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DICKINSON WOODRUFF RICHARDS
1895—1973

A Biographical Memoir by
ANDRÉ COURAND

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Biographical Memoir

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Dickman W. Richards

DICKINSON WOODRUFF RICHARDS

October 30, 1895–February 23, 1973

BY ANDRÉ CURNAND

*It is only when Death builds its frame
around life that the portrait of a man
is really hung on a wall.*

HENRY JAMES

*True friends create the charm of life,
their passing, its bitterness.*

ANONYMOUS

MODESTY AND GREATNESS seldom harmonize in one individual. Dickinson Woodruff Richards (“Dick”), to whose memory this biographical sketch is dedicated, is one of those few in whom these apparently opposite qualities balanced one another.¹ Although modest to the point of shyness, he implemented his natural intellectual gifts through strong character and hard work, reaching the heights in whatever he undertook—whether as a schoolboy, college and medical student, physiologist, medical scientist, clinician, chairman of a teaching service in a municipal hospital, organizer of two research laboratories in the field of cardiopulmonary physio-

¹ The following account of my friend’s life and works is derived from several briefer ones I published after his death at the request of societies to which he belonged. It first appeared in my autobiography, *From Roots . . . to Late Budding* (New York: Gardner Press, Inc., 1986), pp. 165–182.

pathology at the College of Physicians and Surgeons of Columbia University, medical consultant to a leading pharmaceutical firm, adviser to the Committee of Medical Research (CMR) of the Office of Scientific Research and Development (OSRD), educator, historian, reformer, or humanist.

This essay by his friend and close collaborator for more than forty years will evoke Dick's life and his fundamental contributions in these many and diverse situations in an attempt to recreate, ten years after his death, the image of a man who achieved greatness by exacting perfection of himself in whatever activity he was engaged.

A retrospective overview of a man's life may lack objectivity when attempted shortly after his death, feeling then prevailing over critical and well-documented judgment. In this last of many tributes to my friend, the essential features of his character and accomplishments will be derived from my personal recollections, from information tendered by members of his family, and by a number of his colleagues and students. Dick's correspondence, and his published and unpublished writings, will also contribute.

FAMILY BACKGROUND: CHILDHOOD, SCHOOL,
AND COLLEGE EDUCATION; MEDICAL AND
PHYSIOLOGICAL TRAINING (1895-1928)

Dickinson W. Richards was born October 30, 1895, in Orange, New Jersey. His ancestors on both sides had settled in New England (Massachusetts and Connecticut) during the seventeenth century. His paternal grandfather was a Congregational minister, as was one of his uncles, and his father was a lawyer. On his maternal side, among the Lamberts, physicians prevailed. His grandfather practiced general medicine in New York City after medical training at Bellevue, then the city's largest municipal hospital. His three uncles achieved leading positions in the medical profession. All three were

connected either with Bellevue Hospital or the College of Physicians and Surgeons, or both.

Dick himself has this to say about the opposite traits of character to be found in both lines of forebears, all of whom were New Englanders sharing a common tradition. On his father's side he saw them as "believers; conformist; non-curious; judicious, steady, firm; noninnovators; meditative, nonscholarly" and on his mother's side, "nonbelievers, non-conformists; curious; vigorous, quick-tempered; innovators, crusaders; scholarly, nonmeditative." The harmonious selection among both sets of traits was evident in Dick's own character and behavior.

Already in his early life are found traces of the distinctive aspects of his personality: innate shyness and modesty, an enormous capacity for work, and the natural bent of a scholar. Dick's modesty did not interfere with the development of his aptitude for learning. A picture of the schoolboy and student at the Hotchkiss School in Lakeville, Connecticut—where, following a family tradition, he received a classical education in the humanities: English, Greek, and history—is drawn from the testimony of a classmate, William Albert Olsen, who later became his brother-in-law: "At commencement, it became automatic that Dick would be called to the platform to receive handsome books for being first in every course he took. He literally walked off with an armful of prizes!" On the wall of the study hall still remains the inscription: *Dickinson Richards, Jr., 1913. Total Year Average: 93.4.*

When he entered Yale University as an undergraduate, he was following a tradition upheld by all the young men among his forebears, whether Richardses or Lamberts. According to Bert Olsen, "He won the Hugh Chamberlain prize for Greek entrance examinations with the highest mark ever obtained." Dick used to communicate in ancient Greek with his room-

mate Bellinger (who later became a professor of Greek at Yale), discussing in this language everyday problems arising in college. Professor Bellinger, recalling his friendship with Dick, stated that, "when evaluating any [other] man, he always used the scale of D.W.R., set at 100."

