconsin in 1971 and from the Hahnemann Medical College in 1974.

#### INTRODUCTION

WE WERE to be called "Wing Q," but Basil MacLean, George Whipple, and Alan Valentine were persuaded that we would have enough trouble launching a Department of Psychiatry in Rochester without having to call it "Wing Q." Most graciously, they allowed us to use "Wing R" to honor Mrs. Rivas, our benefactor.

We were also privileged to build Wing R so that its functions of teaching and clinical service would be woven intimately into the fabric of the parent Strong Memorial Hospital. Unlike many of our sister departments in other universities (Johns Hopkins, Colorado, Cornell, Yale, and others), we have had the good fortune to have lived and worked within bareheaded distance of our colleagues. In these thirty years of its existence, the department has achieved distinction in a number of areas. Among these may be mentioned the building of a model psychiatric teaching service in a university hospital, with a broad pluralistic program for career professionals and with effective liaison programs with other clinical disciplines; the introduction of psychology and the social sciences into the medical school framework; leadership in community and regional planning for professional education and provision of clinical services to all the citizens in the area; participation in national and international affairs concerned with psychiatric research and education; researches into the significance of early life experiences and later vulnerability to illness, and on the origins of schizophrenia; and

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the establishment of a Cumulative Patient Register for Monroe County, which has made possible epidemiologic studies of national significance.

But, first and foremost, the department has been recognized for its devoted and inspired teaching of its medical students throughout the floors and clinics of the Hospital.

# Psychiatric Teaching: A Glance at History

In historical perspective and relative to medicine, surgery, and midwifery, the teaching of psychiatry was a latterday accomplishment. Psychiatric education began in Britain in 1753, when the governors of St. Luke's Hospital, London, authorized William Battie, physician to the hospital, to take pupils, and the first chair of psychiatry designated as such was that occupied by Heinroth in Leipzig in 1811.

# The American Scene

American psychiatric teaching had its origins in the work of Benjamin Rush. His textbook (1812) was the first American general treatise on the subject of mental disease and remained the only text of its kind until 1883, when William Hammond and E. C. Spitzka published textbooks on insanity. However, there was a prevailing indifference to the subject of mental disorders in all but a few medical schools in this country. The first appointment of a professor of psychiatry in a medical school in the United States was that of Samuel M. Smith, who was made professor of medical jurisprudence and insanity in October 1847 at Willoughby University, Columbus, Ohio, which later became the Starling Medical College and eventually the Ohio State University College of Medicine. Pliny Earle was appointed visiting physician to the New York Asylum in 1853; during this year he delivered his first course of lectures on mental diseases at the College of Physicians and Surgeons. But it can be said that until the 1870s even occasional lectures on mental and nervous diseases, not to speak of systematic courses, were rarities in our medical colleges. The appalling lack of psychiatric instruction was formally recognized in 1871, when the Association of Medical Superintendents of American Institutions for the Insane adopted a series of resolutions at its annual meeting vigorously recommending the need for lectures and clinical experiences.

In the first third of the twentieth century national surveys

pointed out deficiencies and the urgent need to develop a systematic curriculum of psychiatry in the medical schools. The single most important determinant of change in the departments of psychiatry in the United States since the end of World War II resulted from the enactment of the National Mental Health Act, passed by the 79th Congress in 1946, which made possible the allocation of funds for education and research. Other determinants included the establishment of psychiatric services in general hospitals, the expansion and liberalization of health insurance programs under public and private auspices, and the Hill-Burton Act, which provided federal matching funds for the building of psychiatric services in general hospitals.

## Rochester—Before 1946

What about Rochester? In 1824, the county of Monroe founded one of the first institutions in Upstate New York for the care of the mentally ill. A report to the New York State legislature, dated January 12, 1844, included this: "The insane who were in close confinement were in decent cells of pretty good size, furnished with a bed; the ravings of the violent disturbed the sick and maintained discomfort through their 'quarter.' Several insane men, according to very common usage, were dragging about a chain and heavy iron ball attached. These were unified to the fetters and used for such as not being shut up or liable to escape. Of one, it was said that 'the exercise of dragging his ball and chain had much improved his health!' "

Obviously, this report preceded the period of moral treatment which came later in the century and which included the substitution of kindness for harsh means and the reduction of human isolation by creating social situations for the mentally sick comparable to those experienced by healthy or sane persons. The county institution was enlarged in 1863 and the responsibility for the care of these patients was assumed by the state of New York in 1891, when the hospital was named the Rochester State Hospital. A happy accident led to the building of the University Medical Center near the state hospital, and in the past thirty years, due to the interest and support of the directors of the hospital, there has grown an increasing intimacy between the hospital (now called the Rochester Psychiatric Center) and the University of Rochester Department of Psychiatry, in teaching, in clinical services, and in several research activities.

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There were interesting developments in the Rochester community long before the Medical School was established. In 1913 the first Visiting Teacher Department was organized by Emma Case and was said to have been the first in the world under a community Board of Education. In 1910 Judge J. B. M. Stephens became the first special county judge to preside over a children's court. The liberal support of this court by county funds led to a concentration of children's services in two agencies, the Children's Aid Society and the Rochester Society for Prevention of Cruelty to Children. This led eventually to the establishment of the Rochester Guidance Center (1939), which was later incorporated into the psychiatric unit of the Rochester General Hospital, Northside Division (1967).

The Monroe County Mental Hygiene Society was formally organized in 1932, and over the years has contributed significantly to the community in its public educational functions.

In the first twenty years of its Medical School (1925–1945), the University of Rochester did not distinguish itself by any unusual attention to the teaching of psychiatry to its medical students. There were several general physicans who exhibited considerable psychologic insight in their medical practices, and they served as good examples to our medical students. Eric Kent Clarke, Richard Jaenike, Andrew Akelaitis, at the Medical School, and John Van de Mark and Kenneth Slaght, at the state hospital, did participate under great handicaps in the teaching of psychiatry to our students and were helped by Frances Parsons, psychologist, and Marjorie Harle and Marjorie Mann, social caseworkers.

Prior to 1946, psychiatry, in the Medical School and Hospital, existed as a division of the Department of Medicine. Historically, it differed from the other clinical departments because of its early relationship to the Health Bureau of the city of Rochester. Initially, outpatient clinic service was established in conjunction with the Board of Education and the Society for the Prevention of Cruelty to Children (1927); to which was added (1928) service to the criminal branch of city court and later (1933) to the Bureau of Public Welfare. The inpatient division opened for service in the Municipal Hospital in February 1927 with 16 available single rooms arranged in one corridor with a large solarium. One of the principal interests of the division in the early years of its growth was in the field of mental hygiene. This interest led, with the aid of the Rockefeller Foundation, to the establishment of a demonstration child guidance program within the hospital under the general direction of the Division of Psychiatry and the Department of Pediatrics.

Rochester couldn't have chosen a more appropriate time to launch a department of psychiatry in a modern medical school in the United States. The year 1946 provided the auspicious moment. It coincided with the generous financial support of federal funds, the expansion of health insurance programs which included the mentally ill, and the establishment of psychiatric units in general teaching hospitals. And in the spirit of the postwar period, there was a pervasive interest in providing the physicians of the future with more systematic knowledge of man in human and social terms as well as in the traditional biological context of medicine.

# THE "BUILDING" OF WING R

In February 1945 Mrs. Helen Woodward Rivas, of LeRoy, New York, made a generous gift to build a psychiatric clinic in the University Medical Center and to establish a trust fund to apply to its operation and maintenance. On October 12, 1945, I was invited to come to Rochester to give an Eastman Memorial Lecture. My post at that time was professor and chairman of the Department of Psychiatry in the University of Cincinnati. In December 1945 I was appointed professor and chairman of the Department of Psychiatry and psychiatrist in chief of the University of Rochester Medical Center. This led, in 1946, to the establishment of the Department of Psychiatry as one of the major departments in the Medical School and Hospital of this University.

#### Growth of the Department

A detailed chronicle of significant departmental events, the circumstances under which they occurred, and the persons responsible for them has been noted in the annual reports of the department. Similarly, the scientific papers of the department members have been collected and bound. They are available to those who may be interested in learning of the range, content, and quality of the investigative interests and pursuits of our students and faculty.

It would be convenient, were it possible, to outline the his-

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tory of the department into neat, clear-cut divisions of time and objectives; for example, a time for planning of facilities, another for the development of the teaching programs, others for the promotion of investigative efforts, for community services, and so on. It didn't happen that way, and perhaps it never does. Within the first two years, when a great portion of time and energy was devoted to the planning and building of Wing R, the basic objectives of the teaching of psychiatry to our medical students were outlined and put into practice in the teaching of the first two classes, those which graduated in 1950 and 1951. From the start, the friendly and generous reception given us by the School, Hospital, and University not only permitted us to develop our program, but, through the efforts of William McCann, Samuel Clausen, and Karl Wilson, we could initiate the liaison teaching services. Dean Whipple, in spite of his limited understanding of what we were about, was unstinting in his support.

In the past thirty years, including acting and interregnum appointments, there have been six changes in the University presidential office, four in the deanship of the Medical School and five in the director's office of the Hospital. While the greater share of administrative problems were conducted with the deans of the Medical School and the Hospital directors, the broad interests of the department in the University at large enabled me to know and work intimately with Alan Valentine, Cornelis de Kiewiet, Allen Wallis, and Robert Sproull, which I have considered a great privilege. Each has been particularly understanding and helpful to the work of the department.

Building in the immediate postwar period had its problems. There were shortages of materials, delays in deliveries, and interminable strikes. However, due to the skill and devotion of Leonard Waasdorp, architect, Charles Urlaub, who directed the construction for the Hopeman Company, and our administrative colleagues, Sarah Hardwicke and John Law, Wing R was completed in July 1948. Before then, hospital design, decoration, and equipment throughout the country were hardly exciting, much less esthetic or, for that matter, appropriate to a psychiatric service in a modern university general hospital. Most hospitals we visited had high ceilings with reverberating sounds, sepulchral atmospheres, drab colors, and formidable furniture, considered to be secure. Our ideas for hospital rooms, recreation and dining areas came from what we learned in visiting newly

built hotels. Mr. Raymond T. Thompson, then vice president of the University, and Mr. Waasdorp accompanied me on visits to hospitals, clinics, and hotels in New York, Boston, Chicago, and Philadelphia. We were one of the first to use studio beds and attractive domestic furniture, to place toilets within rooms, and to provide colorful wall coverings and curtains in rooms and in dining areas. Wing R's design and decoration has been copied in hospitals in many parts of the world.

Mrs. Rivas, our generous donor, had mixed feelings about the name the new division was to bear. Suggested names had included "Helen W. Rivas Cinic," "Helen Woodward Rivas Clinic," "The Rivas Clinic," "The Woodward Clinic," and perhaps others. Finally, "Helen W. Rivas Clinic" was accepted, and these letters were carved on the entablature above the fluted columns in beautiful Roman letters. Alas, the lady changed her mind, which was her right through gender and gift. The huge blocks of Indiana limestone, carved with the graceful letters, were brought down to be replaced with plain blocks. Naturally, this decision came after long and frequent discussions intended to solve this problem without replacing the blocks. I had suggested that we place a small sign to the left of the inscribed entablature with the legend, "THIS IS NOT," and although this suggestion appealed to George Whipple's frugality, it was not done, and the blocks with the letters came down.

I shall remember always one morning, when Mr. Urlaub and his associates called me to the building site and presented me with a large block of Indiana limestone on which had been carved the Roman letter R. Mr. Urlaub presented it to me, indicating that they thought I had earned my letter. It was the only letter I had ever earned in college, and I brought it home to serve as a stepping-stone.

After considerable negotiation, we persuaded the Municipal Hospital authorities to arrange for the transfer of the psychiatric service from X-3 to Y-2, which was accomplished in August 1950 and which, together with the newly established R-3 floor, made possible an inpatient census of 56 hospital beds. Later, in 1956, we were successful in the construction of security and interviewing rooms in the Emergency Division of the Hospital for purposes of triage and admission. The completion of Wing R, that is, of floors R-2, R-4, and the new activities structure on R-5, was effected in November 1957, and was made pos-

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sible with the generous additional financial contribution of Mrs. Helen Woodward Rivas. In succeeding years research laboratories were constructed in Wing R basement and on R-1 floor. In 1965, because of the anticipated loss of the Y-2 inpatient floor, we began to plan for additions to Wing R, initially to use Wing Q; after a costly comedy of administrative errors by the University Hospital Planning Group, we had to abandon the Wing O plans and begin to design Wing R North. This building, with three floors and a finished basement, was funded by federal, state, and University moneys under Public Law 88-164, Construction of Community Mental Health Centers, 1963. In a sense, the Wing R North addition was the first accomplished stage of the building of the new University Hospital. We are pleased to note that Wing R North addition is completely paid for, due to funds saved by the department over a period of years for this specific purpose. together with support from the University and the federal and state governments. While we have been, since our inception, the westernmost point of the Medical Center, the new Hospital, to the east, adds to the distance between Wing R and several Hospital services, including emergency, radiology, clinical laboratories, and food service. However, this span does not appear to be insuperable. We must remember that we were able to carry on quite satisfactorily a high level of care for our patients when the psychiatric service was divided between Y-2, at the eastern extremity, and Wing R, at the other end of the Medical Center. At the time of this writing, plans are being completed for the renovation of urgently needed space for child, adolescent, and family teaching and research programs in several areas of Wing R, as well as in the pediatric areas of the old Hospital.

# The "Building" of the Faculty

In the beginning we had only 3 full-time and 7 part-time psychiatric faculty, and of these, only 3 were practicing psychiatrists in the community. One must remember that in 1946 the membership of the American Psychiatric Association was 4,000 (there are now over 20,000 members), few of whom were engaged in private practice in communities. Over the years our full-time psychiatric faculty has increased from 3 to 45 (30 of whom have primary assignments in the department), part-time from 7 to 63, and psychiatric house officers, residents, and fellows from 4 to 37. Richard Jaenike, George Engel, Walter Hamburger,

Daniel Schuster, Robert Atkins, and Elihu Howland assumed major roles in the teaching of medical students and psychiatric house officers. As the faculty grew in number, it became possible to rotate certain teaching assignments in order to provide a broad experience for the teaching members of the faculty.

At the outset, a decision had been made not to establish a doctoral degree program in psychology, which would have been competitive with that of the parent department in the University, but to work intimately with psychology in the establishment of a Division of Psychology within the Medical School Department of Psychiatry. We look upon this development as one of the important contributions of our department, as it led to the appointment of psychologists in other clinical and preclinical departments of the Medical School, as well as to the true enrichment of our research programs, patient care, and the teaching of our students. Frances Parsons, Earl Telschow, Norman Harway, Irving Weiner, Arthur Orgel, Leonard Salzman, and more recently Rue Cromwell have played an important part in this development. Initially, there were no full-time and only two part-time psychologists. Currently, there are 31 full-time psychologists, 15 with primary appointments in the department, and over 12 part-time appointments. The pre- and post-doctoral programs in child and adult clinical psychology have achieved national distinction, and the department is well known for its success in maintaining a harmonious and effective cooperative relationship between psychology and psychiatry. Other significant relations with the University at large took place in sociology, with the joint appointment of Dean Harper, and in statistics, with the appointment of Charles Odoroff.

After almost thirty years of chairmanship responsibility (I had served as chairman at Cincinnati prior to coming to Rochester), I asked Allen Wallis and Lowell Orbison whether I could relinquish the chairmanship before I reached the age of 65. With their approval, the announcement of my resignation as chairman was made on January 28, 1970, to become effective September 1, 1971. This led to the appointment of the Ad Hoc Committee, chaired by Robert Joynt, which undertook a detailed search here and abroad for a successor. Lyman C. Wynne, chief of the Adult Psychiatry Branch of the NIMH, was chosen and assumed his post in September, 1971. Dr. Wynne, a nationally recognized authority on schizophrenia and on family and developmental

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psychology, attended Harvard and Yale, received his M.D. from Harvard in 1947, and his Ph.D. in social psychology, also from Harvard. At the time of his appointment, I remarked that the University and the community were to be congratulated on the choice of Dr. Wynne. His record as scientist and clinician assured the further growth and development of the Department of Psychiatry.

We have kept in mind always that departmental organization, as a function of administration, is a means to an end, never an end in itself-the end being the study and care of the sick and their families, the teaching of the young, and the pursuit of new knowledge. As the department grew in the number of its faculty and as it added clinical assignments that extended beyond the Hospital into the community, necessary changes were made, and are still being made, in departmental organization. However, every attempt was made to keep the department members informed about matters within the department and without: for example, in the School and University, as a whole, and in the community. The chairman made every effort to be fully informed from the members of his department, and so he, in turn, could serve appropriately as the department's representative at School, University, and community councils. The increasing complexity of department organization reflected faithfully the extraordinary changes which have taken place in the design and function of the Medical School and the University at large.

From the beginning, we attempted to relate nursing service and nursing education intimately into our teaching and service programs. Thanks to the good works of John Racy, all of us, including our patients, happily survived the decade of rivalrous discord between these two forces. Similarly, we attempted to weave our Social Work Division into the overall Hospital Social Work Department, but this initially proved to be difficult. Our Division of Social Work was more intimately related to the work of our department than were social work services to other clinical departments of the Hospital. Later, another attempt was made to centralize social work in the Hospital as a whole, although our department division still remains a particularly strong section. Our division, under the leadership of Miss Marjorie Harle, both directly and indirectly brought about major changes for betterment in social work services in the Hospital. This development again reflected a national trend in which so-
cial casework in the general hospital expanded both in structure and function.

The Department of Psychiatry has contributed to the overall functions of the Medical School and Hospital. Its members have served on standing and ad hoc committees of both School and Hospital and have participated in special studies relating to the educational and research programs. Several of its members have assumed full-time School and Hospital administrative duties-Drs. Bartlett, Grinols, and Meyerowitz in the dean's office, and Dr. Bartlett as medical director of the Hospital. The magnitude of the change in department function and structure can be illustrated not only in terms of increase in faculty, but also in terms of budgets. To place these matters in some perspective, one must remember that the annual total operating budget of the Medical Center in 1946 was \$4 million, in 1965 was more than \$30 million, and in 1975 is predicted to be \$85 million. In the Department of Psychiatry the department budget in 1946 was \$36,000 (before Wing R was built), in 1965 it was \$2 million, and in 1975 it is more than \$71/2 million. The administrative complexities led the chairman to appoint an administrative assistant. Initially, it was Mr. Raymond Schirmer, who remained with us for a five-year period and was succeeded in 1965 by Mr. Harry Conner. Their contribution to the conduct and welfare of the department has been considerable. One must remember that the Wing R budget, from the beginning, was and is a combined School and Hospital budget, differing from the other clinical departments. While this added to the chairmen's burden, it also made for a greater sense of accountability and for a keener investment in the overall conduct of the department in all of its functions. Happily, the department has been able to live and grow and prosper without dipping into red ink. When I consider the complexities of the moment, with the numerous departmental accounts, I do have a nostalgic twinge with the memory of the remarkable Leroy Agne, who appeared to be in charge of all accounts, both School and Hospital. In the first few years of the department's history, this modest, unassuming man would, at a moment's notice, furnish me with precise financial information about our departmental accounts. He would tell me what we had started with, what we had spent to date, and what was left. So far as I could determine, much, if not all, of this information was to be found on his left shirt-sleeve cuff and on the backs of

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three used envelopes stored somewhere in the rear of his desk's center drawer. And never since have I enjoyed the security and comfort of his immediate and surprisingly accurate financial recall.

# PSYCHIATRY IN THE COMMUNITY

For many years, with the able assistance of our sister institution, the Rochester State Hospital (recently renamed the Rochester Psychiatric Center), we have tried to meet the urgent, at times imperative, demands of our citizens in need of emergency, inpatient, and outpatient study, care, and treatment. The development of psychiatric units in the Monroe County Infirmary and in the Rochester General Hospital helped us immensely to serve the needs of our citizens, and we are encouraged to learn of the recent establishment of the Psychiatric Unit in Genesee Hospital. Similarly, due in great part to the wise planning and initiative of the Monroe County Mental Health Board under the direction of Harold Miles, and more recently the Genesee Regional Health Planning Council, the establishment and expansion of facilities for child guidance clinics, outpatient clinics for adults, and provisions for residential treatment of children have improved considerably the depth and range of health services. The late Christopher Parnall, Ir., William Hart, and Werner Halpern at Rochester General Hospital; Harold Miles and Susan Hanson, at Monroe Community Hospital; and Susan Hanson, now at Genesee Hospital, deserve tribute from the community for their important work.

The department, together with medicine, pediatrics, and preventive medicine, helped to establish the Family Medicine Program at Highland Hospital under the direction of Dr. Eugene Farley. Also, the Liaison Service has taken part in teaching exercises, particularly at Genesee Hospital. It took a long time to influence the local Blue Cross and eventually the state Blue Cross authorities to offer adequate insurance coverage for psychiatric inpatients, and in these at times frustrating moments one learned of and benefited from the presence and influence of benign gray eminences in the community. They played an important part in effecting necessary change, enabling our patients to obtain adequate insurance coverage. One outstanding eminence, certainly not gray, has been that of Marion Folsom, who has given generously of himself in contributing to improvements in the nature and delivery of health care services in our community.

From its inception, the department has enjoyed good working relationships with many of the community's health, legal, social, police, and welfare agencies, and it was quite natural that there emerged within the department persons with special interests and skills who undertook various ventures in the courts and social agencies. As a result of these interests and activities, we were in an advantageous position to launch a community mental health center as a division of the department. At the time of the completion of Wing R North, in September 1969, a special dedicatory exercise took place which drew attention to mental health and social action and the reciprocal roles of the University and the community in the development of community mental health centers. In all of this, Harold Miles, together with Robert Atkins and Haroutun Babigian, played a large part. Due to the considerable efforts of Elmer Gardner and to the sustained financial support from federal auspices, private foundations, and the New York State Department of Mental Health, we were able to launch, in January 1960, the Cumulative Register of Patients in Monroe County. This register has proven to be a treasury of source material for clinical and epidemiological researches.

# UNDERGRADUATE EDUCATION AND INTERNSHIP

As we mentioned earlier, a major concern and interest of our work has been the teaching of undergraduate medical students. New courses, transcending traditional department boundaries, have been established in which the Department of Psychiatry often has played a germinal role. In our preclinical teaching we continue to work towards the establishment of a basic science of human biology.

In all of our teaching, major consideration has been directed to concepts of health and disease; of growth and development; of the social matrix of the patient and his family; and those considerations basic to the idiosyncratic human interaction between patient and physician, and to the disciplined capacity for human intimacy basic to the physician's role. Our students are intimately and responsibly engaged with patients on Hospital floors and in the clinics and Emergency Division, and through them with social and health agencies of the community. Students are assigned to patients who represent the most common types of psychopathology. Through study of their patients, for whom they are appropriately responsible in their student roles, the stu-

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dents work with patients young and old, rich and poor, black and white, those subtly as well as flagrantly ill, and thus learn the major lesson of the remarkable range and incredible variation of human behavior, normal as well as abnormal. And they learn, too, to avoid the error of the single cause and to consider psychologic and social, as well as biologic, determinants of behavior alone and in concert. For many years we have made provisions for summer student assignments, both research and clinical. Many of these students have come from other medical schools in the United States, as well as from medical schools in foreign countries. Until recently, the nature of our School permitted us and our students to know each other well. The size of the class, the setting, and our traditional informality contributed to this. A hallmark of the Rochester teaching program has been the several liaison programs which were established between psychiatry and medicine, pediatrics, and obstetrics. From beginnings in Colorado (1935-38), Boston (1938-42), and Cincinnati (1942-46), and with the initial support of William McCann, Samuel Clausen, and Karl Wilson, we were able to develop teaching programs for medical students and house officers on the floors and clinics of the several services. George Engel and I had worked toward these ends in Boston and in Cincinnati and were particularly ready to develop the liaison teaching programs. George Engel's inspired leadership drew to him and to his colleagues young men and women intent upon becoming more informed and interested in undertaking research programs in the psychosocial aspects of illness in medical care. A more detailed statement of the Medical-Psychiatric Liaison Unit will be found in the essay prepared by Dr. Weed.

While our undergraduate class has been increased from 70 to 96, the School has, thus far, maintained its high standard in not reducing the time of basic core assignments, or in establishing a three-year medical curriculum. We have been dismayed by several trends in undergraduate medical education which we believe may lead to lowering of professional standards, and have on several occasions expressed our views in the professional journals. First-year teaching of medical students was conducted by me for the first seven years and was followed by Walter Hamburger (1953–59), F. Gordon Pleune (1959–62), and Otto F. Thaler (1962 to date). Drs. Hamburger, Pleune, and Thaler were assisted by several senior and junior members of the faculty, par-

ticularly in the conduct of small group discussions. The secondyear teaching has been the responsibility of George Engel since 1947, and he, too, has been assisted by several members of the faculty over these years. For many years third-year teaching was directed by me, together with the clinical directors of the inpatient floors—Drs. Schuster, Atkins, Racy, Grinols, and others. Third-year teaching consisted of six-week assignments to one of the inpatient psychiatric floors. Earlier, fourth-year teaching included assignments to the Outpatient Department and, later on, to the Emergency Division. When the fourth-year schedule provided an increase in elective time, students continued to have an opportunity to work in the Emergency Division and to elect other assignments.

# Student Evaluation

Since the inclusion of psychiatry as an independent examination, in Part II, the National Board of Medical Examiners (1962), Rochester students have distinguished themselves as compared with students of other schools. For the first 11 years (1962-72) Rochester students ranked no lower than number 4 of the schools who took the examination in the country. Our average rating over the eleven-year period was 2.6. Regardless of their eventual career choices, Rochester students have been recognized for their psychologic sensitivity and informed judgments in matters of mental health and illness. The strengths of the department have come from the genuine interest, skill, and devotion of the faculty and the resident staff in teaching our students, from the preclinical instruction and the liaison programs between psychiatry and the other clinical disciplines, from elective and summer assignments, and, perhaps most important, from the six-week third-year assignment to one of the inpatient psychiatric floors, where each student is assured of a broad and yet intensive experience with patients and their families. These are patients who demonstrate a wide variety of psychopathology. At times, well meaning but uninformed colleagues attempted to reduce the six-week assignment, but after seemingly endless conferences, reason and experience prevailed, enabling the student to obtain maximum benefit from his assignment.

# An Experiment in Teaching

A two-year internship was launched, in 1949, which provided for assignments in medicine, surgery, pediatrics, obstetrics, and psy-

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chiatry and also contributed to productive interrelations between the clinical disciplines. This venture, begun on an experimental basis, lasted for twelve years. Its purposes were to provide an experience which could better prepare the young physician who had become interested in the general practice of medicine without acquiring special surgical skills; to provide an experience for those who wished to prepare for one of the career fields in medicine, pediatrics, psychiatry and possibly for some who would enter the fields of surgery and obstetrics. A third and perhaps most important purpose was to afford opportunity for the intern to meet and work with representatives of all of the clinical faculties of the School, enabling him to obtain a more comprehensive background in all of medicine for whatever eventual goal he would seek. One hundred twenty-four interns -15 women and 109 men (they had come from all parts of the nation)-completed the assignment; 1/3 went into the field of internal medicine, 1/6 into pediatrics, 1/6 into psychiatry, and the remaining third was distributed among many fields, including surgery, radiology, and administration. In many ways, this internship anticipated some of the current designs of family medicine programs. However, it did not survive; it probably came before its time. One clear reason was that the other clinical departments wished to increase their roster of straight internship appointments. This parochial decision, then and now, reminds one of Voltaire's remark: "If a camel had a god, it would probably look something like a camel." The record of these interns in their later professional lives is distinguished.

#### GRADUATE AND RESIDENT EDUCATION

In the instruction of our resident group we have tried to establish a setting in which each person could obtain a basic experience in clinical psychiatry, regardless of what was to be his eventual destiny—whether it be that of teacher, investigator, practitioner, community planner, or a combination of these. Our position has been to consider psychiatry as a branch of medicine, one that is particularly related to psychology and sociology, as well as to its more traditional biological parents. We look upon the psychiatrist as a physician. Furthermore, we have tried to remain true to our basic identity as a department of psychiatry. We have not become a department of psychoanalysis, molecular biology, psychopharmacology, behavior therapy, or social psy-

chiatry. Our allegiance is to that knowledge and experience which has relevance to our tasks. Our pluralistic posture has permitted us to look for and to examine information from any source which may add to our understanding of our tasks. These have included physicochemical biology, including genetics; psychology and the computer sciences; the social sciences and the humanities, as well as our traditional clinical knowledge and skills.

## Psychoanalytic Training

By design, we did not provide opportunities for psychoanalytic training during the residency period. Those who were promoted to faculty status and who wished to pursue psychoanalytic training were assisted materially and generously by the department. We are grateful to the late Sandor Feldman, who contributed significantly to the teaching of psychoanalytic psychology in our department. Perhaps our experience over the past twenty-five years with several psychoanalytic institutes in other communities will not be repeated in the future-I sincerely hope it will not. With the exception of the Chicago Institute, which under the leadership of Franz Alexander and Thomas French did exhibit genuine interest in scholarship for its own sake, most of the others with whom we dealt in working out associations for educational purposes reflected the narrowness and the arrogance of those who maintain closed systems of belief and practice. I am encouraged to learn of the program initiated recently by Lyman Wynne. A fellowship program has been established for psychoanalytic and psychotherapeutic education. It is being attended by psychiatrists and psychologists who have had at least two years of residency or two years of clinical psychological internship. It is essentially a program for advanced education in psychoanalysis and psychotherapy, including family and group psychotherapy. Its goals point towards education and research.

From the period July 1, 1946, through June 30, 1974, there has been a total of 226 physicians who have completed residency training in general and child psychiatry, and a total of 63 liaison fellows engaged in training in medicine, pediatrics, and obstetrics-gynecology in association with psychiatric training. Well over 50 percent of both groups are involved full time in university departments of psychiatry in teaching and investigation, including several appointments as department chairmen. The re-

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mainder are engaged in private practices, general or special, with considerable involvement in part-time teaching appointments in university departments. About 20 are involved in public health and administrative work, and 12 are currently serving in military psychiatry. The psychiatric residents and the liaison fellows have come to us from all over the United States. In addition, they have come from Lebanon, Israel, Iran, Australia, New Zealand, South Africa, Colombia, Canada, Scotland, the Philippines, Iceland, Haiti, Jamaica, and Argentina. They have helped to stretch our minds and we have profited from their company.

In addition to medical students and career psychiatric residents, teaching programs were directed to physicians in various liaison assignments (medicine, pediatrics, obstetrics); to preand post-doctoral psychology students; to social casework and nursing students; and to students from nearby state universities in the fields of occupational therapy, industrial arts, and therapeutic recreation.

#### **Research in Psychiatry**

In the beginning, the department chose deliberately not to establish a separate division of research, but to encourage investigative activity on the part of the faculty and our students in all of its several divisions. Funds for investigative work and for research fellowships were received from the National Institute of Mental Health, the Ford Foundation, state and county funds, the Margo Cleveland Research Fund, the Scottish Rite Foundation, and others, for which the department will always be most grateful. No unitary theme for investigative work was set, though common interests led to certain clusters.

One, participated in by Engel, Greene, Ader, Schmale, and others, related to notions of early life experience, separation, and loss. Ader's work from his animal studies attracted wide attention and has been recognized as being of basic importance. Another set of themes, emerging from the Cumulative Patient Register, included concern with diagnosis, incidence, and prevalence studies, and other aspects of epidemiology. These were initiated by Gardner and continued by Babigian, Pederson, Harper, Odoroff, and Romano, and most recently by Strauss. Clinical studies were undertaken by a number of psychologist and psychiatric members of the faculty. A pervasive interest in medical education in general, as well as in the particular aspects of

the teaching of psychiatry to undergraduate medical students and career psychiatric residents, resulted in a series of reports and papers, especially following recent moves to curtail and truncate the educational experience. The department's major investment in education was reflected in the theme of its twentyfifth anniversary celebration in 1971.

Continuing engagement in clinical research, reinforced by the availability of the Cumulative Register and the harmonious cooperation between the University and Rochester State Hospital, led to studies of schizophrenic patients and their families. This had been the theme of the twentieth anniversary of the department (1967), resulting in *The Origins of Schizophrenia*, which has been widely circulated and studied with interest by many. In the schizophrenia project preliminary phases were concerned with diagnosis, epidemiology, and family studies. Support from the Scottish Rite Foundation gave further impetus to the drafting of a major research program in which Norman Garmezy played a generative role through the effects of his seminar on "Vulnerability to Psychopathology" during the 1969–70 academic year.

Lyman Wynne, as the new chairman, brought with him his extensive experience and eminence in the field of research in schizophrenia. Based upon the preliminary organization, his coming led to the construction of a major research program concerned with vulnerability to psychopathology (1971). This consists of the prospective study of male children, ages 4, 7, and 10, born at genetic risk. These are children with one parent diagnosed schizophrenic, who had been hospitalized, the control population being that of children who have one parent diagnosed as depressed, who had been hospitalized. Both parents and children are being studied intensively in psychologic, social, and biologic parameters to learn more particularly of those events which may play a part in the eventual vulnerability or invulnerability of the children to psychopathology in their adult lives.

The department has been enriched with the addition of clinical investigators like John Strauss, Rue Cromwell, and Wells Goodrich, who have come with Lyman Wynne and who have begun to play a major part in the research and educational programs of the department. Rue Cromwell has been appointed director of research for the department as a whole, and John Strauss, director of clinical research. Our current researches

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have been aided considerably by the participation of Norman Garmezy, of the University of Minnesota, Margaret Thaler Singer, of the University of California at San Francisco, and Clara and Alfred Baldwin, of Cornell University. The participation of these investigators reflects a national movement towards regionalization of research programs.

# PARTICIPATION IN NATIONAL AND PROFESSIONAL AFFAIRS

Perhaps earlier, if not more, than most of its fellow departments. members of the Department of Psychiatry took an active part in national planning groups. I believe this was quite representative of my generation of department chairmen. From 1946 to 1948 I served as a member of the original Council of the National Institute of Mental Health and as chairman of its first Research Study Section, and in the succeeding fifteen years served on various NIMH committees, including the Career Investigator Selection Committee. This was an unprecedented experience in the history of American medicine, with the significant engagement of the federal government in making possible the education of professional persons, the pursuit of new knowledge, and the upgrading of clinical services to our patients. Most exciting of all was the response of our professional colleagues from across the nation in serving as advisors and consultants to the governmental bureau staffs. It was an extraordinary exercise of democracy at its best, and I shall remember always the devotion, the seriousness, and the integrity of those who participated in this venture. Regretfully, in the past few years there appears to be increasing bureaucratic intrusion into the educational and research functions of our universities, which, if uncorrected, may lead to serious consequences. In addition to the NIMH assignments. I served on various advisory groups to the Ford Foundation assigned the tasks of allocating funds for research programs in psychiatry and related disciplines both here and abroad.

Several members of the department have served on editorial boards of scientific journals and others have been elected to high office; for example, both George Engel and William Greene have served as president of the American Psychosomatic Society. In 1953 Rochester launched the first of a series of annual meetings of the chairmen of six university departments, in addition to Rochester. These were Cincinnati, Western Reserve, Colorado, Pittsburgh, North Carolina, and Einstein. The objective

was to invite each chairman, and one other person chosen by him from each of these departments, to meet annually for a two-day meeting with the faculty of the host department in order to discuss matters of central relevance and urgency to the university departments. During the first meeting, after wining and dining our guests, we took them to the Dryden Theater to see John Ford's epic movie of the West, Stagecoach, and from that point on, this group was called The Stagecoach Club. Like a stagecoach, each year the group visited the next school on the list. It lasted for twelve years, but at the meeting in Denver in 1965, because of the imminent resignation from the chairmanship of one or two of the founding members, it was decided to discontinue. Another reason for discontinuing was that some of us wanted to have belonged to something which had ended, a refreshing exception to the inexorable permanence of most groups. These meetings were interesting and helpful and very friendly. The host department would set the agenda and discussion was full and free. No notes or minutes were kept, no memos prepared, and no officers elected. At one time we were courted by one of the governmental agencies and asked if we would add other schools to the club, thereby becoming eligible for a generous supporting grant. We decided not to do this. Some of us felt that something like this had not happened since George Washington left his high office. Interestingly enough, the model of the Stagecoach Club was used to establish the associations of chairmen of departments of psychiatry regionally in the South, in the Midwest, in the Northeast, and in the far West, and also served as a model for the establishment of associations of chairmen of other clinical departments.

### WHAT OF THE FUTURE?

And what about the future? If, in the next thirty years, there is to be growth and change in psychiatry comparable to that which has taken place in the past thirty years, one can be assured of an interesting and exciting time. What is to happen to our current belief and practice in attempting to prepare the undifferentiated physician? Over the years, we have tried to select in both method and content that which we consider to be basic and essential to the preparation of tomorrow's physician. We have tried, too, to identify and respect individual differences between our students and to provide each with opportunities to pursue his individual

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interests. Whether current fads leading to reduction of preclinical assignments, increased class size, over-concern with electives and tracks and truncated clinical assignments and responsibilities will be entrenched or challenged will depend upon the resoluteness and intelligence of our faculties and students and their influence on governmental agencies, which undoubtedly will assume increasing control over professional education in the near future.

Another issue is that of the size, scope, and commitment of the individual department to its various functions. Evidence of the explosion of information and knowledge in our field is apparent. Most of this is centrally relevant to our educational program and to the pursuit of new knowledge. Whether all individual departments can expect to do justice to all areas, and, if so, how are they to do so, are matters for serious consideration.

We believe that the major function of psychiatry, and one unique to it, is that it serves as a crucial bridge between genetics, biology, and clinical medicine on the one hand, and the behavioral sciences on the other. The psychologist, the social worker, and the social scientist lack knowledge of the body: the biologist, that of the mind; and up to the present, the nurse has had insufficient background in either field to serve the role of a bridging figure. We believe if we are to serve this function properly, we must not only reaffirm our fundamental membership in medicine, but we must become informed of the contributions of our colleagues in the behavioral sciences. To neglect scholarship at either pole would be to diminish our usefulness for tomorrow. We learned with interest that the American Board of Psychiatry and Neurology has unanimously recommended a reversal of its 1970 decision to eliminate the one-year internship requirement for a certification in psychiatry and neurology.

In addition to our traditional concern with clinical medicine and clinical psychiatry, the preparation of tomorrow's psychiatrist will require more systematic study of genetics, biochemistry, pharmacology, and the neural sciences. It will require, too, more knowledge of the nature of the human family and its community and of means to ensure more effective delivery of health services to our patients. In the last third of this century we shall be increasingly concerned with psychosis—a change from our concern with neurosis, which occupied the attention of most of us in the middle third of the century, and with this there may

come greater interest in involvement with psychiatric patients who are chronically ill, a much-neglected chapter of American psychiatry as well as of American medicine as a whole.

Today we see trends towards clinical medicine and biologic research; towards new ventures in psychotherapy, with an increasing pool of professional and paraprofessional persons engaging in psychotherapy; towards a social public health engagement with health service delivery and prevention, with increasing concern for the chronically ill; and the ever-present search for understanding of the basic causes and mechanisms of mental illness, which underlie all the rest.

Lyman Wynne's interest in promoting studies of child development and family structure and his concern with more systematic approaches to family and group therapy augurs well for the future. I am pleased, particularly in the younger members of the faculty, to find evidence of increasing and sustained scholarship in psychopharmacology, an area of considerable neglect in this department to date. I continue to hope that one day we may recruit more members of our faculty with significant interest and scholarship in the neural sciences, with particular reference to psychiatry. One hopes that we shall continue to maintain high standards of serious engagement in the teaching of the young, in service to our patients and their families directly, and in cooperation with our community health, social, and legal agencies. In addition I would predict that there will be more sustained and vigorous research activities in the next few decades than has been possible to date, and these researches will reflect the intellectual interests of our students and our faculty and the urgencies of their times.

# 16.

# The Impact of the Post World War II Era on House Staff Training



# William L. Morgan, Jr., M.D.

Dr. William L. Morgan, Jr., spent four years training in medicine and cardiology at Massachusetts General Hospital following his graduation from Harvard Medical School in 1952. He was a clinical associate at the National Heart Institute in Bethesda and practiced cardiology from 1958 to 1962 at the Henry Ford Hospital in Detroit.

In 1962 he joined the faculty of the University of Rochester School of Medicine and Dentistry. He assumed responsibility for the physical diagnosis course and became director of the General Clerkship from 1965 to 1970. The textbook Clinical Approach to the Patient, by Morgan and Engel, resulted from new teaching methods introduced in the General Clerkship.

Since 1962, Dr. Morgan has been in charge of the Department of Medicine House Staff Selection Committee and the medical house staff training program at Strong Memorial Hospital. During this time the program has grown from 42 to 54 interns and residents, and the Strong Memorial Hospital senior full-time faculty with primary appointments in medicine has increased from 32 to 70.

Dr. Morgan is professor of medicine and associate chairman of the Department of Medicine for educational programs.

He is presently a member of two national committees concerned with house staff training, the American Board of Internal Medicine and the Residency Review Committee in Internal Medicine.

The striking diagnostic and therapeutic advances in medicine since World War II have had a profound effect on house staff training. The development of definitive treatment for infectious disease in particular has changed the composition of hospitalized patients. With the introduction of penicillin in the mid-1940s, interns and residents no longer had to face serious cases of lobar pneumonia, typing the pneumococcus, and waiting for the crisis. Penicillin also made obsolete the Saturday afternoon "L" clinic for syphilis, which had required the turnout of most of the house staff to diagnose and treat patients with arsenicals and bismuth. After 1954 and the successful use of the Salk vaccine, medical and pediatric floors were no longer filled during summer polio epidemics with paralyzed young and convalescing respiratory patients. During the 1960s more sophisticated physician education led to patients being treated successfully outside of the Hospital, with increasingly acute and complicated problems referred to the inpatient services. House staff dealt with patients who were admitted for complex diagnostic procedures such as cardiac catheterization and angiography, as well as for such therapy as the insertion of heart valves, artificial joints, and renal dialysis. Special units and trained nursing personnel were added, including a surgical intensive care floor, a Coronary Care Unit and a Respiratory Care Unit.

A major factor influencing these advances in medicine has been federal funding of medical research through the National Institutes of Health (NIH). Although funds were designated for research, medical education benefited by the buildup of full-time faculty, and subspecialization came of age. Federal support of trainees and fellows also helped to promote the development of subspecialties. Psychiatric and rehabilitation units became part of general hospitals in the late 1940s. With the establishment of the Psychiatry Department at Rochester there arose such divisions as the Liaison Group (which interacted with other departments), child psychiatry, and the Community Health Center. In the mid-fifties the Department of Medicine subspecialty units proliferated, as did the pediatric subspecialties. In the late

1960s, the divisions of obstetrics and gynecology became recognized nationally. Anesthesiology, a division of surgery, became a department in 1969; neurology, a unit of medicine, a department in 1966; and orthopedics, a division of surgery, a department in 1974. Faculty size expanded rapidly, together with the house staff, to parallel the changing type of patient and the introduction of new subspecialty skills.

