

## John Howland Award Acceptance Address

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### A Tribute to My Teachers

When the telephone rang and Margaret Smith said, "Charlie, I'm calling from the Council Meeting of the American Pediatric Society to tell you that you've been chosen for the Howland Award," I was overcome. No honor means as much as recognition by one's peers. Many others have equal claim to this award, but it does have special meaning for me, because of my unorthodox preparation as a pediatric teacher. It is final proof of what I have learned about the generosity of pediatricians. In telling me of his receipt of the Howland Award, Clem Smith said, "When you get to the podium, look out over that sea of faces and realize that these are all friends, you are deeply moved." I am profoundly moved and thank my friends and colleagues from the bottom of my heart.

My first encounters with pediatrics were prophetic of the good fortune which ultimately propelled me into an academic pediatric career. In 1914, when I was 5, our family moved to Baltimore after my Father had accepted an invitation from Johns Hopkins to become its first full-time Professor of Medicine. His former assistant in his part-time New York practice, Edwards Park, had recently moved there, with Father's encouragement, to work in pediatrics under Dr. John Howland.

In 1917, when I was 8, Father contracted type 2 pneumococcal pneumonia during an exhausting series of visits to survey medical care in the camps where military recruits were being hastily trained to enter the later stages of World War I. With Father seriously ill (he died in Baltimore on December 27), I was sent to my grandmother's outside Philadelphia, where I developed low grade fever with right lower quadrant pain, for which I was given oral doses of charcoal powder; in any case, the attack subsided in a few days. I returned to Baltimore, and clearly remember my visit to Dr. Howland's office in the Harriet Lane Home, the pediatric section of the Hopkins Hospital. Dr. Howland carefully examined me, and my finger was pricked for a blood count while sitting in his lap. Soon after, I vividly recall the stretcher ride to the operating room, the whirling lights, buzzing sounds, and peculiar smell of ether, followed by awakening in a strange room with Mother and a kindly nurse. I had lost an appendix and acquired a neat right lower quadrant scar. This was my introduction to pediatrics as a patient in the very institution where many of the early generation of Professors of Pediatrics in this country were trained by Dr. Howland.

After Father's death, my mother was left to bring up five children from 5 to 18. Our winters were spent among friends and relatives along the Atlantic seaboard from Philadelphia to Boston. But our real home was in the Adirondack Mountains, where Mother and Father had met and where I spent nearly every summer and acquired a permanent love of mountains and forests. Naturally I was close to Mother as a boy. She was the dominant figure in the family, but, as our family grew with the addition of three brothers-in-law, we developed into a loyal family group, often geographically scattered, but increasingly close as all our horizons expanded.

Despite several generations of doctors behind me, I didn't

decide to study medicine until my final year in college. My grandfather, Dr. Edward G. Janeway, was a distinguished consultant, Professor of Pathology and Dean at Bellevue Medical College before it became New York University School of Medicine. My father, Dr. Theodore C. Janeway, worked with him in practice, but, because of his own special skills, as an internist, teacher and investigator in hypertensive cardiovascular renal disease, was named Bard Professor of Medicine at Columbia in 1911, a position he held until the move to Johns Hopkins.

Frequent contacts with family friends, many of whom were doctors, helped to keep my interest in medicine alive. This was particularly true of Dr. Park, whom I came to regard as my medical father. As a boy, our times together were confined to occasional summer fishing and camping expeditions, an ideal way to establish a close relationship. When I was a freshman at Yale, he was Professor of Pediatrics there. The boundless hospitality at their house in the country outside New Haven often included me; I felt that Dr. Park was someone to whom I could always turn for advice, as I frequently did.

Although I took enough science to meet the basic requirements for medical school, my intellectual interests ran to history, religion, and the problems of modern industrial society. Naivete and the idealism of youth even led to my arrest with two fellow students for passing out organizing literature to non-union workers in a New Haven labor dispute. This episode, which was reported on the front page of the *New York Times*, sent shudders through the Yale Corporation, but it brought me letters of support from my liberal Quaker relatives in Philadelphia. Despite this experience, I did not embark on a career of social reform, but finally applied to medical school.