While at Yale, in addition to pursuing his studies in the humanities, Dick acquired a good background knowledge of mathematics and natural sciences, and, as Olsen reported, "led his entire class in grades throughout his undergraduate years." Yet these scholastic achievements did not deter him from finding time for extracurricular or athletic activities. At both institutions he was editor in chief of the school journal. At Hotchkiss he received his letter in high jumping; at Yale he shifted to rowing, but was unsuccessful in his attempt to make the varsity squad.

After graduation in 1917, Dick joined the army and, in 1918, near the end of World War I, crossed the Atlantic with an artillery unit in which he served as lieutenant. Upon his return from Europe and discharge from the service in 1919, the time came for Dick to decide on a career. His choice was the medical profession—not surprising, given a grandfather and three uncles who had responded to similar calls! Dick entered the College of Physicians and Surgeons in 1919. Owing to his enormous zest for work, he not only completed his medical studies brilliantly, obtaining his M.D. in 1923, but also his master's degree in physiology at the end of his third year under the guidance of Professor Ernest L. Scott. Forty-three years later, in 1966, Dick paid his debt of gratitude to his first teacher of physiology by bringing to light documents, totally ignored until then, upon which Scott's Ph.D. thesis had been based: The data collected back in 1911 clearly demonstrated the favorable effect of a pancreatic extract, which he had prepared, upon depancreatized dogs.

After graduation he continued his training in medicine as

an intern and as a resident in medicine at the old Presbyterian Hospital from 1923 to 1927. During this period he formed close friendships, which proved to be lifelong, with Robert Loeb and Dana Atchley. Both were members of the staff of Presbyterian Hospital, newly affiliated with the College of Physicians and Surgeons. Both of these gifted friends guided Dick's earliest footsteps in hospital practice and clinical investigation.

However, the men who most affected his mind and actions in these years were, by his own account, two outstanding physiologists from whom he derived his grounding in physiological research and his approach to scientific medicine and clinical investigation, which would shortly rival the basic knowledge acquired earlier in the century. Of their early influences, Dick said: "A man's mind and his actions are chiefly molded by a very few. For me, in the early years, these were Lawrence J. Henderson and Henry Hallet Dale."

Although Dick never worked in the Fatigue Laboratory, created at the Harvard Business School by L. J. Henderson, the professor's influence on and interest in the budding physiologist were strengthened by numerous exchanges of letters and by Dick's frequent visits to Cambridge, Massachusetts. These exchanges had been facilitated by Dick's Yale classmate and friend Cecil Murray. It was from Henderson that Dick derived what was to be the guiding idea of his work in human physiology and physiopathology. To his influence must be traced one of Dick's earliest publications (in 1927), "The Oxyhemoglobin Dissociation Curves [curves defining the affinity of hemoglobin for oxygen at various pressures] of Whole Blood in Anemia," which supplied the first experimental evidence of a disease-induced decrease in the affinity of hemoglobin for oxygen in man.

Under Henderson's tutelage Dick published three papers during his residency: one on the circulatory adjustments in

anemia; another on the blood flow through the lung and systemic circulations, quantitatively defined (for the first time) in a patient with tetralogy of Fallot; and a third one on the influence of posture upon the mechanics of blood flow.

On several occasions Dick Richards paid tribute to Professor Henderson as his mentor in physiology and his ideal as a scientist. The most notable of these was Dick's speech at the respiration dinner of the American Physiological Society held during its meeting in Chicago, in April 1957. Here, Dick offered the following portrait:

It seemed to me he was quite a bit like Socrates, the Socrates of those early dialogues when he was young and lively, poking fun at aged philosophers and straining the wits of young ones. . . . It may as well be said now as later that in spite of his complete freedom of mind, in personal demeanor Henderson was always *most courteous and considerate*. That Jeffersonian phrase, "a decent respect for the opinions of mankind" applied well to his manner of life. . . .