Both the change in the type of patient hospitalized and the development of subspecialties has led to a progressive increase in the number of house staff over the past thirty years. In the academic year 1945-46, the total number of interns and residents was 54, which by 1974 had grown to 322. Figure I illustrates the annual increase in Strong Memorial Hospital house staff. In addition to the quantitative change, there has been a fundamental qualitative change in the relationship of the house staff to others who also care for the patient. There are many new Hospital personnel who are also responsible for the management of the patient. On the floors there are now licensed practical nurses, secretaries, and unit managers. Dieticians, physiotherapists, and social workers advise patients. Blood-drawing teams, electrocardiography technicians, and hospital messengers come to the floors daily; and there are many consultants who see the patients, including a large number of subspecialty trainees and fellows. No longer is the relationship of the intern and resident just limited to the head nurse and a few faculty members, as existed in the thirties and forties. The house officer is now in a more impersonal role, relating to many people who are also interested in the patient but who do not necessarily know him.

## INTERN SELECTION AND THE DRAFT

Up to 1952, when the National Internship Matching Plan was established, the selection of interns had been a chaotic procedure. Department chairmen would indicate to some applicants at interview that they had a job, even though there was an agreedupon uniform appointment date. When that date came, departments would make telephone calls at all hours of the day and night to offer positions and immediate answers would be expected. The Matching Plan was in the interest of the student, allowing him to rank his hospitals; if not accepted by the hospital of his first choice, he would usually match with his second or third



Figure I

# DATA FOR FIGURE I

Growth of Strong Memorial Hospital House Staff from 1945-46 to 1973-74

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No. of House Staff

	NO. Of HOUSE Stuff		
1045-46	54	1960-61	203
1046 - 47	101	1961-62	191
1940 47	102	1962-63	192
1947-40	194	1963-64	195
1948-49	132	1964-65	218
1949-50	140	1965-66	211
1950-51	136	1966-67	224
1951-52	130	1967-68	240
1952-53	130	1968-69	246
1953-54	150	1960 - 70	256
1954-55	155	1070 - 71	298
1955-56	147	1970 - 71 1071 - 79	321
1956 - 57	161	1971-72	336
1957-58	177	1972-75	399
1958-59	178	19/3-74	344
1959 - 60	199		

322

## TO EACH HIS FARTHEST STAR

choice. Although very efficient, the plan was occasionally delayed, as when attempting to match married students. A practical solution was to allow them to accept positions outside the plan. On a given day in March when the internships were announced, fourth-year students would gather to open their envelopes to learn their fate. They would usually blow off steam with a party and skit portraying the faculty as they really were. Residencies continued to be offered outside a matching plan, usually on a uniform appointment date according to a gentleman's agreement with variable compliance.

The military draft, particularly during the Korean and Vietnam wars, affected house staff training programs, often with last-minute inductions which left departments short of their full complement of residents. Interns were protected from the draft, but anyone on completing internship was fair game to run a dispensary, to do induction physicals, or to go to the war zone, the sooner after internship the better. Many joined the Berry Plan so as to be deferred for one or more residency years, signing up for one of the branches of the armed forces. Others were deferred in the Public Health Service CORD Plan to enter Public Health Service hospitals, the Indian Service, or, later, cancer and heart disease control programs. A lucky few went to the NIH in positions analogous to subspecialty traineeships. On their return most managed the transition back to house staff training, surviving the vagaries of moving companies, and returned to face higher prices of civilian goods and rigorous on-call schedules. When the draft ended in 1973, most house staff remained in their own programs each successive year, and there were fewer openings for residents trained outside of Strong Memorial Hospital.

#### HOUSE STAFF RESPONSIBILITIES

There have been three major areas of house staff responsibilities: the inpatient wards, the Emergency Department and the ambulatory clinics. In the years immediately following World War II, interns and residents were expected to be immersed in their work with a heavy patient load, performing many laboratory tests and procedures that in later years were delegated to others. Even the chief resident on most services was expected to be on duty 24 hours a day, at least for the first six months, signing out to others if he wished to leave the Hospital. All house of-

ficers had a room in the Staff House when on duty, with the telephone strategically placed on the wall across the room to be sure the intern or resident was awake by the time he reached the phone. Not only were the house staff responsible for the care of the patient, but also for laboratory procedures such as plating cultures, doing urinalyses, diagnostic hematology, routine urine sugars and acetones, taking electrocardiograms, drawing bloods, and putting in intravenous needles. Needless to say, house staff considered it a valuable part of the medical student's education to help with laboratory work and procedures. Such training produced skilled physicians, who made most judgments on clinical grounds at the bedside, doing only an occasional white count and rarely a differential count. With the development of supporting technical personnel, the house staff did little laboratory work unless called to do so in the middle of the night. Teams were added who drew bloods and took electrocardiograms, and the major area left to the house staff and students were patient procedures such as thoracenteses, lumbar punctures, and cutdowns. The development of the SMA-6 and SMA-12 automated chemistry analyzers, the introduction of precise diagnostic procedures and the delegation of laboratory work to others have led to an abundance of laboratory tests ordered for each patient so that the present house officer has become more laboratory oriented. Yet these powerful tools, including revolutionary developments in roentgenology, have resulted in more accurate and precise diagnoses so that unexpected findings at post-mortem have become rare.

Not only has the type of disease problem changed in hospitalized patients over the past thirty years, but so has the distribution of patients by social and economic background. Formerly, ward or division patients were isolated in the Municipal Hospital, which was physically part of Strong Memorial Hospital with its adjacent semiprivate two and four bedrooms and the strictly private Q Wing with single rooms located further down the corridor to the west. Floors were also segregated by sex. The civil rights movement in the 1960s, and third-party Medicaid payment, were impetuses to integrate patients on all floors. On the medical service, for example, there no longer is any social, economic, or sex discrimination on any floor. There has also been little segregation of patients according to disease by any clinical department except in the intensive care units. This pol-

icy has provided medical students and junior house staff with a variety of general problems and has helped to give them a broad, patient-oriented approach. The disappearance of wards of indigent patients has been a relatively easy transition at Rochester, with primary responsibility for patients maintained by the house staff. Patient care and teaching has been enhanced by having senior faculty members ultimately responsible for patients. The good relationship with the part-time faculty in particular has been a very important factor in maintaining the tradition of educating house staff with private patients. In the eleven-week General Clerkship course it is remarkable that some 45 students, learning fundamentals of interviewing and physical diagnosis, can be assigned to all floors of Strong Memorial Hospital to practice these basic skills on any patient regardless of social class.

In the Emergency Department house staff responsibility has become more complex. Rather than serving as a straightforward acute-care facility the Emergency Department has become an extension of clinic and community practice, so that patients come with minor problems, especially nights and weekends. In 1967, the Emergency Department was expanded and made more functional, with the addition of cubicles for nonacute patients to complement the holding beds and the traditional acute area. Conference rooms were added for the new Emergency Department Clerkship, where all fourth-year students are required to spend a month in the Emergency Department. The numbers of house staff assigned to the Emergency Department have expanded, and they have the additional unique experience of being responsible for teaching large numbers of students who are based in the facility. In July 1963, house staff as well as senior staff were acutely tested shortly after the arrival of new interns, when a commercial airplane crashed at Monroe County Airport and 36 patients arrived at the Strong Memorial Hospital Emergency Department. All of the injured who reached the Hospital lived, and television sets given by a grateful company, many of whose employees were on the flight, still are present on the Hospital patient-floor porches.

In the 1940s and 1950s each department had its large typical clinic for indigent patients, manned primarily by house staff. Several services appointed chief residents, whose major responsibility was the clinic. Full-time faculty members saw their patients throughout the Hospital in space adjacent to their offices.

In 1960, the U Wing Clinic was added to provide a practice area for full-time faculty as well as space for an ambulatory continuity experience one morning a week for fourth-year students. In medicine and pediatrics, during the 1960s, full-time faculty were appointed as clinic directors. Ambulatory teaching was increased and the numbers of patients assigned to house staff were made more appropriate. Innovative projects, such as the Early Disease Detection Unit and the Nurse Clinician Program, were added to test their impact on patient care. Other developing Rochester programs for ambulatory care are expected to have an increasing influence on the community, on house staff training, and on medical student teaching. These programs include the Highland Hospital Family Medicine Program, the neighborhood health centers in the Rochester Health Network, the Genesee Valley Group Health Association, the Community Mental Health Center, and fellowships for advanced training in medicine, pediatrics and preventive and community medicine. Intramural experience with ambulatory health care delivery is expanding for house staff, not only in the general medical fields but in subspecialty areas as well, including experience with private patients. The new clinic wing will facilitate teaching of ambulatory medicine. At present, house staff have limited ambulatory experience extramurally, primarily working evenings by choice in neighborhood health centers or in migrant labor camps.

# SALARIES AND BENEFITS

The influence of marriage on house staff training programs has helped to humanize postgraduate training, particularly with regard to housing, time off, social activities, and salary. University Park, only two blocks from the Hospital, has long served as excellent housing for house staff families. Whipple Park, opened in 1968 and located in its choice setting of woods a mile and a half south of the Hospital, is particularly attractive for house staff families with children. Most recently, in 1972, the Goler House apartments, only a block east of Strong Memorial Hospital, became available for single Medical Center personnel and families without children. When the Staff House closed its living accommodations in 1968, University housing was more than ample for house staff. By this time marriage and children had had their influence. No longer was the lounge of the Staff House the center of social activities, as it formerly was for unmarried

house staff. The days of the weekly late afternoon "history meetings" appeared numbered with the appearance of wives and baby carriages. In their heyday, history meetings were enlivened by a generous supply of alcohol, contributed by the house staff from their meager salaries. At times festivities were heightened by a punch of ethyl alcohol, resulting in one or two members of the house staff being admitted to the Emergency Department for intravenous fluids. On one occasion the attempted burning of a Christmas tree in the fireplace resulted in a blaze that brought the fire department. In earlier days Hospital administration could not be prevailed upon to purchase a television set for the house staff lounge and the members chipped in to buy one. In subsequent years, with the decline in history meetings, each department has provided for social functions, such as picnics, cocktail parties, and dinner dances. When one department moved its social function from the Staff House to the Faculty Club, there was great concern on River Campus that inordinate damage might result. However, the formality of the occasion subdued those prone to be wild.

As the house staff increased in size and marriage became the rule, salaries began to rise. A significant jump occurred in the late 1960s, when interns and residents became more aware of their rights and approached Hospital administration collectively. With a major increase in salary, free meals were discontinued. resulting in fewer numbers of house staff eating in the dining room. From 1945 to 1957, an intern earned \$180 a year. Since 1957, there has been a steady increase in salaries, to \$10,400 a vear in 1974. Figure II indicates the annual increase in intern salaries. There has always been an increment in salary for each year of residency. Since 1969, resident salaries have increased \$500 for each year. House staff salaries for 1973-74 were as follows: Intern-\$10,400; first-year resident-\$10,900; secondyear resident-\$11,400; and third-year resident-\$11,900. There are additional indirect costs for educating house staff, including faculty teaching time. Such costs were estimated for five clinical departments in 1970 and approximated \$10,000 a year per house officer. A major question facing teaching hospitals at present is, what should be the source of payment for indirect educational costs? The high hospital room charge per diem includes payment for house staff services, and the most logical future source of funds for education is the state or federal government.



# DATA FOR FIGURE II

Increase in Intern Salaries at Strong Memorial Hospital From 1945–46 to 1973–74

	Salary Per Year		Salary Per Year
1045-46	\$180	1960-61	\$1500
1945 - 40 1046 - 47	\$180	1961-62	\$1500
1047 - 48	\$180	1962-63	\$1500
1947 - 10 1048 - 49	\$180	1963-64	\$2000
1940 - 50	\$180	1964-65	\$2700
1949-50	\$180	1965-66	\$3000
1950 - 51 1951 - 52	\$180	1966-67	\$3300
1951 - 52 1959-53	\$180	1967 - 68	\$4000
1952 - 53	\$180	1968-69	\$5000
1959 - 51 1954 - 55	\$180	1969 - 70	\$6500
1055-56	\$180	1970-71	\$8500
1956-57	\$180	1971-72	\$9000
1957-58	\$380	1972-73	\$9500
1958-59	\$980	1973-74	\$9900
1959-60	\$980		
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In addition to salary, interns and residents receive benefits. In the 1940s and early 1950s, house staff were provided with free drugs, uniforms, laundry, board and room. Benefits have grown to include health, malpractice, term-life, and disability insurance. Uniforms and drugs continue to be provided. There is a four-week vacation, and in recent years full tuition benefits have been available for classes at the University of Rochester (should the house officer have spare time).

The House Staff Council was created, with two representatives from each department, and in the late sixties a Faculty-House Staff Council held breakfast meetings to discuss areas of mutual concern. All the chief residents continue to meet regularly with the medical director. There is also house staff representation on the Student-Faculty Council, the Faculty Council, Medical Records Committee, and the Executive Hospital Committee. All house staff appointments and policy decisions, such as those concerning numbers of house staff and yearly increments in salary, are the responsibility of the Executive Hospital Committee, which is composed of Hospital administration and the clinical chiefs. Major recommendations brought by house staff for discussion that have been implemented are: higher salaries, tuition benefits for wives of house staff, refurnishing the house staff lounge, the addition of blood-drawing teams, and "moonlighting" policy. It is quite clear that program directors can no longer make arbitrary decisions concerning the house staff, as was done in the forties and fifties. Mutual discussion is necessary before changes in policy are made. Major issues have been resolved by good will on both sides. The newly formed National House Staff Association has not as yet had much impact at the University of Rochester, nor have the house staff become unionized, as is the case in New York City.

#### ROTATING INTERNSHIPS AND COMMUNITY PROGRAMS

The remarkable spirit of interdepartmental cooperation at Rochester was particularly evident with the institution of a two-year rotating internship from 1949 to 1961. The program consisted initially of three six-month rotations in medicine, pediatrics and psychiatry, and one six-month block divided between obstetrics-gynecology and surgery. Designed to provide interns with a more comprehensive background in all the fields of medicine, the program attracted many able house staff to Rochester.

Most of the group completing the internship continued in the various specialties of medicine, including full-time professional positions in medical schools, with only nine out of 124 going into general practice. One-third of the group went into internal medicine, one-sixth into pediatrics, one-sixth into psychiatry, and one-third into other clinical specialties. As straight internships became more popular and problems arose in providing a graduated experience in the second year of the internship, the program was terminated. In its place, six mixed internships were created, each with six months of medicine and two positions in obstetrics-gynecology, pediatrics, and surgery. These programs remained highly popular, but gradually the number of applicants decreased so that medicine/obstetrics-gynecology was discontinued in 1968 and medicine/surgery in 1974. The medicine/ pediatrics internship at Strong Memorial Hospital ended in 1975.

Rotations of house staff between departments has been of mutual benefit. There have been psychiatric residents on neurology, obstetrics-gynecology interns on medicine in the affiliated hospitals, medical interns on psychiatry and neurology, and exchange of medicine and surgery interns in the Emergency Department. Consultation is freely sought between house staff of various departments as well as between subspecialty trainees. Traditionally, the surgical house staff cover the medical service, allowing medical interns and residents to attend their annual dinner dance; medical house staff cover for their surgical counterparts in return.

For many years Strong Memorial Hospital residents have rotated to the five community hospitals. In recent years such rotations have become more formalized, particularly in medicine, pediatrics and surgery. At the present time, residents rotate to Genesee Hospital for medicine, obstetrics-gynecology, pediatrics and surgery; to Highland Hospital for medicine, obstetrics-gynecology and surgery; to Rochester General Hospital for pediatrics and surgery; and to St. Mary's Hospital for medicine and surgery. In 1967, the Medical School assumed responsibility for medical and dental care in the 416-bed Monroe Community Hospital, a county-supported institution for the chronically ill. Two medical first-year residents staff a 40-bed floor for patients with acute problems and are available for consultation throughout the Hospital. Neurology and pediatric residents rotate to the Monroe Community Hospital, as do psychiatric chief residents.

Strong Memorial Hospital surgical residents are at the Batavia Veterans' Hospital. Psychiatric senior residents elect to be at one of the community health centers for a continuity ambulatory experience. Residents in affiliated hospital training programs also have elective opportunities at Strong Memorial Hospital, especially in subspecialty units or divisions.

In 1966, pediatrics developed a community-wide house staff training program with more emphasis on ambulatory continuity care and a first-year resident in-patient rotation that included Genesee Hospital, Rochester General Hospital, and Strong Memorial Hospital. In 1970, the Department of Surgery began a University of Rochester Surgical Residency Program following internship in each of five hospitals. Residency appointments are coordinated through a central office in the Medical Center. In the first- and second-year residency, rotations are provided through at least two of the five hospitals, and in the third and fourth years residents are based in those hospitals in which they interned. The University of Rochester Associated Hospitals Program in Internal Medicine began in 1974. The program director's major responsibility is to appoint house staff and supervise the educational programs in five community hospitals. The program runs parallel to the Strong Memorial Hospital Medical House Staff Training Program with a rotation of the Associated Hospital Program house staff to Strong Memorial Hospital at each level of training. These house staff have the majority of their experience at the affiliated hospitals, as well as a continuity ambulatory care experience with particular emphasis on the practical management of general medical problems, including experience with office dermatology, gynecology, and orthopedics.

# INFLUENCE OF NATIONAL POLICIES

Outside agencies have always had a large influence on house staff training programs, especially the Residency Review Committee of the AMA Council on Medical Education and the subspecialty boards, which affect content and the length of training programs. With the heavy NIH funding and support of research, more and more subspecialty training evolved since World War II. The increase in number of subspecialty boards in recent years lengthened the period of training and narrowed the field of interest for many residents and fellows. However, significant change in federal government policy occurred in the late sixties.

No longer was there abundant funding for individual subspecialty investigators, but health care delivery programs received increasing emphasis. It was perceived that more general physicians were needed, not subspecialists. The new direction in federal funding helped to establish several important programs in Rochester such as the Family Medicine Program at Highland Hospital, the neighborhood health centers, and, more recently, the Nurse Clinician Training Program. All would have increasing impact on postgraduate education. Training for careers in investigation was affected adversely by federal decisions to curtail funding for subspecialty traineeships and Career Investigator Awards. A great push from the federal government came through capitation grants to increase the number of medical school graduates. Class size increased dramatically, new medical schools were created, and curricula were universally affected. With such a stimulus, enrollment of first-year medical students in American medical schools went from approximately 9,000 in 1965, at the time of the Health Professional Education Act, to more than 14.000 in 1974.

An additional milestone influencing house staff training was the Millis Report of 1966, which recommended "that the internship, as a separate and distinct portion of medical education, be abandoned, and that the internship and residency years be combined into a single period of graduate medical education called a residency and planned as a unified whole." The House of Delegates of the AMA, following this recommendation, abolished the freestanding internship as of July 1, 1975. The abolition of the internship led to a confusing variety of terms for "internship," including First Postgraduate Year, Pediatric Level I (PLI), or Medical Resident I. Despite the abandonment of the title of intern, it was clear that residents in the first postgraduate year would not lose the privilege of doing intern's work in such specialties as medicine, pediatrics and surgery.

Several specialty boards interpreted the decision by the AMA to mean that the internship experience should be abolished and they no longer required a general first postgraduate year of training. Beginning in 1972, medical students could enter directly residencies in such subspecialties as neurology, obstetrics-gynecology, ophthalmology, psychiatry, and radiology. Such a national decision was met with dismay by the department chairmen at Rochester, and provision was made in the above

specialties for broader training in the first postgraduate year. An official policy statement was made by the Advisory Board concerning the first year of house staff training programs:

The medical faculty of the Strong Memorial Hospital of the University of Rochester embraces the principle that broad clinical study in the undergraduate years coupled with the maturing experience of the responsibilities of a well-supervised initial postgraduate year constitutes the indispensable foundation for the preparation of the professionally competent physician regardless of his eventual choice of specialty. Further we believe that systems which impose early commitment to a specialty choice may not serve all the interests of the physician in training or the cause of good patient care. Young medical graduates should have available to them a wide range of postgraduate programs which afford the opportunity for their maturation as clinicians and a vantage point from which to make future career decisions.

Accordingly we view with some concern recent recommendations that the internship *per se* be abolished and integrated instead into the residency graduate program as a unified and coordinated whole. Implementation of such a policy might discriminate both against medical school graduates who seek a broader clinical training and against those who wish to change their field of concentration for training programs. It would perforce give preference to students likely to complete their residency program rather than those wishing to use the first year as preparation for another specialty. This policy might force some students to make a career commitment before they even had exposure to one or another branch of medicine and it would also tend to "lock" graduates into residency programs. It would discourage movement of house officers from one program to another according to their free choice of the program that best suits their needs. Finally, it might result in discrimination against specialties which are, and should remain, dependent upon other services to provide early clinical training; for example, psychiatry, radiology, obstetrics-gynecology, anesthesiology, etc., and as a result would produce specialists extremely narrow in their persuasion.

The goal of producing more physicians in a shorter time is a desirable one, yet there is the likelihood that the end result of the recommendation will be the proliferation of narrow specialists rather than of more broadly competent clinicians. Such a possibility is enhanced by programs in medical schools which encourage early election of specialty tracks, thereby narrowing even further the clinical base of their graduates. This is an era when many medical schools are experimenting with the most diverse educational

programs, most of which will not graduate their products for some years to come. The time seems particularly ill chosen to weaken or abandon the year of clinical training which experience has demonstrated to provide a maturational and educational experience with the widest range of options for future career choices for the young physician.

The clinical departments of Strong Memorial Hospital will therefore continue to recognize the broad range of interest and career plans of graduating medical students. The first postgraduate year of Strong Memorial Hospital house staff training program, whether they be called internships or residencies, will continue to be broadly based, well-supervised clinical experiences and to allow full freedom of individual choice for future career development.

It is heartening to see that there is beginning to be a reconsideration of the decision to abolish the internship by some of the clinical specialties. In early 1974, the American Board of Psychiatry and Neurology recommended unanimously a reversal of its 1970 decision to eliminate the one-year internship requirement for psychiatry and neurology.

Within the space of ten years there have been unprecedented changes in medical education. Curricula in virtually all medical schools have been revised, there are an increasing number of medical school graduates, cuts in federal funding are discouraging research and subspecialty training, ambulatory health care is being supported, and the internship has been abandoned by several specialties. All of these influences have had a dramatic impact on house staff training programs. With more medical school graduates and relatively fixed numbers of intern and residency positions, internships in university hospitals are becoming more competitive. The lack of the internship requirement for some specialties, plus a shortened medical school curriculum, mean narrower and clinically less competent specialists. Since residents are no longer being drafted in the middle of their training, fewer residency positions are available and it becomes very difficult to shift from one training program to another, let alone to a different specialty.

Where are the house staff training programs at Strong Memorial Hospital headed in the future? Following World War II there were three significantly different periods in training programs, each lasting approximately ten years. The first period

represented a continuation of programs very similar to the late thirties. More house staff were added, as were faculty, but the house officer was in the traditional role-working long hours and doing most of his own laboratory work, with little pay. From the mid-1950s to the 1960s, house staff training became more humanized: most interns and residents were married, there was greater representation of women and minority groups, house staff pay began to increase significantly, subspecialists proliferated as did laboratory work on the patient, and a more diseaseoriented house officer was the product. From 1965 to 1975 the impact of concern for individual rights and for health care delivery has put the intern and resident in more of the position of colleague with senior staff, leading to higher pay and shorter hours, sharing responsibility with private as well as indigent patients, and directing more interest towards the individual patient rather than his disease.

The next decade will see continued evolution and accelerated change in postgraduate training programs. More teaching will occur in the community and in the ambulatory setting. There will be opportunity to work with other health professionals. The number of subspecialty research opportunities will be fewer but the quality will be higher.

Rochester is indeed fortunate that it has such a high degree of interdepartmental cooperation and imaginative new health care delivery programs in the community, as well as excellent affiliated hospitals where faculty, house staff and students may work effectively together in teaching, research, and the care of patients.

# 17.

# Beyond the Walls

The Medical School and Its Associated Hospitals



# Harry L. Segal, M.D.

Harry L. Segal, professor of medicine, emeritus, began his medical practice in Rochester as an internist with the subspecialty of gastroenterology. In addition to clinical practice, his interests have encompassed teaching and research in the field of gastroenterology. He has been unit head of the Gastrointestinal Division of the University of Rochester School of Medicine and Dentistry and physician in chief and coordinator of medical education at Genesee Hospital, a major affiliated hospital of the Medical School. On eight different occasions he has spent three to four months as visiting professor of medicine at the College of Medicine of the University of Lagos in Nigeria as a participant of the exchange program between the medical schools of the Universities of Lagos and Rochester.

Investigations pursued by Dr. Segal in collaboration with colleagues at the Medical School resulted in the first successful color photography through the gastroscope, introduction of tubeless gastric analysis, and the separation by column chromatography of varying numbers of pepsins and pepsinogens. He has been the recipient of three awards by the Rochester Academy of Medicine, a 1970 Syracuse University Centennial Award, and a 1973 University of Rochester Alumni Citation, and was corecipient of the Schindler Award of the American Gastroscopic Society.

Since attaining emeritus status in 1970, Dr. Segal has continued his interest in gastroenterology at the Medical School and at Genesee Hospital as well as his role as coordinator of the Rochester-Lagos exchange program. Currently, he is also a member of the Genesee Health Service of Genesee Hospital, as consultant in gastroenterology and clinical research advisor.

#### INTRODUCTION

**T**<sub>HE</sub> University of Rochester School of Medicine and Dentistry was established with the idea that the construction of both its preclinical and clinical facilities under one roof would provide the appropriate ambiance for the education of its medical students.

The combined facilities of its University hospital, Strong Memorial Hospital, and its then adjacent Municipal Hospital, staffed by full-time academic clinicians reinforced by faculty appointments of qualified community practitioners, seemed more than adequate for the clinical education of the future physician.

Thus it was, until a number of factors heralded a change in clinical medical education not only at Rochester but also throughout the United States. At Rochester the transition began in 1945, when a carefully worded informal agreement granted a community hospital, Genesee Hospital, minor affiliation with the Medical School. This was the beginning by the University of Rochester Medical School of the use of community- and governmentsupported teaching institutions in its educational program.

The first general hospital in the United States engaged in medical teaching was Pennsylvania Hospital, founded in Philadelphia in 1751 with the help of Benjamin Franklin. By 1845, nine American cities had thirteen general hospitals, in which attending physicians made rounds with their students. These hospitals, in addition to Pennsylvania Hospital in Philadelphia, were located in New York, Baltimore, New Orleans, Boston, Cincinnati, Louisville, New Haven, and St. Louis. In spite of bickering between students, house officers, and/or teachers on the one hand and hospital trustees and administrators on the other, teaching continued to play an essential role in these hospitals. Students attended William Osler's ward rounds at Johns Hopkins in the 1890s and perhaps earlier at the University of

Pennsylvania. By 1890 students were helping in care of outpatients at Massachusetts General Hospital, and by 1910 fourthyear students were participating in the hospital's wards as clinical clerks.

Although general hospitals, as stated above, had become teaching institutions intimately associated with medical schools, a number of university hospitals, such as Strong, were established by medical schools primarily for teaching purposes and were staffed more or less exclusively by a full-time academic faculty. Controversy has prevailed relative to the distinction of which medical school had established the first hospital for the primary purpose of teaching medical students. Daniel Drake, in an inaugural discourse on medical education delivered in 1820, stated that Commercial Hospital, founded in Cincinnati in 1827, was the first hospital in the United States established primarily for teaching and staffed exclusively by the professors of a medical school. However, the first hospital controlled by a medical school, for teaching, was the Infirmary of Starling Medical School, founded in 1848 in Columbus, Ohio. This institution opened in 1852 and remained under control of the school for only fifteen years. From the evidence it is apparent that the University of Pennsylvania, in 1874, established the first universitycontrolled hospital.

Medical education today is not limited to the so-called university hospital and has become an essential discipline, not only in community hospitals but also in government-supported hospitals, with the corollary development of significant associations of these institutions with medical schools.

The increase in community hospital affiliations is attested by the 1972–73 report of the Journal of the American Medical Association, "Medical Education in the United States." This report reveals that affiliations of community hospitals with medical schools increased from 235 in 1964–65 to 749 in 1972–73.

To compare the relationship of community hospitals with the University of Rochester Medical School, the author surveyed 116 medical schools. The responses from 80 of these schools confirmed the increase in affiliation noted in the JAMA report. Furthermore, comments included in the replies to the questionnaire indicated that most medical schools now consider working associations with community and government hospitals to be essential to their educational responsibilities.

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#### THE ROCHESTER SCENE

Today, 1975, the University of Rochester School of Medicine and Dentistry has major associations with four community and one tax-supported hospital and minor affiliations with the Rochester Psychiatric Center and three veterans' administration hospitals located 27 to 65 miles from Rochester.

This constellation of associations evolved at Rochester, as in other medical centers, from several forces, without any master plan or design, to meet the challenges of new social, economic, emotional, and environmental factors. Among these factors were the increased number of hospital admissions resulting from the growth of health insurance programs, more sophisticated technology in diagnosis and treatment, and an exponential increase in the number of interns, residents, and training programs. All this was reinforced by new attitudes in the delivery of medical care, with accompanying pressure for increasing both the number of medical schools and the number of medical students admitted to existing schools. As a consequence of these new requisites. Strong Memorial Hospital no longer had the facilities or the faculty necessary to provide the additional number of medical students and house officers with appropriate clinical experience. The expansion of educational programs to meet these new circumstances was made possible through the use of community hospital associations involving practitioner-teachers.

It is of historical interest that the impetus in 1945 for the first community hospital affiliation originated with the medical staff of Genesee Hospital and was later achieved through the efforts of its Board of Governors. In April 1956, Rochester General Hospital became affiliated with the Medical School, and Highland Hospital followed in June of the same year. The affiliation with St. Mary's Hospital was established in 1967.

Although each agreement was stated in general and rather informal terms, opportunity was afforded the individual clinical departments of community hospitals to work with their counterparts at Strong. Later, minor affiliations matured into major associations.

From 1945 to 1963, involvement of the University faculty in the various community hospitals was minimal. A more significant relationship began in 1965, under a new policy which provided academic appointments for full-time members of the faculties at the affiliated hospitals. Previous to this, most of the chiefs of the clinical services of the community hospitals were practitioners who accepted their assignments with little or no remuneration from either the community hospitals or the Medical School. In 1970, Dean J. Lowell Orbison prepared guidelines for faculty appointments at the community hospitals, and a committee was established to review and make suggestions about interrelationships between the Medical School and its affiliated institutions. Members of both groups participated in search committees for candidates, and approval of appointment was required by the Board of Governors of the community hospitals before submission to the Board of Trustees of the University.

In 1971 a Medical School faculty ad hoc committee reported that much of the total teaching of third- and fourth-year medical students occurred in community hospitals and that approximately a third of the full-time teaching faculty in the departments of medicine, surgery, and pediatrics were to be found in such hospitals. Research programs were taking place in the community hospitals with or without the collaboration of the clinical (and other) University departments. In spite of these findings, it was believed that the Medical School faculty, or many of the faculties in the community hospitals for that matter, did not appreciate the significance of the contribution of the community hospitals to medical education. Many staff members of the community hospitals perform attending and other teaching duties at Strong in addition to their primary assignments at the community hospitals. They also play an important role in many subspecialty units and to a lesser extent work in basic science departments at the Medical School. On the other hand, flow in the opposite direction-that is, from the Medical School to the community hospitals—has remained relatively insignificant, with only a few of the faculty based primarily at Strong participating to any extent in medical student and postgraduate teaching at the community hospitals.

#### Genesee Hospital

Because Genesee Hospital was the first to have become affiliated with the Medical School and thus set the pattern, the events leading to the establishment and success of this venture will provide an overall view of the relationships between the Medical School and the other community hospitals.

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Genesee Hospital is a nonprofit community hospital, founded in 1889 as a homeopathic institution. It is now a general teaching hospital, with a bed capacity of 427.

It might be of interest to record the salient events that led up to this affiliation. In the early 1940s some members of the medical staff had clinical appointments at the Medical School in addition to admitting privileges at both the Genesee and Strong Memorial hospitals. The exposure of these individuals to the differences in medical education and level of specialized medical care between these two hospitals convinced them that medical education would benefit from the exchange of ideas and teaching facilities in both institutions. This conviction was accepted by a majority of Genesee Hospital's medical staff after favorable recommendation of a committee chosen by the staff to study the advantages and disadvantages of affiliation. The recommendation to affiliate was approved by the Board of Governors.

The association of Genesee Hospital with the Medical School can be divided into three successive periods: the first, from 1945 through 1956; the second, from 1956 through 1967; and the current period, beginning at the end of the 1967 academic year.

During the first ten years of affiliation, the clinical chiefs were Jerome Glaser, in pediatrics, Charles Boller, in medicine, Samuel J. Stabins, in surgery, and Shirley R. Snow, Jr., in obstetrics/ gynecology. They were practitioners who worked without remuneration from either the hospital or the Medical School.

In the next twelve years the relationship of Genesee Hospital with the Medical School became increasingly significant. The author was appointed full-time chief in medicine with eventual change in rank from clinical professor of medicine to professor of medicine. Edward W. Douglas became chief of surgery and clinical professor of surgery, A. J. Tatelbaum was chief of obstetrics/gynecology and clinical associate professor, and Richard S. Meltzer was appointed as chief and professor of pediatrics. Six full-time instructors were recruited in medicine to provide faculty for teaching and expertise in medical subspecialties.

During the current period, 1967–75, in addition to a fulltime professor of medicine, full-time professorial chiefs were appointed in pediatrics and surgery, namely, Rene Menguy, in surgery, previously professor and chairman of the Department of Surgery of the University of Chicago School of Medicine, and James B. Hanshaw, professor of pediatrics and microbiology, a
position he already held at the Medical School. Dr. Hanshaw succeeded Dr. Meltzer. Nine of the twelve subspecialty divisions in medicine are now directed by full-time faculty, and three by practicing clinicians.

An adult-pediatric center for service, teaching, and research in gastroenterology has been established as the Isaac Gordon Gastrointestinal Center. The creation of this center was approved by the chairmen of the Departments of Pediatrics and Medicine of the Medical School with the understanding that it would be the main pediatric gastrointestinal center of the University of Rochester School of Medicine and Dentistry.

In 1973, a new Department of Mental Health, under the direction of Sue Hanson, was established, with assignment of the 35 in-hospital beds previously located at Monroe Community Hospital.

In 1974, the Department of Radiation Therapy became fully integrated with its counterpart at the Medical Center. Integration of the Department of Obstetrics-Gynecology with that of Strong and another associated hospital is now in the planning stage.

In 1969, the Department of Dentistry at Genesee formally became an affiliate of the University of Rochester, with a joint program in oral surgery sponsored by Strong. Dr. Bejan Iranpour, associate professor of clinical dentistry, is the chairman of this department.

As a matter of historical interest, in 1945, when Genesee became affiliated with the Medical School, it, like most community hospitals in the United States, was and still is controlled by a lay board, the members of which had little direct communication with the medical staff. At Genesee thoughts and convictions of the medical staff reached its Board of Governors through the hospital's administrative officers. Inevitably, the lack of communication between the medical staff and the lay board of governors led to misunderstandings. Furthermore, the lack of recognition by the administrative officers of the work of the medical staff is affirmed by the content of the annual hospital reports. Until 1962, the available annual reports included only gross income, hospital expenses, and a list of members of the Board of Governors. In 1964 a new spirit of cooperation took place among the medical staff, administration, and Board of Governors. Every annual report since then includes the officers of the med-

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ical staff and heads of hospital services. This change reflects a natural movement in the organization and conduct of community hospitals. Illustrative of this new movement, the medical staff at Genesee now has voting representatives at the meetings of the Board of Governors and is intimately involved with present and future planning of the hospital as a whole.

#### **ROCHESTER GENERAL HOSPITAL**

Rochester General Hospital, with a current bed capacity of 546, is the successor to Rochester City Hospital, founded in 1864. During its recent construction period it had a westside division, located at the site of the old Rochester General Hospital on Main Street, and a northside division, which now continues as Rochester General Hospital.

\* The affiliation with the Medical School, which occurred in July April 1956, followed many meetings and discussions of repre- 1954 -577 sentatives of the hospital and the Medical School. A large factor in the establishment of the affiliation was the decision of the directors of Rochester General to commit the resources of that institution to support its medical staff in efforts to improve education and research through joint participation with the Medical School.

The affiliated educational activity began on an elective basis, with some second-year students rotating through Rochester General on regular assignment for physical diagnosis and some attending teaching sessions in surgery, medicine, and pediatrics on an elective basis. During the first phase of its affiliation, the chiefs of the clinical departments were Leonard Horn, medicine, Charles O. Sahler, surgery, and the late Edward H. Townsend, pediatrics, all of whom had clinical appointments in the Medical School. They served on a voluntary basis, but received a small Estistipend from the hospital. Paul W. Weld, director of medical education, played an integral part in coordinating the educational programs of the various services in addition to teaching students midical on the medical service. The senior residents also participated in iducation this program. Qualified attending surgeons and physicians assumed substantial teaching responsibilities without remuneration.

Because of the important role that research played in highgrade education, a new research and teaching building was undertaken, and was completed in 1968. With the concomitant increase in teaching activity, it became evident that full-time chiefs

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would be necessary to carry the expanded load. The full-time chiefs appointed were Raymond J. Hinshaw, professor of surgery, Stanley B. Troup, professor of medicine, and Edward H. Townsend, associate professor of pediatrics. Dr. Townsend was succeeded by Gerald Miller, professor of pediatrics. In 1963 Dr. William T. Hart was appointed chief of the new Department of Psychiatry and clinical associate professor in the Medical School. The Department of Medicine had six subspecialty divisions directed by full-time faculty members. The various laboratories provide excellent facilities for service, teaching, and research.

A special feature is the Hemophilia Division, sponsored by the chairmen of the Departments of Medicine and Pediatrics of the Medical School with the understanding that it would serve as the main hemophilia center of the Medical School, in a capacity comparable to that provided by the Isaac Gordon Center at Genesee Hospital as the Medical School's center for pediatricgastrointestinal disorders.

#### HIGHLAND HOSPITAL

Highland Hospital was founded in 1889 as a homeopathic institution. Currently, it has a bed capacity of 262. An informal agreement of affiliation with the Medical School was signed in June 1956. Jacob W. Holler was appointed the first full-time chief of medicine in 1958 and was promoted to full-time professor of medicine in 1967. In 1966 Harry D. Kingsley left the Medical Center to become the first full-time surgeon in chief with the rank of professor. A year later George C. Trombetta was appointed as full-time chief in obstetrics/gynecology and associate professor. The Departments of Diagnostic Radiology and Radiation Therapy are chaired by clinical chiefs.

The present organization of the Department of Medicine began with the establishment of a pulmonary disease laboratory in 1964. This was followed by appointment of a chief of hematology-oncology in 1969. In 1970 William W. Faloon was appointed professor of medicine and became the new chief of medicine. Since then the full-time faculty has increased to seven full-time members, with teaching as a primary responsibility. In 1970, laboratories were established in gastroenterology, endocrinology, and cardiology.

Family medicine is a special unit, under the chairmanship of Dr. Eugene S. Farley, Jr., professor. This division was estab-

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lished by the Medical School in 1967 with the approval of the chairmen of the Departments of Medicine, Preventive Medicine, and Psychiatry. In 1968 the family residency program was of-ficially included among the other residency programs, which had been in existence for approximately twenty years.

#### ST. MARY'S HOSPITAL

St. Mary's Hospital, with a current bed capacity of 337, was founded in 1857. Its relationship with the University of Rochester School of Medicine and Dentistry began in 1967 with an agreement of affiliation between the Departments of General Surgery of St. Mary's Hospital and the Medical Center, and with appointment of A. J. Graziani as a part-time chief. Dr. Graziani became full-time chief and associate professor of surgery in 1970 when a more formal affiliation of the Surgical Department with the University of Rochester Surgical Residency Program was instituted.

Discussions, beginning in 1964, between the representatives of the Departments of Medicine of St. Mary's Hospital and the University of Rochester effected in 1970 an affiliation between the departments of both institutions, with the appointment of Gerald Eckert, associate professor of medicine, as its full-time chief. In 1974, Rudolph J. Napodano was appointed chief of medicine and associate professor. The Department of Medicine now has a total of seven full-time faculty members who are involved in teaching and patient care both in general and subspecialty divisions of medicine.

#### Associated Government-Supported Hospitals

Although not generally appreciated, the University of Rochester School of Medicine and Dentistry had a close agreement with a government-supported hospital from 1925 to 1963. Strong Memorial opened its doors to patients about December 1, 1925, with a capacity of 230 beds. At that time, by an agreement with the city of Rochester, Rochester Municipal Hospital, with a 200bed capacity, was being erected adjacent to Strong on land donated to the city by the University of Rochester.

The city assumed financial support of this hospital with the stipulation that the two hospitals were to function as one institution and that the Medical School was to provide professional care to all patients of Municipal Hospital free of cost to the city. In 1963 this contractual relationship was terminated and the Rochester Municipal Hospital was entirely transferred to the University as part of Strong Memorial Hospital.

Today, five government-supported hospitals, namely, Monroe Community Hospital, Rochester Psychiatric Center, Batavia Veterans' Hospital, Bath Veterans' Hospital, and Canandaigua Veterans' Hospital have varying degrees of affiliation with the University of Rochester Medical School. Only one of these, Monroe Community Hospital, will be described, because of its major and unique relationship with the Medical School.

#### MONROE COMMUNITY HOSPITAL

Monroe Community Hospital has replaced Rochester Municipal Hospital as a major government-supported institution associated with the University of Rochester School of Medicine and Dentistry.

The evolution of the relationship between the county-owned, chronic-disease hospital and the Medical School presents an interesting development. In 1957 the former, then known as the Monroe County Infirmary, was an overcrowded and understaffed section of a complex known as the Monroe County Home. Recognition of this state of affairs was the impetus for studies by three consecutive county committees which independently arrived at the same conclusions, namely, that the county of Monroe needed a first-rate chronic disease hospital for the active treatment and rehabilitation of patients with long-term illness, and that the county infirmary should be transformed into such a hospital, with a major association with the University in order to expand opportunities for teaching and research related to chronic disease.

In 1964, following acceptance of these conclusions, the county government and the University developed and agreed upon terms of affiliation, which included University responsibility to provide full medical and dental staff (for which it was to be compensated by the county), and the change in the legal status of the institution to that of the Monroe Community Hospital. In 1968, Dr. T. Franklin Williams was appointed director and professor of medicine, with Dr. Anthony J. Izzo as associate medical director and clinical professor of medicine.

Today, rotations from Strong Memorial Hospital consist of fourth-year students and residents in neurology, assistant resi-

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dents in medicine, as well as residents in subspecialties such as infectious and pulmonary diseases and cardiology. Medical residents also rotate from St. Mary's Hospital, and residents from the Family Medicine Program of Highland Hospital spend regular periods in the Rehabilitation Unit of the Monroe Community Hospital. A combined residency-intern program in physical medicine and rehabilitation has also been established by the respective units of Strong Memorial and Community hospitals. Third-year students are regularly assigned to the Clinical Clerkship Program at Monroe Community Hospital.