With the advice of one of Father's friends, Professor Graham Lusk, in September 1930, I entered Cornell Medical College opposite Bellevue Hospital in New York. Its size (only 35 students in our first year class and 55 in our second) made for close contacts with its small, distinguished faculty, including Dr. Lusk. He had studied nutrition in Europe, and I am happy that his textbook, *The Elements of the Science of Nutrition*, is still being printed as a medical classic (1).

During the summer of my junior year in College, I had gone abroad on a studentship with college friends. I still remember coming up on deck the first day at sea and being introduced by a Vassar friend to one of her classmates who was reading in a deck chair. She and I both instantly had the feeling that this was something special, and, before the summer was over, it had proved so. We celebrated our 45th wedding anniversary last July. Besides bringing me companionship and sharing the later adventures of family life with our four children, Betty trained as a social worker after college and supported our household during our early lean years. In this last decade, she has returned to work, at the Boston Hospital for Women, where she began a social service program for mothers of infants in the Intensive Care Nursery. She has become an important teacher for me in the field of neonatology where my unorthodox pediatric training was deficient. As we drive home after work, she often gives me a picture of the intensity of the unexpected emotional and social problems for mothers and

families when the normally happy experience of pregnancy and delivery goes wrong. Thus, she has enriched my personal life and deepened my professional understanding of this critical period for the mother and child.

We moved to Baltimore for the last 2 years of medical school in the fall of 1932, after marriage just a week behind two intimate school friends, Lelie and Barry Wood. Barry had ended a brilliant academic and athletic career at Harvard and was starting medical school at Johns Hopkins. We organized a happy arrangement for living in adjoining apartments and for the division of housekeeping responsibilities by our working wives. Barry, though 2 years behind me in his course work, shared his experiences as a student in the basic sciences at Hopkins with me and always continued to be an important influence on my professional life. For the next few years, we had wonderful contacts with the Parks and other hospitable Baltimore families. Our medical education was enlivened by round the table discussions with each other and with fellow students. Dr. Park loved to read aloud to his guests and children after Sunday evening supper, or to take us on bird walks in the afternoons, while he described the campaigns of the Confederate armies in the border regions of Maryland nearby. He became known as an authority on the War between the States, and often led a weekend expedition of enthusiastic disciples for a guided tour of the site of the battle of Gettysburg. We could vividly imagine Colonel Pickett's gallant charge of his men in gray up the slopes of Cemetery Ridge, which proved to be the high water mark of Confederate advance into the border region between North and South.

Fortunately, we were able to repay the Parks in some measure for their role in the development of our careers. We had introduced the Woods to them in their early days in Baltimore, and a close relationship developed which continued throughout their lives. In a later period, when they lived near one another, Barry usually drove "Punk" to work, as Dr. Park was known to his children and close friends. Their discussions must have influenced Barry's later decision to return from St. Louis, where he served for several years as Chairman of the Department of Medicine of Washington University, to become Vice-President of the Johns Hopkins Medical Institutions. In this role, he initiated curricular changes aimed at shortening the medical course. Two years were to be saved, first by integrating college scientific education with the basic medical sciences as taught in the medical school, and second, by condensing clinical education at the medical school with the early stages of hospital internship training. In the end, only part of this telescopic scheme of reform was accomplished at Hopkins due to faculty resistance, but it was one of the first serious efforts to shorten the period of formal medical education and better coordinate scientific education with clinical training as specialization began to increase. Punk's wisdom proved beneficial to Barry's work in education, but he also took a keen interest in the biomedical research Barry continued to do in his laboratory as Professor of Microbiology.

My own small contribution affected Punk's keenness for fly fishing. He had taught me the art of casting the fly for trout in Adirondack streams, when I was younger, but I started him tying his own flies during the time we were in Baltimore, with a Christmas present of a fly-tying kit. As his interests shifted to Atlantic salmon fishing on Cape Breton Island, where the Parks began to spend their summers camping on the banks of the Margaree River, Punk quickly outdistanced his instructor. His salmon flies earned him a unique reputation for taking salmon along this heavily fished, but lovely stream. He was generous, not only in loaning his equipment, from rods, wading boots, to leaders and flies, but above all, in sharing his knowledge of the river and the habits of the salmon with his guests, who were drawn to Northeast Margaree for the simple joys of life with this remarkable family in that pleasant, peaceful river valley.