Dick's description of what it was like to discuss actual work in progress with Henderson vividly depicts their personal relationship at this early time:

What would happen was something like this. You would work and strive to put your experimental ideas together, then go to the Professor and tell him about them. He would then either decapitate your entire brainchild in a single whistling sentence, or else take about three more sentences to put your ideas in order for you, and you would come back and start to work. Then (after a while) you would go back again with what you had done, and again, with great kindness, yet with still the same unsparing critique, he would take your work apart. If there was anything left, after he finished with it, you would feel elated and go back and try some more.

At the end of his residency, Columbia University awarded Dick a research fellowship to work at the National Institute for Medical Research in London, England, during the period 1927 to 1928. There he worked under the guidance of Henry

Dale. Looking back on this period of training in experimental physiology, Dick had this to say about his British mentor:

[Sir] Henry Dale could theorize, too, but his [mind] was [as compared with that of L. J. Henderson] different. Dale was primarily an experimenter and continued this through almost all his active years. . . . On a day when an experiment was planned, Collison, the head technician, would start at some time in the dark British predawn; Walter [Bauer]² and I would arrive about nine . . . we were working on the dog's hepatic circulation. Just as we reached the key point of cannulating the blood vessels and bile duct, the laboratory door would fling open, and Sir Henry (Dr. Dale as was then) would come charging in, often in morning coat and striped trousers, grab a lab coat off the hook, and be with us in seconds. What is more, he would stay until the experiment was finished, whether at tea time, dinner time, or later.

As it happened, it was in the spring of 1928 that the concept of the chemical transmission of the nervous impulse was born. Our job in this was the simplest, to test in cats the vasodilator principle—supposedly histamine—in extracts of horses' spleen. I recall one afternoon when the testing was finished, I had some extract left over, and I went on to acidify and then alkalize samples of it and test them again, to find, suprisingly, that on the alkaline side of neutrality all vasodilator activity disappeared. This would not occur with histamine, but would with acetylcholine. I reported this to Dr. Dale at tea that day, and he said, "Hmm," no more. But this was clearly one small addition to many things he had been thinking about, because only a few days later he began to construct for us the possibilities of acetylcholine as a biological agent. The generation of a great idea in a first-class research mind, over months and years, is a remarkable thing.

One can only admire the way Dick modestly neglects to emphasize his own role, a trait that was so significant throughout his entire scientific life. In any case his work in Henry Dale's laboratory was sanctioned by the publication in the *Journal of Physiology* of two papers, one in collaboration with Walter Bauer on the vasodilator effect of acetates, and

²Bauer was another American research fellow with whom Dick maintained a life-long friendship.

the second in collaboration with Walter Bauer and Henry Dale on the control of the circulation in the liver.

More significant for his career as an investigator, Dick's training in Dale's laboratory was to prove of particular value in later years when he familiarized himself with the technique of right-heart catheterization in experiments on dogs and in a chimpanzee.

At the end of the tenure of his research fellowship, Dick Richards returned to New York. In 1928 to 1929 he began his career as a clinician, teacher, and independent clinical investigator, pursued entirely at the Columbia-Presbyterian Medical Center and at the Columbia University Division of Bellevue Hospital until his official retirement.

EARLY CLINICAL INVESTIGATIONS (1928-1932)

Upon his return from London in the fall of 1928, Dick was to join the other members of the Department of Medicine in the newly created Columbia University-Presbyterian Hospital Medical Center as an assistant in medicine and assistant physician. The members of the department, under the chairmanship of Walter Palmer, included one of the most brilliant groups of fulltime investigators, clinicians, and teachers in North America.

Dick turned to the problem of how to equilibrate O_2 and CO_2 in a lung-bag system in order to estimate their concentration in the mixed venous blood. A first application of the method, known as "indirect Fick," was to study the effect of therapeutic pneumothorax upon the pulmonary blood flow. It so happened that this investigation was to play an important role in Dick's personal life as well. A young graduate of Wellesley College, Constance Riley, came to work in Dick's lab as a technician. They became engaged in 1930 and married in September 1931.

