The Compleat Pediatrician: Howland Awardee Henry Lewis Barnett

NORMAN KRETCHMER

Department of Nutritional Sciences, University of California, Berkeley, 94720 and Department of Pediatrics and Obstetrics, University of California, San Francisco, California 94143

It is truly a great honor and privilege for me to accept my role this afternoon. I have been on this platform, functioning in diverse ways in the past, but never for a purpose as personally gratifying as the one given to me today. My assignment is somewhat complex. It is to introduce Henry Lewis Barnett, *in toto*, to members of the American Pediatric Society and the Society for Pediatric Research, their guests, his friends, and family. Each of you may think you know him; however, your knowledge of him is reminiscent of the blind Indian gentlemen who described the elephant. To paraphrase Godfrey Saxe, each of these six men of Hindustan went to see the elephant so that each by his own observation could satisfy his mind (1). My comments on the extensive career of Dr. Barnett will be presented in a somewhat dissociated sense. They consider a number of different viewpoints of his life. But at the end of this discourse I will attempt to assemble the entire body of information into a form that properly describes the Howland Awardee of 1984.

I must say I am indeed fortunate. I was seduced into Pediatrics by Henry L. Barnett in 1953. Subsequently, I have had the opportunity to have known all of the recipients of the Howland Award listed in your program, some of them intimately. Each of these men and women are part of our professional history. Each has made major contributions to pediatrics and to children. Each recipient of the award has added significant building blocks to the edifice we have learned to accept as the store of knowledge that contributes to the betterment of children. Nowadays, it is always very disheartening for me to mention to a resident, or even a post-doctoral fellow, a pediatrician of the past who has made major scientific contributions and to hear the response, "Who?", "I never heard of him—what did he do?" It is more disconcerting to observe people inventing the wheel primarily because of lack of knowledge of their scientific history. Because of this reaction, I believe we should view Henry and the Award in the context of pediatric history (2, 3).

Today's awardee typifies the credo of the Award that was first designated by the membership of the American Pediatric Society in 1951 and first awarded in 1952 to Dr. Edwards A. Park of the Department of Pediatrics, Johns Hopkins University. At that time, it was stated that the award would be given to an individual who "has contributed to the advancement of the study of children and their diseases, for prevention of illness and the promotion of health in childhood, for the promotion of pediatric education and research, and to honor those who, by their contributions to Pediatrics have added to its advancement." But who was Howland? What is the place of Henry Barnett in the history of pediatrics? Is there a relationship? Who is Henry Barnett? His work has permeated many fields; predominantly he has made major contributions to developmental aspects of kidney function in health and disease (4). His academic lineage and external stimuli provide insights into the history of the field. In this family of academic pediatrics, Henry is a great-grandson of John Howland (Fig. 1). His immediate mentor was Dr. Alexis F. Hartmann, Chairman of the Department of Pediatrics at Washington Uni-

versity from 1936–1964. He was preceded by Howland and William McKim Marriott. Howland was an exceptional organizer and trained many of the most important contributors in the field of metabolism and nutrition, including Lawson Wilkins, Edwards A. Park, James L. Gamble, Allan M. Butler, and Benjamin Kramer. These were the pediatric scientists who placed metabolism and electrolyte balance on the scientific map.

Howland received his training at a variety of institutions; his scientific impetus came from Graham Lusk and Emmett Holt Sr. at Bellevue. With these men he published some of the seminal works on energy metabolism in children. In 1911, Howland left Bellevue to become Chairman of the Department of Pediatrics at Washington University in St. Louis. He remained for a brief period, then left for the Harriet Lane Home within 6 months in 1912. There, Howland produced some of the giants of pediatrics; prominent among these was William McKim Marriott, a biochemical and nutritional scientist and a pediatrician. He left Baltimore to become head at Washington University. He concentrated on the problem of diarrhea and was the first to describe the acidosis of hypovolemia associated with diarrhea of infancy. A young biochemist by the name of Alexis F. Hartmann was stimulated by Marriott and as a result of his urging, Hartmann left biochemistry to enter pediatrics. After Marriott left Washington University, in the middle of the thirties, Hartmann became head of the Department and made a lifetime of contributions in electrolyte and sugar metabolism. He in turn stimulated our Howland Awardee, first to enter pediatrics, and then to concentrate on metabolic problems. It is interesting that both Hartmann and Barnett won the honorific Senior Gill Prize in Pediatrics at Washington University (Plate 1). It is clear that Barnett is truly a great-grandson of Howland, with an exceptional array of great-uncles. Three, James L. Gamble, Daniel C. Darrow, and Allan M. Butler, contributed the foundational concepts of what we now know and accept as basic principles underlying water and electrolyte metabolism and therapy for the young infant in distress. The fundamental importance of these studies stimulated Barnett to apply the techniques, developed just before by Homer Smith and others, to examine the renal mechanisms involved in the regulation of body composition in infants (5). He extended the studies to provide a deeper understanding of the function of the kidney during development (6). From this intense dedication to developmental renal physiology, a series of papers and books emanated over the next 40 years, papers that today are still quoted, are classic, and influence our thinking in renal excretory mechanisms in early life. In fact, in the published Proceedings of the First International Workshop on Developmental Renal Physiology, there is a simple and poignant dedication; it reads: "To Henry, who started it all" (7). Research concerning developmental renal physiology initiated at Washington University was vigorously pursued at Cornell and explored many aspects of renal function in young infants.