Many teachers at Hopkins made a lasting impression. Read Ellsworth, our landlord for one year, had been at the Massachusetts General Hospital when Joseph Aub's and Fuller Albright's clinical investigations began to make sense of calcium and phos-

phorus metabolism. His ability to arouse medical curiosity and his enthusiasm for teaching were a role model for aspiring young clinical investigators. In pediatrics, Dr. T. Campbell Goodwin, who had recently finished as Chief Resident at the Harriet Lane Home, combined deep pediatric knowledge with excellent clinical judgment and the personal charm of a Virginia gentleman. He remained a warm personal friend, and, in his later years, he and his wife Mary made valiant efforts to improve comprehensive pediatric care for the mentally retarded children in New York's huge mental institutions.

Dr. Warfield T. Longcope, who had followed Father as Bard Professor of Medicine at Columbia, and later at Hopkins, set the tone of the Osler Clinic (the medical wards). His knowledge of immunological phenomena attracted me to work with him as a medical resident in 1936. He was very kind, and his department was a strong one. Highly intelligent, with a fine background in pathology, he had a keen sense of the value of the laboratory, and exemplified outstanding performance in the systematic study of disease. He was always courteous in the management of patients. Perhaps the most brilliant clinical teacher was Dr. Louis Hamman, a charming, handsome man, in whose teaching clinics his gentle wit and Socratic method of teaching often led students unwittingly into logical traps, into which they would fall, much to the delight of their classmates. He had been Father's physician during his final illness, and, for many years, a dozen red roses would arrive for my mother on the anniversary of Father's death. With Arnold Rich, the pathologist, he would debate brilliantly over the diagnosis at a weekly CPC, which was open to all students. These scintillating encounters by two outstanding students of disease did much to set high scholarly standards of medicine. My 2 years at Hopkins were all that I had hoped.

As the last half of the fourth year came close, decisions had to be made. Where to go as an intern? Into which field—medicine or pediatrics? One night, near the deadline, I walked three times completely around the Johns Hopkins Hospital trying to make a decision. Finally, I elected to apply in medicine to the Boston hospitals for many reasons: their fine reputation, the excellence of the Harvard Medical School, and a house on Beacon Hill where we could live with my wife's mother and aunt. So I applied to the Harvard Medical Services at the Boston City Hospital and was luckily accepted. This surprised me, as, during the oral examination, in a room full of medical greats, I was asked to discuss iron metabolism in Gaucher's disease. While I was still reeling from that unexpected question, Dr. Castle suggested that I talk about iron metabolism in Niemann-Pick's disease. This left me speechless until Dr. Weiss, in a kindly way, proposed that I discuss the common cold.

The move from Baltimore to Boston was stimulating. Medical thought traditionally had been dominated by pathologic anatomy in Baltimore. The objective of clinical diagnosis was accurate prediction and description of the pathologic lesions. In contrast, at least on the Fourth Medical Service at the Boston City Hospital, pathology was not neglected, but the main objective was to explain the patient's symptoms on a pathophysiological basis, and there was greater emphasis on how symptoms could be relieved and managed with drugs. I had found pharmacology a dull subject before, but under Dr. Weiss' guidance, drug therapy became an important means of influencing the patient's functional state.

The staff at the Thorndike Memorial Laboratory (laboratories and hospital beds set aside for the study of disease in patients at the center of the hospital, like today's clinical research centers) were particularly strong in three broad areas of clinical investigation: 1) *hematology*; 2) *infectious diseases*; and 3) *cardiovascular disease*. Hematology was led by Dr. Minot, a gaunt, lanky man, who had been saved from diabetic death by the discovery of insulin, and who had won the Nobel Prize for demonstrating that the feeding of raw liver, based on Whipple's work in dogs, would bring about remission in patients with pernicious anemia. Meanwhile, Dr. Castle was demonstrating the essential interaction for remission of two factors, *extrinsic factor* (in liver) and *intrinsic factor* (in the upper gastrointestinal tract).