Two to 3 percent of the institutional space has been assigned to research facilities for the various subspecialty units. Clinical laboratory service is available through a contract with the clinical laboratory of Genesee Hospital.

Monroe Community Hospital is now a first-rate chronic illness institution, the evolution of which can be credited to the foresight and cooperation of a county and a university. In the few years of its association with the Medical School, admissions and discharges increased 25 percent in addition to a two-andone-half-fold increase in the number of discharges to patients' own homes. This county-supported hospital plays a central role in community health service, committed with the Medical School to the improvement of teaching and, most importantly, to the care of the chronically ill and aging population.

#### DEPARTMENTAL PROGRAMS

Although the informal agreement between each community hospital and the Medical School was not oriented toward total affiliation, it provided a basis for the development of departmental relationships. This section will confine itself to a description of the activities of the various departmental programs that have evolved between the associated hospitals and Strong Memorial Hospital.

#### Department of Medicine

During the early years of affiliation, a limited number of students, interns, and residents spent varying periods in the Department of Medicine at the affiliated hospitals. Regular assignments of third-year students for training in clinical diagnosis began in 1964, followed two years later by assignments to a newly established Clinical Clerkship Program.

By 1972-73, significant involvement of third-year students had been effected. In that academic year, 35 third-year students received their introduction into clinical medicine at the affiliated hospitals while a similar number chose to take their advanced Medical Clerkships at these institutions. Both full-time faculty and practicing physicians participated in these programs.

In 1971 the Department of Medicine initiated a formal rotation of first-year residents from Strong to the various affiliated hospitals. This rotation was short lived. It was later replaced by rotation of a limited number of first- and second-year residents.

This failure to continue a formal residency program with the associated hospitals prompted meetings between the chiefs of the hospitals and the chairman and his associates at the Medical School. The ensuing discussions resulted in the establishment of the University of Rochester Associated Hospitals Training Program in internal medicine, in which Genesee, Monroe Community, Rochester General, St. Mary's, and Strong Memorial hospitals are participants. Dr. Lawrence E. Young is the director of this associated hospital program.

This program has been planned to train the medical graduate during a three-year period for a career in primary care. The patient resources, combined facilities, and faculty of the associated hospitals of the University of Rochester School of Medicine and Dentistry provide means for the physician in this program to qualify for certification as a specialist in internal medicine, and at the same time to acquire the skills and experience necessary to work as a practicing personal physician.

Under special circumstances, physicians may enter this program after having one to two years of postdoctoral clinical training programs at other institutions. It is assumed that most participants will complete three full years of training. A vacation period of 20 days is provided in each of the three years.

The ten intern positions in this program listed in the 1974– 75 National Intern Matching Plan were matched by graduates of medical schools representing a coast-to-coast geographical area. All the second- and third-year residency positions offered in this program were also filled.

Physicians completing the various stages of the training program will receive their certification from the University of Rochester School of Medicine and Dentistry.

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#### Department of Obstetrics-Gynecology

In the early phase of Genesee Hospital's affiliation with the Medical School, third-year medical students had part of their training at Genesee. In the fifties, due to a change in the Medical School's curriculum, the total obstetric-gynecological exposure of students was limited to a six-week period during their third year. Some of these third-year students took their obstetric-gynecological training at the community hospitals.

During the first decade of Genesee Hospital's affiliation, an exchange resident program was instituted on an optional basis for periods of three or more months. During Dr. Tatelbaum's chairmanship at Genesee, an exchange of residents was introduced between Genesee and Strong.

Cytologic screening for gynecologic cancer has been a major contribution of this department to community health programs in the Rochester area. The cytological laboratory was first organized in 1947, under the direction of Dr. Karl M. Wilson and the immediate supervision of Dr. Hannah Peters. Four thousand specimens were screened that year, as compared to an average of about 85,000 specimens now processed yearly by the laboratory at the Medical Center, a figure that does not include the several thousand slides processed yearly in the other laboratories subsequently established in the community. As the success of this early-detection effort became established during the fifties, responsibility for processing and interpretation of the Pap smear was assumed by the Department of Pathology. Eighty-five cases of in situ carcinoma of the cervix were detected by the Medical Center laboratory in 1973. Patients with advanced cervical cancer admitted to the Medical Center from the Rochester community are now in the distinct minority of patients with gynecologic malignancy.

However, the main contribution of this department to the health of the Rochester community has been the number of obstetrician-gynecologists who have settled in the community after receiving their graduate education and training within this University department. Of approximately 66 obstetrician-gynecologists currently engaged in patient care in the Rochester community, some 40 percent secured their graduate education at the Medical Center while another 10 percent are graduates of the Medical School. With the advent in the early 1970s of health maintenance corporations in the city of Rochester, maternal and

gynecologic care in the larger corporations that serve the underprivileged of the community are provided by eight obstetriciangynecologists, all of whom served their internships and residencies in the University department.

Over sixty-five physicians have obtained their graduate education and training within the department. While many have remained in the Rochester community, almost 60 percent have established practices or joined medical school faculties in over 25 states and 3 foreign countries.

Henry A. Thiede, who was appointed professor and chairman of the Department of Obstetrics-Gynecology of the University of Rochester in 1974, is planning an integrated program for the Department of Obstetrics-Gynecology at Strong with two of the associated hospitals.

#### Department of Pediatrics

The consolidation of pediatric services in Rochester was formulated on the basis of a report by Joseph Stokes, Jr., professor of pediatrics, emeritus, of the University of Pennsylvania. The problem for which Dr. Stokes was recruited as a consultant in 1964 was to determine whether Rochester should have a children's hospital encompassing facilities necessary for Monroe County with respect to service, education, research, and general community functions, in particular relating to the University of Rochester School of Medicine and Dentistry and its Strong Memorial Hospital, or whether the pediatric services should be dispersed between Strong Memorial Hospital, as the main center, and two or more affiliated hospitals.

The initiation of Dr. Stokes' study was coincident with the appointment of Robert J. Haggerty as pediatric chairman at the University of Rochester School of Medicine and Dentistry. At this time two affiliated hospitals had given up pediatrics as a major service because of the inability to attract residents. Genesee Hospital was chosen to maintain the major pediatric service, primarily because of its nearness to a large midcity population of a relatively low socioeconomic level. The other two excellent pediatric services then available were the Rochester General and the Strong Memorial.

These factors led to integration of these three hospitals, Strong, Genesee, and Rochester General, to provide coordinated pediatric coverage for the Rochester area, under the leadership

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of Dr. Haggerty. Geographically, full-time pediatricians of appropriate professional rank were appointed for Genesee Hospital and Rochester General Hospital, respectively. Arrangements were eventually instituted for research and collaboration. rotation of residents and interns, and coordination of an educational program agreeable to the chairman of the Department of Pediatrics and the respective chiefs of the two associated hospitals. With this centralization, duplication of activities were to be avoided. The Child Guidance Clinic was continued and the Hemophilia Foundation was established at Rochester General. The two centers for premature infants were based at Rochester General and Strong Memorial, and medical pediatric care was available in all hospitals for medical supervision of infants and children in surgical, otolaryngologic, orthopedic, and other child services. The chairman of the Department of Pediatrics delegates newborn and premature medical care at Highland and St. Mary's to a chief of newborn infants based at Strong and working in close association with the chiefs of the newborn services at Highland and St. Marv's.

In 1974, the Departments of Pediatrics of Genesee, Rochester General, and Strong Memorial became fully integrated. Interns are now listed in the National Matching Plan under Strong Memorial Hospital; both interns and residents rotate through Strong Memorial, Rochester General and Genesee. The chairmen of the associated hospitals cooperate with the chairman of the Department of Pediatrics of the Medical School in the selection of interns and residents for this integrated service.

#### Department of Surgery

In 1946 John J. Morton, then professor and chairman of the Department of Surgery, began to assign medical students and rotate surgical residents through the Department of Surgery of Genesee Hospital. Dr. W. J. Merle Scott, who succeeded Dr. Morton, continued Dr. Morton's program and played an important role in the development of the surgical services in the community hospitals and in the eventual association between them and the Medical School. Beginning July 1, 1970, Charles G. Rob, professor of surgery and chairman of the Department of Surgery of the University of Rochester, began a more formal affiliation with the initiation of the University of Rochester's Surgical Residency Program. This program assured residents en-

tering the University program of a wide range of training during their developing years, with the possibility of nine residents completing their training in general surgery in one of five residency programs.

Accredited residency programs in this surgical program exist in general surgery, orthopedic surgery, urology, otorhinolaryngology, ophthalmology, neurosurgery, plastic surgery, and thoracic and cardiovascular surgery. Although rotations are mainly in general surgery, residents of the Strong Memorial program in plastic surgery may rotate through Rochester General Hospital, while residents in ophthalmologic, orthopedic, neurologic, and cardiothoracic surgery receive part of their training at both Rochester General and Genesee. Residents in general surgery rotate through the surgical departments of Genesee, Highland, Rochester General, and St. Mary's. The chiefs of these respective departments are Rene Menguy, professor of surgery, Harry D. Kingsley, professor of surgery, J. R. Hinshaw, professor of surgery, and A. J. Graziani, associate professor of surgery.

The assistant residents in the program are selected from several sources. Preference is given to applicants who have had either a straight surgical internship or a six-month rotation through surgery at one of the University of Rochester's affiliated hospitals. The assistant residents are assigned for a threemonth period to at least two of the five affiliated hospitals. The assignments are made on the basis of both personal preferences and individual capabilities.

#### Department of Psychiatry

Separately in this volume appears a detailed account of the contributions of the University Department of Psychiatry, in its several divisions, to area community and governmental hospitals.

In essence, the Department of Psychiatry was, in great part, responsible for the establishment of psychiatric units in Monroe Community Hospital, Rochester General Hospital and Genesee Hospital, as well as the residential treatment center of the Convalescent Hospital for Children and the DePaul Psychiatric Clinic for Children. In addition, it maintained effective working relations, on a consultative basis, with the Rochester Psychiatric Center and Canandaigua Veterans' Administration Hospital. Intern and resident staff assignments in the University Department of Psychiatry were made possible for house staff from

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Highland Hospital and its Family Medicine Program, Rochester General Hospital, Genesee Hospital, Rochester Psychiatric Center, and Canandaigua Veterans' Administration Hospital.

In 1946 the Medical-Psychiatric Liaison Program was established in Strong Memorial Hospital. It was initiated by John Romano and George L. Engel, with the cooperation of William S. McCann, then professor and chairman of the Department of Medicine. The program was based on earlier experiences at Peter Bent Brigham Hospital, in Boston, and Cincinnati General Hospital. It is concerned with the teaching of medical students, interns, and residents in medicine and psychiatry and has had as its major objective the study and care of the sick in psychologic and social, as well as in biological, terms. It has attempted to deal more systematically and consciously with the patientphysician encounter, formerly dealt with in intuitive or sentimental terms. Later, members of the Medical-Psychiatric Liaison Service also participated in teaching exercises in several of the community hospitals, and several intern and resident members of the community hospitals were assigned to the liaison service activities at Strong.

#### Dentistry

The Department of Dentistry at Genesee Hospital became formally affiliated with the program of the University of Rochester Dental Division in 1969. This division includes the Department of Dentistry at the Medical Center, and Eastman Dental Dispensary, now on Main Street but scheduled to be relocated at the Medical Center. The new Wasyl Pluta Center at Genesee Hospital provides added facilities, which have enabled the development of a joint program in oral surgery sponsored by Strong Memorial and Genesee.

#### Laboratories

No coordinated program has been established in the clinical laboratories. Bernard B. Brody, director of the clinical laboratory at Genesee, which was originated in 1946 by Jacob D. Goldstein (later succeeded by Frederick W. Anderson), has a working relationship with Stanley F. Patten, chairman of the Department of Pathology at the Medical Center. Residents in pathology receive their training in clinical pathology at Genesee.

No formal relationship exists between the Departments of Diagnostic Radiology of the affiliated hospitals and the Medical Center. However, during the first decade of affiliation of Genesee Hospital with the University, the late George H. Ramsey, professor and chairman of the Department of Radiology of the Medical School, rotated residents for periods of six months through the Department of Radiology at Genesee. This loose arrangement ended in 1960 with Dr. Ramsey's retirement. Currently, students spend elective periods in the Diagnostic Radiology Division of Rochester General Hospital.

An integrated program in radiation therapy is in effect between Genesee Hospital and the University of Rochester Medical Center. Colin Poulter, associate professor of oncology in radiology and radiation oncology, is chief of Genesee's division.

#### UNIVERSITY ASSOCIATIONS OUTSIDE THE UNITED STATES

In addition to informal participation of members of its faculty in research and conferences outside the United States, the University of Rochester School of Medicine and Dentistry has joined other medical schools to participate in projects involving developing countries. Its two formal projects have consisted of an exchange program between the medical schools of the University of Lagos (Nigeria) and the University of Rochester, and a cooperative research project involving the medical schools of the Universities of Puerto Rico and Rochester.

## Exchange Program with the College of Medicine, University of Lagos, Nigeria

In the winter of 1962, Dr. Henry Van Zile Hyde, director of the office of international education of the Association of American Medical Colleges, induced representatives of the University of Lagos to meet with Dean Donald G. Anderson and the late William D. Lotspeich, professor and chairman of the Department of Physiology at the University of Rochester Medical School, relative to recruitment of faculty for the University of Lagos Medical School, which was to open in the fall of 1962.

The mutual enthusiasm of the representatives of each school was rewarded by the establishment of an exchange program supported by the Commonwealth Fund of New York. This fund provided travel expenses and supplementary salaries for members of the University of Rochester to spend varying periods as visit-

ing faculty at Lagos in addition to fellowships for members of the University of Lagos Medical School and teaching hospital to participate in or observe teaching and research activities at Rochester.

This exchange program was an exciting experience for faculty members of both schools. Lagos is the capital of the most powerful country in tropical Africa, and those members of the University of Rochester who participated in this exchange program broadened their medical experience and met colleagues from all over the world, which further enhanced the international reputation of the University of Rochester School of Medicine and Dentistry.

Although support from the Commonwealth Fund has ended, members of the medical faculties of the Universities of Lagos and Rochester have maintained a mutual and constructive relationship. The medical schools of the Universities of Rochester and Missouri are now collaborating in recruiting faculties from the United States to spend short periods in Lagos for teaching in various subspecialties.

In 1970, the University of Rochester entered into a collaborative program with the University of Puerto Rico School of Medicine with the inauguration of the Tropical Malabsorption Unit of the Universities of Puerto Rico and Rochester. For the first two years, the unit was under the direction of Frederick A. Klipstein, professor of medicine at the University of Rochester; subsequently, it has been under the direction of Jose J. Corcino, assistant professor of medicine at the University of Puerto Rico. The unit has addressed itself to research into certain medical problems particular to the tropics and to the training of medical personnel from both Puerto Rico and Rochester in clinical approaches and research techniques related to these problems. The principal area of research activity has been concerned with elucidating the pathogenesis of malabsorption in the tropics and the prevalence and nutritional implications of the disorder among rural populations in various countries in the West Indies, in addition to the development of appropriate prophylactic and therapeutic programs to eradicate this disorder. Trainees in both gastroenterology and hematology at the University of Rochester have spent varying periods with the unit in Puerto Rico while medical students, residents, and postgraduate trainees of the University of Puerto Rico School of Medicine have had the op-

portunity to study the specific research techniques available in this unit.

#### SUMMATION

At Rochester, difficulties arose with the introduction of affiliated hospitals into the Medical School's expansion of medical education. At the time of the affiliation of Genesee Hospital it was rumored that the Board of Governors held back from establishing a major affiliation with full-time chiefs because of its fear that Genesee might lose its identity as an independent community institution.

Concepts and differences in expectations and points of view between the Medical School and the various community hospitals led to misunderstandings. The faculty at the Medical School was concerned about sending their students to community hospitals. where they believed that the students would be instructed by physicians inexperienced in teaching medical students. Members of the community hospitals resented the attitude of fulltime faculty members at the Medical School and felt that they did not appreciate the contributions of the community hospitals in teaching and research, not to mention the financial difficulties entailed by the community hospitals in constructing appropriate educational facilities and providing support for full-time faculty. Some resentment also stemmed from the University's retaining much of the overhead provided by the National Institutes of Health for grants for investigation carried on at the community hospitals. Many members of the community hospitals, although delighted to participate in teaching and research, also believed that the relationship was more of a one-way stream, with the flow mainly from the community hospitals to the Medical School.

Regardless of the difficulties, the overall benefits outweighed them. One of the benefits to the medical students was exposure to private practitioners in the community hospitals. This was of considerable aid to the students in their decision as to the type of hospital they would choose for internship. One of the advantages to the Medical School was the financial support given by the community hospitals for the full-time faculty necessary for teaching the increased number of students and house officers. Benefits to community hospitals were improved education of the staff, the institution of research, a broader range of con-

#### After the War — Segal

sulting services, a better hospital image for recruitment of prospective house staff, the recruitment of practitioners of high caliber, full-time faculty for their staffs, and, most important, the improvement in medical care of patients.

Time, frank discussions, and better exchange made for more objective appraisal and improved understanding by both Medical School and the community hospitals of the role of each in the overall education of the medical student. Subsequently, new concepts and attitudes emerged, with an improved spirit of cooperation. A common meeting ground for practitioners and teachers developed, with the blending of scientific advances and the practicing art to the advantage of all—student, practitioner, and patient.

The Medical School is now confident that the student, intern, and resident will be exposed to excellent teaching and clinical experience during their period in the associated hospitals. The School also appreciates the extent and importance of clinical research in progress at these institutions. The community hospitals, on their part, now realize that time, money, and space are required if they wish to be seriously engaged in medical education and realize its accrued benefits.

Today, the relationship of the University of Rochester School of Medicine and Dentistry with its associated hospitals has evolved to a more fully integrated group of teaching hospitals committed, with the Medical School and Strong Memorial Hospital, to excellence in teaching, research, and delivery of medical care.

The increasing facilities throughout the United States for clinical training of the medical student and house officer consequent to the evolving partnerships of medical schools and teaching hospitals, combined with the provision of a sound background in the biomedical sciences, should insure the fulfillment of the highest aims of the medical profession.

# 18.

### The Urge to Grow and The Urge to Stay Small

The Dilemma of the Postwar Years



### Robert J. Joynt, M.D., Ph.D.

Robert J. Joynt is professor and chairman of the Department of Neurology and neurologist in chief in the Medical Center. He attended medical school at the University of Iowa, interned at Royal Victoria Hospital in Montreal, and spent a year as Fulbright scholar studying neurophysiology at the University of Cambridge. He returned to Iowa for his training in neurology and remained on the staff until appointed chairman of the newly created Department of Neurology at the University of Rochester in 1966.

In addition to his interests in clinical teaching, Dr. Joynt has pursued basic and clinical research while at the University of Rochester. He is particularly interested in the role of the hypothalamus in regulation of metabolism and has collaborated with the Department of Anatomy in various related studies. In the clinical area, he, along with other members of the Departments of Neurology and Surgery, has pursued large clinical trials in the treatment of strokes with surgery and various medications. He has an interest in the history of medicine and helped develop a program, originally started by Dr. George Corner, in that area.

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Dr. Joynt is presently chairman of the Section Council of Neurology in the American Medical Association, a member of the board of directors of the American Board of Psychiatry and Neurology, and a member of the board of directors of the American Academy of Neurology.

AT THE end of World War II, the University of Rochester Medical School could be characterized as small, prestigious, traditional, and conservative. There had been little change in the ideals or the governance of the School since its founding. The departmental structure was traditional with very little evidence of schism in the basic specialties. Indeed, with few exceptions, the chairmen and most of the major departmental members were those originally appointed during the founding phases. Dr. George Whipple, who was responsible for formation of the School, was still dean and there was little evidence that the administrative structure had changed. Research was excellent but limited because of the small faculty size, the exception being the group of radiation biologists loosely organized as the Atomic Energy Project within the Department of Radiology. The curriculum had changed very little and the rather strict division of preclinical and clinical years prevailed, with little effort at interdisciplinary teaching. The total number of students listed in the 1945-46 bulletins was 258. Wartime expansion was waning and enrollment had changed only slightly from the 1940 figure of 200.

Postwar expansion in medical education was truly phenomenal. The era of governmental largesse of the 50s was immense. Research grants, training grants, and institutional grants were given almost for the asking. Student enrollment in some schools doubled and even tripled in size. Building programs made medical school campuses look like boom cities, the result of some newly found wealth. Faculties were enlarged, often with moneys from tenuous sources. With many minds and much money came experimentation in various areas of medical education. System teaching rather than discipline teaching became popular. Early exposure to patient care was tried. Independent study programs and broad electives were offered. Rochester, too, felt the frenzy of postwar expansion, but its approach was more cautious. There has always been a feeling that something was lost in the pursuit of bigness. There were, as there continues to be, pressures to

keep the Medical School classes restricted in size. This was done, in spite of criticism at the national level. Changes in the curriculum were approached cautiously after viewing their success or failure at other schools.

The physical plant has increased in a stepwise fashion. It was too slow for some but at least utilization of existing space was never a problem. In spite of a less frenetic tempo than that which characterized most schools in the last twenty-five years, there have been changes. Class and faculty size, programs, funding, and space have all increased. It is hoped that growth has been achieved in a way which has preserved the ambiance of close teacher and student relationships which exists at all levels.

This presentation will trace the changes in the Medical School since World War II, emphasizing additions of new departments and divisions, the growth in research funding, and changes in teaching as measured by curricular modifications and student and faculty size. Some facts pertinent to this topic will not be mentioned, or mentioned only briefly, as they are covered more fully in other contributions. For example, extensive reports dealing with the administration of the Medical School and Hospital, and with the nursing, psychiatric, dental, and radiation biology programs, are subjects of other essayists.

The departmental structure of a school represents much more than the principal divisions of interest within a group of scholars. It also reflects the willingness or unwillingness of individuals or groups to initiate change, the acquisition of knowledge which opens up new areas, the assessment of the relative importance of various parts of knowledge within a broad specialty, and the reluctance to divide areas of medicine which may already seem fractured beyond repair. Rochester resisted the ineluctable urge to fragment traditional departmental barriers, as was the almost universal characteristic of most schools in the 30s, 40s, and 50s. Some departmental organizations are idiosyncratic to institutions for reasons which are often not apparent to an outsider.

The 1945-46 bulletin of the Medical School lists five basic science departments—anatomy, physiology (to include vital economics), biochemistry and pharmacology, bacteriology, and pathology, and five clinical departments—medicine, surgery, pediatrics, obstetrics and gynecology, and radiology. It listed dental research as a special division. The only change from the original appointments as chairmen were Dr. Mason, in anatomy,

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and Dr. Berry, in bacteriology. The only change in departmental structure was in radiology, which had not been a department in 1925, although its subsequent chairman, Dr. Warren, was a member of the original faculty. Changes in and additions of departments affect the governance of the School because the chairmen constitute the Medical Advisory Board, which shapes and directs the policies of the School. Its increase in size over the years necessarily influences the way decisions are made.

THE MEDICAL ADVISORY BOARD



The first postwar change was the creation of a Department of Psychiatry. Prior to that time it had been part of the Department of Medicine. By this time, and indeed for many years, almost all medical schools in this country had established departments or major divisions of psychiatry, neuropsychiatry, or psychiatry and neurology. The creation of this department, with the arrival of Dr. John Romano, led to a major change in the undergraduate, graduate, research, and service functions of the Medical Center.

1945

The Department of Radiation Biology (and Biophysics) began in 1948. This group is illustrative of the interests which are often idiosyncratic to an institution. Its establishment was one of the more fortunate events in the history of this School. In 1943, Dr. Stafford Warren was appointed as a consultant to the Manhattan Project. The group rapidly expanded with acquisition of space and personnel. Governmental funding for most basic medical research was sparse at that time, but was relatively munificent for this project. Soon there was more funding for research

in the Atomic Energy Project (Manhattan Project) than for the rest of the Medical School, a situation that prevailed until 1959. In 1948, the group became a formal department of the Medical School, the Department of Radiation Biology (adding Biophysics in 1965). Dr. Henry Blair was the chairman until 1965, and was followed by Drs. Rothstein and Neuman acting as cochairmen.

The Department of Dentistry and Dental Research was started in 1952. This is likely a unique development within a medical school and its role is covered elsewhere. It was the culmination of a long history of interest in dental research within the School. It combined talent from three programs: the Eastman Dental Center, the dental clinic at Strong Memorial Hospital (officially in the Department of Surgery), and the Division of Dental Research. Dr. John Hein was the original chairman and was succeeded by Dr. Erling Johannsen in 1955.

Nursing was listed as a department in 1957 with Eleanor Hall as chairman. This was originally established as a school, then a department, and now again as a school. The circuitous course of these changes is dealt with in another essay.

In 1958, two new departments were established: pharmacology, and preventive medicine and community health. Here again, Rochester was behind other schools in formally designating these as departments, although excellent teaching and research were being carried on in these fields.

The influence of John Jacob Abel may have retarded the recognition of pharmacology as a department. Dr. Whipple learned his pharmacology at Johns Hopkins from Abel, who was a biochemist and looked upon pharmacology as applied biochemistry. Pharmacology was originally part of the Department of Biochemistry. Dr. Walter Bloor, a lipid chemist, had little interest in the subject and usually delegated it to a junior faculty member. Dr. Harold Hodge, who was trained in physical chemistry and worked in dental research, was one of those designated to teach the course. He developed a course in pharmacology with a personal bias toward toxicology. Because of this latter interest, Dr. Hodge was incorporated into the Atomic Energy Project and later into the Department of Radiation Biology. This unusual marriage lasted until departmental status was given and Dr. Hodge appointed chairman.

Preventive medicine was listed as one of the few interdisciplinary courses in the Medical School for many years. Dr. Albert

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Kaiser, medical officer of the city of Rochester and professor of child hygiene, was a talented and dynamic person who incorporated medical school teaching and service into many areas of preventive medicine and community health. An academic chair in this area was created in 1956 to memorialize Dr. Kaiser's efforts. The department was established in 1958 and Dr. Robert Berg was appointed as chairman. The primary purpose of the department was originally to promote teaching in the area of comprehensive personal health services; a secondary intention was to promote more effective health efforts in the community as a whole. It was also recommended that the newly established rehabilitation unit be part of its duties. The mission has expanded into areas of epidemiology, health care administration, and industrial medicine.

The Department of Health Services was established in 1962. It was tied in with the creation of the post of medical director of the Hospital, who would also be associate dean of the Medical School. The search committee recommended that this individual should be chairman of a Department of Health Services. The chairman was Dr. Leonard Fenninger; following his resignation in 1967. Dr. James Bartlett became chairman. The committee pointed out the role of the department as follows: "... The Department will carry on a sophisticated program of investigation in the field of health services, that it will contribute to the educational program of medical students, house officers, and students of nursing, and most important, that it will eventually attract as graduate students or trainees a significant number of young physicians who are interested in preparing for careers of leadership in other university hospitals." The present department is actively engaged in several areas relating to health services, including the University health service, emergency department, ambulatory care, the division of social work, and service departments of the Hospital. There is collaboration with the master's degree program in health care administration of the Department of Preventive Medicine and a program in clinical pastoral education administered by the Colgate-Rochester Divinity School.

By the mid-60s about two-thirds of the medical schools in this country had separate departments of neurology. Traditional ties with psychiatry had been rent as neurology moved closer to internal medicine and psychiatry moved toward the social sciences and community programs in mental health. There was also

a less philosophic but equally compelling force. Neurology, which had traditionally been a rather small specialty, was munificently funded in the 50s and 60s through the then named National Institute of Neurological Diseases and Blindness. Money for research and training was more available to those schools where neurology flourished as a major division or department. Neurology had been part of the Department of Medicine since the arrival of Dr. Paul Garvey in 1928. He, at times with assistance, carried the teaching and service load until he retired in 1963. Dr. Richard Satran came in 1962 to run the electrodiagnostic laboratories, which were then in the Department of Psychiatry but subsequently transferred to neurology. Dr. Wilbur Smith was responsible for the teaching, research, and service in pediatric neurology. In spite of limited personnel there were many prominent neurologists trained and many students inspired to pursue careers in neurology. Dr. Forbes Norris, Jr., and later Dr. Richard Satran, were acting chairmen of the Division of Neurology until it became a department, in 1966. Dr. Robert Joynt, who was at the University of Iowa, was appointed chairman. Although neurology is a separate department, it continues its traditional ties with psychiatry and medicine in training, service, and research. Dr. Frederick Horner was appointed professor of pediatrics and neurology and director of child neurology in 1968.

The Anesthesia Division was in the Department of Surgery until 1969, when a Department of Anesthesiology was founded, with Dr. Alastair Gillies as the first chairman. Nurse-anesthetists were solely responsible for this service until the early 50s. Miss Helen Geiss directed 13 nurse-anesthetists at that time. The development of anesthesiology as a separate specialty was slowly taking place in the 30s and 40s, but most of the service functions were still being performed by nurse-anesthetists. However, outstanding departments had been developed by Beecher at Massachusetts General Hospital, Lundy at the Mayo Clinic, and Cullen at Iowa. The efforts to duplicate this at Rochester were abortive in the early stages, with short tenure for those interested in this field. There was little support from the administration or the Department of Surgery to develop anesthesiology as anything more than a service necessary to carry out surgical procedures. This attitude was frustrating to the early faculty. Dr. Robert Sweet came in the early 50s as head of the division but left after one

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year. Dr. Nicholas Greene followed and left in two years, taking most of the staff he had recruited with him to Yale. Dr. Vernon Thomas was head of the division until 1959, when Dr. Gillies, who had been here in 1954 and 1955, returned as chief of the division. By this time most medical schools had or were establishing separate departments of anesthesiology which recognized its unique contributions to the field of medicine and surgery as applied pharmacology and respiratory physiology.

A Department of Clinical Dentistry was founded by the University in 1972. Programs in clinical dentistry had been in existence for many years. One of the most successful was a three-year program in oral surgery given in conjunction with Genesee Hospital. This department has programs for advanced training in various dental subspecialties. It is integrated with the community hospitals and Eastman Dental Center. Dr. William Mc-Hugh is the acting chairman. Developments in this area are described in another chapter.

Orthopedics became a department in 1974. The Department of Surgery had included it as one of its specialties until then. Most medical schools had developed separate departments in this specialty years before. The national orthopedic community has constantly campaigned for departmental status in medical schools. They emphasize that it is as much a medical as a surgical specialty and deserves the status of a separate discipline. This view helped convince the School to make a new department. Dr. Plato Schwartz was chief of the division after World War II, followed by Drs. Robert Duthie and Louis Goldstein. Dr. Frederick Zuck was acting chairman at intervals. With the creation of the department, Dr. Charles M. Evarts, who had trained here, returned as chairman.

Although not departments, there are major divisions that have been formed within the School as part of the change in medical education and research. These often developed around a few individuals with a special interest, and gradually expanded to fill a vital role in the Medical Center.

Genetics became a formal division within the Department of Anatomy in 1966. There had been active interest in the field of medical genetics for some time; in 1945, for example, Drs. Neel and Valentine had described the hereditary pattern of thallasemia. The teaching of genetics was usually combined with embryology, but there were two significant developments after



Departmental changes in the Medical School since World War II

World War II which gave impetus to the development of genetics as a distinct specialty. In 1949, Dr. Linus Pauling introduced the concept of "molecular disease" by his characterization of the abnormal protein in sickle-cell disease, and in 1959, Lejeune and coworkers noted the first chromosomal abnormality in Down's syndrome. These developments affected the medical scene at Rochester as elsewhere, so that, in 1960, a cytogenetic laboratory was established here for chromosomal analysis. This

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was unsupported by direct financial aid and gave free service. As the field expanded, the Advisory Board established a committee to investigate its place in the Medical Center and they recommended a division within the Department of Anatomy. Dr. Philip Townes, who had been responsible for teaching and genetic counseling, was named director of the Division of Genetics. This division is responsible for teaching genetics to students and house officers, genetic counseling, and research.

A medical education unit was formed in the dean's office in the mid-1960s and Dr. Hilliard Jason was recruited for this. The role was to develop means of improving and evaluating the education process. Dr. Jason left in 1967, and a committee then was formed to evaluate the need and to delineate the functions of a medical education unit. They recommended that a unit on medical education be established with its primary function as service to the faculty, but ultimately to develop teaching and research responsibilities. Dr. Robert Geertsma, trained in psychology and education, was recruited as its first director in 1969. This unit has expanded rapidly and has moved into many areas of medical education, such as audiovisual instruction, evaluation of teaching, and testing the results of curricular change.

The idea for a Division of Biostatistics goes back to the Atomic Energy Project. Dr. Lee Crump was appointed head of the Statistics Division in 1948. He and his colleague, Dr. Arthur Dutton, did most of their work in the Department of Radiation Biology. There was no formalized program until Mr. Allen Wallis, the president of the University, initiated this in the mid-1960s. A Department of Statistics was started in the College of Arts and Science, with active participation by the Medical Center. Dr. Charles Odoroff was appointed acting director. Its responsibility is to teach statistics to the students, to collaborate in research programs, and to train graduate students.

The Center for Brain Research was established in 1961 and was in the College of Arts and Science until its geographic and administrative move to the Medical Center in 1971. The foundation of the center was largely the work of Professor E. Roy John, the first director, who had seen the benefit of the multidisciplinary approach to the neural sciences from work at the Brain Research Institute at UCLA. Dr. John was a professor of psychology and interested in learning, so that much of the early efforts were in that area. Dr. Karl Lowy was the second faculty appointment.

Among those instrumental in helping form the center were Drs. Engel, Lotspeich, and Romano, from the Medical School, Professor Raven, from Biology, and Professor McCrea Hazlett, the dean of Arts and Science. Faculty were appointed and four major divisions were established: neuroanatomy, neurophysiology, neurochemistry, and neuropsychology. Dr. John resigned in 1963. Drs. Ray Snider and Garth Thomas have followed as directors. While research in the neural sciences has been its main function, there is an extensive graduate and postgraduate program and active collaboration with research and teaching within the University. They have trained more than 125 graduate students and 41 postdoctoral students.

The growth of research within the Medical Center is difficult to assess. It is certain that the worth cannot be measured by the number of involved personnel, the number of publications produced, or the amount of money spent; these can all be counted but the score may mean little. Perhaps the peer review system of the National Institutes of Health and other health foundations has made the total dollar amount of funding a measure of scientific worth. These are the figures which are most easily available. Their significance is problematical, for dollars do not necessarily buy good research.

During and immediately after World War II, funding was small unless it was for some research related to the war effort. Limited money was available from private foundations and some individual philanthropy. Some funds from industry, such as pharmaceutical companies, were available. The massive expansion in availability of funds came after the establishment of the National Institutes of Health. Funds were then readily available for research and training. The 50s and early 60s were the golden era for most medical schools, including Rochester. This School, like others, expanded in physical size and in the number of personnel and now, like others, faces the problems invoked by the narrowing largesse of funding agencies.

The expansion of research effort in the Medical Center can be gauged by the figures presented in Table 2. Reliable figures are available from 1950. It is notable that, in 1950, of the total funds for research in the University of \$3.03 million, \$2.3 million was from the Medical Center, and of that, \$1.8 million was from the Atomic Energy Project. It was not until 1959 that the amount of funds for the Medical Center, exclusive of the Atomic Energy



Sponsored research and research training funds for the Medical Center from 1950 to 1974.

Project, was equal to that of the Atomic Energy Project. While the figures for funding continue to rise, they are not meeting the increased cost of research nor the increased number of investigators in the field. Also, the type of funding has altered so that training grants in most areas have been terminated, and it is this type of funding which is so essential to a medical school. More and more funding is being put into contract grants or projects in which a specific answer or service is the object. This is a sharp restriction on the pursuit of ideas, which is the hallmark of a scientific institution.



The Medical School teaching program changed very little in the immediate postwar years. Experiments in medical education elsewhere were watched with interest, but only minor changes were effected here. Even student numbers were not altered in spite of the general expansion in class size. Class size was 258 in 1945-56, and 280 in 1950-51. At the time, Dean Whipple stated the following in "The Next Twenty-Five Years?," an essay in the volume commemorating the first quarter century of the School: "It is our belief and devout hope that the medical student classes will not be increased in number as this would inevitably change the informal type of teaching in small groups and impair the quality of instruction." His hope was realized, for it was not until the 1966-67 academic year that the student number exceeded 300. It was at this time that the federal government, through withholding funding, exerted pressure for expansion of medical student numbers. There has been a gradual rise toward the present figure of 381. This was accomplished by expanding the entering class number from 75 to 96.

It is fortunate that Dean Whipple did not voice the same hope for faculty size. The number of faculty, full and part time, with the rank of assistant professor or above, went from 95 in 1945– 46 to 878 in 1973–74, a ninefold increase! If assistants, instructors, and associates are included, the two figures are 361 and 1,592. Needless to say, the faculty-student ratio is one of the highest of any medical school.

> STUDENT-FACULTY RATIO







PRESENT



Graph showing changes in faculty (full time and clinical with rank of assistant professor or above) and total Medical School enrollment.

The organization of the courses followed a fairly traditional Flexnerian model until the early 60s. Basic science was taught in traditional departmental enclaves the first two years. Immediately after the war, the clinical years were divided into clerkships comprising half of the year. Surgery and obstetrics and gynecology was done for half of the year and medicine and pediatrics the other. Ambulatory care was introduced in the fourth year.

Psychiatry was introduced in the preclinical and clinical years after the new department was added.

There were only minor changes in the curriculum during the 50s, although an intensive examination was being made by various committees in the School. This culminated in the reports made by the Committee of Six of the Advisory Board.

In 1957, a combined clinic was instituted so that students could establish continuity care with ambulatory patients. Also, short elective periods were instituted about this time.

A major curricular change was made in 1964 by shortening time spent in traditional basic science instruction, inclusion of new courses such as Embryology and Genetics, and Introduction to Medicine. The following year additional courses in statistics were added. An interdisciplinary course in neural sciences was placed in the second year.

The General Clerkship was initiated in 1966 and was given in the third year; it replaced the physical diagnosis course given at the end of the second year. Its goal was to establish an approach to the patient which not only emphasized the essentials of history-taking and physical examination but which also stressed finding how illness affected a patient's life and then helping the patient and his family to cope with this change in their lives. The course Concepts and Mechanisms of Disease was offered in the second year. The purpose of this course was to relate basic sciences to the clinical practice of medicine. In the third year there were rotations through the major specialties—medicine, surgery, psychiatry, pediatrics, and obstetrics and gynecology. Shorter rotations in other services and electives were given in the fourth year.

In 1973 an independent study program was started, under the chairmanship of Dr. Herbert Morgan. Some students may complete their preclinical requirements by independent study. There is a small group of faculty assigned for their supervision,

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and an emphasis on individual instruction and the use of teaching aids.

A recitation of courses can neither reflect the many hours spent nor the opinions voiced in effecting change. The thoughts about curriculum are as diversified as the number of faculty and students. The results of curricular change are difficult, some would say impossible, to measure. There has been a constant effort at Rochester to assess these changes in some way. This work is being done by Dr. John Donovan and the Division of Medical Education.

This essay has pointed out some of the changes in the Medical School since World War II. It has been a time of excitement for anyone viewing the field of medicine and medical education. Obviously, this essay has only touched on a few aspects of this change. Any exclusion of significant changes is due to the author's relatively recent arrival on the Rochester scene and not due to intentional minimizing of events which others believe to be important.

## 19.

### Child Health and the Community



### Robert J. Haggerty, M.D.

Robert J. Haggerty, professor and chairman of the Department of Pediatrics, has long been interested in the provision of general health services. He interned in the original "class" of rotating interns at Strong Memorial Hospital, a program designed to prepare physicians for general practice. Following this, he was a resident in pediatrics at Children's Hospital Medical Center, Boston. He then remained at Harvard Medical School, where he developed the Family Health Care Program. In 1964 he was appointed to his current position.

Dr. Haggerty's interest has been in developing educational programs to prepare health professionals to meet health needs of populations. This has led him in his research to study the effectiveness of various innovations in health care—the field of health services research—in order to know what programs to teach health professionals. He has been chairman of the Health Services Research Study Section of the Public Health Service, a member of the President's Science Advisory Panel on Health Services Research, a member of the Carnegie Commission on Children, and a member of the National Advisory Council of the Professional Standards Review Organization.

Dr. Haggerty's current interests lie in adding formal health education to the programs of health services more rationally,

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and studying more effective adaptation to life stresses. He is spending a sabbatical 1974-75 year at the Center for Advanced Study in the Behavioral Sciences at Stanford to pursue these interests.

#### The Setting

THE University of Rochester and its School of Medicine and Dentistry was fortunate to be located in a community such as Rochester, New York. To understand how the current programs in community child health came about, it is important to describe the soil in which they grew, namely the Rochester community the laboratory in which they were nourished.

Rochester has many virtues as a laboratory. It is neither too large nor too small. Today the city has nearly 300,000 people, with a total population of the surrounding county adding up to  $\frac{3}{4}$  million people,  $\frac{1}{4}$  of these being children under 18 years of age. More and more the county and even the adjacent 10 counties, rather than the political area called the city, are becoming a community. Although Rochester is basically a city of highly skilled industry with an above-average family income, it also has examples of all the social problems seen in any large metropolispoverty, crime, civil riots, and school crises. Even with a very low unemployment rate, which has averaged about 3 percent or less for the past decade, many children still grow up in poverty, a condition so closely related to poor health. On the other hand, the region has a very high rate of hospital insurance coverage from one carrier, Blue Cross, which covers more than 80 percent of the population. With Medicaid added, nearly the entire population (over 95 percent) had full hospital insurance coverage by the late 1960s. (A significant gap in this rosy picture is the lack of full coverage for obstetric and normal newborn care.) Financial barriers to hospital care were thus almost eliminated by the time the new community programs were developed. The Rochester area also has a high ratio of physicians to population with a deserved reputation for providing high-quality medical care.

Rochester has a strong tradition of trying to solve problems in a rational way: identifying the problem and its cause, instituting programs to attempt solutions, and then evaluating the effectiveness of the new programs.

The overwhelming influence of George Eastman and Eastman Kodak Company are to be seen in nearly all aspects of life in

Rochester, although in recent decades other industries have emerged to add their input. A government research institute, formerly the Bureau of Municipal Research, was a typical example of the influence of Mr. Eastman on the nonmedical field. He stimulated its development as a group to develop data and evaluate programs in the governmental field, where it set a pattern for informed, unbiased assessment of problems and provided information for public policy-making bodies to use for rational decisions in the political-governmental sphere. The relationship of the University to this enterprise has been close, with one of the first professors of sociology at Rochester, Professor Koos, being active in the founding of this municipal research group. In his writings, Koos strongly advocated the close interaction of a university academic department and community programs, although he was one of the few at the University to do so. His study of health in the community, carried out in a rural area near Rochester, has remained a classic for over a generation, for it documents so clearly the relation of social class and environment to health, and of the recipient to health services.<sup>1</sup>

The city has also had a long record of innovations in health care. It had the first community-based hospital planning council in the nation<sup>2</sup> and one of the first visiting teacher programs.<sup>3</sup> The fact that there is one medical school in the region diminished competition between schools, competition that has often been destructive in other cities. It is fair to say, however, that, in the first part of the history of the Medical School, this lack of competition also allowed the School to be more remote from the community than many might have wished.