A survey of Dick's scientific activity after his return from

London is not limited to the research already mentioned. In 1929, in collaboration with Alvin Barach (a part-time member of the Presbyterian Hospital clinical staff), he initiated a series of investigations, pursued during the next five years. The studies concerned the effects of oxygen therapy in chronic cardiac and pulmonary diseases, including cardiac failure, pulmonary tuberculosis, pulmonary fibrosis, and emphysema. Dick was well prepared for these studies since they had as their particular focus of interest the effects of oxygen therapy on serial blood respiratory gas and electrolyte responses. For the first time, they observed the seemingly paradoxical response to O_2 therapy in certain pulmonary diseases (fibrosis and emphysema) of a high CO_2 tension that developed as a result of the relief of hypoxia followed by reduced ventilation.

THIRTY YEARS OF COLLABORATION WITH A. COURNAND

(1932-1961)

To Dick himself should be left the occasion to present, in his own terms, how he envisioned the long period of his collaboration with me. This purpose will be served by reference to the contents of a letter he wrote in December 1972, to Julius Comroe, a distinguished colleague who since the mid-1940s had greatly contributed to pulmonary physiology and pathophysiology. In this letter Dick established the natural sequence of his investigative work. The first sequence, termed by Dick "Blood and Circulation," deals with the investigations mentioned previously during the period 1922 to 1932. The second sequence is the signal of his extending interest from "Blood to Lung" in order to cope with "neglect of lung performance by cardiocirculatory physiologists." This latter period stretched from 1932 to 1942. A series of tests and the equipment these necessitated were devised for the analysis of the various components of the pulmonary func-

tions as they were observed in normal subjects in whom standard measurements were established and in patients with various forms of chronic pulmonary diseases.

The beginning of the third sequence, from 1940 to 1961, termed by Dick "Lungs, Blood, and Circulation," is heralded by the introduction into clinical investigation of the technique of cardiac catheterization. This additional technique enabled the exploration of the dynamics of the cardiac functions—output, filling and ejection pressure, pulmonary and systemic blood flow. In association with implementation of the techniques established during the previous periods, the new technique heralded the crowning fulfillment of the plan laid down for him by his mentor, L. J. Henderson, allowing the description of the successive phases of respiratory gas transport from the atmosphere to the tissues in normal humans as well as in an almost limitless variety of diseases.

Our daily collaboration over several decades provided a unique opportunity for observation and insight. To begin with, my recollections, vivid in my mind, are of his display of technical skill—he was truly ambidextrous—and efficiency; of his care and caution in studying human subjects; of his implementation of self-experiment in the true tradition of the British and Scandinavian respiratory physiologists; of his foresight and careful planning, which included taking advantage of the unexpected and stressed methodological innovations; and of his thorough knowledge of medical literature, current and classical.

For all his affability, even temper, and friendliness, Dick was a hard taskmaster and a demanding teacher, always probing the prior question, exacting high accuracy in the collection of data and strict objectivity in their interpretation. He expected from his associates, if not the perfection, then at least the work pace that he set for himself. Indeed I recall my mixed feelings when confronted by a deluge of books,

manuscripts, and reprints fed to me in our early meetings and during my initiation into the many techniques I was supposed rapidly to master.

Dick Richards's contributions to medical research were not limited to physiology and physiopathology. In 1934, without any letup in his other activities, he became medical advisor to Merck's research organizations. His expanding knowledge of medical science and medical affairs was a great asset in formulating therapeutic research policies. These policies were particularly fruitful during World War II, as they led to close cooperation among scientists in government, industry, and the universities. They also led to a valuable reduction in the time lag between discovery, clinical testing, and practical use of such agents as drugs, antibiotics, and vitamins.

At the end of the war, in 1945, he became the head of Columbia University's First Medical Division at Bellevue Hospital; at the same time he was promoted to the fulltime Lambert Professorship of Medicine at the College of Physicians and Surgeons. In these functions he gave his full measure as a leader in clinical medicine. One of his former residents, Thomas Q. Morris, recalls him as a teacher of physicians in these terms:

Members of the Bellevue Hospital House Staff who made rounds with Dr. Richards saw him as a multifaceted man—clinician, teacher-scientist, and chief-of-service. His impact on physicians in training can be fully appreciated only in his meld of these three roles. As a gentle clinician—concerned in the utmost for the comfort of his patient, but, above all, the master of clinical judgment—able to discern the proper course in a labyrinth of clinical and laboratory data though never reluctant to seek consultative advice. As a teacher-scientist—applying principles and results of research to interpretation of clinical phenomena and toward improved medical treatment, and awakening investigative potential in residents and interns through his attitude of constant inquiry. And finally as chief-of-service—always available to members of his house staff, fostering an at-

mosphere conducive to the happy blend of excellent patient care and fruitful clinical investigation, and willing (and able) to do combat with the administrative structure of a municipal hospital system.