Chester Keefer and Wesley Spink were studying the variety of infectious diseases at the hospital, noting how their pathogenesis, course, and treatment were modified by malnutrition, liver cirrhosis, and other rampant chronic illnesses. In another program, Maxwell Finland, collaborating with the Massachusetts State Laboratories, was vigorously studying the treatment of lobar pneumonia by type-specific antipneumococcal serum. House officers were inevitably involved in all these studies, often through most of the night, typing pneumococci and administering serum intravenously. We therefore acquired an unusual depth of clinical experience with this major cause of mortality and morbidity.

Finally, Dr. Soma Weiss, with his splendid training in physiology and pharmacology, was studying the cardiovascular aspects of disease. In our time, he and his associates described beri-beri heart disease, the mechanisms of syncope, and the relationship of hypertension to chronic pyelonephritis.

Several research fellows worked with each of these men contributing to the progress of the research. Bright young people, drawn from all over the country, they acted as residents overseeing the work of students and house officers. Ultimately, most of them achieved important teaching positions in this country or abroad. It is a tribute to Dr. Francis Peabody, who set up the Thorndike Laboratory as a focus for teaching and investigation in a busy hospital, that this unit in its hey day was the source of more full-time professors of medicine than any other unit in the United States.

The Harvard Medical services at the City Hospital had become outstanding for teaching and research. But, located in the poor district of the city, the hospital had to care for huge numbers of indigent patients in the midst of the great depression of the 1930's. During the era of James Michael Curley as mayor, the Hospital was an effective instrument for his political control, through jobs, patronage, and contracts for meat and other supplies, all favors distributed by city officials. The patients received excellent medical care from some of the brightest young people graduating from medical school. We learned a lot about medicine and politics. The system really protected us from political interference. Many buffers stood between us and the politicians so that what manipulation there was was more amusing than annoying. Most important for an Irishman, no matter how poor, was the preservation of his dignity and sense of importance. Rather than go directly to the emergency room, a patient would prefer to go to his City Councillor, who would arrange admission by a series of favors—telephone calls or even visits—first, to the Mayor's office, then to the Hospital Director's office, finally ending in a call to our admitting physician to say, "Doctor, the Mayor, Councillor Moriarity, and the Hospital Director, are interested in this patient. Please take good care of him." It took the patient much longer to get admitted, but everyone involved in the chain ended up feeling that he had displayed his influence, and the patient felt certain that he had been given special treatment. For us house officers, work was hard, hours long, but morale high. We were known as "iron men," able to work as much as 18 to 36 hours at a stretch without sleep or pay, a picture which seems to excite more pity than envy from current generations of house officers.

There was an interval between the end of my appointment in April 1936 and my next appointment as Assistant Resident in Medicine at Hopkins, which I spent at the Thorndike in Chester Keefer's laboratory. We returned to Baltimore in the fall, again living cooperatively with the Woods. It was a splendid year of expanding clinical experience as a resident, supervising house officers, medical students and patients. Most notable were the first three patients seen with acute hemolytic anemia from sulfanilamide (now clearly recognizable as instances of glucose-6-phosphate dehydrogenase deficiency) described with my classmate, A. McGhee Harvey (2), who subsequently held the Professorship of Medicine at Hopkins in a long, distinguished career.

At the year's end, I considered the private practice of internal medicine in Boston, but decided on further research training. Fortunately, Dr. Hans Zinsser offered me a fellowship in Bacteriology and Immunology at the Harvard Medical School. Center-

ing my interest on the  $\beta$ -hemolytic streptococcus, I worked on the mode of action of sulfonamides and the use of immunotransfusion in sepsis (3). Besides teaching and laboratory duties for the medical students, our graduate education went on at the lunch table where we would all gather in a rather dismal laboratory, to partake of food which Morris Shaffer and I would fetch from a neighboring delicatessen, and devote an hour to discussion of science, literature, history, and the European situation. The beginnings of World War II were looming on the horizon, and Dr. Zinsser was particularly concerned as an ardent supporter of French culture and civilization. It was an interesting group. Howard Mueller, whose work in bacterial nutrition standardized media for the harvesting of diphtheria and tetanus toxins, was at times a stubborn man. Dr. Zinsser told me he had had to give him tenure, so that he couldn't fire him when he got mad at him. John Enders, who had been lured into microbiology from graduate study in English by his literary contacts with Dr. Zinsser, was at the start of his brilliant career. Dr. Zinsser's own day was divided into several periods: riding to hounds before breakfast, intense scientific work and teaching during the day, and, in the evenings, literary work and discussions with friends in the arts and literature. He was a Renaissance Man, and an enormously attractive human being.