Research in private pediatric practice has been carried out in Rochester by several busy pediatricians who have had close links to the University.<sup>4,5</sup> Leaders of pediatrics moved from practice to full-time status and vice versa. Most faculty, especially Dr. William Bradford, who was the first chief resident in pediatrics, later a colleague in practice with the leading pediatrician of his day, Dr. Albert Kaiser, and still later chairman of the Department of Pediatrics, maintained very close ties with practitioners and their needs. Most practicing pediatricians were early accorded admitting privileges in the new University Hospital, thereby diminishing the potential town-gown conflict among pediatricians. Another factor promoting community-wide programs for children, in contrast with other population groups,

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certainly must be that there is less publicly voiced opposition to services for children than to other age groups.

In the community, there has been a long history of effective community-wide programs for health services. The courageous, longtime city health officer, Dr. George Washington Goler, achieved a successful program for assuring pure water and organized a program of "certified" milk before pasteurization was widespread.<sup>6</sup> Believing that pasteurization would allow milk of poor quality, production, and processing to be sold, he continued his support of certified milk rather than the shift to pasteurization. (This was but one measure of Goler's strong, independent personality.) The justly famous community-wide study, by Kaiser,7 of the effects of tonsillectomies was another important factor in establishing the community as the basis for improving child health. Still another example of the background against which community child-health programs developed was the shift in the mission of the Convalescent Hospital for Children as the needs of children changed. Originally built for the long-term treatment of children with osteomyelitis and rheumatic fever, it later became a center for care of chronic poliomyelitis patients. Then, as these diseases decreased in frequency, its board had the capacity to change to still another type of institution-a residential center for emotionally disturbed children—once this health need emerged as dominant. This ability to change as health needs changed was most significant for the development of subsequent community programs.

It was in this setting of a well-to-do city, with a long history of innovations in health care, the resources to develop new programs, the tradition of public-minded citizens, and a strong interrelated leadership of stable community organizations, that community pediatrics later flourished. These factors made it possible in Rochester to do things of which other communities only dreamed. The critics point out that the way of doing things was often paternalistic, at least in the past, but the tradition of community-wide programs was present throughout. In this laboratory, community pediatrics has been allowed to develop with vigor in the last decade of the first fifty years of the Medical School.

In the 1960s, there was considerable expansion of the Department of Pediatrics into the community programs described below.<sup>8</sup> This new thrust, called community child health, added to the former programs the concept that a university department of
pediatrics has responsibility for improving the health of all children in the area, not only those who come to the teaching hospital. This chapter outlines these "population" programs that have been joint enterprises of the community and the University.

#### CHANGES IN CHILD HEALTH NEEDS

A brief comment on the rapid changes in child health needs over the past half century is in order to explain why the community programs initiated in the sixties concentrated on ambulatory primary care.

Barely a half century earlier, such concentration would have been unthinkable. The large numbers of deaths from diarrhea and contagious diseases, such as diphtheria, made hospital curative care for children the first priority in the early part of the century. Although curative medicine was responsible for little of the subsequent decline in these diseases or the later virtual elimination of poliomyelitis or measles, it did dominate the thinking and energy of pediatrics and the community for most of the first half of this century. The large numbers of very sick children for whom hospital care was of at least some benefit had made curative medicine the first priority. But a remarkable change in childhood morbidity is now apparent. This change has been due to a step-wise reduction in the old diseases as they were eliminatedone by one-by better sanitation, effective vaccines, better social conditions, and effective treatment, rather than to any single revolution in care. Now the "new morbidity" in children is apparent: the need for universal access to care for preventive services, treatment for frequent but usually mild acute illnesses, and provision of interdisciplinary care for complex chronic diseases, such as asthma, and social-educational problems, such as learning and behavioral disorders. These are now the major causes of dysfunction in childhood. Only in the newborn period is death a common phenomenon. It is noteworthy that after the newborn period accidents and cancer (leukemia and solid tumors) are now the major causes of death in childhood, and they fortunately are rare. Only 1 in 200 children from one through fourteen years of age now dies, and half of these deaths are from accidents or cancer.

The implications for child health services are profound. Today over half of all child health services are for maintenance of health (preventive services). These are increasingly being

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rendered by pediatric nurse-practitioners as well as by pediatricians. No longer is the hospital the place where most of the action is, although the level of tertiary care necessary for the few who require it continues to rise as new technology becomes available. The shift to practitioners' offices, schools, outpatient departments, and the new community health centers as the places where most child health care is given, and where more pediatric practitioners will spend most of their professional lives, has profound implications for medical education. If past trends are any indication, the future of child health services lies more in these new sites, more with preventive and social services, more with teaching children how to stay healthy-or, when this is not possible, more with multidiscipline ambulatory programs for the chronically ill-than with the traditional hospital-based types of subspecialty services. Teaching programs must take these changes into account and use new service programs for education (and if such new sites or programs are not available, they must be developed) or they risk teaching obsolescent skills.

While all fields of medicine have seen rapid changes in the past half century, probably none have seen such a great change in the types of diseases prevalent, nor in the types of services needed, as pediatrics. It is within this context of change that the community child-health programs were developed.

#### WHY UNIVERSITY INVOLVEMENT IN THE COMMUNITY?

There should be no need to document why a university ought to be engaged with its community to promote the health of all children in the area, but there are still skeptics who contend that the function of a university is only to teach and do research and that commitment to service dilutes these goals. A word of justification is therefore in order.

The relation between the type of environment or community and the health of its children is firmly established. The major determinants of health in childhood, besides heredity, are such environmental factors as socioeconomic status of the family, quality of mothering, quality of housing, nutrition, sanitation, education, quality of the air and water, and access to high-quality health services. The goal of pediatrics is to improve the health and welfare of all children. To teach students how to reach this goal most effectively requires that an academic department be engaged in the improvement of these socio-environmental factors and health services in order to have the "laboratory" for effective education and research.

While the more traditional teaching and care of relatively complex medical problems (seen mostly in teaching hospitals) and research on basic processes of human development must be a part of any pediatric department, academic departments must also be engaged in programs in the community to "complete the clinical picture," to study the most prevalent health problems, to prevent disease, and to teach the skills of improving the health of all children in its "parish" or territory. When model programs that encompass these factors are not present, it is necessary to build such services. A large amount of energy was necessary to develop these services in order to be able to teach. Had they been present, the University would not have had to take this lead. Without them, it was essential for us to do this first.

#### PROGRAMS IN COMMUNITY CHILD HEALTH IN ROCHESTER

The concentration in this chapter on child health and the community should not ignore the many other close relations between the University and the community, such as in planning for the care of the aged, in mental health, or more recently in family medicine. Child health is selected to provide examples of this relation because the author is most competent in that area.

#### A. Affiliation with Local Hospitals

Hospital consolidation of pediatric services has been described by Segal elsewhere in this volume. This achievement did set the pattern for a unified community-wide approach to problems of child health that has since served well as a model of cooperation. With a unified faculty and house staff, the next stage of development, the major expansion into community ambulatory care, was set.

Today, this three-hospital consolidated pediatric program works well. Nearly all hospitalized children in the region are cared for by an excellent house staff under the supervision of full-time faculty. The majority of newborns in the area and children seen in emergency rooms benefit from the presence of these highly qualified staff people. Few communities can boast of this accomplishment, small though it may seem.

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#### B. The Neighborhood Health Centers

With hospital care of children consolidated, the next task was to assure that all children received high quality general pediatric care. While the number and quality of pediatricians in the more affluent areas assured this for the middle class, a different picture was apparent by the mid-sixties for the inner-city poor. Over 50,000 black and nearly 20,000 Spanish-speaking people had moved into the inner city, largely into two separate ghetto areas. during the postwar period. Few physicians remained to give care to them there. Cultural differences, financial barriers to ambulatory care, and transportation problems precluded high-quality care for this group in either the University hospital or private practices. Every index of health examined-infant mortality, tuberculosis rates, hospitalization rates, immunization statuswere all poor for this group of children. The Department of Pediatrics' commitment to care for all children, and to teach this concept, coincided with the War on Poverty financing to make possible the development of a neighborhood health center in 1967 in one ghetto area. By 1972, in close working relation with the poor, this center was expanded to a network of four health centers, offering 24-hour-a-day access to primary care for nearly all inner-city residents. Funded by federal dollars and initially administered and staffed by the University, this extensive program has by 1974 been transferred to community ownership, but with close ties remaining with the University. The four health centers now serve over 60,000 inner-city residents. They have expanded their services to the near poor and nonpoor, offer capitation prepayment programs, serve as the bases for education of some pediatric residents and fellows, and permit the focus of considerable research and evaluation efforts of the department.

#### C. Migrant Health

In the more rural areas of the county, agriculture has depended extensively upon seasonal migrant workers. This group is a particularly deprived group medically. Beginning in 1964, the Department of Community Medicine at the University developed a migrant health project, which was later transferred to the Department of Pediatrics. Through many conflicts, the program developed by 1974 into a year-round rural health program and, like the neighborhood health centers, transferred management to a community corporation.

#### D. School Health

School health has been an orphan of medicine. While many pediatricians serve as school doctors, and schoolchildren are an almost totally captive population for whom screening and care programs should be most effective, this branch of medicine has had very low status. We believe that school health and school-age children deserve better. Beginning in 1968, a program in school health was developed to provide a new and more effective role for the pediatrician and other health professionals in the schools. Today over a dozen schools in the area have developed exciting new partnerships of pediatricians with teachers, school nursepractitioners, health centers, health educators, and reading specialists to provide diagnostic and therapeutic services to large numbers of children. Students from the College of Education as well as medical students and pediatric residents participate. The physician has learned to move from his protected role of doing only physical examinations and screening to becoming a partner with parents, children, and teachers and other professionals to help children with the most common problem of schoolchildren today-learning and emotional problems.

#### E. Programs for Teenagers: the Rochester Adolescent Maternity Program (RAMP) and Threshold

Teenagers have been neglected by medicine until recently. An adolescent program was first developed in 1963 in the Department of Pediatrics. This clinic has expanded its scope over the years and reached out into the community to study the frequency of such health problems among teenagers as the prevalence of drug usage. Such studies overcome the usual bias of conclusions based only on the types of problems brought to physicians or to a clinic.

In 1969 a further extension of services was the development of a teenage pregnancy service (RAMP). This program grew out of experience in seeing the problems, medical and social, resulting from premature pregnancy in teenage and usually unmarried girls. Among the significant achievements have been the development of a coordination of obstetric, pediatric, nursing, social work, and psychological services in one clinic and recently the addition of family planning services.

Another problem of which everyone is aware today is the drug

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problem of youth. Indeed, most adults seem to believe the stereotype that all teenagers are sexually promiscuous and on drugs. The truth seems more to be that teenagers, like adults, have problems in these areas. Drugs, especially the "adult" drugs such as alcohol, tobacco, and medicines, are used by most people-sometimes to excess. In addition, a minority of youth have real problems with the new drugs. In the belief that drug centers should deal with all health problems, not merely hard drugs, the department was instrumental in establishing a walk-in center, informal yet offering high-quality services for all the major health problems of youth, of which drugs, infections, behavioral problems, and sexual problems are the most frequent. The center, called Threshold, located in the downtown Rochester area, is physically unprepossessing but also not intimidating. Staffed by a wide array of professionals-obstetricians, internists, psychiatrists, social workers, community outreach workers, and recreation workers-it attracts large numbers of youth, many of whom find uncomfortable barriers to use of traditional medical services such as hospital clinics or physicians' offices.

#### Collaborative Research and Preceptorships with Practicing Pediatricians

In our community, 85 percent of all child health services are rendered in private physicians' offices-over 60 percent of these by practicing pediatricians, the rest by family physicians. Most of our graduates end up in such practices. As noted before in this chapter, Rochester has a large number of high-caliber practicing pediatricians, several of whom have pioneered in carrying out research in their own practices. It seems very logical, therefore, to use this resource for teaching and investigation. A program of collaborative research was begun in the mid-sixties and continues today. A wide variety of clinical problems-epidemiologic, controlled clinical trials, and manpower innovations-have been studied in private offices. The University faculty provide the organizational, laboratory, and statistical help; the practitioners provide many of the ideas and patients. It must be emphasized that this is a true collaborative effort. Problems are defined, research designs developed, and projects carried out jointly. We do not impose studies on the practitioners; authorship in publications is joint. Altogether this has been a very fruitful experience,

both as to data generated and in the mutual understanding that is fostered.

More recently, we have begun to reinstitute the old process of preceptorships for residents and fellows, some of whom spend blocks of time in these offices, learning skills and organization that have proved successful in real-world settings. We believe this partnership is also one of the few successful methods of continuing education for both practitioners and faculty.

#### MANPOWER STUDIES

In the mid-sixties, a major limitation to expansion of health services to children was lack of manpower. The rapid decline in the number of general practitioners, the minor increase in the number of pediatricians, and the large increase in the child population made any improvement in services dependent upon increase in manpower. We took the route, pioneered by Dr. Henry Silver and Dr. Loretta Ford (the latter now dean of Rochester's new School of Nursing) of educating pediatric nurse-practitioners to meet this need. In close collaboration with the School of Nursing, over sixty nurses have been recruited and educated in only four months, plus eight months on-the-job training, to work in pediatric offices, health centers, and outpatient departments. While we have a large pediatric residency program, the pediatric nursepractitioner (PNP) program has produced an even larger expansion in local child health manpower than our total pediatric residency. With short but specific education for predetermined settings, these PNPs have been shown to be extremely capable in providing well-child care,9 screening for acute illness, satisfying parents' wishes, and monitoring care of the chronically ill. Although the sharp decline in numbers of children being born has reduced the pressure to produce more manpower, the PNP has made a radical difference in qualitative, as well as quantitative, aspects of child health care. She has proven to be most effective as a counselor and educator, areas in which physicians traditionally have spent little time.

The principle of manpower innovation illustrates how a department interested in improving child health must attend to developing manpower (as well as assuring that the content of care is first class) or to developing new care programs. There are other factors that we have not done as much for but that are equally important: removing financial barriers (Medicaid and

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OEO helped us with these), improving transportation (still not solved), and controlling costs. Unless all the pieces are put together, it is difficult to implement a community child-health program.

#### CHILD HEALTH ADVISORY GROUP (CHAG)

Consumerism is a new force in many aspects of American life. In this University, we have had relatively little consumer input for a variety of reasons. One of the major ones is that the Hospital is wholly owned by the University and has no board of trustees of its own. (The central University Board of Trustees, while very interested, cannot be involved in each department's affairs.) This has had the advantage of allowing medical staff to initiate new programs without prolonged and potentially damaging community debate. However, it has had the disadvantage of failing to develop a community constituency that is supportive of the community health programs. We believe the community has a very vital role to play in health care.

To achieve some of these goals, we have invited a group of citizens and parents to join a group, now self-named the Child Health Advisory Group to the Pediatric Department. With skillful staff work, they are now organized into several task forces, examining, advising, and assisting in improving programs. Examples include a study of the needs of children of families who have suffered from job-induced moves. Other activities have been expansion of the school and activities program in the Hospital (formerly called "play ladies") and a major expansion of services for the physically handicapped child in the area—a neglected aspect of child health care in Rochester.

While the project is only two years old and results are still limited, we strongly believe that university hospitals need more such interface with the community. Students and house staff, as well as faculty, need to learn to work with lay groups, something that we have not taught well to date, and the community needs to be more fully informed and involved in health care. We strongly believe that this or some similar model is an important part of community child health.

#### COMMUNITY CHILD HEALTH STUDIES

A final piece of our program and, we believe, of any university program of child health is our research and evaluation unit. With

several disciplines represented (health services research physicians, sociologists, psychologists, and nursing) we have sought to study the needs of children in the area and to evaluate the effectiveness of our own new programs such as the health centers, pediatric nurse-practitioners, and chronic disease programs, as well as socially conditioned new programs like Medicaid and abortion law changes. Significant results include such findings as the reduction in hospitalization and emergency room use by users of the health centers, the failure of Medicaid to change patterns of care, the marked impact of abortion on child health services, and the steady decline during the past eight years in the use of child health services in this county in spite of increased facilities and decreased barriers to health care. This finding contradicts one current school of thought that believes that increased use will inevitably result from such changes in medical care. The importance of a research and evaluation team can scarcely be overemphasized for any serious academic group engaged in new programs in the community.

#### PROBLEMS AND POTENTIAL OF COMMUNITY CHILD HEALTH

No final, global verdict of success or failure of any effort as complex and multifaceted as this community child-health program can be offered. Obviously we believe there are more benefits than deficits; but, to be a successful venture into a new field, an academic department must attempt to assess the pros and cons, and there will always be both. On balance we believe the pros outweigh the cons, else we would not continue.

1. Issues of *control, power and conflict* are perhaps most difficult for those of us reared in the protected environment of universities to accept. Once we move into the community, we must learn to share control and power. Conflict is inevitable. We believe some conflict is productive, but we have had to learn that various groups with whom we must work do not share our priorities and goals. In the brave new world of partnership with the community, we in academic centers and our students need to learn this lesson and also the skills to work productively with people who have different goals.

2. Service vs. science is another problem. We strongly believe that medicine is both a service and a science. Neither aspect can predominate if our educational programs are to succeed. However, there are inevitable tensions as we develop large, needed service

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programs. We must be careful that in the process our science efforts do not suffer. Romano has aptly characterized this as the dilemma of engagement vs. detachment. The task, we believe, is to achieve a balance between them. Lack of emphasis upon education is another potential problem of large service commitments. The argument that business schools do not run business, therefore why should medical schools run health care programs, needs sober consideration. We believe that a major goal of our educational effort is to teach commitment to service and to teach attitudes such as that all children are the concern of pediatricians. Since role models probably play a large role in the effectiveness of teaching these attitudes, we strongly believe that having responsibility for services increases teacher effectiveness.

3. Disengagement after initiation is often a problem. The community, as well as the faculty of a university, has a great deal of ambivalence over control. The community is anxious about the monopoly this University has on manpower, grantgathering ability, and control. They usually wish to take over programs. At the same time, they protest when the University seeks to disengage from active management of new programs, seeing it as a rejection by the University of their needs. We have strongly felt that maturity of a program is characterized by its ability to be managed by the community once the program is initiated by the University. Like one's adolescent children, both partners have tensions over the disengagement. However, as in the case of the migrant project and the health centers, community boards have developed that now receive the grants and negotiate with the University for manpower, research, and education. Disengagement with continued contractual relations is our goal.

4. Limited *financial support* and restrictions caused by the categorical nature of some funding agencies cause considerable difficulty. All of the programs described have been developed with extramural sources of funds. Vigilance against accepting funds with too many strings must be balanced against the equally damaging effects of doing nothing unless all the limitations are eliminated. We recognize the dangers of both extremes.

5. The role of clinical departments is not yet clear in these new ventures. The extensive involvement of the Department of Pediatrics in the community might prompt the skeptic to ask, "What's a nice department like yours doing here?" In some

schools these new functions are lodged entirely in a department of community medicine. I suspect that there are many ways to skin a cat, and ours may not be best for all. However, we believe that clinicians must learn more about the community in which children live, more about how to work with disparate community groups to effect change, and more about how to evaluate the effectiveness of new programs. We are unwilling to see the pediatrician of the future become only a technician of medical care. We think he should be involved in changes in organization and delivery of care. If one accepts this goal for the future of pediatrics, then the community laboratory needs to be developed by clinical departments, and esteemed clinical faculty need to be engaged in this process. Role models remain one of the most effective ways to teach the young. The role of a clinician working effectively in partnership with the community to improve child health has been our goal.

#### SUMMARY

The future of child health requires investigation and alteration of adverse factors that affect health of children. Evidence to date indicates that the major factors in children's health lie in their environment.

Environment is composed of social-cultural, economic, educational, family, air-water-food, and stress factors. The task of those engaged in promoting child health is to identify those factors which promote or diminish health, and to engage in efforts to maximize the former and minimize the latter. University departments of pediatrics that have as their goal the promotion of child health will of necessity be led to engage in the improvement of the community. To educate the next generation of child health workers to be effective, academic pediatric departments will be forced to demonstrate, as well as to analyze, how to improve the environment-the community-of the child. They must develop effective new care programs, they must educate their patients how better to maintain their own health, and they must evaluate how well they do these tasks. Departments of pediatrics will be increasingly engaged in community programs to improve the health of children. They will in effect become departments of human ecology. Rochester has taken the first steps along this path.

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## Students Then and Now

# 20.

### "We needed understanding"



### Martha Gene Stearn, M.A.

Martha Gene Stearn was born in New York City and lived there and in Aurora, New York. She attended Oberlin College in 1963, where she majored in psychology and wrote for the college newspaper. She graduated in January of 1967 and returned to New York City, where she worked as an assistant editor at Appleton-Century-Crofts for two years. She then became an associate editor at Hayden Book Co.

Miss Stearn earned a master's degree in clinical psychology from St. John's University in Jamaica, New York, in January 1970, and worked in the Social Psychiatry Department of Cornell University Medical Center, doing research, psychological testing, and patient interviewing. In 1971 she earned her premedical credits at Hunter College.

Miss Stearn served on the Curriculum Committee as a Student Senate representative during her first two years of medical school and is currently a third-year student.

**B**<sub>ECAUSE</sub> I attended high school in Upstate New York, I had heard of Rochester, but never thought of it as anything more than a place that provided an escape and employment for a lot of people in my class. This somewhat negative preconceived notion of the area probably explains why I initially chose not to investi-

gate the Rochester Medical Center as a possibility for application.

However, when I was taking premed courses in New York City, I was surprised to hear the widespread acclaim attached to this School from people whom I regarded as sophisticated. Further observation led me to decide that it would be a wise choice. I was attracted by the fact that Rochester was one of the rare schools that did not require MCATs. This was not a mere rationalization (since I was no star on that test); I thought it must take considerable courage for a school to take on the individuality of thousands of applicants when it would be so much easier and cheaper just to have some cutoff on the basis of "objective" measures. I learned that many schools relied heavily on such measures, and individuality became subordinated to efficiency. In fact, I was advised by people in medicine that often the lesserquality schools used numerous objective cutoffs because they couldn't afford to take a chance.

So I applied, and found my interview experience to be quite unique. My interviewers were not so much interested in what I thought, but *how* I thought. This was particularly refreshing after a series of interviews at a midwestern school where my interviewers spent the bulk of time fishing for my political views, only to reassure me that had I been *black* and female, I could have been guaranteed acceptance. At this same school, the student guide told me that applicants were rated as to what specialty the Admissions Committee thought they would probably end up in, then the committee accepted a quota for each specialty, depending on society's needs. I was reminded of Huxley's *Brave New World*.

I had similar experiences at other schools, usually feeling that the interviews were structured as a test, looking for key answers that would somehow magically inform them of my qualifications as an M.D. candidate.

I've always been glad that I came to Rochester, despite many bleak moments. The first year was especially difficult in its challenge to learn how to organize time effectively. There were problems with the quality of the basic science teaching in that considerable chaff was tossed at us along with the wheat. Since there was already more wheat than was humanly consumable in a year's time (much less a lifetime), I felt lost. I often questioned my capacity to channel the scientific bombardment and learned that my classmates felt similarly inadequate. We sought teachers

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who would stress concepts and thought processes; conversely, we resented the attempts to render our education a rote experience. The Student Senate, on which I served my first two years of medical school, was a vehicle for voicing frustrations and looking for improvement. We wondered how students might be able to provide meaningful rewards for deserving teachers: a plaque? a gift? financial incentives? publicity? Financial incentive was critically important by any just criteria, but Student Senate could not provide the funds by itself. We arranged talks with members of the administration regarding the actual budgeting of funds for teaching, as opposed to research, as well as the factors contributing to decisions for faculty promotion. Opinions were quite varied, but there was sufficient agreement that enough problems existed to lead to the development of a Student-Faculty-Teacher Evaluation Committee.

Another issue that confronted us early on was the ambiguity of the grading system. Students individually and via the senate requested clarification of the manner in which grades are determined, and we established channels through which students could make appeals and could also find faculty member support when experiencing difficulty with grades that might stem from more subjective bases, such as personality conflicts.

There was a common theme in our criticisms of the teaching and the grading system, and it derived from a need to be valued as human beings with a finite intellectual capacity, a need to use our minds in a stimulating manner, and a need for feedback. That is, we needed understanding. At the end of our first year, our class elected Dr. Michael Sheridan as teacher of the year. I voted for him because I felt that he understood these needs, and he helped me and many others gain perspective on our own values.

Starting with the third year, the desire for perspective on our value acquired a new dimension, and I found myself grappling with questions such as: Will I *ever* feel adequate? and, How can I maintain the required objectivity with patients and still retain my emotional capacity to empathize with them?

One very effective way that these and many other questions have been dealt with is through a group, comprised of myself and five other students and Dr. Mack Lipkin, organized by Dr. Lipkin in the beginning of the year. This group has turned out to be one of the year's highlights. We have focused on emotional

conflicts that arise in our dealings with patients, fellow students, faculty, and parents. What has evolved is an atmosphere where expressing ourselves openly and directly becomes increasingly natural as we learn how much we can trust each other. There is generalization of the group experience to dealings outside the group. For example, a frequent problem encountered in the third year involves the conflict of personalities and/or responsibilities. It becomes easy and sometimes tempting to hang back as house officers carry on with their responsibilities, often oblivious to the student's presence. Assertiveness is required, and my experience in the group has helped convince me that not only do I have a right to expect more, but a right to openly request it.

The group has also helped me with the conflict that I think we all face: the need to relate to an inspiring role model, but the difficulty, after finding such a person, in viewing him as human and relating to him on an emotional level. Too often we stand back, admiring people from a distance, never investing ourselves in them as people but only as subordinates. The problem with this approach is that it tends to aggravate preexistent feelings of inadequacy. The results of this attitude are analogous to attending a festive banquet, only to eat a peanut butter sandwich. Dr. Lipkin has been an inspiring role model, who has stepped outside conventional boundaries and related to students as equals. We have all been able to learn from each other.

I would like to see more of this kind of experience at Rochester. While there are many strong barriers here to establishing such open lines of communication, my impression is that the barriers are fewer and less formidable than at most other medical centers. In fact, while attending last summer a California conference on medical education run by Carl Rogers, I found that Rochester had a reputation for being one of the more advanced schools in terms of introducing human dimensions.

Considering that Rochester is a large and continually growing medical enterprise, contending with numerous financial and governmental pressures, I think it does well in providing some consideration for the problem of dehumanization in medicine. Certainly I have found a surprisingly receptive environment to making friends here among both students and faculty. In this respect Rochester has especially enriched my medical education.

# 21.

### "Society needs thoughtful and humane physicians"



### Anthony Frank Lehman, M.D.

Anthony Frank Lehman was born in Utica, New York, and raised in the nearby rural community of Cold Brook, the oldest of five children. He was educated in the local central school and graduated in 1966 as valedictorian of his class. He did his undergraduate work at St. Lawrence University, with major interests in biology and philosophy, and received his B.S. summa cum laude in 1970. While at the University of Rochester Medical School, he spent a "year-out" in psychiatry, with specific interests in the evaluation of treatment environments and issues of social psychiatry. His current plans include a flexible internship at the University of Virginia and a residency in psychiatry at the University of California at Los Angeles (UCLA).

T was with enjoyment and a fair portion of envy that I read Jacob Goldstein's nostalgic account of the students, faculty, and environment of the Medical School in its earliest days—"a familysized school." I recall my first visit to the School in 1969, at a time when my own undergraduate campus, as many others, was wrought with unrest over an unfortunate war, and the apparent

cohesive warmth of Rochester's Medical School seemed very attractive. Many factors contributed to my choice of Rochester. It was relatively small and suburban, and it seemed to offer many opportunities for individual growth, including proximity to a diverse university community, emphasis on clinical investigation, and ample time to explore one's own interests in the form of many electives and in summer and "year-out" fellowships.

Many of us came to Medical School, in the fall of 1970, full of ideas for social change and with a definite amount of distrust of authority and the Establishment, which included the medical profession. The social discontent that we carried from college augmented the great internal concerns we felt about performing adequately in a demanding academic discipline. In my estimation the word that most closely describes the atmosphere of my first two years here is *dissonance*, a lack of harmony among the students in the form of disagreements about the "purpose of a medical education" and between students and faculty over priorities of education ("relevancy") and more general issues of life style and the rights and limits of authority. These issues came to the fore in 1971-72 during meetings between students, faculty, and administration over curriculum and grading policies. It was indeed difficult moving from the campuses of protest into a well established profession and dealing with the philosophical dilemmas this posed.

There were of course also many warm moments enjoyed with fellow classmates and with faculty members. I have fond memories of the large dinners our class held in Helen Wood Hall for the faculty during each of our first two years. We slowly began to realize that the one thing we all shared was the awesome task of coping with an exponentially expanding body of knowledge and technology and a society with rapidly increasing needs, demands, and complexities. Somehow, through all the transistorized equipment and expansive bureaucracy of a modern medical center, we needed to find the humanness and warmth that should characterize the relationship between students and teachers, as it apparently did in Jacob Goldstein's student days here.

The diversity among the 79 students in my original class and among the large faculty that has replaced the 20 or so teachers of 1925 seemed to prevent a sense of overall unity. But that same diversity has provided room for each student to pursue his/her special interests and to find guidance from faculty mem-

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bers who shared similar interests and goals. For at least 12 out of the original 79 students in the entering class of 1970, the desire for diversification was fulfilled in the form of a "year-out" fellowship. This provided an opportunity to pursue special interests, both clinical and research, to work closely with faculty, and perhaps most importantly to step back from the great collage of the Medical Center to seek better insight into and appreciation of one's own personal and professional needs and goals. For myself, I think nothing has been more meaningful during my medical education than my "year-out," the professional interests it nurtured, and the close relationships I developed with certain faculty members, other staff, and friends.

This type of experience, though not necessarily in the form of a "year-out," is an extremely important part of modern medical education because of the expansiveness of the profession and the risk of getting lost in the complexities of it all. Even in my five short years here, there has been tremendous physical expansion in the form of more students per class, the opening of the new education wing, and now the move into the new Strong Memorial Hospital. This growth is also manifested in greater distances, both physical and functional, between the clinical departments and increasing pressures for early specialization, often beginning in the third year. The internship per se has now passed on, and in its place is the "first postgraduate year" as part of a specialty training program. The push for more efficient medical education, purportedly in the form of such changes as a threeyear curriculum and decreased elective time, poses the risk of eliminating many opportunities for personal growth for students. Although the need for more physicians is evident, in my opinion the answer is not to diminish the assets of an education which allows for individual diversification and development. Society needs thoughtful and humane physicians who have had opportunities to learn about themselves as well as about the technology of medicine. The University of Rochester has recognized this need and has not assumed a three-year curriculum at the student's expense, despite many external pressures to do so.

It is hoped that the ideals for change and reform that many of us cherished as first-year students in 1970 have not been lost. It is personally painful at times to have the medical profession viewed by close friends and by the general community with a fair degree of distrust and coldness. It is even more difficult to

have to admit that the profession often does plod along and does not adapt swiftly enough to changing social and educational needs. Rochester, by not enforcing a narrow, standardized approach, continues to engender in its students the kind of flexibility and breadth necessary to adapt more meaningfully to changing needs of patients and the community.

This institution has undergone a great many changes since 1925, and the small, close-knit fabric of the original School has been stretched, weakened, and patched, and is constantly being rewoven to adapt to the current situation and beyond. The vastness of medicine, the increased numbers of students and faculty, the businesslike functioning of a modern medical center, and the pressures for specialization have all taken their toll on the warm atmosphere of the "family-sized" School of the 1920s. Nonetheless, the belief in individualized growth upon which the School was founded has been preserved, and with conscious and deliberate effort on the part of administration, faculty, and students this spirit will continue to be a hallmark of this School.

22.

### "We stopped being taught and began to learn"



### Stephen Kellogg Plume, M.D.

Stephen Kellogg Plume graduated from Harvard College in 1964, after preparing at the Taft School. He then attended the University of Rochester School of Medicine and Dentistry, where he was a member of the Student Council, the first president of the Student-Faculty Committee, and a Class Marshal at graduation in 1969. Dr. Plume then joined the surgical house staff as an intern, serving as chief resident in general surgery in 1974–75. He plans an academic career in thoracic and cardiovascular surgery after two years of further training in this field at the University of Toronto.

An avid squash player, Dr. Plume has played on teams representing Rochester in several National Squash Racquets Association tournaments. He was married in 1961 to Marguerite Stevens, and they have two children, Keg and Rosemarie.

**L**O EACH his farthest star": a multidimensional task, many facets of which are detailed in these pages. Having spent a decade as a student here, I offer my impressions on the experience. I disclaim objectivity; still, my personal observations may convey a sense of what being a medical student and house officer at the

University of Rochester is like and will provide one example of the outcome of putting into practice this School's educational philosophy.

The first steps in the education of the medical student—application, selection and matriculation—are, in the individual case, as much happenstance as anything else. My initial contact with Rochester was mediated by two Harvard College premedical advisors, Drs. Curt Prout and Daniel Funkenstein, both familiar names to many Rochester alumni. The image they painted of the Medical Center was that Rochester, while not in the first rank of medical schools in the eyes of the lay public (and hence in the eyes of many applicants) was an academically solid school with a tradition of emphasis on clinical medicine and of patientoriented medical practice, in which context specific attention was paid to the educational objectives and abilities of the individual student.

I found this a useful generalization in differentiating Rochester from schools which had a tradition of priority on research or which took a more distant stance towards the student. I found also that I could give substance to the generalization after going through the application process. Rochester demanded a handwritten autobiographical essay and a half day of interviewing. While I have no great faith in handwriting analysis and am well aware that the most unsavory character can delude his interviewers, I was impressed with the effort to collect this much data on the student's presentation of self. The School tried to fill in the abstract portraits of applicants outlined by transcripts and letters of reference. The men and women who carried out the process kept to the spirit of the admission procedures; they really did make an effort to learn about me and my interests and to relate these findings to the resources of the Medical Center.

The typical applicant to medical school in my day, and I would imagine more so now with the increasing competition for admission, welcomed this attention, which thus became an effective tactic as well as a laudable strategy.

I had other reason to be impressed with the care taken by the Admissions Committee in its evaluation process. My undergraduate background was not a typical premedical one in that my major field of study was philosophy and my academic record was checkered with dim achievements in the required premedical courses. It must be difficult for an admissions committee to differ-

#### Students Then and Now — Plume

entiate the late bloomer from the nonbloomer. Without presuming to guess how satisfied the members of the Admissions Committee eventually were with their decision, I can at least express admiration of their courage in taking what may have looked to be a long shot.

Matriculation, once the anxieties of application had been surmounted, was full of expectation and challenge. What a disappointment to the starry-eyed future healer of the sick and lame to find oneself once again in undergraduate-style courses! Labs and lectures bore no conceivable relevance to what we were preparing to spend our lives doing. We were all great experts on *relevance*. We knew (we thought) if not what should be taught, then at least what should not be taught. We groused among ourselves and formed committees, with pretentious statements of our concern for the quality of medical education. The faculty and dean's office put up with us graciously, took our various criticisms "under advisement," and even occasionally took action.

With the passage of time it has become clearer to me that our complaints had been voiced before (and have been since), and that what we were manifesting was more anxiety about changes in life which were both too much and not enough, rather than justifiable concern about medical education. I am wary (now) of self-proclaimed expertise on the necessary content of medical school curricula. Teaching fashions will come and go. As long as the School maintains its basic educational objectives, the details of preclinical instruction will be worked out satisfactorily for each generation of students, notwithstanding the anxieties and pessimism of the novitiates.

Tedious as the first medical studies were, the School incorporated one stroke of Dr. Whipple's genius to which I and other addicts often pay homage. Dr. Whipple thought a sound mind required a healthy body, and saw to it that a gymnasium was built and maintained. Nonathletes do not comprehend the joy in function or the release from tension provided by maximal exertion in sport, whether competitive or individual, nor do they enjoy the feeling of well-being which comes with walking around inside a physically fit body. This is not the forum in which to win converts, but I will point out that the gymnasium exists, despite financial and other pressures, and that there is a substantial segment of the Medical Center population which uses it and enjoys it. Taft Toribara is presently its longest-standing defender,

besides Dr. Whipple himself. I have logged as many hours on the squash courts as anyone over the last decade and am convinced that the loss or diminution of the Medical Center athletic facilities would be undesirable.

As the first year went on, we gradually became more immersed in our studies, which at the same time became increasingly relevant even in our impatient eyes. Sooner than we had thought possible the entire preclinical curriculum was completed. Now came the phase we all had been so eager to start: clinical medicine.

In retrospect, the most impressive change in the educational milieu (apart from moving from classroom to the wards, a shock in itself) was the change in how and why subjects were studied. We stopped being taught, and began to learn. The goal now was not to obtain some level of achievement on an externally administered exam, but to understand and treat disease processes as they occurred in our patients. The learning substrate was different, too. The patients were our texts. Building on classroom- and textbook-derived information about pathophysiology and the clinical presentation of disease, we saw in human terms the impact of disease upon the individual and were alternately impressed and depressed by people's adaptations to their illnesses. From our first hesitant, brief interviews and regional physical diagnosis sessions with senior clinical faculty, we came to acquire sufficient knowledge and self-confidence to function increasingly autonomously as students of medicine in the Rochester tradition: attentive to illness as a social and psychological stress as well as a pathophysiological phenomenon. Our mentors drilled home to us again and again our responsibility to the patient and to ourselves to study the whole patient, and to understand fully the many aspects of disease. Distinguishing characteristics of a Rochester-trained physician are conscientiousness and a compassionate, comprehensive approach to the patient.

It becomes clear during the clinical years that the making of a good physician exacts a price commensurate with its rewards. There is little time to do anything but make rounds, write up charts, and study medicine. Our social and intellectual interests progressively narrow. Many of us find the stress on family life difficult; for some it is intolerable, and divorce is not rare among my classmates or in the profession as a whole. How does one tell a wife or child that, despite earlier plans and promises, one won't

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be home tonight (again)? I don't know where the optimal tradeoff point lies in this area. Physical fitness may be desirable, but emotional stability is necessary in a physician. Most of these problems are very likely settled by a process of self-selection in graduate training, but the incidence of unhappiness significantly stressing the medical trainee is worthy of consideration.

The third and fourth years gave us a taste of what medicine would be like. Internship made it a reality. At each year in our training we had felt ourselves to have been working too hard, and each year made the previous one seem a lark. Now life has given over to front-line medical care and, for the first time, real responsibility. Having fought as students to make a dent in the patient's hospital course, now we found that responsibility unavoidable. However we did our jobs, well or poorly, was an inescapable factor in the overall quality of care rendered. We had graduated from student status, where we were, professionally and legally, interested bystanders, to physician, and now had to face the issues of reliability and accountability. For the first time we really were responsible. Most of us loved the job (covertly; our manifest behavior consisted largely of grousing-again. I suppose, reflecting anxiety over a change in status) and did our level best. The internship was a good sorting-out period, as well as an intensive learning phase. Exposed to the different interests and pressures of the various specialty fields, we matched them to our needs and chose the residencies that seemed appropriate.

I was attracted to the surgical residency program, under the chairmanship of Dr. Charles Rob, a peerless surgeon and clinician and an unequivocating administrator. The Department of Surgery faithfully reflects the overall posture of the School. Solid if not spectacular in academic and research fields, it is tenaciously, almost ferociously, oriented to delivery of first-rate surgical care. Within this patient-centered environment has evolved an effective resident education program. Surgery is learned in a one-toone relationship with a series of faculty members, with the resident performing as much of the evaluation of the patient and of the work in the operating room as the attending surgeon feels is warranted. Although sometimes this is less than what the eager resident thinks himself capable of, few would disagree that on balance he functions at an appropriate level. Having assumed the role of teacher to younger house officers. I appreciate clearly how difficult it is to assist a less skilled operator through a procedure which one feels one could do so much better oneself. I admire the self-restraint and the dedication to training of young surgeons, without compromising patient care, which the attending surgeons manifest.

Surgical expertise does not come without cost. One pays for it with years of training, years of too-frequent sleepless nights, of canceled family and social plans. I mentioned before the stresses on the medical student in balancing personal and professional needs. The senior surgical resident has a still more difficult balancing act to manage. Each of us finds his own tradeoff point, each of us feeling too thinly spread. The residency system here works, however, and its graduates, like those of the undergraduate Medical School, are characterized by careful, conscientious attention to the needs of the patient. I will not apologize to anyone for the professional values or level of clinical skills inculcated in us. I believe the Medical Center generally, and the Department of Surgery in particular, exemplify the meaning I take to underlie the title of this book. The School is devoted to the development of physicians well suited in interests, abilities, and training in their chosen fields for the care of the sick.

### More Point than Counterpoint

### John Romano, M.D.

IN SEVERAL of the essays one learns of the life of the medical student in the early years of the School. Edward Adolph, a founding member of the faculty, drew attention to the importance of Dr. Whipple's example to the faculty of participating in the selection of each student. He described also the tutorial sessions in physiology initiated by Wallace Fenn and himself. Jacob Goldstein, who has the distinction of being the first student accepted in the first class, further attests to the advantages of the small size of the class, under one roof, working intimately with an equally small number of teachers whose commitment to teaching was not distracted by assignments beyond the School and administrative matters. Furthermore, there were opportunities for students to work with their teachers in pursuing new knowledge. These research opportunities for medical students are recorded fully in another essay by Elmer Stotz, and we are grateful to Gordon Meade for his interesting description of the life of the student during the years of war. And so the Rochester tradition grew of a setting in which the medical student had a close relationship to his faculty, in which there emerged a flexible teaching program with individual differences between students identified and respected, all of this in a fairly noncompetitive atmosphere.

What has happened over these fifty years? Martha Gene Stearn, '76; Anthony Frank Lehman, '75; and Stephen Kellogg Plume, M.D., Rochester, '69, currently chief resident in surgery, have responded generously to our invitation to tell us of their experiences now and in the past few years. We learn from them that we still get high marks for our selection and admission interview procedures, but we also find that for several reasons there appears to be less intimacy between teacher and student as well as more formal structure of student activities through the estab-

lishment of student committees. We learn, too, that in their attempts to combat isolation and anonymity students seek and even help to create small student-faculty groups and continue to use the summer and year-out fellowships to pursue their special interests. Many students have been much concerned with the notion of relevance, particularly in the subject matter of the preclinical periods, and at times have become impatient and dissatisfied with their teaching, both in method and in substance.