Indeed, as a member of the Bellevue Medical Board, Dick was outspoken and unyielding in his criticism of the city's neglect of its hospitals and in his efforts to bring to bear pressure to oblige the city to erect a new hospital building. On the occasion of his retirement in 1961, he received, as a commemorative gift from his colleagues, a bronze replica of the casting surrounding the elevator call buttons in the ancient (dilapidated) A and B Buildings of Bellevue.

Dick's retirement was, of course, anything but that. Around that time, with Alfred Fishman's help, he was deeply engaged in the planning and editing of the book *Circulation of the Blood: Men and Ideas*. An unrelentingly critical, albeit sympathetic, editor Dick was perhaps the most severe judge of his own thought and expression.

His last ten years, without letup, were devoted to multiple scholarly undertakings and to a quest for a more decent world and a safer environment.

To the medical historian we owe a deep and illuminating knowledge of his two medical heroes, Harvey, the scientist, and Hippocrates, the practicing physician and natural philosopher; and the creation and implementation of a program of teaching in biomedical history that emphasizes men and ideas rather than facts and chronology.

One of D.W.R.'s most notable achievements was to discover what his hero, Hippocrates of Cos, looked like and who he was. This search for an authentic portrait of Hippocrates and his interpretation of the famous First Aphorism, "Life is short, art is long, opportunity fleeting, experiment treacherous, judgment difficult," are landmarks in the field of anthropological detection and testament to his perseverant curiosity and profound knowledge of the Greek language. An

article published in the June 17, 1963 issue of the *Journal of the American Medical Association* recounts the story of the discovery and identification of a marble bust of Hippocrates in 1940 near the ruins of Ostia Antica, a seaport of imperial Rome. The word-by-word analysis of the quartet of epigrams forming the first part of the First Aphorism was published in the 1961 issue of *Perspectives in Biology and Medicine*.

Richards, a science philosopher, proposed a system of diseases in which recognizable biologic trends have nonhomeostatic properties: the excessive, the defective, and the inappropriate. He also rejuvenated the Platonic concept of Taraxis, or disorder, which our whole human experience imposes on the interpretation of environmental phenomena and the events of life. He emphasized that the chaos, the senseless, and the suffering lead in medicine to the reestablishment of order.

In many lectures, Richards, the reformer, advocated new methods of medical teaching, stigmatizing the pretension of man to become the Lord of Creation without anticipating the consequences of his ill-used power over nature.

In the humanist we can admire a sense of the human, which is not a mere orientation of the intellect but a profound attitude involving the entire being. In the reformer, we admire the man concerned with the consolidation of the promise of the future and the limitation of its threats.

But life was not only work; it was also relaxation in the country surroundings where Dick brought up his four daughters. Each summer he enjoyed his return to the large and simple house built by his parents on Lake Sunapee in New Hampshire. There, many years ago, a lonely foreigner, sitting at the table over which Dick's mother presided, discovered and enjoyed the comforting and warm spirit of a closely knit American family. In this setting also, roughing it along the trails of the White Mountains, grew and ripened a

friendship, of which, on another memorable occasion, I said that "its essence was not to look in each other's eyes, but to look in the same direction."

Late in his retirement, he published a small volume, *Medical Priesthoods and Other Essays*, that contained those of his lectures he believed to be entertaining and to express his general ideas on medicine and the physiology of the heart and lungs, as well as on other topics. In this volume, in line with his dominant intellectual concerns, we hear him commenting on the relegation of a stethoscope to a display case in a university hospital:

Let us pause for a moment and contemplate this humble little device, the stethoscope, by and for itself. Look at it as it hangs on its hook, with its ears up and its rubber legs twisted.