During my second year in the department, Dr. Zinsser, who had spent several months in Peking during the summer, was found to have chronic lymphatic leukemia. This stimulated Sargent Cheever and me to study the immunological behavior of the Brown Pearce Tumor in rabbits. We might have come up with some exciting leads, had we had the sense to persist in cancer research. However, after 2 years, I felt it was time to move back into clinical medicine. Soma Weiss had just been appointed Hersey Professor of the Theory and Practice of Physick at the Peter Bent Brigham Hospital upon the retirement of Henry A. Christian. Soma wanted three young men, one in cardiovascular disease and pathophysiology (Eugene Stead, Professor of Medicine at Duke), one in psychosomatic medicine and neurology (John Romano, Distinguished Professor of Psychiatry at Rochester), and one in infectious disease (myself). Together with John G. Gibson II, who had adapted Magnus Gregerson's dye dilution method to the measurement of plasma volume in patients, we all shared an office, a young secretary, and the excitement of a rejuvenating department under the charismatic leadership of our dynamic professor, whose reputation quickly began to attract able young people to our department for training.

My job was to run the hospital's Bacteriology laboratory, which had to be started completely from scratch, to provide a consulting service and to teach infectious disease to medical students. Our research laboratory consisted of one room about 18'  $\times$  22', adjoining the Hospital Bacteriology Laboratory with its very limited animal quarters. Here, our research group, consisting of myself, Paul Beeson, Chief Medical Resident, who later became Professor of Medicine at Yale and then Nuffield Professor of Medicine at Oxford, Gustav Dammin, an Assistant Resident who became Professor of Pathology at the Peter Bent Brigham Hospital, two technicians and an occasional medical student, all managed to fit in. Despite crowding and limited equipment, this was in many ways, one of the happiest and most productive periods of my career.

But, war clouds were gathering. I told Dr. Weiss I wanted to contribute to the defense effort. He introduced me to Professor Edwin J. Cohn of the Department of Physical Chemistry at the Medical School. Cohn had just been asked by the National Research Council to undertake a study of bovine plasma, which Professor Owen Wangenstein of Minnesota had been testing, as a blood substitute in huge supply, for use in supporting blood volume and protein nutrition in surgical patients. Knowing that procuring adequate supplies of human blood or making safe blood substitutes would present serious logistic and biologic problems to the armed forces if war should come, Dr. Cohn accepted the challenge, after making certain that he would be given sufficient funds and adequate authority to run the program.

Dr. Cohn not only was an outstanding physical chemist, but he

also had the energy, drive, and organizing ability of a captain of industry. He immediately set to work planning a multidisciplinary team to attack this problem in a collaborative fashion. I was asked to join as an immunologist who could also take responsibility for clinical trials. The whole group began to meet weekly in Dr. Cohn's office, where he presided, immaculately dressed in a three-piece suit no matter what the temperature. This practice went on for the next 6 years, through which a varied group of scientists and physicians worked under Cohn's direction with personnel recruited from academic institutions and military, industrial and public health laboratories. The goal was to develop a safe and effective blood substitute for stable storage, ease in shipment, and clinical use in all sorts of conditions and climates (4). Cohn was quick to see the basic problems. First, the globulins of bovine serum produced serum sickness in treated patients. Second, a highly purified albumin fraction could be prepared which we showed to be less antigenic and more desirable from the standpoint of stability and physiologic osmotic action. Nevertheless, the probabilities of continuing immunologic difficulties with a foreign protein seemed likely. So, quietly, Dr. Cohn began a parallel investigation of human blood, obtained from the Red Cross. As the rate of blood donations rose even before Pearl Harbor, it became clear that human blood might become a practical source material. The production of human serum albumin, first in the Harvard Pilot Plant and later in pharmaceutical laboratories, developed rapidly, and, when the tragedy at Pearl Harbor occurred, Dr. Ravdin was able to carry the entire pilot plant supply of finished albumin (12 bottles) to Hawaii to treat a few of the wounded. The excellent results justified albumin's acceptance for the emergency treatment of shock by the National Research Council. Before the war ended, approximately two and a half million blood donations had been fractionated to albumin and the other blood products developed subsequently.