In what follows, I am deeply grateful to Miss Harriet F. Purdy, secretary of the Admissions Committee and associate in medical education and communication, and Sanford Meyerowitz, M.D. (Rochester, 1954), professor of psychiatry and associate professor of medicine and associate dean for medical education. Both have generously provided me with information which may help us to understand some of the changes which have taken place over the past fifty years.

Certain matters have not changed much. For example, the geographical origins of our students over the fifty-year period have remained fairly constant. About 50 percent of our students come from New York State, about 12 percent from Rochester; another 30 percent come from the northeastern states, including Ohio and Pennsylvania, and the remaining 20 percent from other states and foreign countries.

The class size, however, has increased. After the beginning class (1925) of 22 students, there were 158 students enrolled in the four classes in 1930-31, 202 students a decade later (1940-41), and 280 students in 1950-51; currently (1974-75) there are 395 students. Class size has grown from the entering student class of 22 to 65, and then to 70, and remained at 70 until the period 1965-1971, when it grew to 79, and then to 97 in 1971.

As is similar to other medical schools during the past decade, Rochester has seen a rise in faculty numbers in proportion to the increase in students. In the period 1960–1973 there was an increase from 120 to 460 full-time faculty. In the same period medical student enrollment rose from 280 to 388, a rise of only 38 percent, in contrast to the much steeper growth rate of faculty. Dr. Meyerowitz reported on a 1974 survey of Rochester faculty activities which showed that approximately 50 percent of the total activities of faculty are devoted to teaching; however, only 15 to 20 percent of their total activities involve teaching the medical students. The remainder of their teaching is directed toward

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interns, residents, postdoctoral fellows, graduate students, and nursing students. The total student body, including all categories of students to which our faculty has a teaching responsibility, has increased from 700 to 1,200 over the past ten years.

The faculty-student ratio, then, is not quite as extreme as indicated by the graph in Dr. Joynt's essay. In the graph Dr. Joynt has combined both full and part-time faculty, and has not included students other than medical students. Others have believed that faculty growth has improved instruction because of the increased total amount of faculty time available; also, the growth in faculty size has afforded a broader variety of specialists and role models to which the students are exposed. However, there is an impression that such faculty increase has also led to less intimacy between student and teacher, with fewer opportunities to form relationships in depth. With the increasing differentiation and specialization of the faculty, their experiences with the student are more apt to be fragmented. As today's students have remarked, this has led to less intimacy, less individualization of instruction, and less opportunity for sustained contact between student and teacher.

There are several other factors which contribute to the changes in the relations between teacher and medical student. Since the end of World War II, there has been the unprecedented availability of funds for research, with the subsequent recruitment of faculty for nonteaching assignments. With this has been the considerable time spent away from the Medical School by faculty participating in foundation and governmental agencies, advisory committees determining distribution of research funds, and site visits to other institutions. There has been the equally prodigious increase in intern and resident populations in the medical disciplines, which led to major teaching assignments. It became evident to aspiring young academicians that the reward systems for teaching medical students-promotion, and professional recognition beyond the School-could not compete with the rewards of the more public record of research achievement, although in this matter Rochester has been more understanding than any other school I know.

Until 1959 the Admissions Office did not count applicants by sex. During 1959–1969 women comprised from 5 to 10 percent of the applicants each year. Beginning in 1970, there has been a

dramatic and steady increase in both the total number of applicants and in the number and percentage of women applicants.

	Total	Women
	Applicants	Applicants
1970	1648	138(8%)
1971	1902	266 (12%)
1972	2839	429 (15%)
1973	3710	658 (18%)
1974	4177	856 (21%)
1975	4523	1063 (24%)

During the period 1959–1969, from 3 to 10 percent of the entering students in each class were women. Since 1969 there has again been an increase.

	10101	
	Entrants	Women
1970	79	8 (10%)
1971	96	8 ( 8%)
1972	96	13 (14%)
1973	97	18 (19%)
1974	97	25 (26%)

From 1925 to the present 3,366 students have entered the School. Only 8 percent (263) of this total were women; however, 17 percent (68) of the student body in 1974–1975 are women. These 68 women represent nearly one-fourth of all the women admitted to the School.

As Rabbi Bernstein wrote in his essay, the first black student to enter the Medical School was Edwin A. Robinson, in 1940. Dr. Robinson's untimely death on July 29, 1972 occurred when he was serving as chairman of the Medical School's advisory committee concerned with minority students. So far as can be determined, one black student entered this School in each of the following years: 1944, 1946, 1947, 1949, 1950, 1952, 1953, 1956, and 1957. Two entered in 1958, and one in each of the following years: 1959, 1960, 1962, and 1963. Two more entered in 1965 and three in 1968. Four of these students were from Africa.

In the middle and late 1960s interest in providing medical school opportunities to minority students developed rapidly. As Dr. Kenneth Woodward, who came to the Medical School in 1949, indicated, this change in admission rate gave credence to the generally held opinion that "de facto discrimination" had

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existed in the admission of black students. He remarked that this change in admission rate was not unique to Rochester but occurred at all schools where an active recruitment program had been instituted. The Macy Foundation became interested in creating opportunities for students in the predominantly black colleges and, in addition to holding conferences, provided funds to better prepare students in a post-baccalaureate program.

In 1968 both students and faculty became interested in recruiting minority students to Rochester. The Hinshaw Committee, appointed by the dean in March 1969, accepted this critical question and by intensive work reported in June 1969: as a result of their recommendations, this School began an active recruitment program. At the same time, an advisory committee was appointed to work with the associate dean of student affairs, William T. Van Huysen, in recruitment, educational programs, obtaining funds, and other efforts on behalf of minority students. For several years recruitment teams made up of medical students, nursing and medical faculty visited a number of colleges, particularly in the South. As a result of all these efforts, we have increased the minority student population in the School. In the period 1925 through 1968 the School had admitted 21 black students. From 1969 to 1974 we have admitted 27 black students and several mainland Puerto Ricans. In June 1975 5 black students received the M.D. degree.

As Rabbi Bernstein has written, whatever discrimination took place in the early years against Jews, Catholics, Italians, or other minority ethnic groups no longer exists. They are admitted as students and are appointed as members of the faculty, including department chairmen. In the years of my tenure as a department chairman (1946–1971), and as an active participant in the work of the Advisory Board and the Executive Hospital Committee, the two principal policy-making bodies of the University Medical Center, I was not aware of any discrimination on the basis of religion or ethnic origin. As for black students, during that same period, I have the impression that the School and its Admissions Committee discriminated in favor, rather than against, any black student candidate whose scholarship record approached eligibility.

Another change which has taken place over the years has been the greater formality and organization of student activities. In the Appendix will be found the listing of the chairmen of the

several formal student organizations. The Student Council was organized in 1953, with representatives elected from each class; its first president was Donald Henderson. Although no complete records for this council exist, it sponsored a number of social events, criticized and reported on the cafeteria, the shortage of nursing staff in the Hospital, the use of the paging system for location of students, the Medical School curriculum, student health policies, etc. The work of the council also led to the creation of a short-term loan fund for medical students, student membership on the Library Committee, on the committee for planning the Medical Education Building, and the formation of the Committee on Education. In the spring of 1968 the Student-Faculty Council was organized. In 1969 the Medical Student Senate replaced the Student Council, and the Student Curriculum Committee was established.

Beginning in the 1960s, perhaps as a reflection of the ambient national discord, students took a more active part in School affairs through positions on committees, but since then their participation has become a measure of student citizenship in the School. The initial fears of the faculty-that students on committees would inhibit faculty discussion—were largely unfounded. Students have brought important information to such committees and have been discreet and responsible participants in candid discussions of School problems. Many students during the late 60s felt the School was not responsive to social issues. As a result a number of confrontations took place, and students increasingly made demands, but we have all survived, perhaps with better understanding of the privileges and responsibilities of both students and faculty. Many of the faculty have been concerned with the long hair, beards, moustaches, and informal dress of students, which extended into their clinical years. However, the fad, or style, appeared to have been quite persuasive; many of the faculty began to dress more like the students and grew various arrangements of facial hair. I have called this the Ponce de Léon syndrome of the faculty, the futile search for lost vouth.

Unlike many other medical schools, Rochester did not jump impulsively into a truncated curriculum with multiple tracks, one which required a student to make premature commitments, thus reducing options early in his intellectual and professional life and making more difficult the possibility of intelligent choice from

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the wide range of opportunities occurring throughout the undergraduate period. Dr. Meyerowitz has prepared a detailed historical account of curricular changes in our Medical School from the beginning. He pointed out that for the first thirty-five of the School's fifty-year history there was little significant change. The last fifteen years have witnessed a moderate amount of change, most of it occurring between 1965 and 1970. New notions and strategies reflecting the nationwide ferment about curricular change have been studied and debated within the School, but we have tried to avoid fads and change only for the sake of change. Instead, it has been our goal to introduce modifications which appear sound, as well as being responsive to the changing needs and interests of students, faculty, and society. We do not consider any system sacrosanct and have always looked upon the curriculum as an instrument, a means to an end-not an end in itself. Like theoretical beliefs or notions, it should command loyalty only as long as it is useful and germinal, that is, capable of leading one to use intelligence in new ways.

Of all the changes introduced since 1970, the most important may be the mechanisms we have created for the continuing development and implementation for the curriculum. Dr. Robert Cooper's initial ventures in these matters were succeeded by Dr. Meyerowitz's appointment as associate dean of medical education in January 1973. He also serves as chairman of the Curriculum Committee, which is now made up of representatives of all departments, plus students from each class.

In George Corner's address to the members of the first student class on the occasion of its twenty-fifth anniversary, he quoted from that wonderful tribute paid to a teacher. It was made by President Garfield when he said, "I am not willing that this discussion should close without mention of the value of a true teacher. Give me a log hut with only a simple bench, Mark Hopkins on one end and I on the other, and you may have all the buildings, apparatus, and libraries without him." In a literal sense, we have never lived and worked in a log hut, regardless of what our most severe critics have called "Whipple's early penitentiary architecture."

And now, with the resplendent new educational wing and our spanking new Hospital, we can bask in comfort as we walk about our carpeted floors through the halls and rooms in playschool colors. We've run out of simple benches, too, but students

can still find Mark Hopkins or his equivalent somewhere in the Medical Center. It requires more effort today and much more initiative on the part of the student to find him or her in order to enjoy and profit from the intimate student-faculty relation, which was the hallmark of the School in its earlier days, but it can be done, as Martha Stearn, Anthony Lehman, and Stephen Plume have told us in their essays.

## Fifty Productive Years
# 24.

# A Half Century of Medical Science at Rochester

Selected Publications of Faculty and Students



# Gilbert B. Forbes, M.D.

Gilbert B. Forbes completed his undergraduate and medical education at the University of Rochester, graduating from the Medical School in 1940. An internship in pediatrics at Strong Memorial Hospital was followed by residency at St. Louis Children's Hospital and a faculty position in pediatrics at Washington University School of Medicine. After an interlude (1950 -53) as department chairman at Southwestern Medical School of the University of Texas (Dallas), Dr. Forbes returned to Rochester as a full-time pediatric faculty member in July 1953. He received the Career Research Award (NICHHD) in 1962, and now holds a joint appointment in the Department of Radiation Biology and Biophysics.

Dr. Forbes has been granted two sabbatical leaves: Los Alamos, New Mexico 1946-47—combined clinical pediatrics and radioisotope research; Oxford University, England 1970-71—research in Bone Research Laboratory, Churchill Hospital and the Nuffield Orthopaedic Centre.

#### PROLOGUE

We shall never have excellence unless we are willing to recognize it in public —Jacques Barzun

GEORGE HOYT WHIPPLE set the pace. His duties as architect of a new medical school, and as dean and department chairman, seemed not to interfere with his research efforts, for by the end of his first decade at Rochester his name had appeared on 72 scientific papers, and the second decade saw an additional 53 papers. The original faculty joined in this Whipplean penchant for publishable research. Emerson's maxim holds true: An institution is the lengthened shadow of one man.

The fervor of scientific achievement, with its attendant publications, can be contagious. At Rochester the prodrome was short, and the fastigium long, even in the absence of a strict "publish or perish" fiat. Though an institution thrives on such collective efforts, perhaps the real benefit to the author comes from the very act of writing: What you have written remains more vivid in the memory.<sup>1</sup> And what is more,

> Writing is a very pleasant occupation... because it thrashes out the harvest of the senses.<sup>2</sup>

Scientists no less than essayists and poets use their senses to pry open the secrets of nature, and take pleasure in setting down in print what they have found.

In the fifty years of the School's existence, the number of scientific publications by faculty exceeds 10,000 journal articles and 250 books. A number of students and house officers have also published scientific papers, and more than a few Ph.D. and honors theses have found their way into print.

The Medical Library has on file a total of 539 Ph.D. theses, 482 M.S./M.A. theses, and 182 M.D. theses written by students of the School of Medicine and Dentistry (there being 2,930 M.D. graduates, evidently one medical student in 16 prepared a thesis). When the total number of theses is arranged chronologically, there is a progressive increase from 48 for the decade ending in 1933 to 632 for the decade ending in 1973. Of some interest is the fact that a time plot of these numbers on semilogarithmic paper is reasonably linear, which means that one can calculate a

doubling time (see Figure I). This turns out to be approximately twelve years, equivalent to a compounded growth rate of almost 6 percent per year.

A recent survey concludes that the world's scientific literature has grown exponentially since the year 1750, with a dou-



Figure I. Exponential growth in number of Ph.D., M.S., M.A., and M.D. theses at Rochester

bling time of fifteen years.<sup>3</sup> This fascinating statistic simply means that each fifteen-year period has contributed twice as much scientific literature as the immediately preceding one, and that the most recent fifteen-year period produced as much as the sum total of the past! Although a late arrival on the scene, Rochester's growth rate, at least in regard to master's and doctoral theses, has been even faster. Unfortunately, it was not possible to do a similar analysis for all scientific publications of the faculty and students.

Obviously no more than a tiny fraction (less than two percent) of our vast output can be recgonized in the brief compilation of publications which follows. The advice of the departmental chairmen was sought in drawing up lists representative of major contributions to scientific knowledge, and the Publications Committee assumed the responsibility of reducing these lists to manageable proportions. Some publications cited will be familiar to many alumni; many constitute firsts in their respective areas of scientific endeavor; all are recognized as significant by the scientific community.

Because of space limitations, the decision was made to limit the compilation to work done at the University of Rochester; hence the Nobel-Prize-winning efforts of Vincent du Vigneaud, Arthur Kornberg, and Henrik Dam (the Dane of vitamin K fame who worked in biochemistry during World War II), as well as the many contributions made by Rochesterians either before or after their sojourn here, are not included. It was also decided to omit those papers which dealt with purely educational matters. Those departments with a heavy commitment to research have a larger representation in the lists.

# THE NINETEEN-TWENTIES

This decade, the first of the School's existence, witnessed the work of John Murlin on pancreatic extracts—he and his associates were anticipated by Banting and Best in the isolation of insulin by a mere six months;\* of Walter Bloor, who became an authority on lipids; and of Willard Allen (a medical student at the time) and George Corner on the physiology of the corpus luteum and its role in maintenance of pregnancy—to be followed in due

<sup>\*</sup>Later that year Murlin was to extract a hyperglycemic factor from pancreas, which he called *glucagon*.

time by the isolation of progesterone. It was Stafford Warren's work on radiation toxicity which led the leaders of the Manhattan Project to seek his advice and service in the Manhattan Project during World War II (see essay 14). Warren also was a pioneer in mammography, a diagnostic technique which lay dormant for many years after his early paper and which is now being revived and refined by modern radiologists. George Whipple and his associates established the value of liver in promoting blood regeneration in the anemic dog-it was that paper, noted in the list of references immediately following (only one of many on this general topic), which set Whipple on the road to the Nobel Prize. (The Journal of Experimental Medicine, his favored publication, would have been much thinner had it not been for the stream of papers which poured forth from the pens of this indefatigable researcher, his colleague Frieda Robscheit-Robbins, and their associates.) Philip Jay and Ralph Voorhees studied the role of bacillus acidophilus in dental caries; Richard O'Brien and associates, the role of streptococci in scarlet fever; and Wallace Fenn, the metabolism and gas exchange in nerve and muscle.

Despite its small (by today's standards) faculty, a research momentum had been established by the end of this first decade, and Rochester had become known for its devotion to medical research. This period also saw the transformation of the college, which had devoted itself exclusively for three score years and ten to undergraduate teaching, into a true university, a transformation which was largely the result of scientific activity at the Medical School (I hasten to add that the establishment of the Eastman School of Music was also a factor). The first Ph.D. to be awarded at Rochester went to Warren M. Sperry in 1925 for his work in lipid metabolism, and the second to Vincent DuVigneaud in 1927 for his studies on the chemistry of insulin. DuVigneaud left the Department of Vital Economics for a position at Cornell, where he achieved fame and a Nobel Prize as a result of his work on the isolation and synthesis of vasopressin and oxytocin.

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<sup>\*</sup>The citations for this and ensuing decades are listed in order of their appearance in the text; in the interests of continuity, some papers published in a given decade may appear in an adjacent one.

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Wallace O. Fenn, The oxygen consumption of frog nerve during stimulation. Jour. Gen. Physiol. 10, 767 (1927)

# THE NINETEEN-THIRTIES

This decade saw the work of Willard Allen and Oskar P. Wintersteiner on the isolation of progesterone. In connection with pregnancy tests, George Corner reminded me that his involvement in this new procedure antedated that of Karl Wilson (Am. Jour. Obs. Gyn. 22, 513 [1931]). Following the publication of Herbert Friedman's paper, Corner and John Jares (a medical student) quickly confirmed the results, and actually set up a small clinic for patients; President Rush Rhees allowed Corner to retain the fees, which he used to finance a trip to England!

Irvine McQuarrie and his associates completed a long series of studies on water and electrolyte balance in epileptic patients, which revealed the sensitivity of such patients to water overload, and the changes in sodium and potassium balance which accompany grand mal seizures. Albert Kaiser summarized his decade of observations on the effects of tonsillectomy and adenoidectomy on the health of children. William Bradford, whose work on pertussis is widely acclaimed, isolated a new organism, bacillus parapertussis, from children with whooping cough.

Robert Sinclair was among the first to use isomers of fatty acids as tracers for intermediary fat metabolism (deuterium had only recently been discovered, the Geiger-Mueller tube was still primitive, and the era of artificially produced radioisotopes was yet to come).

Edward Adolph summarized his pioneering experiments on water metabolism, and it was these early studies that attracted the attention of the army, which sought his advice on human survival factors in desert warfare; later NASA was to incorporate Adolph's data in their calculations of the human factors involved in space flight. Harold Hodge and his associates began their work on the structure and metabolism of tooth and bone, and on the effects of fluoride on dental caries. (The 1934 paper by Warren, Hodge and their colleagues on quantitative x-ray absorption in teeth has been reprinted as a "Classic in Radiology" by the University of Arizona Press.)

Plato Schwartz recorded his extensive studies on the kinetics of human gait, and Wallace Fenn made important observations on the physiology of locomotion. Not content with having made significant contributions to two areas of physiology, this remarkable man proceeded to interest himself in the electrolyte metabolism of muscle, and (as we shall see later) achieved equal prominence in the field of respiratory physiology. Fenn was one of the first to document the dynamic features of muscle potassium, a concept which was a distinct departure from the older and then prevalent idea of fixed cellular composition. It was this dynamic concept which led the clinicians of the 1940s to look for aberrations of potassium metabolism in human patients.

Harry Blair characterized the phenomenon of muscle excitation in mathematical terms. Charles Kochakian and John Murlin established the anabolic properties of androgenic hormones; their original observation that these compounds cause nitrogen retention and muscle growth has been amply confirmed. Edmund Nasset described a new intestinal hormone. Newell Stannard was the first to distinguish resting oxygen consumption of muscle from that associated with contraction. Basil Bibby contributed to the study of dental caries, George Berry studied the phenomenon of virus transformation, and Henry Scherp worked on the immunologic and biochemical properties of the meningococcus. Herman Pearse and Stafford Warren's early paper on diagnostic arteriography represented a technical breakthrough in the field.

Meanwhile the group in pathology was very active. George Whipple's Nobel Prize address (December 10, 1934) was reprinted in the March 9, 1935 issue of the Journal of the American Medical Association. Russell Holman and Earle Mahoney collaborated in demonstrating the utilization of intravenously administered proteins, which opened the way for the use of intravenous alimentation in humans a decade later. This latter paper also contained a new term-dynamic equilibrium-as applied to body proteins. In elaborating this theory they anticipated Rudolph Schoenheimer, whose elegant isotopic techniques for demonstrating this phenomenon gained him priority in the minds of many. William Hawkins and Kenneth Brinkhous determined that prothrombin deficiency was responsible for the bleeding diathesis seen in bile fistula dogs (the title of this paper is illlustrative of the direct and substantive titular wording used in many papers from this department).

Late in the decade George Whipple, William Bale, and Paul Hahn were among the first to seize on the brand-new technique of isotopic tracers. At a meeting of the National Academy of Sciences held in Rochester in the autumn of 1937, Whipple fell into conversation with Ernest O. Lawrence, inventor of the cyclotron; Lawrence promised to send Whipple a supply of the newly discovered <sup>59</sup>Fe (the work of Martin Kamen, who a few years later was to discover <sup>14</sup>C). The result was an epoch-making study of the absorption and utilization of radioactive iron, a truly collaborative effort involving production of the isotope by Lawrence, instrumentation by Bale, and physiological expertise by Hahn and Whipple.

This decade, which ended in the shadow of war, saw the Medical School in high gear. Most departments were involved in significant research, medical students were being given the opportunity of research engagement, and there was an air of accomplishment. The number of publications burgeoned.

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# THE NINETEEN-FORTIES

This was the war decade, with its attrition of faculty, accelerated teaching schedule, and the Manhattan Project devoted to secret work on uranium metabolism and toxicity. Despite these diversions, research endeavors continued at a fairly rapid pace.

There was much excitement over the newly discovered radioactive tracers, small quantities of which were available from the University cyclotron. Jeanne Manery and William Bale studied the metabolism of radiosodium and phosphorus; Nolan Kaltreider and his associates used <sup>24</sup>Na to estimate extracellular fluid volume (a full five years in advance of Francis Moore); Wesley Pommerenke studied transplacental passage of radioiron; and Wallace Fenn and coworkers examined the metabolism of radiopotassium. Two of Fenn's students made important contributions: Leon Heppel was the first to document the cellular effects of potassium depletion, and R. B. Dean announced the concept of an energy-dependent intracellular "sodium pump" as an explanation for the very low intracellular concentration of this ion in the face of such a high level in the fluid bathing the cell. Thus armed with a plausible theory to account for ionic concentration differences across cell membranes, researchers took up the study of active ion transport and its manifold ramifications.

The flame photometer had arrived on the scene—an instrument which greatly reduced the burden of Na and K analysis—

and soon Jacob Holler was to document the occurrence of potassium depletion as a complication of diabetic acidosis.

Other technical advances were also to come. William Strain, Theodore Steinhausen, and coworkers developed and put into use a radiographic contrast medium which made myelography a practical clinical tool, still in use today. Robert Burton, Alejandro Zaffaroni, and Henry Keutmann applied the technique of paper chromatography to the analysis of steroid hormones and their metabolic products, a breakthrough in technology; and James Watson and Sidney Weinberg began their work on cinefluorography (see essay 11). Charles Dent (now at University College Medical School, London) did his initial work on paper chromatography of plasma amino acids in the pathology laboratory here; Dent's interest in this technique stemmed from his wartime counterespionage experience in detecting secret writing.

The painstaking studies of Samuel Clausen and Augusta McCoord (that indefatigable doyenne of the pediatric chemistry laboratory) on vitamin A metabolism were summed up in Clausen's Harvey Lecture of 1943. Karl Mason (George Corner's successor as anatomy chairman) and Anne Emmel did much of the early work on vitamin E metabolism. Sidney Madden and George Whipple's classic monograph on the metabolism of the plasma proteins was published early in this decade.

Joseph Volker and Basil Bibby summarized their studies on the mechanism of action of fluorine in limiting dental caries. Indeed, Rochester has been heavily "fluoridated" for many years, and still is, for a number of scientists—Harold Hodge, Reidar Sogannes, William Neuman, Frank Smith, Donald Taves—contributed significantly to our understanding of the metabolism of this uniquely anticariogenic ion, and by their combined efforts contributed to its public health application.

William Van Wagenen took the bold step (the first neurosurgeon to do so) of sectioning the corpus callosum of patients with intractable epilepsy. In a series of widely quoted papers Andrew Akelaitis reported the results of his observations on subsequent cerebral function in these patients, which indicated a remarkable preservation of function. Marvin Goldstein and Robert Joynt (Arch. Neurol. 90, 96 [1969]) reexamined some of these patients three decades later; using more modern techniques, they found significant losses in interhemispheric function. Credit for establishing the autonomic affinities of the cingulate gyrus belongs to

Wilbur Smith, who found that stimulation of this area evoked pupillary dilatation, pilo-erection and cardiovascular changes; ablation produced a profound change in behavior. Later he contributed a classic study on the function of the visual fields in the frontal cortex.

The work of William Valentine and James Neel on the genetics of thalassemia set the stage for genetic studies of other erythrocyte disorders, including sickle-cell anemia. Stimulated by the challenge of the hazards of high-altitude flight during the war, Arthur Otis, Wallace Fenn, and Herman Rahn conducted their now classic studies of pulmonary function. Their book on the subject has been considered the bible of respiratory physiologists for more than two decades.

"No living being exists without regulations...life thrives on controlled process": these words express Edward Adolph's deep commitment to the study of physiological regulations, their development in the growing organism, and their interrelationships. His work on water metabolism in animals had prepared him for the significant study which he and his associates did of man in the desert, in anticipation of the North African campaign.

The newly established Department of Psychiatry made its way into the literature before the decade was out, notably with George Engel and John Romano's study of the phenomenon of vasodepressor syncope.

More knowledge about uranium was needed during the war and several faculty members were engaged in work on this hazardous material, which culminated in a four-volume treatise under the editorship of Carl Voegtlin and Harold Hodge. This work is generally conceded to be the most extensive and thorough study ever done on the pharmacology and toxicology of any substance.

Two groups of investigators were hard at work on the problem of carcinogenesis: John Morton and Burroughs Mider studied tumor induction in mice by methylcholanthrene, and Jerome Syverton and associates investigated the effects of this agent in other species.

Harry Segal and James Watson developed a technique for taking color photographs of the stomach interior, and Howard Slavin did significant work on experimental herpes virus infections.

The end of the decade saw the readiness of the faculty, whose scientific goals had been vigorously pursued during these trying years, to partake in the expanding research efforts of the decade to come, efforts which were to be fueled by the largess of the National Institutes of Health. That so much was accomplished in those pre-NIH years can be credited to the generous nature of our endowment; certainly the hard-working, low-paid graduate student and "year-out" student fellow, whose devotion to scientific duty was repaid by intellectual stimulation rather than hard dollars, have never been accorded the praise they so rightfully deserve. (Wallace Fenn said that he had no outside funding for his research until 1941, when he was granted a paltry \$500; but Rochester was not alone in this respect, for Carl and Gerty Cori, of Washington University, had very little outside funding until after they had become Nobel laureates, in 1947.)

The impact of two new departments—psychiatry and radiation biology, whose genesis and evolution are described in the essays by John Romano and William Neuman—was already significant by the end of this decade; and the School was launched on the postwar scientific boom.

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# THE NINETEEN-FIFTIES

This decade saw an increase in student and faculty numbers, the arrival of a new dean, Donald G. Anderson, several new departmental chairmen, the establishment of the Departments of Community Medicine and Public Health, and of Health Services, and departmental status for pharmacology.

It also saw the exploitation of some new techniques. Chemistry laboratories replaced much of their complement of retorts and condensers and cumbersome glassware with ion-exchange columns, scintillation counters, batches of Whatman filter paper, electrophoresis apparatus, ultracentrifuges, and the like. Cytologic techniques, both pathologic and virologic, became popular, and electron microscopes and chromosomal analysis were to appear late in the decade. Enzymatic analysis boomed; DNA and RNA gained great status; active transport and kinetic theory became the order of the day. In the clinic the cardiac surgeon perfected his art, and the psychosomatist reoriented our conceptions of disease processes and the processes of human development. Funds for research and training poured in from the NIH, which included the financing of a clinical research center.

John Donovan contributed to our understanding of the socalled menopausal syndrome by showing that symptoms often antedated the actual cessation of menses. George Engel and Franz Reichsman, in their studies of an infant with a gastric fistula (the name Monica is familiar to a generation of students), established the relationship between emotional status and gastric acid production. Incidentally, this child was one of the early recipients of the procedure of colon interposition perfected by Charles Sherman and Earle Mahoney. Later, Engel was to advance our understanding of pain and its meaning in various situations, one of many contributions made by this creative thinker in psychosomatics. Sandor Feldman dissected our everyday mannerisms of speech and gesture, and Walter Hamburger's careful-

ly constructed contrast between hunger and appetite helped us to grasp the pathogenesis of obesity: *hunger* is an unconditioned, innate response to the physiological need for food; *appetite*, on the other hand, is a learned psychologic experience involving pleasurable anticipation, and is a mechanism for dealing with emotional rather than nutritional needs. This department was among the first in this country to discard the anecdotal approach to psychosomatic disease in favor of systematic observation and scientific methodology.

Two examples of research done in the context of private practice can be mentioned. Jerome Glaser and Douglas Johnstone were successful in forestalling the development of allergy in some susceptible children by feeding them soybean formulas from birth. (George Whipple and coworkers, in a 1936 paper [Jour. Exp. Med. 63, 277], made the bold statement that in their experimental animals soybean protein "is utilized with unexpected promptness and favors the production of albumin in contrast to other plant proteins." It has since been demonstrated that human infants thrive on soy as their only source of protein.) The second example is the work of Burtis Breese and Frank Disney and their associates on the diagnosis and treatment of streptococcal disease in infants and children. They worked out feasible methods for obtaining office cultures and systematically explored various treatment regimens.

Guido Marinetti and Elmer Stotz developed the now widely used technique of silicic acid chromatography for the analysis of various phosphatides and fatty acid compounds. Leon Miller established the role of the liver in the synthesis of plasma proteins, and developed his now classic technique of liver perfusion. Ralph Jacox developed a method for fractionation of serum proteins; for several years, until superseded by paper electrophoresis, these were affectionately known as "Jacox proteins."

In 1953, William Neuman and his wife, Margaret, set the stage for two decades of work on bone metabolism by their paper, which reviewed research done on the inorganic phase of this important tissue. Their concepts of the hydration shell surrounding the bone crystal and of ionic substitution on the crystal surface stimulated scores of investigators worldwide to take a fresh look at the skeleton and its metabolism. Robert Robinson and Michael Watson had published their pioneering electron microscope studies of the size and orientation of bone crystals the year

before, and Watson had advanced the usefulness of this instrument by developing special staining methods. Meanwhile the orthopedists were using new techniques, including the successful management of idiopathic scoliosis, by Louis Goldstein.

Alexander Dounce made the first proposal for a nucleotide genetic code and the mode of translation of this information in the nucleic acid into specific sequences of amino acids in proteins (Watson and Crick's discovery of the double helix came a year later). Lucille Smith and Elmer Stotz purified one of the cytochromes, and Dounce and coworkers developed techniques for isolating cell nucleoli.

Louis Hempelmann was among the first to study the effects of low-dose X-radiation in man; his observations on the long-term consequences of thymus irradiation in infancy ranks as a classic in its field. Lawrence Young and his associates solved some of the riddles of hereditary spherocytosis. The metabolic responses to neoplasia in man were defined by Christine Waterhouse and her associates.

A major undertaking was the compilation of a comprehensive volume on toxicology of various commercial products by Marian Gleason and her associates. This volume, which is being continuously updated, is now the bible of poison control centers throughout the country.

George Burnett and Henry Scherp further evaluated the role of oral bacteria in the pathogenesis of dental caries. Donald Hare and Herbert Morgan worked out the metabolic requirements of psittacosis virus multiplication.

The iris of the eye is an unusual tissue in that it does not exhibit repair by fibroblastosis after injury. Albert Snell studied this phenomenon in experimental animals, and found that subcutaneous granulation tissue also failed to undergo fibrosis when transplanted to the anterior chamber; hence, he concluded that the chamber itself must produce some inhibitory influence(s).

The decade ended with a maintenance of the scientific momentum begun in the immediate postwar years. New, young investigators had arrived on the scene, laboratory facilities had been built, and research moneys were easy to get.

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## THE NINETEEN-SIXTIES

The choice of significant research publications now becomes a bit more difficult: the test of time principle is not available. Indeed, Alfred North Whitehead has reminded us that "almost all really new ideas have a certain aspect of foolishness when they are first produced." For each of Rochester's Nobel laureates —Whipple, Kornberg, and DuVigneaud—more than a decade elapsed between their important work and the recognition of the prize itself. There was a long period between the discovery of the anticariogenic effects of fluoride and the use of this ion to supplement community drinking-water supplies. Methodology has become increasingly complex and sophisticated, concepts and techniques more difficult for the nonsubspecialist to grasp: radioimmunoassay, scanning electron microscopy, nuclear medicine, ultrasound diagnosis, karyotype analysis—all are new. Hence we approach this decade, and the next, with hesitation.

Microbiologic research activity included studies of genetic mechanisms in viruses by Henry Drexler and Roger Christensen, virus-tumor transformations by Herbert Morgan and Angelo Andrese, and the fine points of antigen structure by Peter Allen and coworkers. James Hanshaw continued his pioneering work on cytomegalovirus and its role in human disease, established the prevalence of clinical disease in fetus and of viruria in the childage population, and demonstrated that inapparent infection can have devastating long-term effects on the central nervous system.

Interest in skeletal tissues continued. Lawrence Raisz developed a new method for assay of hormone effects on bone, which was to advance our understanding of the action of parathyroid hormone and thyrocalcitonin; indeed, he established the action of the latter, a newly discovered hormone, as an inhibitor of bone resorption. He was able to label fetal rat calvaria in vivo with radiocalcium, and then maintain them in tissue culture and observe the effects of various procedures on the release of isotope from the bone. William Peck developed methods for dealing with metabolism of bone cells, an admittedly difficult procedure, vet a necessary one for unraveling their function in skeletal growth, remodeling, and dissolution. Philip Rubin, in the midst of his duties in radiotherapy, produced a book which revolutionized the classification and anatomical conception of the various bone dysplasias. In his introduction to the book John Caffey called it a veritable tour de force. Erling Johansen applied electron microscope techniques to the study of the apatite crystals of human teeth. (The tooth is an amazing structure: can one think of another which can without benefit of a renewal mechanism remain intact for decades in the face of repeated trauma. both chemical and physical?)

Seymour Reichlin, who led the way in the field of neuroendocrinology in this country, contributed an important paper on the functions of the median-eminence gland. Later Karl Knigge, Robert Joynt, and their associates were to define the organizational aspects of this tiny but endocrinologically important region of the hypothalamus. This is but one of several circumventricular organs of endocrinologic interest. The brain *is* truly an endocrine organ: cortical influences on endocrine function were well known, but what was new was the demonstration that compounds are actually produced in the hypothalamus (the socalled releasing factors) which signal a specific action to the pituitary.

Eugene Boyd and associates defined the effects of convulsant drugs on neural transmission within the brain. Using psychological concepts, Irving Weiner contributed considerable precision to the diagnosis of schizophrenia. Haroutun Babigian and Charles Odoroff reported on mortality experience of patients

with psychiatric illness, the first such study of nonhospitalized patients. Stanford Friedman and associates, in their work with animals, delineated the role of life experiences in modifying susceptibility to infection. Their "mouse city" experiments were widely acclaimed. Finally, William Greene was to establish the role of psychosocial factors—stress, separation, depression—in the origin of leukemia and lymphoma in man, a brilliant new concept in psychosomatic medicine.

A number of new techniques were vigorously exploited during this decade. Prominent among them were the techniques used by the cardiovascular surgeon. James DeWeese and his associates reported favorable results on more than a hundred patients who had autogenous venous bypass grafts for arteriosclerotic occlusive disease. Seymour Schwartz published the first modern treatise on surgical diseases of the liver. Earle Mahoney, James Manning, and coworkers had earlier reported success in the use of hypothermia as an adjunct to cardiac surgery. Rochester participated fully in the development and implementation of these elegant techniques which offered so much help to patients with compromised circulation—techniques unheard and undreamed of in earlier decades.

Paul Yu and his colleagues made a series of important clinical studies on cardiac and circulatory function in man, and Carl Honig studied myocardial function in great detail in experimental animals. Arthur Moss and Joseph McDonald reported a new approach, left stellate ganglionectomy, in the treatment of the "long QT interval—sudden death" syndrome. Sidney Lerman joined biochemistry and ophthalmology in his research on the optic lens and on the mechanisms responsible for glaucoma another example of the successful bridging of clinical and basic science skills.

William Lotspeich defined the cellular mechanisms which enabled the kidney to deal with acid loads, a response which is mediated via an acceleration of synthesis of DNA-dependent RNA and the subsequent increase in glutaminase and hexose monophosphate-shunt enzymes. Julius Cohen showed that the kidney is not only involved in the oxidative decarboxylation of large quantities of substrate, but is also an important site for substrate interconversion and hence for energy conservation. Michael Turner and his associates improved our understanding of gastric intrinsic factor. Albert Craig's studies on the physiology

of diving and swimming showed that individuals who hyperventilate in preparation for underwater swimming may lose consciousness and drown as a result of hypoxia.

Mortimer Rosen and Richard Satran solved the difficult technique of recording the electroencephalogram of the fetus, a technique which is now being used to monitor high-risk births. Rosen was subsequently to discover that some infants supposedly damaged at the time of birth actually had abnormal wave patterns prior to the onset of labor. Henry Thiede and John Choate prepared antibodies to chorionic gonadotropin and showed that it localized in placenta trophoblast.

Gilbert Forbes and John Hursh, with the help of medical student James Gallup, developed a new method for the estimation of lean weight, and hence body fat, in human subjects by measuring the gamma rays emitted by natural potassium-40. Hursh's whole body scintillation counter was among the first of these superb instruments to be built in this country.

David Neville, a medical student working in pathology under the guidance of Alexander Dounce in biochemistry, reported a technique for isolating liver cell plasma membranes, a report widely recognized as the first contribution in the field of cell membrane isolation.

Robert Weed, Paul LaCelle, and coworkers studied the metabolic factors involved in the stability of the erythrocyte membrane. Stanley Patten was a leader in the development of modern cytology techniques as applied to diagnosis; his monograph has become one of the standard works on detection of uterine cancer.

John Vaughan and his associates contributed to our understanding of delayed hypersensitivity and erythrocyte-bound antibody. Philip Townes described a new inborn error of metabolism, which leads to protein malnutrition and can be successfully treated by feeding amino acid mixtures. Lowell Weitkamp has become an authority in the field of genetic markers, especially those involving serum albumin variants.

The decade closed with a vastly augmented faculty, a new dean, J. Lowell Orbison, and vigorous programs of research under way in all departments of the Medical School, including the newly established Departments of Neurology and Anesthesiology, and Divisions of Genetics, Biomathematics, and Biostatistics.

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### THE NINETEEN-SEVENTIES

The four years included in this section have been as busy and productive as any previous full decade. Research papers have poured forth in great numbers,\* so the choice of material to be included has been even more difficult. Interdepartmental collaboration flourished: in this section are papers representing combined efforts in microbiology-radiation biology, radiologybiomathematics, and psychiatry-endocrinology, to list but a few examples. The School has a long heritage of interdisciplinarianism, a heritage fostered by the proximity of Medical School and Hospital and by the willingness of the faculty to entertain joint appointments. Departmental "barriers" are necessary for administrative and personnel needs (the instructor and the professor need a departmental "home"), but the barrier should not be so high that it cannot be vaulted.

The phenomenon of active transport of materials across cell membranes—a process intimately involved in such diverse functions as gastrointestinal absorption, renal tubular reabsorption, cerebrospinal fluid dynamics, muscle and nerve cell function continues to intrigue the investigator. George Kimmich devel-

<sup>\*</sup>In 1973 the output of the Department of Medicine alone was 155 papers, and that of the Department of Radiation Biology and Biophysics was 170.

oped a new model for metabolic transport in the intestine, and Adil Shamoo has isolated polypeptides from (Na + K) - ATPaserich tissues which are completely sodium dependent, and hence may represent a "carrier protein" for Na. Clay Armstrong and Francisco Bezanilla, in a technical tour de force, identified and measured the membrane-bound charge movements which control the opening of the sodium channels responsible for nerve impulses. Camillo Peracchia produced clear morphological evidence for the existence, location, and architecture of intramembrane ionic channels in low-resistance junctions between cells. James Coleman and Raymond Terepka have applied the new and powerful technique of electron probe analysis to the study of active calcium transport.

Membranes also have hormone receptors, and Guido Marinetti and coworkers demonstrated the relation of glucagon and epinephrine effects to adenyl cyclase in liver plasma membranes, as well as the arrangement of phospholipids in the red cell membrane. Daniel Baran, Marshall Lichtman, and William Peck have found a specific effect of cortisol and cycloheximide on transport mechanisms in leukemic cells, an effect which explains the antitumor action of these compounds. Aser Rothstein clarified the role of sulfhydryl groups in membrane structure and function.

In the related area of hormone receptors, specifically those within the cell, Angelo Notides and Susan Nielsen have elucidated the molecular mechanisms operative in the transformation of the estrogen receptor, while James Wittliff and coworkers have characterized the steroid binding proteins in normal mammary gland and tumors of rodents and humans. The latter work has extended to the quantitative assay of steroid-binding proteins and its use in predicting clinical responsiveness of breast cancer to hormone therapy. Russell Hilf, working under the cancer center grant in biochemistry, has made a widely recognized contribution in providing animal models of breast tumors and their characterization by enzyme distribution and isoenzyme patterns, and the influence of hormones on the differentiation of these tumors.

In the area of microbiology, Anadi Chatterjee and Frank Young studied regulatory mechanisms inherent in the bacterial cell wall; Jack Maniloff and A. Liss advanced our understanding of the molecular biology of mycoplasma viruses; Louise Prakash and Fred Sherman studied mechanisms involved in mutagenesis

in yeast; and two pediatrician-microbiologists, Marian Melish and Lowell Glasgow, together with a gastroenterologist, Michael Turner, identified the staphylococcal toxin responsible for the "scalded skin" syndrome of infancy.

William Bale and his associates had been exploring for some years the possibility of using radioactive-labeled tumor antibodies in the treatment of human cancer, on the theory that the tumor tissue would thus be subjected to selective radiation. George Casarett and his associates accepted the challenge of documenting the long-term effects, if any, of chronic low-dose radiation exposure, a challenge posed by the advent of nuclear energy (both peacetime and military). The report of their painstaking studies in dogs over a ten-year period contains some unexpected results.