Barnett was born in Detroit, but when he was 6 months of age his family moved to Tulsa, Oklahoma where he spent his child-

hood (Plate 2). He attended Tulsa Central High School, was on the swimming team and was an interscholastic swimming champion, and dreamed of bringing home the gold.

Sadly, he never received an international award for his athletic prowess, but he has received many others, really too numerous

LINEAGE OF A HISTORIC PEDIATRIC FAMILY
(WASHINGTON UNIVERSITY - JOHNS HOPKINS)

Fig. 1. Academic lineage of Henry Lewis Barnett.

to mention. His mother, who graduated from the University of Michigan, had a great influence on him. She studied psychology with Alfred Adler in Vienna, and later did graduate work at Columbia University.

From Tulsa he attended Dartmouth for 1 year and then transferred to Washington University when the family moved to St. Louis. During medical school in St. Louis, he worked in a psychiatric institution for 3 years and seriously considered a career in psychiatry. However, the influence of Hartmann was to attract him into pediatrics, and he was stimulated by Milton Senn who was reaching out from serious studies in biochemistry to problems of child development.

Following service in the Army, he followed Milton Senn to New York Hospital. There, he was influenced by Samuel Z. Levine and Harry H. Gordon to continue his research in renal physiology and metabolism. But equally important, Levine and Gordon introduced him to concepts of biological development. These two pediatricians were pioneers in the documentation and investigation of the handicaps of the premature infant. However, interest in the behavioral and social sciences never left Henry; it was prominently manifested in his teaching and his patient care.

During this period of career indecision, Henry made the most important and constructive personal decision of his life (Plate 3). He met Shirley Blanchard, who was born in Brooklyn, where her family lived for a very short time before settling in Manhattan. She lived there, except for 3 years spent in Paris. She married Henry after only three dates, a decision that was critical to the remainder of his life.

The second great decision was to go into the Army, which he did in 1942. Through a series of events only partially explainable, he found himself in 1943 receiving detailed instructions in Santa Fe, New Mexico on how to behave on the mesa called Los

Plate 1. Department of Pediatrics, Washington University. Alexis F. Hartmann, first row, fourth from left; Henry Lewis Barnett, second row, fourth from left.

Alamos. He was assigned as base physician to the Manhattan Project. He remained there more than 2 years as the pediatrician for that remarkable community. While there, Shirley became secretary to Robert Oppenheimer. They formed close lifelong attachments with the greats of theoretical physics: Oppenheimer, Rabi, Fermi, Morrison, Serber, and many others. He was present

Plate 2. Henry Lewis Barnett, age 2½, and his sister Muriel Barnett Schlosberg, age 4.

at Alamogordo, New Mexico for the first atomic explosion and was a member of the first medical team to go to Japan following the tragic event of Nagasaki. What a humbling and sobering experience. Few of us have the opportunity to be on one thread of history but to be on two is rare, indeed. It influenced Henry tremendously and today he is an active member of the important organization, Physicians for Social Responsibility. In addition, his scientific analyses give evidence that the crisp and creative thinking of these great minds of physics did have an impact. We have now covered three facets of the personality construct of Henry L. Barnett.

With these backgrounds, he came to Cornell and developed his own cadre of disciples and associates. His first papers at Cornell were further studies on renal concentrating mechanisms in young infants (8) the excretion of sodium and potassium in the adrenogenital syndrome (9), and the effect of ACTH on the tyrosyluria of the premature infant (10) (Plate 4). This latter study stimulated the subsequent work accomplished by others (11) on steroid induction of enzymes ranging from those involved in amino acid and carbohydrate metabolism to the induction of enzymes required for the synthesis of surfactin. He continued to follow the trail of functional development of the kidney and made major new contributions.

After these nine scientifically fruitful years at Cornell, he entered the arena of administration in 1955 and accepted the position as Chairman of the Department of Pediatrics at the newly formed Albert Einstein College of Medicine. During his tenure from 1955 to 1972, he shaped this department into one of the great care and training centers for pediatrics in the nation. Many diverse contributions emanated from intense departmental activity and pediatric nephrology and studies of many aspects of human development attained great heights.

In 1970, Henry decided to take a step deeper into administration and he became an Associate Dean. Certainly the early turbulent 1970s was a time to hide from, rather than undertake administrative tasks in, a university. This adage was particularly true in the cauldron known as the Bronx. At this time, there was a major eruption at schools throughout the country including Einstein, and Henry, as usual, maintained his high principles. He returned to the Department of Pediatrics with the honorific title of University Professor. It is really amazing that he found the energy during this period to edit the renowned textbook, *Pediatrics*. A statement in the front of the 15th edition reads "This volume represents the Fifteenth Edition of Holt's Diseases

Plate 3. Henry and Shirley Barnett, 1944.