The success of the Plasma Fractionation program has been told elsewhere (5). It was important because it taught me a lot, thrust my loyal colleague, Lou Diamond, into national service as the first Technical Director of the Red Cross National Blood Program, and ultimately made hematology, immunology, and, later, genetics central foci of research in our department program under Drs. Diamond, Nathan, Rosen, and Gerald.

In early 1942, the tragic and unexpected death of Soma Weiss catapulted me from medicine into pediatrics. Within a few months, George W. Thorn was picked to succeed Dr. Weiss. He was generous and helpful to me, as he always has been, but an invitation to move across the street into the Department of Pediatrics at the Children's Hospital came almost simultaneously from Dr. Richard M. Smith, who was running the department of pediatrics while he continued to care for the many patients who sought and needed his professional help during the war years. He had to replace R. Cannon Eley, who had been called to active duty as a high ranking naval reserve officer, leaving no one to teach infectious disease. This was a chance to do what I was most qualified for, and meant that our research group would have access to a unit, with two infectious disease wards, and laboratories which had been set up for Dr. Charles McKhann's brilliant work on the harvesting of human antibodies from an extract of placentas (6).

For the next 4 years, I was given a course of on-the-job training in clinical pediatrics by my colleagues on the hospital staff and by our best house officers, particularly Dr. Edward Pratt who was later to succeed Ashley Weech as Professor at Cincinnati, and subsequently by William Berenberg, who has remained a stalwart support throughout my career. Our research program on blood derivatives continued with Dr. Cohn's group. Meanwhile, my practical instruction was supplemented with the generous sharing of their knowledge by Drs. Gamble, Crothers, Byers, Diamond, Davies, Smith, Clifford, Farber, and others, who gave me a chance to absorb both the history and theoretical basis of scientific pediatrics.

Our collaborative work with Dr. Cohn's group led to the production of human  $\gamma$ -globulin from the plasma fractions other

than albumin (5). Its thorough clinical testing and the standardization of its dosage for measles prophylaxis was made possible by the cooperation of practicing pediatricians principally in Boston and Philadelphia (7). In this, we worked closely with Dr. Joseph Stokes of the University of Pennsylvania and Philadelphia Children's Hospital, a wonderful colleague who later demonstrated the value of  $\gamma$ -globulin in passive protection against hepatitis A with Neefe and Gellis (8). Herbert Scheinberg later joined our laboratory group and began his work on the diagnosis and management of Wilson's disease, based on the availability of purified ceruloplasmin from plasma fractionation (9).

The war finally over, the Dean called me in in 1946 to ask me if I would accept the Thomas Morgan Rotch Professorship of Pediatrics at Harvard and serve as Physician-in-Chief and Head of the Department at Children's Hospital. The decision was frightening but easy. I had become very happy there. My colleagues had proved themselves wonderful, and the challenges were exciting. I've never regretted that decision in the 32 years that followed.

They have been full, active years, dominated by two main concerns—one very concrete, the other less consciously thought out than deeply sensed. The concrete concern was with facilities. Our buildings were totally inadequate for the needs of the postwar era. But we all felt that, unless the goals and programs planned were important and innovative, and the people to implement them were of the highest caliber, new buildings would both be hard to achieve and prove inadequate for the future. Programs had to come first or we would not know what to build for. Of course, both evolved together. Only in recent years have we achieved the flexibility needed to permit these two aspects of institutional development to adapt to one another, as the opportunities presented by scientific advances and the changing demands imposed by the needs of society and the community could be brought into some kind of uneasy equilibrium. The whole planning and building process has taken an inordinate amount of time, and never will be finished in any dynamic institution, but, with that background, I'd like to present a few examples of what has happened.