The intricacies of DNA interactions with compounds such as actinomycin, which interfere with its replication, were explored by Henry Sobell and Shri Jain, who used sophisticated computer techniques to analyze the results of x-ray diffraction measurements. Paul Coleman, William Simon, and associates developed an automated technique for three-dimensional quantitation of dendrite number and arborization in brain. Raymond Gramiak, Robert Waag, and William Simon extended the newly described technique of ultrasound cardiography by developing a procedure which yields cross-sectional motion pictures of the heart. Panoramic scans are sampled at specific times in the cardiac cycle. and the resultant images are assembled by computer. When these are viewed sequentially, the result is a motion picture. Ultrasound techniques, which presumably got their impetus from antisubmarine warfare, are fast gaining importance in many areas of medicine. One cannot help being fascinated by a motion picture of the echoes cast by the mitral valve. And, incidentally, one might comment on the flexibility of radiologists, who have been able to extend their medium from electromagnetic to sound waves.

The School is also involved in meeting the challenge posed by the modern citizen's demand for more health care. One means of meeting this demand is through the training of nurse-practitioners, and Evan Charney and Harriet Kitzman were among the first to mount a scientific appraisal of the role of this new health professional. Progress in refining vascular surgery continued. A member of the London triumvirate (with Eastcott and Pickering) that fathered carotid artery surgery, Charles Rob and his associates in surgery, neurology, radiology, and ophthalmology made largescale studies on the indications for and techniques of endarterectomy for carotid atherosclerosis. The result has been the salvage of hundreds of patients with cerebrovascular insufficiency.

Robert Ader's years of devotion to the study of the role of early-life experiences in influencing developmental processes as well as susceptibility to disease in experimental animals are recorded in a recent article. Arthur Schmale defined the role of depression as it contributes to the individual's adaptation to illness, a concept which postulates the existence of biological mechanisms which serve to protect by means of withdrawal and inactivity when stimuli become excessive and cannot be actively avoided. George Engel was the first to speak of the "conservation-withdrawal reaction" (Intern. Jour. Psychoanalysis 43, 89 [1962]).

William Greene, Bernard Schreiner, and coworkers were able to correlate growth and adrenal hormone responses in patients undergoing the stress of cardiac catheterization with certain personality characteristics. Evidently the "emotionality" of the subject is a determinant of the level of endocrine reactivity to stress.

Upon completion of the education wing in 1970, the Brain Research Center, which had been in operation on the River Campus since 1962, moved to the Medical Center, bringing with it a corps of experts and sophisticated paraphernalia. From work on monkeys Robert Doty has developed a general theory of operation of the corpus callosum: this remarkable structure serves to limit the formation of a memory trace to a single cerebral hemisphere, thereby doubling the mnemonic storage capacity of the brain; at the same time it allows each hemisphere access to memory traces stored in the other. Ray Snider was the first to document the salutory effects of cerebellar stimulation on induced convulsions in animals, and trials are now under way of chronic electrical cerebellar stimulation in human epileptics who do not respond to medication. From the Department of Neurology came the observation by Richard Satran and Marvin Goldstein that the threshold for pain intolerance is raised and cortical evoked potentials suppressed by cutaneous electrical stimulation (one immediately thinks of acupuncture!).

From the Department of Pathology has come Goetz Richter's work on ferritin metabolism in neoplastic and nonneoplastic disease processes, and the immunologic properties of this compound. Lowell Lapham has made detailed studies of the organization of the cerebellar cortex in the human fetus, pointing out the unusual tetraploid nature of certain cells. Leon Wheeless and Stanley Patten have developed a sophisticated computerized method for the automation of tumor cell detection; this instrument, a prime example of bioengineering expertise, will allow the Papanicolaou cancer detection technique to be extended to a much larger segment of the population. John Jaenike made detailed studies of the renal functional defects incident to urinary tract obstruction.

Some years ago Harold Hodge saw the need for a further expansion of activity in the field of modern toxicology, and set up a degree program in this area. Two important reports can be mentioned. Donald Taves, Alastair Gillies, and associates were the first to document the high levels of fluoride (both inorganic and organically bound) in the blood of patients who developed nephrotoxicity subsequent to methoxyflurane anesthesia. Subsequent work in animals confirmed the dose-related nature of this effect. Methyl mercury, a compound new to the environmental pollution scene, produces a particularly debilitating state because of its tendency to lodge in the central nervous system. The recent, and most unfortunate, episode of methyl mercury poisoning, in Iraq, offered the opportunity of studying the metabolism of this compound in man. The report by Farkam Bakir et al., which represents the combined efforts of scientists in Iraq and members of the Departments of Radiation Biology and Biophysics, Toxicology and Pharmacology, and Pediatrics, under the leadership of Thomas Clarkson, will be a classic in its field. Air pollutants, radioactive and otherwise, pose a challenge to the environmentalist, so the work of Paul Morrow and his associates on the manner in which such materials are handled by the human lung is of great importance.

The second half of this decade poses a new challenge, that of diminished government funding for training and research. The ingenuity of the research scientist, which we have attempted to portray in this essay, must now be channeled, in part at least, into ways and means of achieving financial support. As the School continues to expand (recently added departments and

divisions include orthopedics, the cancer center, dental research and clinical dentistry, laboratory animal medicine, medical education and communication, and the School of Nursing), we may anticipate an increasing diversification of academic and scholarly interests.

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# Epilogue

Physician and nonphysician scientists alike are products of the scientific revolution which had its beginnings, some three centuries ago, in physics and engineering, then spread to biology and chemistry, and later to psychodynamics, until it embraced all facets of medicine and replaced faith in divine guidance with rationalism, experimentation, and objectivity. We are proud to have been an integral, and at times an important, part of the modern scientific scene.

In looking back over the entire half century of research endeavor at Rochester, one has to marvel first at the generosity of private philanthropy, and later of the federal government, in pro-

viding the necessary financial resources, and the wisdom with which these resources were used by our faculty.

Graduate student training has always occupied a prominent position at Rochester (see Chapter 7). Through the device of the "year-out" fellowship program (the brainchild of Drs. Whipple and Corner), from the first our medical students achieved an early experience with basic science,<sup>4</sup> and so learned of their place in what Wallace Fenn spoke of as the continuum of the scientific process;

A medical school must do much more than train medical students. It must serve as a center of learning and research in the medical sciences. As such, the heads of its several departments must be so trained as to cover the whole broad field of the medical sciences; since the progress in medical science is based on progress in chemistry, physics, and biology, there must be some departments that maintain strong contacts with these fields. Every preclinical department in its teaching must correlate both forwards into the clinic and backwards into the basic sciences. Similarly the clinician must correlate his teaching backwards into the preclinical sciences and forwards into the life of the practitioner. Both the forward and the backward correlations are important, but of the two the backward correlation is ultimately more essential for the enduring vitality of the medical school. Without this the medical school is no longer part of the continuum which is science but becomes an isolated applied branch of science. Like the leaves of a tree, the clinic cannot flourish in the long run if the flow of sap from the roots is cut off and the roots of medical science should remain firmly embedded in the departments of physics, chemistry, and biology. The pre-clinical professors and departments must serve as conduits for the transfer of new concepts and new knowledge from the basic sciences into the clinic...<sup>5</sup>

The clinician, in the setting of the clinic, must immerse himself in this scientific milieu. Rather than dwelling on the "art of-science of" medicine controversy, our students now address themselves to the question posed by John Romano:

What is the clinician? Is he a biochemist, a biologist, a pathologist, a psychologist, a psychiatrist, a social scientist, a statistician? He is none of these, and at the same time he must be something of all of them. Something akin to a chemical change must take place, a new compound, a new entity must be formed... He must learn that which is central and obligatory to him as a clinician, not as a biochemist or as a social scientist. What can be more central and obligatory to the clinician's task than knowledge

of the events of human interaction?...Is this knowledge to be left to chance? Is the clinician of tomorrow to depend solely, as has his predecessor, on his personal idiosyncratic sampling of human experience?" The answer is simply that "the clinician must now examine his own mind as well as those of his patients, in order to learn more systematically of those cognitive and emotional factors which underlie the basic operations of his work; he must examine his task.<sup>6</sup>

Science is alive and well; it is all-pervasive; it is life-giving. Scientists are imaginative doers, curious students of nature and mankind, and it is altogether fitting that they set down in print the result of their observations, their hypotheses, and their speculations so that others may profit from their experience and insight. Science is cross-cultural: centuries past and present have seen many wars fought in the name of religious and political ideology; none in the name of science. As Adlai Stevenson put it, at the height of the bomb-testing controversy: There is no evil in the atom, only in men's souls.

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# View from the University at Large

# 25.

# Fond Recollections



# Alan Valentine, M.A., LL.D.

Alan Valentine served as president of the University of Rochester from 1935 to 1950. A graduate of Swarthmore College and the University of Pennsylvania, he was picked as a Rhodes Scholar and studied for three years at Balliol College, Oxford, where, among other accomplishments, he won a Rugby Blue and during the Paris Olympic Games of 1924 was a gold medalist on the victorious American rugby team. On his return to Swarthmore he was appointed dean of men and assistant professor of English, and in 1932 was lured to Yale as master of Pearson College and professor in the history, arts, and letters department, and chairman of the Board of Admissions. During his tenure at Rochester he introduced the Honors Work Program in the undergraduate college and the conferences devoted to the study of "New Frontiers in American Life."

Throughout the difficult war years, Dr. Valentine maintained a high level of morale for both students and faculty and expedited the contributions of the science faculties to the war effort, which established the University of Rochester as a great university. He has served as chief of the Netherlands Mission, ECA, and administrator of the Economic Stabilization Agency.

Dr. Valentine is the author of several books, including The English Novel, 1927; The Age of Conformity, 1954; and most recently, with Lucia Valentine, The American Academy in Rome, 1973. He was a beloved friend and counselor to the medical
faculty of the University and earned national recognition for his chairmanship of the 1947 Committee on the Survey of Medical Education, the most significant systematic survey of medical education since the Flexner Report of 1910.

WHEN I came to the University in 1935 my ignorance of medical education was profound. That was patent to all, and the appointment of a new president so naive in their professional field must have troubled the faculty of the new Medical School, still working out its problems of adjustment to community, to University, and to one another. Doctor Rhees had brilliantly overcome his own inexperience in that field of education, but there was only one Rush Rhees and even then I knew it. But fortunately experience had enabled me to recognize fairly quickly men of high quality, and given confidence to support them.

My first experience with the School of Medicine and Dentistry was inadvertent and somewhat alarming, but it was also dramatic and highly reassuring. It came through my wife, who, with her usual tact and initiative, helped to remove the distance between Medical School and me. In the small hours of our first night in Eastman House, as guests of Dr. and Mrs. Rhees (when Dr. Rhees and I were looking, somewhat fearfully, the other over), she began to writhe with what proved to be appendicitis. I managed to telephone from our bedroom, without disturbing the sleeping Rheeses, to an almost unknown Dr. McCann, who in a matter of minutes appeared with ambulance and managed to remove her to Strong Hospital all unknown to the Rheeses, who knew nothing of our nocturnal adventures until I returned in the morning to tell them at breakfast that my wife was doing well after an emergency operation by one Dr. John Morton. She thus made Strong Memorial Hospital her first home in Rochester, and had began warm friendships with some of its leaders. Two years later she returned in style to her old home, when she and Dr. Karl Wilson cemented a mutual devotion through the production of our daughter Sarah.

Those were happy if somewhat tense initiations, and later events fortified my admiration for the high quality, absolute integrity, and unself-seeking cordiality of Dean George Whipple and the remarkable group of medical men he had assembled. My misgivings regarding my ignorance, and I think theirs too, began to lessen as personal friendships developed. I slowly learned a

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little about the administration (though not the practice) of medical education, and under their guidance even took a layman's part in discussing and evaluating it.

Looking back at that experience some twenty-five years later, it was so happy a one that to tell the truth about it may, I fear, seem too much like promotional fiction. For not once during those fifteen years, as I recall, did I become involved in any difference with George Whipple on any issue, large or small, in medical affairs.

Of course there were problems, sometimes almost insoluble, and of course even the warmest human relations are not a perpetual love feast. The Medical School and its creators had their problems. But fortunately for me those problems were not issues between the faculty of the Medical School and University administrative officers or trustees. Not once during my term of office did I hear any trustee (though he might still be a member of the board of a rival hospital) voice anything but admiration and support of Dean Whipple and his School. And during those years of close association with both the dean and University treasurer Ray Thompson, each of whom recognized the integrity of the other, I never knew a single difference to cloud over their mutual friendship with one another and with me.

Of course in so large, so complicated, and so new an organization, in a community also large and complicated but far from new in its traditions, institutions, and habits of thought, some mutual worries and tensions were inevitable. It was only natural that the sudden creation and rapid success of a medical school and hospital in its intimate midst should create some community and personal concerns. Other hospitals in Rochester, going concerns supported largely by local private citizens, naturally feared that some of their support might be diverted to the new University Hospital and Medical School. And it was not unreasonable for some local medical men to have similar fears for their own private practices.

Even within other schools of the University one occasionally heard expressions of envy as well as of pride for the Medical School. Would its success overshadow the much longer service and much harder won development and standing of the undergraduate college? Would medical education draw too heavily upon the old and new University endowments given by George Eastman and others? Would the great foundations make their

future grants to the University Medical School to the exclusion of arts, science, music and other graduate study? And when the foundation now generously supporting the Medical School terminated its grant, would the University have to make up from its general funds this loss of millions? Those concerns were never more than an undercurrent, and never held or voiced by more than a fraction of Rochester community life. But Whipple and his professors, as well as University officers and trustees, were in the nineteen-thirties often made conscious of them in their dealings with other hospitals, other schools of the University, and other men of public affairs.

During the decade before World War II these tensions and concerns were greatly eased and largely removed. Crucial members of the University medical staff patiently acted upon every opportunity to demonstrate in various fields, by actions as well as by words, their desire to fit genially into the life and affairs of the community they had entered. Local doctors were appointed to the part-time staff of the Medical School, and they appreciated what came to be regarded as an honor (and whose services in Strong Memorial Hospital usually justified the honor). I think that well before I left Rochester in 1950 those former problems and alarms had well-nigh vanished from city and University. But of course, within the large and constantly expanding organization of University medicine, there are bound to be internal rivalries of persons and departments, some personality frictions and some envies. Medical education involves hospital administration and patient care, and those in charge of various fields have slightly variant objectives and loyalties to them. These must be understood and adjusted with mutual good will, by all involved. To expect perfection in assembled humans, even of the highest ideals and character, is unrealistic. Medical schools were not created to be substitutes for paradise, but to ameliorate all-too-fallible humanity.

Despite those fallibilities, I can report that never before or since those years have I been associated with a group of men in whose individual abilities and characters, and in whose collective judgments, I held such confident esteem. As Rochester the city has come to know them better and better, it too has given them a high place in civic esteem and pride. Rochester's citizens derive from its traditions and its industries an appreciation of character and personal quality as well as ability. Let us hope that town and

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gown together can preserve and develop, for all time, the pursuit of those virtues in all its infinite fields of work and living. To have shared in a small and brief way the formative years of a medical school which has contributed to them so generously was a rare and happy experience. I write now what I realized then; now, after nearly three decades, I feel it even more strongly.

# 26.

# Medicine in the Architecture of a University



# Cornelis de Kiewiet, Ph.D., LL.D.

When he was prime minister of Great Britain, Lord Salisbury said that if one wanted to be misinformed about a country, one should talk with a man who had lived there for twenty years and spoke the language. This remark might equally apply to the views of an educator who gave his first university lecture fifty-two years ago. In more than half a century of continuous university activity, Dr. Cornelis de Kiewiet has worked in four universities and has had a direct share in the founding and development of half a dozen more.

Dr. de Kiewiet has divided his intellectual preoccupation between two major interests. The first is with the impact of the western developed world on the undeveloped world; the second is with the university as both an academic and social institution. In his own assessment, he is most conscious of a sense of ambivalence or contradiction about university policies. When he was deprived of his first university appointment because of his views on the civil and economic condition of black men, Dr. de Kiewiet became aware of the need for a clear sense of academic freedom. When he was a student in Germany before Hitler, he witnessed the dereliction of social responsibility on the part of the universities as they wrapped themselves in the vulnerable armor of a doctrinaire academic freedom. In the days of Senator McCarthy, Dr. de Kiewiet led the defense of the American Council of Learned Societies against an assault

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from the senator, while at the same time he argued in the Association of American Universities against an overstatement of the nature and range of academic privileges. In the last decade he has spoken against the error of new universities which had a restricted sense of social responsibility and an exaggerated sense of academic aloofness.

While such views are not universally accepted, Dr. de Kiewiet has from the beginning tried to further the idea of the dual role of the university—that of being, through its intellectual performance, an implicit critic of the ordering of its society, and at the same time supportive of the basic historical, social, and moral commitments of that society. The successful advocacy and pursuit of these dual functions, incidentally best expressed in such academic areas as engineering, medicine and law, produce the essential phenomenon of consensus. This describes the relationship of a shared involvement and cooperation between a society and its university system.

The exposure and hazard of university policy making result from the need to defend academic freedom, while yet to further social responsibility and involvement. This obligation has become ever more essential, and increasingly more difficult, as the traditional clear-cut boundaries of the modern university have disappeared. Conventional definitions of the university are easy to formulate. Realistic definitions are much more difficult. The life of a proper university is one of intellectual advancement—but also one of continuous historic adjustment, which itself is an effort to gauge and anticipate the major imperatives of a nation's development. Thus, the University of Rochester's abandonment of a separate educational regime for women was a generation ahead of what today is obvious and unavoidable.

It also has been Dr. de Kiewiet's view that the most effective university systems are those that can generate their reforms and adjustments from within, rather than having them imposed from without. It was his conviction that the universities were in no real danger during the McCarthy era. As a spectator he felt that the era of student unrest was a far greater danger to the integrity of the total university. As a spectator, Dr. de Kiewiet also felt with pleasure that the University of Rochester was one of the institutions in the nation where issues were faced with the best sense of realism and discernment.

N 1951 the School of Medicine and Dentistry was chronologically not the oldest component of the University of Rochester.

Academically, however, it was the most mature of the colleges, and nationally it ranked with the senior centers of medical studies and training. For an incoming president there was reassurance in these facts, even though the School, together with Strong Memorial Hospital and the Municipal Hospital, was no exception to the historic fact that the whole of American higher education was engaged in changes so great in character that they could be broadly discerned more easily than they could be accurately described, or precisely implemented. It is only in retrospect that it has become more possible to achieve some measurement of the magnitudes and the complexities of the physical change, of the economic change, and above all of the academic change in which the entire national university system was involved.

This volume, to which this brief essay is a contribution, deals with the details and the specific decisions which kept the School of Medicine and Dentistry in the center of the stream of medical, scientific, and social development. This essay should and could do no more than discuss the setting in which problems were debated, and policies were decided, on Crittenden Boulevard.

At midcentury two conclusions about the University seemed clear. The first was that the standing and the future of the entire institution depended upon its ability to gauge and to respond to the imperatives of the postwar world. The second, for reasons far too complex to discuss, was that the University of Rochester was off to a late start compared with many institutions of similar ranking and aspiration. Programs on behalf of the University had behind them a special urgency, and an unusual pressure for effective decisions.

The list of national imperatives can be placed under several headings, which can best be expressed in the form of questions. Where was the center of gravity in the University? Had the University correctly interpreted the meaning to higher education of the Manhattan Project? Had the University recognized that two great streams in the history of American higher education had converged, and that the convergence had given the national university system characteristics that could not be matched by any of the classical systems of Western Europe? Was it clear that standing and effectiveness depended upon the acceptance of the phenomenon of this convergence? Because of the very special technological character of the Rochester community, its cultural interests, and its real, though implicit, habits of social discipline,

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what was the balance between a national identity and a more immediate community responsibility?

To such comprehensive questions, there could be no simple or direct answers. Nor could they have been set down as propositions or recommendations in the agenda of trustee or faculty meetings. Yet upon the comprehension of these questions in the first place, and upon the range, the number, and the effectiveness of practical answers to these questions, depended the quality of performance and the standing of every university in the land. Today, after almost a quarter century, it would be possible, in a broader review than could be undertaken here, to assess the accomplishment of any of the front-ranking universities, including the University of Rochester, in terms of the answers to each of these questions.

For each major question, there must be an explanation and an effort to apply it to the University of Rochester and its constituent colleges. The center of gravity in higher education is a term used to indicate the level at which the function and purpose of an institution can be most reliably determined. It is the point from which the impact upon society is greatest and most valuable. It is the principal area of innovation, and a special focus of informed cultural interest.

At the beginning of the century, and even for a period between the two world wars, the center of gravity was the fouryear college. This was the generation of Swarthmore, Amherst, Dartmouth, and many more. Even in more complex institutions like Princeton, Chicago, or Michigan—the liberal arts college held the central position, to which public recognition, benefaction, and institutional loyalty could be most easily attracted.

All through this period events were happening which, in course of time and in their cumulative effect, were to shift the center of gravity upwards into the areas of research, graduate education, and the advanced professional schools. The first significant shift had been undertaken by the nation's medical schools. Because it was, as a rule, not taken in concert with the universities themselves, there were two important consequences. The first was that, for a lengthy period, medical education stood apart from, or tended to conduct its affairs outside the mainstream of, American higher education. The second was that medical education lost contact with the lower reaches of concern for health

and training, and did not seek to regain that contact till a later period.

At the University of Rochester these facts were of very special significance. Because of the existence of two undergraduate colleges, and more especially because of the philosophy of education that was predominant in them, the core of the University could more easily (although very creditably) be compared with the leading four-year colleges than with its own medical school. or with the other complex universities that were vigorously thrusting their way upwards into the advanced fields of research and instruction. Admittedly, departments like chemistry and physics were on their way to the higher center of academic gravity that would henceforth be the national test of standing, maturity, and achievement. Irresolution and ambiguity placed the University as a total institution in danger of profiting insufficiently from the tide of development that had begun during the war, and that became even more rapid after the collapse of McCarthyism. One was reminded of a phrase popular among sociologists in the twenties, the contemporaneity of the noncontemporaneous. Between the colleges there was an imbalance because of two chronological stages of development, which limited cooperation and reasonable integration between them.

To those who recognized that the University would forever bear the marks of any serious failure to share in the powerful surge of growth and development in the nation, the School of Medicine and Dentistry was both encouragement and vindication. In the area of research and advanced scientific training it was the principal justification for the inclusion of the University in the ranks of the prestigious Association of American Universities, and a stimulus to the effort to equalize the center of gravity between itself and the rest of the institution.

In the early fifties considerable national attention was directed to the proposition that conventional departmental divisions no longer conformed to the deeper relationship between fields of knowledge which had been revealed by atomic and microbiological investigation. Discussions of the merits of structural changes in the organization of education and inquiry were particularly active at Massachusetts Institute of Technology. Had that University had a medical school it is likely that very significant changes in the relationship between medicine, fundamental science, and technology would have resulted. Even to a medical-

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ly untrained mind it was obvious that the researchers and the scientists in a strong medical school were closer to an understanding of the continuum in fundamental scientific knowledge, and of the intellectual rewards to be derived from a greater facility in the exchange of ideas and techniques.

In imagination, it was possible to conceive of a radically new and exciting structure of relatedness between the main branches of intellectual inquiry, regardless of particular concentration or special purpose in application, as was the case in medicine. With so much undone at the University—or rather so much to be done. for example in biology and psychology—how possible might it be to pioneer an organic linkage with the work and the leadership at the University's School of Medicine and Dentistry? In discussions there was no lack of interest, as the most effective organization of advanced scholarly inquiry, together with the special character of medical education and scholarship, were recognized as issues of prime importance. In practice, however, it is always easier to state a problem, or advance a proposition, and the difficulties were very great. There were objections that were valid beyond easy contest. Problems of policy, organization, and finance did not permit such thinking to go beyond the state of a vision of possibility. What was important, and what did matter in a practical way, was the sympathy, the willingness to engage in serious consultation and provide effective assistance, that came from scientists and scholars in the School of Medicine and Dentistry in the effort, so essential to the welfare of the University, to raise the center of gravity further into the area of graduate studies and advanced training.

The momentum towards extending the range and advancing the level of student enrollment, faculty appointments, and scholarly activity was spurred indirectly by another phenomenon most easily discernible at the School of Medicine and Dentistry. This was an attitude that can be explained in both psychological and financial terms. In the history of any institution, large or small, it is a simple matter to set down and arrange the order of actual events. It is more difficult, but also more important, to discuss the attitudes, the assumptions, the preferences and the patterns of mind of students, faculty, administration, trustees, and the special constituency of the University.

In its fiscal management and thinking the University was cautious and conservative. In any history of the University as a

whole there would have to be a chapter on a paradox and a contradiction. An institution marked by a substantial endowment was marked also by a stern frugality. The need to spend had to contend with a desire to conserve. By some the great gift of George Eastman was regarded as a windfall that was unlikely to be repeated. The conviction, moreover, that all great wars are followed by great economic recessions gave force to the view that contingent protection against the hazards of the future was less precarious than too bold an investment in the challenges of the future. There was an attitude of doubt towards the reliability and the continuity of the supportive funds that had begun to flow into university budgets, including that of the University of Rochester, during World War II. The outbreak of the Korean War made it even more difficult to advance the proposition that the war had ushered in the greatest era of university opportunity in the history of the nation.

These comments now lead directly to the influence of medical schools upon university development, and from then on to the meaning of the Manhattan Project. The movement of the medical schools a generation earlier to a distinctive level and location in the university system gave them a special status and initiative in the early postwar period. They could much more easily justify the claims of advanced research and professional training, and could more easily gain access to support. That their opportunities and their initiative were a source of occasional concern and embarrassment to university administrations is undeniable. While he was president of Columbia Dwight Eisenhower once placed his hand on the shoulder of President Harold Dodds of Princeton and said: "Harold, now I know why you are always so calm and unruffled. Princeton does not have a medical school." In perspective it is evident that the leading medical schools were a powerful force in changing the pattern and the conception of the university role in modern society. At the University of Rochester the growth in research and in the medical equivalent of graduate students revealed proportions and established an atmosphere propitious to similar changes in the rest of the University.

There may be some exaggeration in the statement that medical educators like George Whipple were the first to discern the meaning of the Manhattan Project for the academic and scientific life of America. Nonetheless that discernment was more easily possible because of the special character of medical educa-

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tion. It was President Conant of Harvard who most clearly expressed the judgment that the Manhattan Project had revolutionized the definition and the role of scientific investigation. From his judgment there were several inferences that could be drawn. The manner in which they were drawn, and the extent to which they were drawn, would go far towards determining the degree of progress and the level of national attainment of a university. If one accepts the Manhattan Project as a major episode and a major symbol of research devoted to an overriding national objective, then, for the multiple and expanding military and peacetime purposes of the postwar period, the United States was gravely underequipped and as gravely understaffed at the top levels. It was under compulsion to build new facilities. and to expand those that already existed. Universities stood at the strategic center, where reluctance or caution or complacency would be penalized.

A second inference was a fact that conventional scholarship had been reluctant to accept. The continuity in the principal categories of human knowledge, the transferability of experience and perception between its divisions, not merely placed a new emphasis on community and planning cooperation in investigative scholarship, but drove home the conclusion that a relatively underdeveloped institution, such as the University of Rochester still was, should seek to push upwards its center of gravity, not selectively, but as comprehensively as possible.

A third inference was complex and most difficult to state in brief terms. The distinction between pure and applied research in intellectual activity was an exaggerated distinction, and an impediment even to scientific progress. The technological and the chronological gap between intellectual discovery and social use had traditionally been accepted as an unavoidable fact of human history. Now it was evident that the gap could be functionally narrowed, and foreshortened in time. Goethe had said as much, with less turgidity, when he said that thought was the thought of action, and action was the action of thought. For any university, and especially for the University of Rochester, it seemed obvious that the value of professional schools and professional training was not limited to the specific curriculum which they professed. They had become an intrinsic and essential part of the central responsibility of the modern university of discovering knowledge, of preserving it, and of facilitating its transfer

into the social, economic, and political processes of a nation and a people.

At the University of Rochester in the early fifties there was only one professional school. That was the School of Medicine and Dentistry. (The Eastman School of Music was *sui generis*, and stood outside the mainstream of contemporary discussion.) The influence of the School was both indirect and direct. Indirectly it influenced the atmosphere of discussion. Medical education, in its fullest aspect, is a threefold process. It is a process of inquiry and of the collation of knowledge. It is a process of instrumentation, in both a literal and figurative sense. It is a process of delivery and application in a practical context.

In a university where it was becoming increasingly evident, especially to the science departments, that the neglect of professional education was not merely a gap or an omission, but a serious intrinsic and philosophic weakness, the existence of a successful medical school was an endorsement of the view that the sponsorship of professional education was a part of the process of seeking academic maturity. A more direct influence was exercised by the growing and vocal emphasis in modern medicine upon instrumentation and upon the development and use of sophisticated equipment. It was at the University that the phrase was coined that a successful heart operation depended upon a surgeon and an engineer. There was much truth in the statement that important areas of medicine had become dependent upon successful engineering. The term medical engineering came into vogue. The dependence of physics upon engineering, and the discussion of needs based upon engineering principles in medical research and practice, were an added endorsement of the view that a university in an advanced technological center like Rochester could not creditably have an inchoate and unconvincing program of professional education.

The third national imperative has to endure severe compression in this essay, even though it is one of the great themes of university formation. Seen from the Sorbonne, Oxford, or Heidelberg, American higher education is remarkable for its success in incorporating and blending the two great streams of skills and training that flowed into modern culture from the Middle Ages and the Renaissance. The first has its source in the craft guilds, as of Nuremberg, and the ateliers, as of Florence. The second derives from the medieval university, with its special emphasis upon

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law, theology, and medicine. Expressed in American historical terms, the act and the moment of the reception of the two streams into university education came during the Civil War with the establishment of the land grant college. Still, in the very briefest terms, this was an acceptance of a broader, a more direct, and a more practical social responsibility by the university. It was the movement of higher education closer to the daily life and work of a society in formation. It was an intellectual phenomenon. More profoundly yet it was a social phenomenon, since it struck at the roots of intellectual aloofness, and erased the distinction between skills and education along class lines. The second and critical act of blending was the result of intellectual osmosis between the Eastern Seaboard and the Middle West. It was the process whereby tradition learned from innovation, and innovation learned from tradition. When James Conant was elected president of Harvard, he was told to go to the University of Minnesota to see the newest forces and patterns in higher education. By midcentury, one critical test of the quality and the vitality of the true and complex university was the manner and the degree of its acceptance of the process by which Harvard had become more like Minnesota, and Minnesota had become more like Harvard.

It was a test which the University of Rochester, still at midcentury, met imperfectly and ambiguously. This was a sign of transition. Traditional academic responsibility on the one hand, and innovative social responsibility on the other, were uneasy neighbors in the life and thought of the University. In the relationship between University and community there was an atmosphere of irresoluteness. In its legitimate search for national standing, the University was unsure and sometimes reluctant about the proper form to be given to its standing and conduct in its immediate community. In this there was nothing unusual or unique. The leadership in the community, marked as it was by a very high level of scientific competence and cultural interest, had a corresponding unsureness about the national standing and the local performance of the University. Because the University was severely compartmentalized, its significant contacts with the community were at specialized points, and with special constituencies.

The task before the University was to determine, and then to work towards achieving, compatibility between standing and

performance in the nation and standing and performance in the community. In this the School of Medicine and Dentistry had a share and made a contribution of importance. The task, of course, was not the correction of remissness, even though Vergil's famous lines on the sins that were committed inside and outside the walls of Troy could apply to University and community. The task was a stage in development. The School of Medicine and Dentistry had a role to play and played it. To someone whose point of vantage was more outside than inside, not all the problems of the School were equally plain, nor were all the steps taken to meet them. But one's perception was along the following lines. Through the eminence established by George Whipple and his carefully chosen staff, the School had become a magnet and a beacon to the professional medical community in the city and the county. Yet its doors and its facilities, in the years of struggle and growth towards national status, could not be freely opened. This was one unavoidable cause of an impression of aloofness, and illustrates the wider problem of compatibility between national and local performance. To professional medical men outside the School, the attachment of the Municipal Hospital to Strong Memorial Hospital gave an impression of privilege and subsidy, which contrasted with the trials and the shortcomings of the other hospitals, the community, and the county.

It is not for this essay to go into detail about the meetings, the consultations, the acts of cooperation, the concessions, and the mutual enlightenment that transformed relationships in one important area of community life, and which helped the University better to meet the national imperatives on which this essay is in part based. What this essay has tried to bring out is the academic ecology of an institution, fortunate in its School of Medicine and Dentistry, as it moved through a period of its history up the endless inclined plane of academic progress.

# A University in Fact

# W. Allen Wallis, A.B., LL.D.

W. Allen Wallis, chancellor and trustee, was the chief executive of the University from 1962 to 1975. After graduation from the University of Minnesota, he studied economics at the University of Chicago and Columbia and taught statistics and economics at Yale and Stanford and then at the University of Chicago, where he became the first chairman of the Department of Statistics and later dean of the Graduate School of Business. He is author or coauthor of numerous articles and books on economics and statistics, including a best-selling textbook, Statistics: A New Approach, and has been president of the American Statistical Association.

As chief executive, Mr. Wallis presided at all meetings of the Advisory Board of the School of Medicine and Dentistry and was therefore in close touch with the planning and administration of the Medical Center. He has also served as president of the National Commission for the Study of Nursing and Nursing Education, as a member of the Committee for a Study of the Governance of the Academic Medical Center, sponsored by the Josiah Macy Foundation, and as chairman of the editorial board of the International Encyclopedia of the Social Sciences.

 $T_{\rm HE}$  founding of the School of Medicine and Dentistry, in 1921, began the evolution of the so-called University of Rochester from an undergraduate liberal arts college to a university in fact as well as in name.

True, it was in 1918 that the charter was changed to that of a university, including professional schools. The change was made to accommodate the Eastman School of Music, which, however, was virtually independent and autonomous and had its own governing board. Indeed, it appears that bringing it under the University's charter was in the short run mainly a mat-



W. Allen Wallis with the late Joseph Chamberlain Wilson, alumnus, trustee, and benefactor of the University

ter of convenience, though in the long run it assured that after George Eastman's death the University's Board of Trustees would assume responsibility in perpetuity. Thus, the Eastman School's relations with other parts of the University initially were minimal; it had no perceptible impact even on the humanities, much less on other parts of the college.

The very conception of the Medical School, on the other hand, made relations with the University important from the first. In choosing a site, for example, it appears that thought was given to moving the college to an adjoining site. A little more than five years after the first class of M.D. candidates arrived in 1925, the adjacent River Campus received its first students.

Although the University of Rochester had awarded a few earned master's degrees before the Medical School opened, it was in medicine that the first Ph.D. students were enrolled, and they were enrolled before the first M.D. candidates arrived. It was in 1925 that the first Ph.D. degree was awarded (to Warren M. Sperry), and that may perhaps be taken as the date on which the University of Rochester became a university in fact as well as in name.

## View from the University at Large — Wallis

The greatest contribution of the Medical School to making the institution truly a university came, however, after the great Eastman bequest of 1932. Until then only music and medicine had been well endowed. The bequest provided an opportunity to build the rest of the University to high quality. Such opportunities have been rare in the history of universities, and their successful exploitation has been rarer.

The great obstacle to making the best use of a sudden large infusion of funds is that everything depends on the quality of the men selected. It is not sufficient to get very good men; they must be truly among the greatest of their generation if they are to attract others of high quality and establish teaching and research of lasting excellence. But men who are clearly among the greatest of their generation usually are not movable, especially not to a new and uncertain situation. So it is essential to find those who are not yet, but will be later, among the leaders. That can be done only by men who themselves possess the very qualities being sought. Without an egg, you can't get a chicken; but without a chicken you can't get an egg.

This circle was broken at Rochester by turning to the Medical School, where a number of the great leaders of the generation had been assembled. These men assisted with such key appointments as Lee DuBridge, in physics, Albert Noyes, in chemistry, Benjamin Willier, in biology, Leonard Carmichael, in psychology, and others. Major developments came first in the sciences, where the Medical School faculty could be most effective.

It may be asked how the Medical School, which opened its doors in 1925 with a remarkable galaxy of stars, had overcome the chicken-and-egg difficulty. The answer is, of course, by getting a great man, George Hoyt Whipple, as dean and letting him pick the department heads. Undoubtedly President Rhees' attention was directed to Whipple by Abraham Flexner, who had had a major role in establishing the School, and it may be conjectured that Flexner was guided partly by his brother Simon.

This history, it seems to me, must be a large part of the reason that our Medical School's relations with the rest of the University are excellent. Members of the School's faculty continue to play a significant role in University affairs, including continuing to help in selecting and evaluating people. Now, however, the rest of the University reciprocates frequently by helping in the selection and evaluation of Medical School faculty. The School col-

laborates in teaching and research with many parts of the rest of the University: biology, computer science, economics, education, engineering, management, psychology, sociology, statistics, visual science, and others.

Another factor that has helped to create better relations than often obtain between universities and their medical schools is finances. The Medical School has its own substantial endowment and so does the rest of the University. Few of the gifts and bequests received by either are at the expense of the other. In the net, complementarity outweighs competition in finances. The result is that we are virtually free of the mutual resentment that at many universities arises from competition for the same funds, and of the envy that arises from unequal success in attracting funds.

I look to the future with some trepidation. Social forces in America are steadily encroaching-indeed, at an accelerating pace-on the rights of individuals and institutions to make their own decisions. During the past thirty years, public funds for medical education and research have increasingly been used to induce acquiescence in policies that are judged unwise or even harmful by those best qualified to judge-the medical faculty as individuals. Recently there has developed a strong trend toward outright coercion, prescribing by law how even trivial and inconsequential things must be done and how subjective judgment must be exercised. I fear that we have passed the point of no return, and I doubt that under our present system of pervasive control and coercion we can match in the next half century the magnificent contributions to human welfare that have come about in the past half century through free institutions of research, education, and patient care.

This fiftieth anniversary of the entrance of our first medical class, however, is an occasion for reviewing the past half century of medical science, training, and practice. In that half century there has been much to admire and marvel at, and we at Rochester take pride in having played a part of some consequence in it.

28.

The Years Ahead



# Robert L. Sproull, Ph.D.

Robert L. Sproull was born in Lacon, Illinois, in 1918. He attended Deep Springs College, in California, and transferred to Cornell University (AB, 1940; Ph.D. in experimental physics, 1943). During World War II he developed microwave radar at RCA Laboratories and taught evenings at Princeton and Pennsylvania. He became an assistant professor of physics at Cornell in 1946, and, as they say, rose through the academic ranks. Academic leaves were spent at Oak Ridge National Laboratory, at European Research Associates in Brussels, and at the Pentagon as director of the Advanced Research Projects Agency. He was director of two laboratories at Cornell and became vice president for academic affairs there in 1965, still teaching physics each year. Dr. Sproull came to Rochester as University vice president and provost in 1968 and became president in 1970. Without change of title, he became the chief executive of the University early in 1975.

Dr. Sproull has served on many government boards and committees, is a director of four corporations, and is chairman of the General Motors Science Advisory Committee. His textbook on atomic physics is in two editions in five languages. He

and his graduate students have published many papers on imperfections in ionic crystals and on phonon scattering at very low temperatures.

ANYONE who agrees to write about the future should be committed to Wing R. Up to this point, this volume has been sober, scholarly, and above all secure. To add now some speculations about the future is to add jelly beans to a cordon bleu recipe.

Nevertheless, there are *some* statements that can be made with substantial confidence. The first of these is that tomorrow will look very much like today. If all of a weather forecaster's instruments and synoptic reports are denied him, he can still do rather well by predicting that tomorrow's weather will be the same as today's. The academic equivalent of meteorological inertia is the statement that changing a curriculum occurs with all the speed of moving a cemetery.

But there is much more to this prediction at the University of Rochester than academic inertia. There is a *determination* to preserve some key elements of the design of the University.

The first of these is the determination to be among the very best in any discipline or program we have or undertake. We may not have the best Department of Psychology or Musicology at any one instant, but over the years we will not be measurably inferior to any one of our rivals. There will be, of course, a constant game of leapfrog; as we gain and lose people, as the various subfields rise and fall in importance, and as bandwagons arrive and depart, we may be now No. 1, now No. 5, but always among the few best both as a place to go for advanced training and as a contributor to knowledge.

The Medical Center has reached this status. Elsewhere in the University, many departments have reached it but some are still growing toward it. Some of these latter are standing on the shoulders of the School of Medicine and Dentistry to speed their development.

The second element of design follows inexorably from the first: If a firm commitment to quality is a fixed point, then the finiteness of resources (both at hand and realistically attainable) dictates that size must be a dependent variable. At the time of writing, finiteness of resources has a particularly compelling ring to it, and the size of some operations may be forced to decrease. But even in what we hope will be more "ordinary" times,

## View from the University at Large — Sproull

we shall have to control expansion to secure our central goals. In engineering and the sciences, for example, our realistic aspirations in this century are to rival Cal Tech, not MIT.

The third element of design is related to, but not identical with, the first two. A key element will be a kind of fugue on two themes: eclecticism and complementarity. We will not enter every field. I doubt very much if we shall have a college of architecture or veterinary medicine, or a library school. We have no prejudice against such colleges and are happy they exist elsewhere. But we do expect to have a college of law; this will be a special kind of law school, built on the social and natural sciences, unlike any school extant. Such exercise of choice already occurs, of course, in the famous Department of Radiation Biology and Biophysics. It also occurs in the quantitative emphasis throughout almost all of the University but most notably in the social sciences. We shall be eclectic without being queer.

Complementarity, a Niels Bohr word, describes our recognition that we are not alone, that we plus other universities together constitute a spectrum of opportunities for students and a spectrum of extension of knowledge and of development of technique and technology that serve the country well. Our Graduate School of Management, for example, with its quantitative, socialscience flavor, is different from schools emphasizing the "practical" case-study approach; it is neither better nor worse than the other kind, and the presence of *both* on the American educational scene is one of the strengths of the country.

It is no accident that our role in complementing other institutions is probably less pronounced in the Medical Center than elsewhere in the University. As one of the very first of the modern medical schools, the School of Medicine and Dentistry staked out its own (high) ground at a time when complementing one's intellectual neighbors was not of much consequence. As time goes on and additional rivals develop, however, the theme of complementarity may become stronger even here. The theme will certainly *not* be all-encompassing; most areas in medicine, and perhaps neuroscience is the best example, will be so rich in possibilities that we will continue to match our competition.

I state the fourth and final element in a very gentle voice, since it would be easy to overemphasize it. I believe that as the University matures it will become a more human institution. It is probably inevitable that a young and ambitious institution

would suffer from a certain chillness as it scrabbles for success and recognition. As I view it, the School of Medicine and Dentistry and the Eastman School of Music have already matured to the extent that the chill is gone. They serve as an "existence theorem" to the rest of the University, symbolizing that it is possible to be human and yet not become soft-headed, to be warm and yet not retreat from high standards.