Plate 4. Patient with Eleanor Roosevelt and Dr. Henry L. Barnett.

SEVEN STEPS IN THE DEVELOPMENT OF THE COMPLETE PEDIATRICIAN
(Henry Lewis Barnett)

¹UNITS AND DISTANCES ARE OFTEN ARBITRARY AND INDEFINITE

Fig. 2. Seven steps in the career of Henry L. Barnett.

of Infancy and Childhood, originally written in 1896 by the late L. Emmett Holt, Professor of Diseases of Children at Columbia University from 1901–1923. Associated with him in several revisions was John Howland, Professor of Pediatrics at Johns Hopkins University from 1912–1926. From 1927–1962 L. Emmett Holt, Jr. and Rustin McIntosh were responsible for its revision. In 1962 they shared the responsibility with Henry L. Barnett, who, since 1968, has carried it alone.” Again, we see a direct line linking Barnett with Howland.

The fourth career was initiated during the seventies, stimulated by a 1-year sabbatical spent at the London School of Hygiene and Tropical Medicine. Here, he was introduced to the disci-

plines of epidemiology and statistics. This event was to guide him, in part, in his endeavors until the present. He states that his motivation for pursuing this direction was not only a deep concern for the importance of this discipline to clinical pediatrics, but to try “to bring scientific evaluation to clinical endeavors and to have a field that was more compatible with age.” His decision has borne fruit in the form of the International Study of Kidney Disease in Children, an extremely tight, careful, epidemiologic study of clinical trials of therapy of the nephrotic syndrome and other renal diseases. The study (12) involves investigators from the United States, Mexico, Israel, Japan, and European countries. He developed an exceptionally close rela-

tionship with associates in Japan. A statement in a letter from his close friend and admirer Professor Fumio Yamashita is "I would say that you are like Admiral Perry who visited Japan on a black ship in 1853 and opened our country to the international community." In addition, he has applied his acumen in epidemiologic investigation to the complex entity known as sudden infant death syndrome. As a result of this new dedication, the language of our awardee was renovated, and words like stratification, randomization, significance, and cohort have now become prominent in his speech replacing GFR, electrolytes, sodium-space, and solute-load.

In 1981 he became Emeritus Professor, and retired from the world of kudos, "approved but not funded," and "how many papers do you have" to his new career in child health and welfare as Medical Director of the Children's Aid Society, New York. In a sense, this is a culmination of all that has gone before. It is an opportunity to apply the various stimuli received from his mother, the exposure to tragedy as epitomized in Nagasaki, the critical eye of the scientist, the background of the clinician, and the analytic approach of public health and epidemiology.

What have we, then (Fig. 2): Henry the athlete, the psychologist, the renal physiologist, the department chairman, the clinician, the administrator, the writer, the epidemiologist, the husband and father, and now the violinist? My answer is no. None of those singly, but all together make Henry L. Barnett, the scientist-philosopher pediatrician an heir of Howland, Marriott, Hartmann, and Levine, prepared to take his place with his illustrious predecessors, the previous Howland awardees.

Colleagues, I give you Henry L. Barnett, the compleat pediatrician.

All the world's a stage,
And all the men and women merely players.
They have their exits and their entrances,

And one man in his time plays many parts,
His acts being seven ages.

William Shakespeare
As You Like It
Act II, Scene 7

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Acceptance of the John Howland Medal and Award of the American Pediatric Society for 1984

HENRY L. BARNETT

The Children's Aid Society New York, New York 10017 and Albert Einstein College of Medicine, Bronx, New York 10461

I am very grateful to the members of the American Pediatric Society for selecting me for the John Howland Medal and Award for 1984. My pride and pleasure in receiving it are heightened by the fact that just 20 years ago I had the honor to introduce my teacher and cherished friend, the late Samuel Zachary Levine, to receive the Award. It is enhanced further by my being introduced today by my dear friend, former student, and also my teacher, Norman Kretchmer. I'm very pleased, too, that the Award was presented to me today by Joseph Dancis, who knew my wife Shirley, though not in the biblical sense, before I met her 45 years ago.

Dr. Kretchmer has alluded to Shakespeare's description of the seven ages of man. In a remarkable address to students entering Cornell University Medical College in 1958, Dr. Levine used this concept to describe the seven ages of medical man that he believed traced the evolution of a physician. Today, I have tried

to recall the stages involved in my own evolution as a physician. Norman has presented his very generous assessment of my professional career. In response, I would like to reveal my own recollections of the personal motivations and satisfactions that determined it. Working now in a child welfare agency, I have wondered especially how much the social value of my work influenced my career choices.

All of us in medicine, and especially in pediatrics, have the satisfaction that we are contributing to the health and well being of others and this assures us, in a sense, that our work is socially useful. However, I suspect that the choices determining the course of our careers are probably motivated less by this general belief in our social usefulness than by the immediate gratifications we get from what we do.

I cannot recall when, or even why, I became certain that I wanted to be a physician. I assume that, among other reasons, I