An interest in childhood nephrosis, stimulated by Lew Barness' 20-year review of the disease (10), tied in with our clinical work on passive prevention of measles as we began to study the spontaneous remissions which an intercurrent attack of measles would cause in these edematous children, who often had to stay in the hospital for weeks or months. Gretchen Hutchins Moll, and Niilo Hallman, a Finnish postwar fellow, now a world pediatric leader, carefully studied our early attempts to produce remissions either with albumin infusions or by inducing an attack of measles (11). A little later, Jack Metcalf joined the group to correlate the course of the disease with serial changes in physiologic measurements of renal function (12). Then came David Gitlin, after completing his house officer training. He applied immunologic tools: immunofluorescence to localize serum proteins in tissues and body fluids, tracer studies with radioisotopes to study the distribution and metabolism of the plasma proteins in the changing states of diuresis and fluid accumulation (13). These research interests led to intellectual exchanges with colleagues in other centers like Walter Heymann, Henry Barnett, Wallace McCrory, and others, and ultimately led to the development of a foundation for support of work on nephrosis. From this start, a program of research on serious kidney disease in children and its treatment with dialysis and renal transplantation has developed in our hospital into a major activity affecting a number of clinical and laboratory departments, serving the children of our area.

I cite this as one example of the development of a program of tertiary care, closely linked with and originating from research, at our institution over a period of nearly 30 years. Though not unique, it indicates how the Children's Hospital Medical Center, linked with the Harvard Medical School, has developed as an institution.

I was extremely lucky, as I joined the hospital at a favorable moment in history, with a great tradition from the past and many problems ahead. Our Trustees were faced with physical recon-

struction and replacement of inadequate buildings. There were a young, new group of chiefs in most departments with distinguished predecessors, like Dr. James Gamble, Dr. Bronson Crothers, Dr. William G. Lennox, Dr. S. Burt Wolbach, and others who were still active. Sidney Farber, as the new Pathologist-in-Chief, had a clear vision of a Children's Medical Center, which he was able to communicate to our remarkable new President, Mr. J. Wells Farley, as well as to many important lay and governmental people. The staff was enthusiastic, and the time favorable financially. A number of smaller institutions for children were anxious to consolidate their resources with a larger institution in a way that would preserve some identity and make it possible to strengthen their programs. And finally, the United States Public Health Service was just embarking on its highly successful effort to expand and strengthen biomedical research in the United States with funds of the United States government.

It has taken nearly 30 years to flesh out the plans the staff had developed in their minds and to implement them with facilities and personnel. Under Dr. Leonard Cronkhite's able administrative leadership in the recent past, and with the backing of our Trustees, the public and private foundations, both programs and buildings have become realities, even though a steady process of improvement, maintenance, and adaptation to changing needs must go on all the time.

What the Hospital has been able to accomplish depended on certain sound principles in addition to the basic strengths I have mentioned. The close ties with Harvard University have assured high standards of intellectual honesty and professional excellence in all appointments, particularly in those with tenure. When an appointee meeting those high criteria has been found, that person has been given great freedom to develop ideas, subject to the criticism and advice of colleagues. Finally, once these ideas have been accepted, they have been backed as strongly as possible by staff, hospital administration, and trustees. The Children's Hospital Medical Center staff has grown both by seeking the best candidates from all over the world and by listening carefully to those who come with an idea they would like to develop.

A fine example is the Cardiology program, which really began with Dr. Robert Gross's pioneering work in cardiac surgery and then expanded with Dr. Nadas' leadership into a program involving other hospital departments, contributing service to the children of this region, while training personnel and doing research of benefit to children everywhere.

I have had the privilege of observing and helping this growth process in the field of pediatric medicine, but the Children's Hospital Medical Center of today is the product of many minds, many hands, and many hearts. First, we had to overcome our worst clinical handicaps to get adequate bed facilities, urgently needed; but beds don't make a medical center. They are necessary for care when we neither can prevent illness nor keep a patient at home or on his feet. Next, facilities for ambulatory patients were essential for the vast bulk of patients who seek help, either with chronic or simple illnesses, and the worried parents who come with them. And finally, with those basic needs cared for, we had to create better research facilities, adequate to provide for the unique mission of a university teaching hospital—to discover new knowledge so that disease may be eradicated, prevented, or at least palliated. We must handle each patient better every decade. Only research can make that possible, and fulfill Mr. Farley's originally stated goal of transforming the Children's Medical Center of the present into the Children's Health Center of the future.