In continuing with these four key elements of the design of the University there will be one dominant problem: We must maintain a lively, exciting, dynamic, and responsive faculty atmosphere, despite a constant, or possibly even decreasing, faculty size. Many universities have developed in spirit and quality during periods of nonexpansion, and therefore one might think this is no great problem. But only a handful of (and in five years, none of) the present Rochester faculty have had any experience in a pre-World War II university, and five years from now none will have had such experience. In the postwar era, all of us have enjoyed the fruits of monotonic expansion as if it were a Godgiven attribute of all universities at all times. Thus, we approach a period of constant size with a special handicap; we have never experienced a dynamic department, center, or college that was not growing in size. It will be interesting to observe how we solve this problem and whether we solve it more successfully than our neighbors; most of them (because of their past expansion) will have a more virulent form of the problem than we have.

These, then, are my speculations for the future of the Medical Center and the University of Rochester. They will probably surprise no one since they are so closely a continuation of the momentum vector already set. They do describe, however, a most attractive place to be.

# View from the Community

29.

New Records on the Old Race Track



# Ernest A. Paviour, Sr., B.A.

Ernest A. Paviour's association with the University of Rochester has extended for sixty-nine years. During his undergraduate days there he was editor of the college newspaper and Junior Year Book, as well as college correspondent for the Rochester Evening Times, which he joined as a reporter upon graduation in 1910. Before the University news bureau was established, Mr. Paviour handled publicity for the University, and was editor of the Alumni Review for several years.

In more recent times, Mr. Paviour was insurance advisor for the University. He has been an active or honorary trustee for forty-two years.

Under the caption "Paviour Reminisces," he has written some 200 articles for the Brighton-Pittsford Post.

SIXTY-NINE years ago I was a frosh at the University of Rochester Prince Street campus, where Rush Rhees was the presiding genius. In those days undergraduates supplemented their incomes, if any, by finding odd jobs. One of those available was that of ticket-taker at Crittenden Park, on the southern edge of the city. There wealthy people trotted their horses, the University of Rochester participated in intercollegiate track meets, and John

J. Frisbie and John F. Cooley experimented with the newfangled flying machines.

This was to be the site of a great medical center later in the century.

After graduation in 1910, and after spending a few years in newspaper and publicity work, I became interested in the promotion of the University through the news media. For many years I was the unappointed and generally accepted publicity agent (they were agents then) of the growing and news-rich University. It was President Alan Valentine who saw the need of a news bureau and appointed the resourceful Armin Bender as its first manager in 1937.

In 1920 I sent out to the three press associations—Associated, United, and International News—a story under a Rochester dateline for June 12 release, using the signature of Raymond N. Ball, executive secretary.

It began: "George Eastman and the General Education Board have given the University of Rochester a \$9,000,000 school of medicine, surgery and dentistry...A 250-bed hospital will also be constructed."

It continued: "Mr. Eastman said that the proposed hospital and school will make Rochester a better place in which to bring up a family. It means that the people of Rochester and the surrounding territory will have the best advice and treatment in medicine and surgery that can be found anywhere in the country."

The prophecy was correct. This School is among the top ten in the country and the Hospital is unique in specialized services which it performs.

Mr. Abraham Flexner, of the General Education Board, picked Rochester for one of two locations for new medical centers using new techniques, marked by informal teaching, small classes, and school-hospital integration. He liked Rhees' sound arts college and the Eastman money.

Dr. Rush Rhees accepted the challenge of finding leadership of the highest grade. It was necessary for him to visit the University of California to induce Dr. George H. Whipple to accept the pivotal post of dean of the School. He found the Hospital director—at the other side of the country—in Dr. Nathaniel W. Faxon, from prestigious Massachusetts General.

Plans for the new School-Hospital were carefully reviewed by George Eastman, who wanted to see the community get the

### View from the Community — Paviour

best interest on his investment. Early drawings of Gordon and Kaelber didn't satisfy him. He was interested in utilitarian, rather than artistic, features. He invited one of the architects to accompany him to Kodak Park, where he pointed out a factory building as his model of a hospital. He wanted "no fancy stuff."

He paid much attention to fire protection and accident prevention. That the building had exposed pipes and was labeled by some critics as "early penitentiary" architecture didn't bother him. But a Cleveland Clinic or Hartford Hospital fire with heavy loss of life, which came later, would have devastated him.

An ugly temporary two-story \$60,000 research building and animal house, facing Elmwood Avenue, was the first structure to arise in 1922, four years before the opening of the Medical Center. It was occupied by Dr. Whipple and several hundreds of animals. There the new dean continued the research on blood-building liver extracts that led to the alleviation of pernicious anemia, which gave him the Nobel Prize in 1934.

Mr. Flexner said that the entire \$10 million for the School-Hospital and endowment was justified in that work alone.

Dr. George W. Goler, Rochester's health officer, battler of impure milk, ratty slums, outhouses and smallpox, who had burned down the old pesthouse on Wolcott Street (Wilson Boulevard) and had built a small contagious-disease hospital on Waring Road, now saw an opportunity in the proposed medical center to obtain superior health advantages for the city.

When the public municipal hospital was opened in 1926 as a wing of the private Strong Memorial—something brand new in municipal medicine—Eastman labeled the alliance as second in importance to the establishment of the Medical Center itself. It meant that the poorest citizen had the same treatment as the richest.

In 1933, ten years after the University and city signed the cooperative agreement, University treasurer Raymond L. Thompson reported that Strong was receiving 100,000 outpatients annually and that the 255-bed municipal registered 91,156 patient days in the year 1932–1933.

Eastman, Goler, Faxon, Whipple, Flexner, et al., had a right to be proud of what was happening on the old race track.

In the early building days the contractors ran into quicks and and had to spend extra money in driving concrete pillars for support. Also, there was flack from some of the local doctors when

the Hospital first opened. They were apparently satisfied with the status quo. The spirit of Rochester conservatism was illustrated by Dr. Henry T. Williams, a highly competent surgeon, who told me that he always knew when one of his patients went to Strong. He added, "I read the name in the death column."

S. Wirt Wiley, general secretary of the YMCA, after he had been in Rochester ten years, complained that he hadn't yet been accepted as a Rochesterian.

Really, Rochester badly needed new people and new methods. The University, Kodak, and Xerox have contributed in shaking Rochester out of its old-family complacency.

Strong's first director was an early advocate of medical service by organized groups of physicians working from hospital centers. Dr. Faxon maintained that if this was not done, the government would ultimately take over the prevention and care of sickness at a staggering cost to the taxpayers. He was thinking way ahead of his time, but in 1932 many local doctors violently disagreed with him.

Dr. John R. Murlin was working on antidiabetic extracts of the pancreas in the science building on the Prince Street campus when Whipple and Faxon set up temporary headquarters there during the development of the Medical Center. Dr. Murlin was almost ready to announce the discovery when the Canadian team of Banting, Best, and MacLeod broke in print as the discoverers of insulin. He had, though, the first electrocardiograph instrument in western New York.

A colorful figure at the Medical School was R. Plato Schwartz, head of orthopedic surgery, who established a gait laboratory for the study of human locomotion. His work resulted in a significant scientific contribution, in addition to an affiliation with a shoe manufacturer for the development of corrective footwear.

When Dr. Schwartz built a home on French Road with sufficient land for a horse track, he told me that he might test the gait of horses for racing potentialities. That sounded like a good news story and I sent it out to the press. It was gobbled up and even made *Time* magazine. As the story displeased one of the foundations supporting research, Drs. Whipple and William S. McCann made it plain to me that the best publicity for a medical center was "no publicity." Drs. John Morton, Karl Wilson, and S. W. Clausen agreed.

## View from the Community — Paviour

One doctor said that Johns Hopkins and Mayo Clinic had been injured by the publicity urge.

Later, Armin Bender, news bureau head, had his difficulties with the press. Dr. McCann was disturbed over a news story about one of his patients. He thought the newspapers should be told what the attitude of an ethical hospital should be on its news. It would have been quite a task to teach newspaper city editors ethics.

Dr. George Packer Berry came to the Center in 1932 after he had suffered parrot fever while doing research at Rockefeller Institute of Medical Research. He had isolated an encephalitis virus and continued research projects here until he became dean of Harvard Medical School in 1949.

Silicosis, the dust disease, was troubling local employers in heavy claims before it was made compensable under the Workmen's Compensation Law. Dr. Nolan L. Kaltreider did important research in solving dust problems in his chest laboratory in the early thirties, thereby serving Pfaudler Company, American Laundry Machinery, and other employers and their employees. A room at the Center memorializes this laboratory.

Dr. William S. McCann organized the chest and heart laboratory with Dr. Alberto Hurtado, who later became dean of the medical faculty of the University of San Marco, Lima, Peru. Dr. McCann was a star money-raiser for the Medical Center, attracting \$20 million in private gifts for various purposes. He served as professor of medicine for thirty-four years, retiring in 1957.

Research continued in a score of directions. The School was graduating well prepared physicians and attracting attention by the large number of qualified administrators being supplied to other schools and hospitals. Because of reputations developed at Rochester, the Center also lost good staff to other institutions.

All this attracted money from government, foundations, business corporations, and individuals, to be used for specific purposes. Building after building continued to crowd the site, now a \$100 million sprawl of bricks and concrete.

Based on today's construction costs, the \$1 million gift of the daughters of Henry A. Strong, Eastman's business associate, for the original hospital wouldn't build a small wing. And don't even whisper that in 1935 a division room at Strong was \$4.50 and a private room \$6.00 to \$12.50.

Next to the million-volt x-ray laboratory a mysterious new building was constructed on the north side of Elmwood Avenue during World War II. Few knew the purpose of it. It had something to do with the war and Dr. Stafford F. Warren was in charge.

In March 1943, General Leslie R. Groves of the Manhattan Project called on President Alan Valentine. He told Dr. Valentine that the country needed the immediate services of Dr. Warren, director of the Department of Radiology, for a secret mission, the purpose of which he could not divulge. When Valentine showed reluctance to acquiesce, General Groves used President James B. Conant, of Harvard, and Fred Hovde, Valentine's former assistant, both of whom were engaged in war work, to exercise pressure. Valentine released Warren when he learned from them that the outcome of the war was at stake. Only when the bomb was dropped on Hiroshima August 6, 1945, did Valentine know the full purpose and value of Warren's release.

In these days I was in charge of the University insurance program. Treasurer Thompson asked me to call at his office.

Thompson said: "I don't know what this damn thing is but it's got to be insured for liability and workmen's compensation. Only a couple of people have the dope. You might call Warren."

Dr. Warren did tell me that a poison hazard was involved and that was as far as he could go.

I took the sleeper that night to New York and called upon the chief underwriter of the University's casualty company. I told Frank Bullen that the University wanted protection against a war project, the nature of which couldn't be revealed. It had a poison hazard and no inspection rights.

Bullen consulted associates and then told me: "We will have to take a chance. We are all in the same box. We have got to win the war."

Later Dr. H. A. Blair, of the Department of Radiation Biology, accompanied me to New York to acquaint the insurance company with the Atomic Energy Project. Dr. Blair convinced the underwriters that proper precautions had been taken to safeguard hazards and the project had only to do with the development of safety features to protect workmen and the public against atomic energy exposure.

As a matter of fact the Atomic Energy Project, the atom smasher on River Campus, and the nuclear structure laboratory on South Campus have had remarkable freedom from claims.

## View from the Community — Paviour

Then came Woodward "Jello" money from LeRoy for a much neglected purpose. Mental hygiene was treated as a division of the Department of Medicine in Municipal Hospital. Mrs. Helen Woodward Rivas made it possible to establish a department of psychiatry in a new five-story building for teaching and treatment. Additions have been made to the 1948 building, known as Wing R.

The new building was originally called Rivas Clinic, but Mrs. Rivas asked the University to remove a tablet using that name, at the entrance. The contractor complained that it cost \$3,000 to do.

Under the leadership of Dr. John Romano, Wing R has established its identity as a highly successful department of a growing need in medicine.

Strong in fifty years has had but one disaster test. In July 1963 a Mohawk plane crashed in bad weather at Monroe County Airport. Despite the failure of the airport to flash any warning to the hospital, Strong was quickly in action with all of its facilities, taking care of 30 victims dumped into emergency and corridors. Grateful for the costly services rendered several injured employees, IBM sent the Hospital \$10,000.

In 1968 it was declared that the Bikini Atoll was free of contamination and fit for human habitation. This was of special interest to Stafford Warren, Brian O'Brion, Lee A. DuBridge, and other Rochester scientists who participated in the bomb tests in the Marshall Islands in 1946.

Liver extract for pernicious anemia, insulin for diabetes, penicillin and the antibiotics, heart, chest and hip surgery, organ transplants, blood bank, poison control, radiation therapy, cancer control, rehabilitation, Manhattan Contract, atomic energy, atom smasher, million-volt x-ray, brain research, psychiatry made respectable—all this, and more too, in fifty years' growth of the Medical Center. Rochester profited, the entire country profited, when Abraham Flexner met Rush Rhees in 1920.

# 30.

Impact of the Medical School and University Hospital on the Community and Region



# Rabbi Philip S. Bernstein, D.D.

Philip S. Bernstein is one of the nation's most distinguished scholars and religious leaders, having served as spiritual leader of Temple B'rith Kodesh in Rochester, New York, from 1926 to 1973. He has been president of the Central Conference of American Rabbis, chairman of the American Israel Public Affairs Committee, advisor on Jewish affairs to the United States Army, and a member of the board of directors of the American Friends of the Hebrew University. Among his published works are What the Jews Believe, Rabbis at War, and numerous scholarly articles in leading journals. He holds the honorary degree of Doctor of Divinity from the University of Rochester. The Philip S. Bernstein Professorship in Jewish Studies is being established by the University of Rochester in response to expressions of interest by faculty, students, and community supporters of the University. The chair honors the eminent rabbi and world leader whose name it will bear.

ON THIS subject my only claim to authority is longevity. I was born in Rochester on June 29, 1901, in a small house at 9 Cumber-

## View from the Community — Bernstein

land Street, opposite where the Post Office now stands. Apart from temporary absences when I sought higher education, or my father sought greener pastures which he never found, I have lived here ever since.

My first contact with a hospital (of course I was born in my mother's bed) was for a tonsil operation, which was then the routine answer to all children's problems. The surgery was performed at the Homeopathic Hospital on Alexander Street. I did not know then that I was in the midst of a raging controversy between the allopathic physicians and the homeopathic followers of Dr. Hahnemann.

My next experience with a Rochester hospital was my visit to the newly built Strong Memorial in the fall of 1926, when I returned to Rochester as rabbi of Temple B'rith Kodesh. The style of the building was referred to as nineteenth-century penitentiary. Invited to join the Twenty Club, lunching then as now on Friday noons at Sibley's dining room, I became a friend of Ed Gordon, whose firm Gordon, Kaelber and Waasdorp were the architects. I had spent a summer in the Soviet Union and he was very eager to learn all he could from me about the people he called the "Rooshians." He took me to Strong and almost defensively explained the architecture of the building to me and described George Eastman's concern and influence in the structure.

Since that time I suppose I have been to Strong a thousand times, calling on sick congregants. I have known many of the teachers, graduates, interns, and students as personal friends. I was even the author of an aborted plan by which Jewish medical students and interns were invited to the homes of temple families for hospitality. The medics suspected that this was a plot to get them to know and marry "nice Jewish girls."

It never occurred to me to formalize my reactions to the Medical Center. However, I could not resist Dr. Romano's invitation to attempt this, so I have searched my memories and talked with perhaps twenty persons, medical and nonmedical, who have had one contact or another with the Center; and I will now present, not my conclusions for that would be presumptuous, but my personal impressions as well as my impressions of the impressions of others. Shall I characterize this as my anecdotage?

Let's get the negatives out of the way first. The Medical School, in 1926, seemed to have little interest in community problems. Its primary interest seemed to be in attaining the highest

level of research and medical education possible. There was a minimal involvement in community life and problems. There was a deep separation between town and gown. The net result was insularity.

I encountered then a great deal of resentment against the Medical School on the part of local physicians, and Jewish doctors particularly. There was a general feeling that the Hospital authorities were snooty, elitist, arrogant, and unfair. In fact, it was noted that referrals to Strong Memorial were made by "local medical doctors," as if this were a breed apart. Jewish physicians were appalled by the almost Judenrein situation at the Hospital and Medical School. It was pretty much a WASP institution. At that time the University of Rochester was said to have a *numerus clausus*—a five-percent quota for Jewish students; the Medical School was supposed to have even fewer Jews. Many brilliant young Jews who subsequently became successful physicians were compelled to pursue their medical studies abroad because on the quota basis they could not be admitted to such schools as the University of Rochester Medical School.

These problems were not limited to Jews. Similar difficulties, although not identical, were faced by other minorities—including Italians, Catholics, and women.

Blacks, of course, had special problems. Most Blacks got their education in two Black medical schools; the renowned (all-white) medical schools were simply mirroring the society out of which they came and which they served. The first Black graduate of the University of Rochester Medical School, Dr. Edwin A. Robinson, was graduated in 1943, nearly twenty years after the School came into existence.

Obviously this has changed. Jews are admitted as students and appointed as faculty members on the basis of merit with no regard to race or creed; there is an active search for Black medical students. World War II seemed to have marked the turning point. Section 291-2 of the New York State Human Rights Law made discrimination illegal. Federal research projects had safeguards against discrimination. And probably an important factor was the change in psychology wrought by World War II, for the war shook up American society and threw together people, especially young people, of all sorts and groups. They learned to like or dislike each other for what they were, and not for race, religion, wealth, or origin.

## View from the Community - Bernstein

In the late 1960s many of the nation's medical schools organized programs to increase the number of minority students admitted. The University of Rochester School of Medicine was part of this effort. As a result the number of Black students in the entering classes in the seventies rose to an average of eight per year from the traditional rate of one per year.

Dr. Kenneth Woodward (a University of Rochester Medical School graduate) believes this change in admission rate gave credence to the generally held opinion that de facto discrimination had existed in the admission of Black students. This change was not unique to Rochester but occurred at all schools where an active recruitment program had been instituted.

How does one evaluate the impact of a medical center on a community? One way is to get the reaction of the people who come into contact with it. Here are some reactions, for what they are worth.

There is a consensus of opinion that the elevator service at Strong is atrocious. For example, visitors have to waste endless time in waiting to get on an elevator at levels B and Q. Sometimes I have thought that the cardiologists' recommendation to walk the stairs was only a rationalization for the poor elevator service.

The general impression is that the housekeeping at Strong could be improved. Informed persons understand that this is due to an antiquated building with antiquated equipment and insufficient competent help, and there is the hope that these problems will be corrected in the new building.

I asked a friend who twice recently has been admitted to the Emergency Department at Strong about his experiences. Once the process was concerned and efficient. On another occasion it seemed indifferent and incompetent. On the whole I think there is satisfaction with the emergency admission process at Strong. In fact, a social worker who has been employed by the Society for the Prevention of Cruelty to Children went out of her way to speak of the understanding and help given to children at the Strong emergency service. Similar reports came to me from a social worker of the Monroe County Department of Social Services.

Once I visited two congregants on the same floor at Strong. One was angry with the professor and students who had just left his room. He felt that his was "just a body for students to practice on." The other gentleman, the head of a local industry, said,

"There's only one place to go when you're really sick—Strong." Two weeks later the complainer left the Hospital, restored to good health. At the same time the satisfied customer died. I think there is a general feeling that there are wider options and more diversified specialized skills at the University Hospital than anywhere else in town.

Is it felt that the specialists at Strong live in a rarified atmosphere, interested only in medicine, not in people? Well, I have never known two kindlier men than Dr. Karl Wilson, head of the Department of Obstetrics, and Dr. Sam Clausen, chief in pediatrics at Strong. Dr. Wilson was my mother's obstetrician, and she loved him. He would talk with me at every opportunity about medicine in the Bible. Sam Clausen was a dear personal friend.

My impression is that there is a substantial and growing appreciation of the role of the Medical Center in the health of the city and the area. As one informed person said, Rochester compared with New York, Chicago, Boston, Philadelphia, or Los Angeles is a small town, and yet medically it rates among the greatest in the country. It wasn't so long ago that when people spoke of going to Rochester for some special medical treatment it was obvious that they meant Rochester, Minnesota. It is more likely now that they will be referring to Rochester, New York, many of whose specialists are outstanding. Four Nobel laureates have been faculty members or graduates of the School of Medicine and Dentistry. It invited greatly gifted scholars here, and encouraged and supported their research. More than 600 doctors are on the faculty of the Medical School.

It is obvious that the Medical School here has poured into the community or brought back to the community highly trained physicians who are equipped to meet the community's health needs. I have heard it said that Rochester and Denver provide the best medical care at the lowest cost.

As Howard Hosmer points out in his book *Monroe County*, "Approximately forty percent of the city's emergency patients and many from outside the city are served by Strong Memorial Hospital, which also cares for a fourth of the hospital inpatients and two-thirds of the city's clinic patients."

It is hard to know the extent to which the ancillary role of the University Medical Center has penetrated the mind of the community. Certainly informed people are aware that the University Medical Center incorporated the Rochester Municipal Hospital
### View from the Community - Bernstein

into its Strong Memorial Hospital. It assumed responsibility for the county hospital by making it into a large model chroniccare facility known as the Monroe Community Hospital staffed entirely by its faculty. Many staff members of the other hospitals of the community are graduates of the Medical School. These hospitals rely on the Medical Center for interns and residents. An important recent development has been the establishment of neighborhood health centers, which are turned over to the appropriate maintaining organizations. All this has resulted in the elevation of medicine throughout the area.

There is community awareness of specialized services rendered by the Medical Center—for example, cancer research, treating intensive burns, controlling tooth decay, and its Drug Crisis Center. (Recently the Youth Crisis Center, operated by the Department of Psychiatry of the University of Rochester Medical Center, has been chosen as one of the nation's top ten model programs for walk-in, informal, client-oriented services.)

The Department of Psychiatry, under Dr. John Romano's dynamic and imaginative leadership, has had observable and subtle effects on the mental health program of the area. The Psychiatric Division has had a close working relationship with the County Mental Health Board. The Strong Memorial Psychiatric Clinic serves a large part of the southern area of the community and the neighboring towns. The grand rounds, the psychiatric amphitheater program which enables personnel from all of the mental health fields to observe psychiatric patient interviews through one-way mirrors and to participate in the discussions, was a significant contribution of the division.

Less measurable but possibly even more profound have been the changes in attitudes and practice brought about by new insights into psychosomatic medicine. The role of emotions in lowered resistance to disease has been explored. The significance of interpersonal family relationships, the impact of housing needs, and other social conditions have received necessary attention. An ivory tower medical school is now inconceivable.

As one associated with Jewish Family Service and other family welfare agencies for almost a half century, I am aware of the contribution made by the Medical Center to these agencies and through them to their clients. The family welfare agencies have been able to approach the outstanding specialists in such fields as psychosomatic medicine and neurological disorders for evalu-

ation and direction in a variety of cases difficult to diagnose and treat.

The Hospital clinics have been indispensable and remain so today in spite of other programs that have been developed. Not only has there been a teaching facility for physicians but also for professionals and paraprofessionals in allied fields such as psychology, social work, and nursing; specialists are available for particularly difficult problems. The Medical Center has helped the various groups who came to the community as immigrants at a time when the cost of private medical care was prohibitive for them. Practically every ethnic group, including the current Black and Puerto Rican population, has received tremendous help from the Hospital's medical and psychiatric services.

The Medical Center has truly been a blessing to this community and to humanity.

# 31.

### Engagement versus Detachment



### Andrew D. Wolfe, M.A.

Andrew D. Wolfe is editor and publisher of The Brighton-Pittsford Post and other Rochester area suburban newspapers, which often have been cited as among the leading small community newspapers nationally. He has made a specialty of area and regional history, and has written four books dealing with various subjects in that field.

Other major interests are environmental beauty and historic preservation. The historic Pittsford Inn in Pittsford, restored as his newspapers' headquarters, is included in the National Register of Historic Sites.

Before purchasing the Post newspapers, he was director of development for the University of Rochester, and thus is acquainted with aspects of the University's history.

He is a native of Pittsburgh, Pennsylvania, holds a bachelor's degree from Harvard College (1944-66, magna cum laude) and a master's degree in English from the Harvard Graduate School of Arts and Science. He is a member of the New York State Council on the Arts and a former chairman of the Monroe County Metropolitan Arts Resources Committee.

 $I_{\rm N}$  1923, when Dr. Whipple was moving ahead rapidly with plans for the new medical school at the University of Rochester, a leading citizen lay dying in a city hospital.

When the treatments for a ruptured appendix standard in that day failed, a fond and despairing family, reared in the old tradition of homeopathy, sent for a New York specialist.

A brilliant local physician, called to consult, reported that the specialist, forced to desperation measures to save the dying man, blew concoctions of powders about the sickroom.

The powders had no effect, and the man died shortly.

This incident was, no doubt, a freak happening, and certainly would not be representative of medicine in Rochester when Dr. Whipple was called to establish a medical school with the help of George Eastman and the Rockefeller Foundation. But the event does give some insight into the historical context in which Dr. Whipple and his colleagues would try to develop their School.

Obviously, in 1923 many physicians were current with the established trends of scientific medicine and few if any would have resorted to powders. But much of the actual handling of health and sickness problems had its roots in earlier medicine.

In the fifty years which were to follow opening of the Medical School in 1925, many individuals, groups, and forces were to play major roles in the modernization of health service for the Rochester metropolitan area, but the mainspring of this development was to be the Medical Center and those associated with it.

Its role in a real sense would be revolutionary.

The task of fifty years, viewed in a long perspective, would be a singular triumph.

But that triumph would not be achieved without the disruptions, misunderstandings, and deep-seated antagonisms which fundamental and far-reaching change creates.

Into a still closely knit city would be thrust an institution glowing with the glamour of newness, the support of the patriarch Eastman, and funding which appeared to many to be limitless. Gestures would be made to the existing hospitals and the local hierarchy of medicine, but the new school essentially would be staffed with outsiders, many of them brilliant, ambitious, and superbly trained.

And the entire School and Medical Center would be led by a man beneath whose gentle exterior was a determination which would permit no compromise of what he considered the mission and responsibility of the School and hospitals—the infinitely careful training of physicians, the carrying forward of medical research, and the provision of medical service of unfailing quality

### View from the Community — Wolfe

in the hospitals needed for the education and research programs.

From these circumstances inevitably would develop a complex group of relationships, some of them highly favorable to the institution, others more neutral, and still others which were less favorable, or in some circumstances hostile, to the institution.

So large and so intricate an entity as the Medical Center employs thousands, spends many millions of dollars annually, touches the community at a thousand points, and today reaches into the bodies and the very lives of more than 150,000 patients each year.

To try to trace the course of the relationship between the center and the wider community it serves would be an oversimplification in a thousand pages; in ten pages one can do scarcely more than list chapter headings.

Acknowledging, then, the inevitability of oversimplification let us look at various aspects of Medical Center-community relations. Let us list some of the principal factors.

First, the overall purposes of the Center should be studied. Dr. Whipple's vision, accepted by George Eastman, Rush Rhees, and others, was of a medical school which, incorporating and helping create advances in medical science, still would emphasize the crucial relationship between gifted teacher and gifted student in the creation of physicians. This would require a physical plant of wide capability, a teaching hospital of first quality, students of both mental capacity and high character, and a galaxy of professors with ability and with a single-minded dedication to their medical and teaching tasks.

It never was questioned that this statement of objectives presupposed perfectionism in the services rendered patients and the community. But the central reason for the institution's existence would be the training of physicians, not hospital operation.

To phrase it in another way, Dr. Whipple did not come to Rochester primarily to be an agent of public health; he came to create outstanding physicians, to carry on the research which he considered part of the basic commitment of modern medicine, and to make certain that where his institution did public service it would perform that service with excellence.

Dr. Whipple's unrelenting search for these goals resulted in one of the classic successes in the history of medical education. His definition of his goals, therefore, was thus responsible for the special place which the School and Center would make for itself

in the mind and heart of the community; and the definition of these goals would create some of the community relations problems which developed over the years.

But in the long run, the Center's commitments, established by Dr. Whipple and not greatly altered since, would provide the means of overcoming the most important of the community relations problems.

Continuing our oversimplifications, one can think of three important eras in the relationships between the Medical Center and the community.

1. This was the period of the initial planning of the Medical School and hospitals, and their opening (note that initially the Medical School was the Medical School, and the hospitals were Strong Memorial and Municipal, and the phrase "University Medical Center" would not be stressed for many years).

2. The period between the opening of the School in 1925 and World War II.

3. The time since World War II.

Before reviewing these periods in any detail, let us consider for a moment the various segments of the community with which Medical Center community relations have been concerned. The most important of these audiences have been the Medical Center itself and its staff; the area of medical establishment, including most notably medical practitioners in the other area hospitals; patients served by the Center and their families; local business, including suppliers and financial supporters; and the metropolitan community at large. It requires only a second's reflection to conclude that no single pattern dominates relations with these constituencies. A former patient might in a single breath laud the Hospital staff for its medical skills, but in the next damn the institution for its alleged insensitivity to its costs to patients.

Now let us look more carefully at those three major periods in the history of the Medical Center's relationships with the community.

By and large, the first or honeymoon period, from the announcement by the General Education Board, the University, and George Eastman that the Medical School would be established, was characterized by warm enthusiasm and anticipation.

If some people had strong reservations, they did not break the surface of community thinking in any truly significant fashion.

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Some debate, yes, over matters like location, but no significant dissent.

Obviously, as the project gained momentum, reservations began to surface. Why the decision to build a completely new hospital? Why not local men for important professorships? And a host of more mundane examples of friction, such as who was commissioned as hospital designer or who would supply certain materials.

But people active in the community, in the University, and in the medical profession in the early 1920s recall that the period between 1921 and the opening of the Medical Center generally was an era of good feeling.

Things did not move so smoothly once the extraordinary new center had opened and it entered the second period of the school-community relationship. In one sense, the period between 1925 and World War II can be described as one of difficult adjustment in the area of community relations.

Yet, such an assessment can be misleading, because, despite considerable acrimony and controversy, particularly in medical circles, the Medical School moved steadily ahead toward the goals outlined by Dr. Whipple, and in so doing was providing future answers to the problems which seemed so difficult in the 1925-41 period.

For example, many of the physicians trained in that period would go into practice in the Rochester area, would provide high levels of service, would maintain close contacts with the Medical Center, and would ultimately provide effective spokesmanship for the institution.

But, the years of adjustment would be difficult. A major portion of the existing medical establishment felt themselves excluded and threatened by the new institution and its personnel. They helped carry other hospitals into what for some years would be an enemy camp so far as the Medical School was concerned. Some of these practitioners became steady sources of derogatory comment about the School and its hospitals. They helped spread the notion that the Center was an efficient, but unfeeling, scientific monster. "Excellent medicine, but poor and impersonal care," was the way many expressed the idea.

Clashes and confrontations between "Strong men" and the "non-Strong" physicians became legendary.

Although much of the fault lay with those who felt themselves displaced by a new center, it must be admitted that Medical School personnel sometimes did not ease the problems the center created for their envious colleagues. Many are legends of their disapproval of what they considered shoddy medicine.

Moreover, neither the University nor the Medical School was ready to accept fully the notion that public relations were a serious and legitimate concern of educational institutions, worthy of careful planning and proper concern. Often, the Medical School seemed to cling to the honorable but not fully practical notion that it was enough to do an outstanding job and one should not worry about getting credit for it.

The appearance of a medical school in the community naturally affected the existing professional establishment. Those physicians who had hitherto held dominant positions in the medical community and in the eyes of the public could not help but be uneasy. Innuendoes about "experimentation" on patients at the Medical School and the economic advantages of "free" offices and assistants were inevitable. At the same time a young and inexperienced faculty, feeling insecure in this latently hostile setting, took refuge in a stance of isolation which seemed to confirm the charge of academic arrogance.

The system of clinical full-time appointments, the establishment of which had been one of the chief reasons for starting the School, tended further to discourage participation of the clinical faculty in the professional activities of the community. Under this system the faculty received a flat salary; any income accruing from consultations was handed over to the University. While this diminished the economic threat of the new physicians it also removed a strong incentive for participation of the faculty in the community.

By the early 1930s this system was abandoned in favor of a plan which lowered fixed salaries, but allowed the professor to keep a substantial amount of income derived from consultation. This encouraged consultation and thereby satisfied prominent citizens who wished to have available such advice, pleased the faculty by increasing income and the University by conserving funds. At the same time, however, it threatened the economic and professional status of those in the community who had hitherto been called upon for professional advice.

Problems of the School and hospitals, however, were not con-

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fined to friction among physicians. Operation of the Municipal Hospital by the University, hailed as a great forward step when it was conceived, worked well in some ways, but never fulfilled the hopes of the developers of the scheme. To be sure, the graft and inefficiency of the legendary municipally operated hospitals were avoided. But the "Municipal" was often regarded as something of a stepchild in the Medical Center. Moreover, the city authorities, glad to be relieved of responsibility, tended to pay little attention to it. Patients tended to resist being sent to this new version of a charity ward, and politicians became wary.

Another factor in public relations was the much-exaggerated "teaching" responsibility of the University hospitals. Former patients were quoted as telling how students peered in on them at awkward moments, and rumors circulated about families of deceased patients being pressured to agree to autopsies.

George Eastman's admirable reluctance to see money wasted on frills in the Center's buildings was cited as evidence of lack of concern for patients.

Yet another stumbling block was the widely held feeling that the Medical School was not sympathetic to the admittance of minority-group students. The determination to keep classes small seemed to some people to be a reflection of what they felt was discrimination.

Finally, Medical Center personnel, from Dr. Whipple down, became involved in a series of controversies over how the broadening and improvement of medical care were to be financed. This resulted in additional confrontations with conservative members of the local medical establishment.

Nevertheless, one should not get the impression that no one sought to bridge the gap between institution and the community. An individual like Rebecca Keene can be cited. Handling many aspects of public relations for the Hospital, she was particularly adept in providing a sense of personal warmth to both patients and their families. Many others, from receptionists on up through the echelons of medical care, were unsung heroes in humanizing the Medical School and its hospitals. But Rome would not be built in a day. Understanding of what the Medical Center was and what it sought would have to precede full acceptance. And that was a task which required time.

The third period saw a remarkable change in the Schoolcommunity relations.

Today controversy and conflict have not departed from the medical scene in the Rochester metropolitan area. But far less frequently than a generation ago does conflict center on the relationship between the Medical Center and segments of the community. What has happened?

To skim the surface of events briefly:

World War II softened and diverted attention away from the conflict between Strong and non-Strong physicians.

The various hospitals had developed much more dependence upon one another.

Physicans trained at the Medical Center were playing a leading role in the community and with staffs of the other hospitals.

Dr. Albert D. Kaiser, the notable city health officer, the Regional Hospital Council, and other individuals and groups had led the fight for a regional health concept in which the Medical Center would play a central supportive role.

Coordinated building fund efforts had helped foster cooperation among the hospitals.

Many of the older physicians who had been bitterly opposed to the original Medical Center group had died or retired.

Medical insurance and a wide range of government support programs had radically changed the economics of medicine and patient care.

Cooperative arrangements, including rotation of interns and other staff, had been worked out between the Medical Center and other hospitals.

Public relations efforts were broadened and increasingly professionalized.

No portion of the Medical Center better or more clearly epitomizes what had been taking place than the psychiatric program which developed in Wing R.

From its earliest beginnings, the psychiatric program was massively involved in concepts of community service. Even before Wing R opened, ties had been established with other hospitals, with educational institutions, with government, and with civic groups concerned with mental health problems.

People or groups may have differed with some of the concepts and programs identified with the Department of Psychiatry, but such differences generally did not involve the assumption that the department was separate from, or alien to, the general medical community.

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Thus, Wing R personifies the new pattern of community relations which developed over the fifty-year period of the Medical Center's existence. Slowly, step by painful step, a sense of identification has grown up between the community and the Medical Center.

What of current and future problems?

Let us mention a few.

Within the University of Rochester and the area academic community, the Medical Center still remains to some degree isolated.

Still not fully defined is the Medical Center's role in the central medical struggle of this era—how to bring the full range of medical science to all citizens.

Nobody yet has begun to work out a definition of how much human effort and treasure a community logically can direct towards medicine—or toward a university medical center.

Within a metropolitan community and a nation still struggling to understand and work with ethnic differences, minority-group members, whether employees, patients, or the general public, still feel they lack full acceptance and opportunity.

The image of bigness and impersonality still hangs over the growing complex of brick buildings along Crittenden Boulevard.

With the presence of government funds and direction present in almost every nook and cranny of the Medical Center, some people fear that, without anyone noticing, the institution has become almost an arm of government.

Now, to turn back, one can see an extraordinary change in the relations of the Medical Center and its community. Since the Center in its total operation is one of the landmarks in American medical education, one can hardly say that even the more difficult aspects of community relations have been built upon wrong judgments. One can infer from this a lesson for the future: So long as the institution maintains its central commitments, there can be little permanently wrong with its community relations programs.

## Beyond Town and Gown

# 32.

### An Outside View



### Robert Swain Morison, M.D.

Robert Swain Morison is the Richard J. Schwartz Professor of Science and Society at Cornell University. He is a graduate of Harvard College and of the Harvard Medical School. Early in his career he made important original contributions to neurophysiology. Beginning in 1944 and for the following twenty years, he was associated with the Rockefeller Foundation in New York City, where he became director of the medical and natural sciences. Since 1964, he has been at Cornell, initially as director of the Division of Biological Science, and since 1970 in his present position.

As a medical scientist, foundation executive, university scholar and administrator, Dr. Morison has had a continued, intimate, and informed experience with medical education and research in universities here and abroad. The University of Rochester has long benefited from his scientific and administrative counsel.

WHEN I sat down to prepare this tiny counterpoint to the long line of essays that form this book, I found that Professor John Romano, in his majestic way, had given me the tentative title "View from the Nation." Try as I would, I could not make myself into an ambassador plenipotentiary from the nation as a whole.

All I can present is a series of snapshots from one man's pocket camera. It will be a very personal account, but I do not apologize for that, because the history of the School turns out to be, in large part, the sum of individual contributions from inside the School. It may therefore not be unreasonable to assess its effect on the outside, at least in part, by the impressions of an individual consciousness.

It so happens that I entered college just the year before the first class entered the Rochester Medical School, but I did not really become conscious of its existence until I myself entered a rather more ancient and more complicated medical school some six years later. While I was studying physiology in Dr. Walter Cannon's celebrated department, I discovered that a former member of the department had gone off to Rochester, where he was continuing the studies he had done with the distinguished A. V. Hill on the nature of muscular contraction. My first impression of Rochester, therefore, was a good one. A little bit later I became entangled with a problem in lipoid chemistry. When I inquired of the local biochemists, I discovered that there were only two people in the world who knew much about lipoids; one of them was in Cologne, and the other was a man named Bloor in Rochester. A little bit later I began to collaborate with Dr. David Rioch, who had just come to Harvard to help us all learn the anatomy of the nervous system, and I soon discovered that he had done his surgical internship at Strong Memorial Hospital, so I deduced that Rochester was pretty strong clinically, as well as being good in the basic sciences.

In my senior year, two of the men who had taught me internal medicine received the Nobel Prize, but astonishingly enough shared it with a man named Whipple out in Rochester, who had apparently discovered the wonderful virtues of liver before they had. It took a little bit longer to hear about Rochester's distinguished professor of anatomy, perhaps because we didn't talk very much about sex in Boston in those days. But this was soon rectified when George Wislocki arrived from Johns Hopkins to bring the Harvard Anatomy Department into the twentieth century, and I was fortunate enough to be asked to learn how to teach histology under his direction. In this way I quickly learned about the estrous cycle and the important contributions of Drs. George Corner and Willard Allen to our understanding of the role of the corpus luteum.

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Then there came somewhat of a lull, while we all devoted ourselves to wartime acceleration. But even then there was something to be learned about Rochester. Forced by wartime shortages of administrative timber and my own 4F status to become cochairman of our admissions committee, I quickly learned that we took a dim view of students who wanted to study for both the M.D. and Ph.D. degrees. Our practice was to refer all such applicants to Rochester, which was more tolerant. How wrong we were and how right was Rochester was shortly demonstrated by the emergence of James Neel, with his extraordinary competence in both medicine and genetics. From that day to this he has led what amounts to a revolution in medical genetics, whose influence stretches from the clinics of Ann Arbor through the consanguinous villages of Japan, the fava bean fields of the golden crescent, the malarial coasts of Africa, the jungles of the Orinoco, and back again to the amniocentesis centers of the United States.

When I joined the Rockefeller Foundation and found it necessary to learn something about how the several Rockefeller boards had interacted with certain medical schools to help bring about the famous revolution in American education, my first visit of any consequence was to Rochester, where I met all the people I had read about and found them just as able, and rather more charming, than I had expected. The School itself made an immediate and lasting impression of the Flexnerian word "made flesh"; it was the veritable Platonic ideal of medical schools, and all others could be nothing but imperfect shadows on the wall of a cave. Clearly all the department heads, as already implied, were perfect specimens of their types. Furthermore, the basic and clinical sciences were all under one roof and that same roof housed a municipal hospital, to keep the dream in touch with reality. Finally, the Medical Center, though perhaps not precisely "within bare-headed distance" of the College of Arts and Science, was close enough to fulfill Flexner's vision of a continuum established between the most basic university sciences and their application in the clinic. Clearly, Rochester was everything that Flexner hoped the Johns Hopkins might have been but couldn't quite be, partly because by the time Flexner got to it the school was established miles away from the Homewood campus. Even more sadly, some of the most senior and distinguished members of the Hopkins faculty had been supporting themselves with private fees, and they never quite got over the

habit. (Incidentally, the discussion of "full time" at Rochester in Dr. Edward Atwater's essay demonstrates once again how universally the clinicians of this world manage to blend a genuine high-mindedness with an equally vigorous self-interest. Even if one happens to agree, as I do, that it was probably a mistake to relieve clinical teachers completely from responsibility for private patients, one cannot help marveling at how neatly this principle fitted the needs of the great clinicians for Renaissance libraries and 20th-century Cadillacs.)

Certainly, in those early days, one went to Rochester in search of perfection rather than innovation. Even today, one notes in this very volume a thread of skepticism about the value of innovation for its own sake. Thus, it appears that Rochester has done less than have many other institutions to corrupt the classical foundation of the basic sciences, divide the clinical curriculum into modules, substitute audiovisual aids for direct experience at the bedside, and so on.

It appears, however, that Rochester has not escaped history entirely. The excellence of its faculty could not fail to attract the large sums of money which have done so much to make American medical research the wonder of the world. At the same time, of course, such largesse has made American medical education the most technically oriented in the world, and has had other effects which are not entirely easy to evaluate. (Indeed, the effects of institutional change on the products of education at any level seem impossible to evaluate with any degree of precision. This means, among other things, that parents, teachers, and pupils argue heatedly and interminably with each other about every feature of the educational process, demonstrating perhaps that the less one knows the more strongly one feels. Rochester may then be regarded as fortunate in having refused to spend so little of its time arguing about educational innovation.) Perhaps, however, the most easily demonstrable quantitative educational effect of new money is the change in student ratio, depicted in Robert Joynt's essay. At first glance, this seems to exceed even the ideal of Mark Hopkins at one end of the log balanced by a student on the other. For a moment, one is captivated by a vision of a student in the middle of a log with Wallace Fenn and George Corner at each end. But is this what really happens? When I visit other schools with comparative teacher-student ratios, I find that the students complain just as loudly that they never get to know

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any of their teachers as do the undergraduates in institutions with ratios a few percentage points of what they are in medical school.