Has anyone ever commented how remarkably in this posture it simulates the snakes of the caduceus, the symbol of our friend Aesculapius? Well, one can say that in this particular posture it is indeed equally symbolic, and equally useless with the aesculapian wand.

But now suppose we put the thing into operation. There occurs a metamorphosis. . . . This ancient and outdated instrument of nickel, rubber, and plastic has one attribute that transcends all the laboratories that ever were or ever will be built. In order for the stethoscope to function . . . there has to be . . . a sick man at one end of it and a doctor at the other. The doctor has to be within 30 inches of his patient. It won't work by long distance telephone, or by word of mouth through half a dozen intermediaries, or by radio, or by television, or in a dry clinic, or even in a committee. . . . We are concerned over the widening gap between the clinic and the laboratory, the interest in the measurement and the neglect of the person. . . . Be assured that I am in no sense arguing against the physician working in the laboratory. But once a physician does take upon himself the responsibility for a patient's care, he becomes a different man. He accepts a social discipline. He must define the problem anew . . . in each particular case. . . . Human suffering pervades the whole sick man, and this whole must be cared for. Hippocrates said it more clearly . . . than anyone: "It is necessary for the physician to provide not only the needed treatment, but to provide for the sick man himself, and for those beside him, and to provide for his outside affairs."

In *Medical Priesthoods* there also were two of his writings on Hippocrates, long of interest to him and now, according to his preface, his "chief preoccupation." In one of these essays, "Hippocrates and History," he succeeded in weaving into one fabric his dominant intellectual concerns—those of physician, classical scholar, humanist, and social critic.

One facet of Richards—the social critic—I have already mentioned in connection with his effort to provide a better plant at Bellevue. Important as this was, it would not do to leave the matter there, for like his uncle Alexander Lambert, who in the 1920s urged that the medical profession develop what we today would no doubt term new models of health care to better meet the needs of the population at large, Dick was not always content with existing patterns of practice.

To my mind this illustrates one aspect of Dick's extraordinary progression: the child and young man, brought up in a New England tradition, from early on demanding perfection of himself, presenting a rare example of a happy marriage from which issued four daughters and many grandchildren; mastering medicine and contributing substantially to cardiopulmonary physiology; withstanding with easy grace the challenge to personal integrity occasioned by the highest recognition afforded scientists and physicians; remaining the man formed by his early training, education, and culture, and yet going far beyond them, as reflected in one sense in the above statement and in another in his inspired new understanding of Hippocrates.

As I noted at the outset, Dick's modesty remained fundamental throughout his life. When he was awarded the Nobel Prize in Physiology or Medicine in 1956 and the Kober Medal in 1970, he converted each occasion into one for the detailed appreciation of the work of his colleagues and peers. Proffered many doctorates *honoris causa*, he accepted but two: one from his *alma mater* and the other from the univer-

sity with which he was to be connected for more than fifty years.

In the task of paying a last tribute to my friend, I have been guided by what appeared essential in the man. And yet I have not touched on his enormous correspondence, couched in his fine, precise writing, which he sustained on a multitude of topics with scientists, philosophers, historians, colleagues, former students, and friends. Nor have I listed all the honors, endowed lectureships, editorships, committee memberships, and organizational assignments bestowed upon him. Such an enumeration would not have satisfied his deliberate avoidance of easy effects.

What, then, of the essence of the man? With Alfred North Whitehead and Shmuel Sambursky, Dick affirmed that the “language of Science is incapable of application to, or use in the description of, the qualities of consciousness.” To characterize “man’s essence—actual” he cited, with his deeply felt pessimism, *Measure for Measure*:

. . . man, proud man,
Drest in a little brief authority,
Most ignorant of what he’s most assured,
His glassy essence, like an angry ape,
Plays such fantastic tricks before high heaven
As make the angels weep.

And of “man’s essence—ideal” he wrote to me, “Man’s potentiality, or in these days his survival, will depend on his consciousness, more specifically his conscience, more specifically still, the ability of the leaders and their followers to change character, into *more merciful beings*.” If one believes, as he did, that science is of no use in the description of the transformation of which he writes, those who knew him may yet feel that his character provides an example of what can be accomplished.

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