What is the philosophy of our research building, to me a huge and impressive structure, but becoming more crowded all the time? The design places major research programs on horizontal floors, but immediately above or below those related programs where collaboration and sharing of equipment is desirable. Senior scientists—some M.D.'s, some Ph.D.'s—preside over these floors, with fellows in training or junior investigators working on basic and clinical problems. The aim is to encourage easy contacts and collaboration between scientists, trainees, and clinicians, an ideal

never fully achieved, and even not always desirable for certain unusual individuals. For this is not a single institute with its research targeted, but one to provide maximum opportunity for talented young people to work out their ideas and to grow in the process. At present, our research building is too separated from the hospital of which it is an integral part—it needs a bridge (both physical and conceptual) to promote closer interaction between clinical medicine and biomedical science.

There is still one dimension missing in what I have described. When I became responsible for pediatric education in 1946, I was disturbed by the discrepancy between the training of house officers for intensive care of children with life-threatening disease in the hospital and the very different knowledge, skills, and experience demanded for care of the vast majority of children who need preventive services and primary medical care in home, school, and community. Moreover, the emotional, social, and developmental problems which practicing pediatricians have increasingly had to face were often overlooked in many aspects of teaching.

With the help, successively, of Robert J. Haggerty, Joel Alpert, and Richard Feinbloom in our Family Health Care Program, of T. Berry Brazelton in Child Development, of the Adolescent Program started by Dr. Gallagher in 1953, in close collaboration with Psychiatry, first with Dane Prugh and then under George Gardner, Julius Richmond, and Leon Eisenberg, we have worked hard at this increasingly major aspect of pediatrics, which demands teamwork among professionals—doctors, nurses, psychologists, and social workers. Many encouraging new programs are developing, and more staff and house officers are turning towards careers in ambulatory and primary care.

I look on this as a most important development for the coming decade. For, as our control over infectious, genetic, hematologic, neoplastic, cardiac, collagen, neurological, renal and metabolic diseases improves, as it inevitably must, with the advance of biomedical science, the problems of adaptation to life in our complex physical, cultural, and social environment seem to grow greater. But, if we are to develop this new area of medical concern, we must give it a scientific base as strong as the one which has built the successful programs of treatment, care and prevention for organic illness. Emotional drive is needed to motivate the opening up of this new field of "social disease," but it will take knowledge, imagination, and critical observations to define these new problems and measure the results of intervention.

We have a fine example in the President of this Society, Dr. Kempe, who, after a distinguished record in infectious disease, has embarked on a new career, studying child abuse with the tools of epidemiologic, biologic, and social science; he has organized programs of care for its victims, and of prevention for families and communities. The problems of alcoholism, gun control, homicide, accidents, school dropouts, and violence in our society are all around us. Many of these are related to and affect family and community stability; they seem to be nurtured in our culture of intense competition and the tendency toward confrontation rather than reasonable compromise in disputes.

But there is promise in the air. Pediatrics and obstetrics, made safer by technology, based on the hard science of the past, now are beginning to be "humanized" in their practice. The encouragement, with scientific support, of maternal-infant bonding, of breast feeding, and of family delivery all are efforts to strengthen the deep natural bonds which have held families together for many centuries and hopefully will strengthen the infant's sense of love and security from the earliest age.

My successor, Dr. Avery, though harboring a healthy, proper skepticism about research and its evaluation in the social sciences, has thrown herself energetically into the development of necessary studies and services in the ambulatory field. Moreover, she has organized a burgeoning program under Dr. William Taeusch to carry Clement Smith's work with the fetus and newborn into the future. So, I look forward with confidence in the institution that has occupied most of my working life and feel very fortunate to be an admiring spectator and an occasional participant, as the next generation gets on with the job. The thickness of the program

of this meeting testifies eloquently to the intensity with which pediatric research is being vigorously pursued all over this country today. It is essential that we continue to see that the advancement of knowledge which it brings is effectively applied in pediatric education, in pediatric practice, in ways that are most relevant to the needs of children and families now and in the future.

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