One explanation, of course, is that the latter-day Fenns and Corners are either out of town, serving on national and international committees, or at home, making out grant requests and telling their "postdocs" what to do next in the lab. But there is a more subtle point. Medical knowledge, like all scientific knowledge, is pursued on very narrow pathways. The result is that not only does each organ system have its acknowledged expert, but so do the intracellular organelles. If he is to finish in four years, the student cannot give more than two or three days to the autoassembly of the mitochondrial membrane, or the placement of acetylcholine receptors within the synaptic cleft; current theory holds that he must be taught these matters only by experts, and he therefore must change teachers every two or three days. No wonder students and teachers rarely get to know each other as persons. This, at least, is the explanation that has been given to me of why things are so different than they were when my classmates and I learned our physiology from Walter Cannon and Hallowell Davis, and our colleagues at Rochester were learning the same topics from Wallace Fenn and E. E. Adolph. This commemorative volume, which the School has undertaken under the direction of John Romano and his committee, serves to remind us that continuous, close interaction with inspired scientists and clinicians is of paramount importance in medical education.

It is clear from reading the recent record that Rochester has slowly come to realize, as we all must, that the Flexner ideal was based on assumptions that were not all to prove workable. One of these was that a school's responsibility ended when it had turned out an excellent, scientifically trained group of clinicians. It was regarded as obvious that such men would go out into the world and provide optimum medical care through the facilities of institutions which distributed medical services. If such efforts proved ineffective, what could be more natural than that these excellently trained, ideal physicians would themselves make the necessary corrections? Certainly it was not then thought that a medical school need make any special provisions for the preventive or community aspects of medicine, and it is characteristic of the period that the dean of the school at Rochester confidently believed that the necessary preventive and community consciousness could best be cultivated by diffusing the responsibility

through all the conventional departments. But, of course, what is everybody's responsibility turns out to be nobody's.

This possibility was early suspected by some of the great foundations. The Rockefeller Foundation, for example, recognized the reluctance of medical schools to become deeply involved with community problems, but persuaded a wary few to add separate schools of public health—a move which, in retrospect, may have been counterproductive. At Rochester (if memory serves) the Commonwealth Fund encouraged the development of an early experiment in "regionalization," with the Medical School at its heart. Somehow the heart failed, or perhaps it was asked to beat prematurely. In any case, the experiment seems to have sunk without a trace, since I could find no mention of it in the papers prepared for this volume.

The last five to ten years have shown a growing recognition by almost all medical schools that medical science doesn't automatically turn itself into medical care; and one is reassured to discover that our Flexnerian ideal, which began in splendid isolation under one roof, is now changing to encompass relations with community hospitals. This is certainly an important step, but it should also be recognized that most people seek their medical care outside of hospitals, and it would be nice if they should find medical care where they look. Some years ago this need was recognized with the formation of the Department of Preventive and Community Medicine, which focused the spirit that Whipple had hoped would be diffused spontaneously throughout the School. The vigorous efforts more recently instituted by the Department of Pediatrics to permeate the entire city, especially those sections where, up to now, large numbers of children were condemned to a very inadequate start in life, are of particular interest. Those of us who have followed the Rochester Medical School from outside for so long will want to continue our observations to see how this challenging experiment is proceeding.

There were two other additions to the original ideal that command the respectful attention of the outside observer because of their national, and even international, importance. One, the distinguished unit in biophysics and radiation biology, appears to owe its start to serendipity; the other, the Department of Psychiatry, grew out of the belated but more conscious recognition that people may have problems requiring a different kind of atten-

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tion, that the general physician or surgeon, no matter how well trained, cannot give.

It is illuminating to learn how the interest of Whipple and Warren in the effect of x-rays on animals unexpectedly fitted the needs of a developing Manhattan Project for some control of the biological consequences that could be produced by the ominous device they were engaged in building. The combination of talents and capacities at Rochester proved just what was needed, and the unit emerged from the war as an almost unique environment in which to study the biological effects of radiation and related matters.

As a further example of serendipity, part of this same unit was found ready and waiting with all necessary methods for the investigation of the ugly outbreak of mercury poisoning in the land of the Arabian nights. Perhaps this example is also worth bearing in mind by those who would focus our available research money ever more explicitly on targets that can be precisely defined in advance. Happy accidents still occur even in the course of applied research, and the availability of the Rochester experts in heavy metals must be regarded as one of the happiest ones in the recent history of international technical assistance.

The sudden rise of psychiatry immediately after the war was somewhat more consciously planned, but was as marked by lucky circumstances as by design. As has so often been the case at Rochester, it involved the pairing of just the right man with a handsome gift of money from an enlightened individual donor, put to work together by an energetic and far-seeing administration with the sense to keep hands off the details. Here again, although the department fully recognized the importance of a strong community base, its influence has been strongly national and international as befits the Flexnerian ideal.

What farthest stars should attract Rochester's attention in the future? First, if I may indulge an old man's nostalgia, there is the possibly reactionary hope that Rochester may find a way of unwinding the pedagogical tangle caused by the excessive teacher-student ratios discussed above, and restoring something of the personal intimacy which is described so movingly in the essays by George Corner and others. As I have intimated, the same spirit was not entirely foreign to a much bigger and more complicated school, like the one I attended. I cannot believe that its disappearance is a necessary concomitant of healthy educa-

tional growth. It reminds one more of the "proud flesh" we used to see when wounds healed by second intention.

Secondly, I can see great hopes for Rochester leading us out of the wilderness that now divides what my colleague Walsh McDermott calls the scientific from the Samaritan aspects of medicine. It would appear that Rochester has several assets which could be put together to make such a quest successful: a strong scientific base; more than a mere Jeremiah's remnant of those who understand that science is not enough; and a growing two-way flow of confidence between the School and the community. Finally, there is still the Flexnerian vision of a university medical school which is an intellectual and spiritual force in its university, and not only a physical entity. To be candid, none of the Flexner-supported schools ever quite made it in this respect. Hopkins was already divided physically when Flexner arrived, and in the others, the princely sums given to the medical school often served to divide rather than unite the university. This became particularly true after the war, when the disproportionate allocation of funds to the health sciences greatly exaggerated the already large inequalities in salary, laboratory facilities, teacherstudent ratios, pride and prestige that separated medical schools from their parent institutions.

As has already been declared, I received all my training in puritan Boston, where the professors' wives were wont to explain the meagerness of their Sunday-night suppers by observing that plain living leads to high thinking. This background makes it natural to reflect that the presently growing budgetary stringency may actually be good for our souls. If it forces the medical teachers to live lives somewhat more commensurate with those of their brothers and sisters in the arts college, they may more easily join hands in what is, after all, a common enterprise.

In my old age I have shared some responsibility for acquainting undergraduate college students with medicine's place in the general scheme of things. In preparation for these talks, I have spent a good deal of time gazing at mortality tables and the scanty statistics available on what it is that continues to bring patients to physicians. Generally speaking, it is easy to demonstrate that medicine, public health, and the wonders of the industrial revolution have combined to very nearly win the battle against premature death. Approximately two-thirds of people now live to the biblical standard of three score years and ten; before the

### Beyond Town and Gown — Morison

industrial revolution, or in some underdeveloped areas existing today, two-thirds were dead by their middle thirties. An even more striking way of putting it is to say that a cohort of 100 babies born today can expect to complete a total of a little more than 6,400 person years, or over 90 percent of the potential 7,000, by the time the survivors reach 70. In a pretechnology society the figure is more like 2,600, or 35 percent. If we look at what causes the deaths responsible for the 10-percent deficit in person years, we find something even more interesting. Up until about 40. so far as males are concerned, accidents, homicides, and suicides lead the list; thereafter, heart disease and lung cancer take over. If one accepts the evidence that much heart disease can be postponed if one refrains from smoking, takes a little exercise every day, doesn't eat too much, and perhaps takes a drug to reduce storage of water and sodium, it can be concluded that all the major regular remaining causes of premature death are conditions that the doctor cannot deal with very well by himself. Indeed, there is some question as to whether he should be regarded as being primarily responsible for their correction. Most, if not all, of them appear to be much more causally related to our contemporary style or quality of life than to the teachings of the hard sciences.

Finally, turning to the statistics on morbidity, or what it is that takes the patient to the doctor, we discover a series of uncomfortable things like upper respiratory disorders, bad backs, and poor family relations. The doctor cannot really do very much about these either. He can help, but again, the help depends critically on having more knowledge about the quality and style of life than most scientifically trained doctors usually possess.

How much the rest of the University can contribute remains an open question. Clearly, a thoroughly awakened university community should treat the question of health care as a social and cultural consideration seen in the context of the total human environment, not just as a decline in the causes of death. As a result of the various factors outlined above, it seems to me, the outside observer, that Rochester may have a better chance than most places of preserving necessary traditions in responding to the emergence of medicine as an agent for social innovation.

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## Appendix

### OFFICERS OF ADMINISTRATION, 1899 to 1975

### The University

Rush Rhees, A.M., D.D., LL.D., President	1899-1935
Alan Valentine, A.M., LL.D., President	1935-1950
Cornelis Willem de Kiewiet, Ph.D., LL.D., President	1951-1961
Wilson Allen Wallis, A.B., LL.D., President	1962-1970
Chancellor	1970-
Robert Lamb Sproull, A.B., Ph.D., President	1970-
Chief Executive Officer	1975-

### School of Medicine and Dentistry

George Hoyt Whipple, M.D.	
Dean and Director of the Medical Center	1921-1953
Donald Grigg Anderson, M.D.	
Dean and Director of the Medical Center	1953-1966
James Lowell Orbison, M.D.	
Dean and Director of the Medical Center	1966-
Executive Secretary and Recorder, Dean's Office	
Laura Olmsted Dunson	1921-1929
Hilda DeBrine, A.B	1929-1954
Executive Secretary, Dean's Office	
Hilda DeBrine, A.B	1954-1959
Emily J. Kane	1959-
Recorder, Dean's Office	
Harriet F. Purdy, M.A	1954-1958
Registrar, Dean's Office	
Harriet F. Purdy, M.A.	1958-1969
Marie E. Barnes	1969-
Secretary, Admissions Committee	
Harriet F. Purdy, M.A.	1969-

### ASSISTANT AND ASSOCIATE DEANS

Walter R. Bloor, Ph.D.	1922-1941
George P. Berry, M.D.	1941-1949
William L. Bradford, M.D.	1947-1954
Wallace O. Fenn, Ph.D.	1949-1960
Leonard D. Fenninger, M.D	1954-1967
James W. Bartlett, M.D. (Student Affairs-1958-67)	1958-

J. Newell Stannard, Ph.D. (Graduate Studies)	1960-1975
Frank W. McKee, M.D	1962-1965
Herbert B. Hudnut, M.D	1965-1969
Donald R. Grinols, M.D. (Student Affairs)	1968-1970
Robert A. Cooper, Jr. (Curricular Affairs)	1969-1972
William T. Van Huysen, M.D. (Student Affairs)	1969-
Ernest W. Saward, M.D. (Extramural Affairs)	1970-
William D. McHugh, D.D.S. (Dental Affairs)	1970-
John R. Jaenike, M.D. (Admissions)	1971-1975
Sanford Meyerowitz, M.D. (Medical Education)	1973-
Paul L. LaCelle, M.D. (Admissions)	1975-
Irving L. Spar, Ph.D. (Graduate Studies)	1975-

### DEPARTMENT CHAIRMEN

(listed in chronological order of the establishment of departments)

### PATHOLOGY

George Hoyt Whipple, M.D	1921-1955
J. Lowell Orbison, M.D.	1955-1970
Stanley F. Patten, Jr., M.D.	1970-

### BIOCHEMISTRY

(called BIOCHEMISTRY and PHARMACOLOGY before 1)	947)
Walter Ray Bloor, Ph.D.	1922-1947
Elmer H. Stotz, Ph.D	1947-

### ANATOMY

George W. Corner, M.D	1923-1940
Karl Ernest Mason, Ph.D.	1940-1965
Karl M. Knigge, Ph.D.	1965-

### BACTERIOLOGY (after 1961, MICROBIOLOGY)

Stanhope Bayne-Jones, M.D	1923-1932
George Packer Berry, M.D.	1932-1949
Herbert Roy Morgan, M.D.	1950-1968
Frank E. Young, M.D., Ph.D	1970-

### OBSTETRICS AND GYNECOLOGY

Karl Miller Wilson, M.D	1923-1952
Curtis Joseph Lund, M.D	1952-1972
Henry A. Thiede, M.D.	1974-

### PHÝSIOLOGY

(called PHYSIOLOGY and VITAL ECONOMICS, 1944-19	954)
Wallace Osgood Fenn, Ph.D.	1924-1959
William D. Lotspeich, M.D	1959-1967
Paul Horowicz, Ph.D	1969-

### Appendix

### MEDICINE

William Sharp McCann, M.D.	1924-1957
Lawrence E. Young, M.D.	1957-1974
Daniel V. Kimberg, M.D	1974-

### SURGERY

John Jamieson Morton, Jr., M.D.	1924-1953
William Justus Merle Scott, M.D	1955-1960
Charles G. Rob, M.Chir.	1960-

### PEDIATRICS

Samuel Wolcott Clausen, M.D.	1924-1952
William Leslie Bradford, M.D.	1952-1964
Robert Johns Haggerty, M.D	1964-1975

### VITAL ECONOMICS

(later	combined with the Department of Physiology)	
John R. Murlin,	Ph.D	1925-1944

### RADIOLOGY

Stafford L. Warren, M.D.	1939-1947
Andrew H. Dowdy, M.D.	1947-1948
George H. Ramsey, M.D.	1948-1960
Louis Henry Hempelmann, Jr., M.D	1960-1971
Harry W. Fischer, M.D.	1971-

### PSYCHIATRY

John Romano, M.D.	1946-1971
Lyman C. Wynne, M.D., Ph.D.	1971-

### RADIATION BIOLOGY AND BIOPHYSICS, AND THE ATOMIC ENERGY PROJECT

Henry A. Blair, Ph.D	1947-1965
Co-chairmen: William F. Neuman, Ph.D	1965 - 1969
Aser Rothstein, Ph.D	1965-1969
William F. Neuman, Ph.D.	1969-

### DENTAL RESEARCH

Erling Johansen,	D.M.D.,	Ph.D.		955-
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### NURSING

Eleanor Abell Hall, R.N., M.A. ..... 1957-1972

PHARMACOLOGY	AND TOXICOLOGY	
Harold C. Hodge Ph D		1958 - 1970

ruord O. Houge, I h.D	1550 1570
Louis C. Lasagna, M.D	1970-
ANESTHESIOLOGY	

Alastair J. Gillies, M.B., Ch.B. ..... 1959-

### HEALTH SERVICES

Leonard D. Fenninger,	M.D	1961-1967
James W. Bartlett, M.D		1968-

### NEUROLOGY

Robert J. Joynt,	M.D., Ph.D.		1966-
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### CLINICAL DENTISTRY

William D. McHugh, D.D.S	1972-1975
Fred G. Emmings, D.D.S., Ph.D.	1975-

#### ORTHOPEDICS

Charles McCollister Evarts, M.D 19
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## DIVISION CHAIRMEN WHO REPORT TO THE DEAN (listed in chronological order of the establishment of the division)

### CENTER FOR BRAIN RESEARCH

River Campus (after 1970, Medical School)	
E. Roy John, Ph.D	1961-1963
Ray S. Snider, Ph.D.	1963-1970
Garth J. Thomas, Ph.D.	1970-

#### LABORATORY ANIMAL MEDICINE

Alan Lee Kraus, D.V.M. ..... 1967-

### BIOMATHEMATICS AND COMPUTER SCIENCES

William Simon, Ph.D. ..... 1968-

ONCOLOGY (after 1974, CANCER CENTER)	
Thomas C. Hall, M.D.	1968-1972
Robert A. Cooper, Ir., M.D.	1974-

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### BIOSTATISTICS

Charles L. Odoroff, Ph.D 1	19	)	7	7		ļ	ļ	ļ					1	1	7	7	7	7	ľ	ľ	)	)	g	0	(	(	(	(	0	(	(	(	(	(	(	(	0	0	0	0	0	(	(	(	(	(	(	(	1	ľ	l	l	l	l	]	1																																																																				.,																						
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### Appendix

### MEDICAL FACULTY COUNCIL—CHAIRMEN

Gilbert Forbes, M.D.	1969-70
Albert B. Craig, Jr., M.D.	1970 - 71
Sanford Meyerowitz, M.D.	1971 - 72
Stanford Zane Burday, M.D.	1972 - 73
Ronald B. Hartley, Ph.D.	1973 - 74
Irving L. Spar, Ph.D.	1974 - 75

### HEALTH SERVICES FOR MEDICAL STUDENTS

Einar Lie, M.D.	1934-1964
John Flinn, M.D	1964-1969
Alex Braiman, M.D.	1969-1970
Clifford B. Reifler, M.D.	1970-

### HEALTH SERVICES FOR NURSING STUDENTS

Einar Lie, M.D	1934-1945
Priscilla L. Cummings, M.D.	1945-1970
Clifford B. Reifler, M.D.	1970-

### LIBRARIAN

Hester Hopkins (Mrs. C. P. Cochrane)	1923-1924
Olga S. Schaefer (Mrs. Hawley B. Nell)	1924-1928
Mildred Emily Walter, A.B., B.LS	1928-1963
Stanley Truelson, Jr., A.B., M.L.S.	1963-1966
Willis E. Bridegam, Jr., B.M., M.S.	1966-1969
Henry L. Lemkau, Jr., M.L.S.	1970-

### STUDENT COUNCIL PRESIDENTS 1953-1969

1953-54	Donald Henderson	1961-62	Charles Faulkner
54 - 55	Kay Huntington	62-63	David Vaules
55-56	William Mayer	63-64	Joseph VanderVeer
56 - 57	Charles Collins	64-65	Barry Blum
57 - 58	John Rutledge	65-66	Martin Skinner
58 - 59	Christian Beels	66-67	John McIntyre
59-60	Richard Behrman	67-68	Edward Reiter
60-61	Charles Faulkner	68-69	Thomas Bonfiglio

### STUDENT SENATE CHAIRMEN

John Rowe	1969-1970
Richard Aronson	1970-1971

Marten W. deVries	1971-1972
Thomas DeWitt	1972-1973
Michael Sise	1973-1974
James Higgins	1974-1975

### STUDENT FACULTY COMMITTEE CHAIRMEN

Stephen Plume	1968-1969
John Rowe	1969-1970
Thomas McMeekin	1970-1971
William Corrao	1971-1972
Laurence Robbins	1972-1973
John Brewer	1973-1974
Dale Morse	1974-1975

### THE BORDEN AWARD

These students have received Borden Undergraduate Research Awards in Medicine, for meritorious research completed during their medical training.

- 1946 W. Addison Clay
  1948 V. M. Emmel R. J. Blandau
  1949 Thomas B. Barnett
  1950 W. Burkett Mason
  1952 Mortimer Litt
  1953 Garson H. Tishkoff
  1955 Rolla B. Hill, Jr. O. D. Kowlessar
  1956 Bruce Breckenridge
  1957 Robert E. Canfield
  1958 David H. Smith
  1959 David M. Neville, Jr.
- 1960 Charles E. Windsor
- 1961 Robert E. Burke
- 1962 Michael B. Mock
- 1963 Allan C. Stam, Jr.
- 1964 John W. Frymoyer
- 1965 Harold H. Gardner
- 1966 Wayne W. Myers
- 1967 Barry J. Hoffer
- 1968 Roger A. Nicoll
- 1969 Alan L. Cowles
- 1970 Albert B. Deisseroth
- 1971 David C. Duebner
- 1972 Kim Solez
- 1973 Eric Thomas Nielsen

### THE DORAN J. STEPHENS PRIZE

The Alumni of the School of Medicine and Dentistry established this prize, and award it each year to a graduating student who shows promise of developing the personal and professional qualities that distinguished the late Dr. Doran J. Stephens, a graduate of the first class of the School and a devoted teacher and scholar in the Department of Medicine.

1942	Louis Jenrette Zeldis	1958	Russell H. Clark, Jr.
1943	John Freeland Harrah	1959	Paul Francis Griner
	James Van Gundia Neel	1960	William Arno Peck
1944	Frederick William	1961	Arnold Louis Lisio
	Anderson	1962	Alfred John Defalco
1945	William Addison Clay	1963	Robert Dixon Patton
1946	Robert Lewis Tuttle	1964	Joseph James Scibetta
1947	William Franklin Scherer	1965	Daniel Gottovi
1948	John Robert Jaenike	1966	Wayne William Myers
1949	Thomas Buchanan Barnett	1967	James Alan Brown
1950	Neil Johnson Elgee	1968	Ann Louise Sullivan
1951	Norman James Ashenburg	1969	John Lee Stauffer
1952	Milton Moore Howell	1970	Joseph Peter Harris
1953	Richard Tisdale Cushing	1971	Thomas Owen McMeekin
1954	Paul Otis Simenstad	1972	Lawrence E. Feinberg
1955	John Donald Hare	1973	James W. Battaglini
1956	John Russell Little, Jr.	1974	Robert F. Ozols
1957	Richard Foster Bakemeier	1975	Charles Robert Tucker

### THE BENJAMIN RUSH PRIZE

This prize is awarded to the fourth-year medical student who has given evidence of unusual promise of creative scholarship in the field of psychiatry by clinical scholarship, by participation in research, or by both.

- 1954 Sanford Meyerowitz
- 1956 Cyril Melvin Worby
- 1957 Stanford Barton Friedman
- 1959 Michael Benjamin Sporn
  - Charles Wesley Dingman, II
- 1960 Daniel Herbert Josephthal
- 1961 Carol Cooperman Shander (Dr. Carol Nadelson)
- 1964 Joseph James Scibetta
- 1966 Wayne William Myers
- 1967 Daniel Paul Asnes
- 1969 David Mark Schachter
- 1970 Donald Raymond Sweeney
- 1971 Marc Andrew Frader
- 1974 David C. Dillon
- 1975 Marten W. deVries

Anthony Frank Lehman

### THE BRYCE COLLIER PRIZE

Established in memory of a 1964 graduate, this prize is given to a med-

ical student demonstrating exceptional qualities of responsibility and devotion in the compassionate care and understanding of the sick.

1965	Joseph Bedford VanderVeer	1971	Susan Clark Ristow	
1966	John Michael Livingood	1972	Douglas Menzies	
1967	Thomas Carey Bisett		Haselwood	
1968	William Lowell Medd	1973	David Elliott Heppel	
1969	Werner A. Bleyer	1974	Charles A. Mangano	
1970	Chester Joseph Herman	1975	Dwight Davis	

### THE CUSHING PRIZE

This is awarded to a student of the School of Medicine and Dentistry for the best essay on an aspect of the history of medicine, based on original research and deemed worthy of publication.

1938	Jean Captain (Sabine)	
941	Kennett Arrington Greig	
943	S. Farnum Coffin, Jr.	
944	Charles Kennedy, II	
951	Salvatore Raymond	
	Gambino	
953	Gabriel Smilkstein	

1954	Donald Ainslie Henderson
1960	Michael Terrance McGuire

- 1965 Frederick Pei Li
- 1972 Llovd A. Wells
- 1975 David B. Lovejoy, Jr.
- 1953 Gabriel Smilkstein

### THE OBSTETRICS-GYNECOLOGY AWARD

This prize is awarded to a fourth-year student who shows promising qualities of scholarship in the field of obstetrics-gynecology.

1948	William Franklin Scherer	1966	Allan Evert McLaughlin
1951	Donald Penhallegon	1969	Werner A. Bleyer
	Pederson	1970	Spencer Shaw
1953	Robert Leonard Brent	1973	Paul Richard Singer
1957	George Albert Whipple	1974	Timothy J. McCormack
1965	Harold Hepworth Gardner		

### THE GEORGE V. METZGER AWARD

Awarded to a graduate student in the Department of Radiation Biology and Biophysics whose doctoral dissertation is judged to be of exceptional quality.

Samuel J. Gibbs 1969	William Baldwin 1973
Philip Knauf 1970	Ronald Warner 1973
Tor Norseth 1970	Zvi Ioav Cabantehik 1974
Rudolph L. Juliana 1971	Fouad Ezra 1974
Joseph G. Brand 1972	Eugene J. Barrett 1975
Robert Swift 1972	

### Appendix

### THE ROBERT KATES AWARD

Awarded to a graduating student who has demonstrated excellence in both clinical medicine and in research by qualifying for both the M.D. and the Ph.D. degrees in the combined program or by earning the degree Doctor in Medicine with Distinction in Research.

Lewis J. Smith ...... 1973 Eugene J. Barrett ..... 1975 Donald G. Puro ..... 1974

### THE DOROTHEA LYNDE DIX PRIZE

This prize was established by the Department of Psychiatry in 1950 and is awarded annually to a graduating student for high scholarship and outstanding skills demonstrated in the basic course in psychiatric nursing.

- 1950 Elizabeth Frost (Mrs. Harry E. Siver)
- 1951 Barbara Longstaff (Mrs. Hugh D. Outterson)
- 1952 Marilyn Ernest (Mrs. Ronald A. Straight) Kathryn Connell Koch (Mrs. Raymond H.)
- 1953 Shirley M. Gantz Garvin (Mrs. Hugh L.)
- 1954 Jane Tector (Mrs. George D. Reilly)
- 1955 Mrs. Grace Handrahan
- 1956 Jean Frances Schwartz
- 1957 Joan Zabadal (Mrs. Donald J. Hoeffel)
- 1958 Verna C. Wesselmann (Mrs. Donald J. Fox)
- 1959 Bette Marie Pancoe
- 1960 Ruth VanLare Stanton (Mrs. Robert W.)
- 1961 Mabel Stringham Patton (Mrs. Robert D.)
- 1962 Elizabeth Kellogg Speegle (Mrs. James R.)
- 1963 Linda Klipple
- 1964 Ruth Ellen Wilder (Mrs. James E. Bell)
- 1965 Madeline Schmitt (Mrs. Albert T.)
- 1966 Diane Deater (Mrs. Kenneth Elliott)
- 1967 Elanita Meyer Vogt (Mrs. David P.)
- 1968 Ann Verdgeline
- 1969 Catherine Collins Wolchok (Mrs. John)
- 1970 Kathleen Patricia McMahon
- 1971 Mary Ann Tapke
- 1972 Donna Rowland
- 1973 Mary Ann Christ
- 1974 Marlene Giuliani
- 1975 Linda Pedley Schwartz

### THE CLARE DENNISON PRIZE

The Clare Dennison Prize was established by Dr. Basil MacLean in 1954, honoring Clare Dennison, who served as director of the School

of Nursing and Nursing Service, 1931–51. It is awarded annually to the senior student who has shown the most outstanding proficiency in the nursing care of patients.

1955	Marion M. Lopuszynski	1965	Madeline Hubbard Schmitt	
1956	Mary F. Wemett	1966	Deborah A. Peterson	
1957	Ruth A. Rhoadhouse	1967	Carolyn A. Wolf	
1958	Marion A. Jacobs	1968	Linda J. Sharlow	
1959	Eva Pang Pan	1969	Rhea Keller Fox	
1960	Helen Fleckenstein Haws	1970	Ann E. Gustafson	
1961	Jeanie Maddox Sy	1971	Marcia J. McCarthy	
	Faye Wadsworth Whitney	1972	Karen E. Knaebel	
1962	Anne K. VanRensselaer	1973	Nancy J. Newton	
1963	Josephine S. Emy	1974	Marcia Powell Reissig	
1964	Deborah J. Lawrence	1975	Susan Harford Terwilliger	

### EXCELLENCE IN TEACHING AWARD

This award is given by the students of the first- and second-year classes to the teacher in each class most gifted in communicating, in inspiring enthusiasm for basic medical science or clinical medicine, and in leading an enlightened and imaginative dialogue between student and teacher.

FIRST-YEAR CLASS	SECOND-YEAR CLASS		
Peter T. Rowley, M.D 1972	Louis Lasagna, M.D 1972		
Michael N. Sheridan, Ph.D 1973	Robert A. Cooper, Jr., M.D 1973		
Clay M. Armstrong, M.D 1974	David Goldblatt, M.D 1974		
Donald A. Young, M.D 1975	John P. Leddy, M.D 1975		

### THE GOLD MEDAL AWARD

This award is presented by the Medical Alumni Association of the University of Rochester to a member of the faculty in recognition of his integrity, inspiring teaching, and devotion to medical students.

- 1952 Samuel W. Clausen
  1953 George H. Whipple
  1954 William B. Hawkins
  1955 Karl M. Wilson
  1956 Lawrence A. Kohn
  1957 Paul H. Garvey
  1958 Wallace O. Fenn
  1959 William S. McCann
  1960 William L. Bradford
  1961 John J. Morton, Jr.
- 1962 Ralph F. Jacox
- 1963 Charles E. Tobin

- 1964 Edward F. Adolph
- 1965 Henry A. Blair
- 1966 Wilbur K. Smith
- 1967 E. Henry Keutmann
- 1968 J. Lowell Orbison
- 1969 Earle S. Mahoney
- 1970 Harold Hodge
- 1970 Harola Houge
- 1971 John Komano
- 1972 George L. Engel
- 1973 Lawrence E. Young
- 1974 Jacob W. Holler

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### Appendix

## THE KEITH MINER FORD AWARD FOR EXCELLENCE IN TEACHING

Awarded each year to a member of the faculty selected by the graduating class.

Robert C. Griggs	1972	David Goldblatt	1975
Theodore Van Zandt	1973	William J. Hall	1975
John M. Mazzullo, III	1974		

### HONORARY DEGREES GRANTED BY THE UNIVERSITY OF ROCHESTER TO PERSONS NOMINATED BY THE MEDICAL FACULTY

George Washington Goler	D.Sc
Friedrich von Muller	D.Sc
Andrew Balfour	D.Sc 1926
Lewis Hill Weed	D.Sc
Richard Clarke Cabot	LL.D 1930
Ray Lyman Wilbur	LL.D 1930
Harvey Cushing	D.Sc
James Ewing	D.Sc
Lloyd Ancile Jones	D.Sc
Edwards Albert Park	D.Sc
Thomas Milton Rivers	D.Sc
Alice Hamilton	D.Sc
Philip Anderson Shaffer	D.Sc
Mary Breckenridge	LL.D 1940
Herbert Spencer Gasser	D.Sc
George Washington Carver	D.Sc
Eve Curie	D.Lit 1941
Rene Jules Dubos	D.Sc
Warfield Theobald Longcope	D.Sc
Frederick Fuller Russell	D.Sc
Elizabeth Kenny	D.Sc
Stanhope Bayne-Jones	D.Sc
George Washington Corner	D.Sc
Alfred Leroy Johnson	D.Sc
Elliott Carr Cutler	D.Sc 1946
Barbara McClintock	D.Sc 1947
Carl Voegtlin	D.Sc
Eugene Floyd DuBois	D.Sc
Martha May Eliot	L.H.D 1948
Gioacchino Fialla	D.Sc
George Hoyt Whipple	LL.D 1950
Alfred Blalock	D.Sc

W. Edward Gallie	D.Sc 1952
Hans Thacher Clarke	D.Sc 1953
Herman Ertresvaag Hilleboe	D.Sc 1953
Herman Gates Weiskotten	D.Sc 1954
George Packer Berry	D.Sc 1955
Gerty Theresa Cori	D.Sc 1955
Stafford L. Warren	D.Sc 1956
Willard M. Allen	D.Sc 1957
Nathaniel Whales Faxon	D.Sc 1958
Archibald Vivian Hill	D.Sc 1959
Alberto Hurtado	D.Sc 1959
Marion Gleason	M.Sc 1962
Arthur Kornberg	D.Sc 1962
Robert H. Felix	D.Sc 1964
Wallace O. Fenn	D.Sc
Vincent duVigneaud	D.Sc 1965
Warren Myron Sperry	D.Sc
Cornelis Willem de Kiewiet	L.H.D 1966
Alan Valentine	L.H.D 1966
David Shakow	D.Sc
John Clare Whitehorn	D.Sc
James Sibley Watson, Jr.	D.Sc 1972
Alejandro Zaffaroni	D.Sc 1972
Robert Swain Morison	D.Sc 1973
Lewis Thomas	D.Sc 1974
James V. Neel	D.Sc 1974
Hermann Rahn	D.Sc 1974
Nevin S. Scrimshaw	D.Sc 1974
Walle J. H. Nauta	D.Sc 1975
Joseph F. Volker	D.Sc 1975

### ADMINISTRATIVE OFFICERS

### Strong Memorial Hospital

Nathaniel W. Faxon, M.D., Director	1922-1935
Basil Clarendon MacLean, M.D., Director	1935 - 1954
J. Milo Anderson, A.B., M.B.A., Administrator	1955-1960
Robert L. Berg, M.D., Acting Administrator	1960-1961
Leonard D. Fenninger, M.D., Medical Director	1961-1967
James W. Bartlett, M.D., Medical Director	1967-
Allan C. Anderson, M.H.A., <i>Executive Director</i>	1968-
Dorothy Widner, Secretary to the Director	1923-1964
Helen K. Spector, Assistant to Medical Director	1964-

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### Appendix

### Rochester Municipal Hospital

J. Ward Thompson, Superintendent	1926-1933
George J. Dash, Superintendent	1934-1949
William B. Woods, A.B., M.S., Hospital Supervisor	1950-1958
Charles W. Nordwall, M.S., Hospital Supervisor	1958-1963

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- 1924 Helen Wood, R.N., M.A., Director of the School of Nursing and Superintendent of Nurses, Strong Memorial Hospital
- 1931 Clare Dennison, R.N., B.S., Director of the School of Nursing and Superintendent of Nurses, Strong Memorial Hospital (1947—Director of the School of Nursing and Nursing Service)
- 1951 Ruth Miller, R.N., Ed.M., Director of the School of Nursing and Nursing Service and Professor of Nursing
- 1954 Beatrice Stanley, R.N., M.A., Director of the School of Nursing and Nursing Service and Professor of Nursing
- 1957 Eleanor Hall, R.N., M.A., Chairman of the Department of Nursing of the School of Medicine and Dentistry and Professor of Nursing
- 1957 Beatrice Stanley, Director of Nursing Service of the Strong Memorial Hospital and Professor of Nursing (1959—Clinical Professor of Nursing)
- 1961 Ann Rosenberg, R.N., B.S., Acting Director of Nursing Service
- 1962 Marion Nichols, R.N., Acting Director of Nursing Service
- 1964 Claire O'Neil, R.N., M.S., Director of the Department of Nursing Service and Clinical Professor of Nursing
- 1968 Betty Deffenbaugh, R.N., B.S., Acting Director of the Department of Nursing Service
- 1971 Helen McNerney, R.N., M.S., Acting Chairman of the Department of Nursing of the School of Medicine and Dentistry and Assistant Professor of Nursing
- 1972 Loretta Ford, R.N., Ed.D., Dean of the School of Nursing and Director of Nursing and Professor of Nursing

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### Everything Is Up to Date in Kansas City

### John Romano, M.D.

This fiftieth anniversary book of essays is dedicated to George Hoyt Whipple. It occurred to me that such tribute would be best expressed through the words of the late Wallace Osgood Fenn perhaps through the publication of one of his three poems, each entitled "The House That George Built," or preferably through the address given by Fenn at the dedication of the George Hoyt Whipple Auditorium, which took place on October 12, 1950. I remember the occasion vividly and was impressed, as were we all, by Wallace Fenn's wit and wisdom and his genuine affection for the dean. If we could find his address, I thought it would be an excellent means of dedicating the book of essays and also paying tribute to our beloved friend and our most distinguished scientist, Wallace Fenn. With this in mind, I began my hunt for the notes or the typescript, if such existed, of Fenn's talk. And this is the story of my search.

To begin with, Emily Kane carefully looked through the files of the dean's office, both above and below decks, but without success. Lucretia McClure, Henry Lemkau, and I poked through the various archival sources in the Medical Library, again with no success. Virginia Sattler, in Dean Whipple's office, did find copies of the Fenn poems but, alas, no copy of the Fenn address, though reference to it was found in copies of the local press and in the University of Rochester Bulletin. Clara Fenn looked in every nook and cranny of her apartment and so did Katharine Whipple, but to no avail. Clara Fenn enterprisingly telephoned Karl Mason in Washington and Augusta Dustin in Buffalo, but they were unable to help. Albert Craig, Paul Horowicz, and Caroline Mount could find nothing in the files and shelves of the Physiology Department. Katharine Whipple kindly called again to say that she had just spoken to Mrs. William Hawkins, who didn't know where to find the address but did tell her that Roger Terry was about to arrive in Rochester from Los Angeles, and

perhaps he would know its whereabouts, because he had been active in recording many of the talks given at the Medical School on historic occasions. But where was Roger Terry? We learned that he and his wife would probably stay at the home of his wife's sister, but no one knew her name until Virginia Sattler suggested that I call Adelaide C. Steedman, secretary of nursing service, who she knew was a friend of Roger Terry's wife's sister. Adelaide Steedman knew Roger Terry's wife's sister's name but didn't know her husband's first name, so we couldn't find her number in the telephone book until Adelaide Steedman called the hairdresser whom she shared with Roger Terry's wife's sister, and we learned who she was, where she lived, and how we could reach her by telephone. Mirabile dictu, a telephone call to that number was responded to by none other than Roger Terry's wife, who informed us that Roger was somewhere in the air between Los Angeles and Rochester and that he was expected later that very evening. When Roger did arrive in Rochester that evening, he confirmed that Wallace Fenn did give the address and that he-Roger Terry-actually had recorded it, but on a magnetic wire on a wire recorder belonging to Earl Mahoney. Roger believed that if I were to search again in the catacombs of the Library, I would probably find the magnetic wire spools. Armed with a box of Kleenex and a small flashlight and with the generous help of Philip Weimerskirch, we found two small rectangular yellow boxes entitled "Spool O' Sound," recording wire manufactured by the Magnetic Corporation of America, Chicago, Illinois, and on the boxes were Roger's penciled inscriptions, indicating the content of the spools.

Difficulties up to the present were as nothing compared to what happened next. We could find no wire recorder instrument on which to play the wire recording. We turned to Dick Powers in the Medical School, who was valiant but unsuccessful in his search for such a wire recorder. We checked with Emory Cowen, in psychology, with the audiovisual person at the Eastman School, and later with the Department of Electrical Engineering, but again with no luck. I telephoned Earl Mahoney at Nantucket Island and was delighted to learn of his new and interesting life there, but could get no news of the wire recorder which had been his. He said that he had either given it away or exchanged it for a tape recorder or some later device. Earlier, I had called Rhoda Lamb, who had been Earl's secretary, and re-

### Everything Is Up to Date — Romano

gretably she could not be of much help. She did suggest getting in touch with the Eastman House, but that, too, was unsuccessful. Milton Lederman suggested that I call various radio supply houses in the community, which I did without success. I called the always genial and helpful Harold Hacker at the Rochester Public Library, and he said that he would ask his people for help, but here again no wire recorder was in sight. I tried to telephone the Magnetic Corporation of America, in Chicago, the manufacturer of the magnetic spool at hand, but there was no such company in Chicago. A company of the same name in Waltham, Massachusetts, indicated that they did not do any wire recording work and could not be of any help.

A call to a commercial recording firm was responded to by an answering service, asking the caller not to hang up but to leave a message, which I did on three occasions. Three days later, at 11:00 p.m., the phone rang in my house and it was the proprietor of this firm, who explained that he had been away for several days and was calling at his first awareness of my message to ask if he could be of some help. His telephone advertisement was the only one which said "wire recording." I explained my need and I met with him on the following day. After I parked my car nearby, I found the neighborhood of this shop quite devastated. It looked quite bombed out-littered with debris, broken bottles, and empty beer cans-and was deserted. The display windows of the shop were filled with old phonograph records covered with one-half to one inch of dust. My heart sank, as I wasn't sure I wanted to trust my prized spools under these circumstances, but the proprietor was quite friendly, insisted that his son had known me, and was quite sure that he would be able to help me. He then took the spools and found to his distress-and to some degree to mine-that the hubs of the spools did not fit his wire recording machine, and so he would be unable to help me. With mixed feelings I left, with my spools, and found that I had parked illegally and was fined \$10. The love of a man for his school and country has no bounds.

I returned home somewhat disconsolate, with my unrecorded wires and the fine. Sydney Weinberg called and thought he might have someone in town who could be of help, and then one of Harold Hacker's assistants called from the public library and mentioned the name of a man who someone else had thought could be of help, but again no success. So I turned to Nick Grav-

er, our photographer at the Hospital, and he told me of Calvin Communications, Inc., in Kansas City, Missouri. This is the largest producer of nontheatrical motion pictures in the country and makes many films released by educational publishers. He thought that Calvin Communications, Inc., could be entrusted with our treasured spools, for transferring the wire recording onto a reel tape. With high hopes we sent the spools on and two weeks later we received a 10-inch tape on a platter without a reel, together with the returned spools. Sandra Squires Trieshmann met with Dick Powers, and together they were able to transfer the 10-inch reel tape to a 7-inch reel tape; Sandra and I then played back the 7-inch reel tape on one of our recorders and found, to our immense pleasure, that we had recorded the entire dedicatory ceremony of October 12, 1950. Albert D. Kaiser was the toastmaster, and Wallace O. Fenn gave the major address. There were brief statements by Herbert Eisenhart, Donald Gilbert, and Jacob Goldstein, and a response by George Hoyt Whipple. There was a bonus in that the spools also had recorded the dedication ceremony for the Whipple portrait, which had taken place on November 15, 1950, at which time Einar Lie, Robert Todd, and William Bradford spoke, again with the response of George Hoyt Whipple.

Our next task was to transfer the recording from the reel tape to IBM belts so that my secretary, Jane Widman, would be able to type the address from the IBM belts. This required considerable effort on the part of Sandra, Jane, and me because at times the recording became inaudible and there were frequent interruptions of laughter and applause. But the three of us were successful, with Sandra taking honors for the best ear, and Jane Widman merrily went along typing the transcript which we now have and which serves as the dedicatory statement to George Hoyt Whipple in this fiftieth anniversary book of essays.

There is a moral, or least a caution, which we can draw from this story. With the incredible, almost exponential frequency of changes in audiovisual equipment in the past twenty-five years, what will happen to much that has been recorded on machines that have become obsolescent or lost forever? Should there not be some regional or national museum which would insure the collection and maintenance of such apparatus, so that those of us who need to call upon recordings of the past may be successful in our efforts?

### Everything Is Up to Date - Romano

Therefore, we are most grateful to the Calvin Communications, Inc., for preserving for us Wallace Fenn's remarkable address. To those of you who shared in this odyssey of wires and tapes and reels and belts, my sincere thanks. And wouldn't all of you agree with me that "things are up to date in Kansas City"?

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This caduceus is a single snake symbol of Asclepius, the ancient symbol of medicine. The Greek inscription reads, "Life is short; Art is long; Time is swift."

