

Richard Henry Barnes

June 29, 1911 — November 16, 1978

Richard Henry Barnes came to Cornell in 1956 as director of the School of Nutrition, which was then an endowed unit of the University. From that time onwards his guiding role in the development of nutritional science became increasingly apparent. Under his leadership an outstanding program of graduate education in nutrition was established at Cornell. Soon after Dick arrived on the Ithaca campus, the name of the School of Nutrition was changed to the Graduate School of Nutrition. Dick was dean of the school from 1956-73. The graduate teaching and research program of the school flourished through his foresight in bringing together a multidisciplinary core faculty including not only nutritionists with expertise in animal nutrition, public health nutrition, and international nutrition but also biochemists, physiologists, physicians, a food economist, and a psychologist.

In 1973, when it was decided to amalgamate the Various nutrition units at Cornell to form the Division of Nutritional Sciences, Dick stepped down as dean and was appointed the James Jamison Professor of Nutrition.

Born at LaJolla, California, in 1911, he received the Bachelor of Arts degree in chemistry at San Diego State College and then worked for four years as a research chemist at Scripps Metabolic Clinic at LaJolla. In 1937 he went to the University of Minnesota where he was granted the Doctor of Philosophy degree in physiological chemistry in 1940. After obtaining his doctoral degree, he stayed at the University of Minnesota until 1944, first as an instructor and then as an assistant professor.

Dick joined the Medical Research Division of what was then the Sharp and Dohme Company in 1944 as a biochemist, where he became associate director of research in 1950. In 1955 he was appointed director of biochemical research for the combined laboratories of Merck, Sharp and Dohme.

From his early career onward, Dick maintained a deep interest in the role of microorganisms on the nutritional state of the host. After he came to Cornell, his work in this field was carried out with outstanding success due to Dick's genius for meticulous experimental design and the outstanding technical skills of his associate, Eva Kwong. Major advances made through this research program were in the development of a better understanding of the limitations as well as advantages of using the laboratory rat in nutritional research. While it was previously known that the intestinal microbial synthesis of vitamins contributes positively to the nutritional economy of the rat because these vitamins are recycled by the process of coprophagy, Dick discovered the extent to which coprophagy prevention as well as administration of antibiotics altered the rat's nutrient requirements. In the course of these

studies, he devised methods to monitor changes in gut microflora by examination of urinary metabolites. These techniques were later applied to studies of factors influencing the microbiological degradation of nutrients in human subjects.

Dick taught that major problems in nutrition can best be solved by a multidisciplinary approach, and in his further studies he put his teaching into practice. About five years after he came to Cornell, Dick developed an interest in relationships between early malnutrition and learning disability. Tracing the development of his own investigations in this field serves to illustrate his particular genius for collaborative research. Through a close association with the distinguished Mexican nutritionist, Dr. Joaquim Cravioto, he learned of the defect in cognitive and emotional development that follows severe protein-energy malnutrition in infants and young children. In the early 1960s when Dick first addressed this problem, the causes of retardation in these children were not well understood. Current theories were that early food deprivation caused damage to the developing brain or that infants and children who were malnourished were also socially disadvantaged because they came from impoverished households where there was a lack of stimulation and a reduced opportunity to satisfy their emotional needs. Dick believed that a new understanding of the respective roles of malnutrition and other environmental factors in determining mental development could be gained by animal experimentation. Choosing weanling rats and pigs as animal models for the human condition, he had to develop techniques to produce states of protein-energy malnutrition that were analogous to those occurring in children, and he had to have testing procedures available that would permit valid behavioral testing.

In order to produce marasmus and kwashiorkor in baby pigs, Dick obtained the collaboration of Wilson Pond, who had broad experience with nutritional studies in swine. Behavioral tests for use with the pigs were newly developed by Ulric Moore, whose experience was in psychological techniques, and later David Levitsky, who was also trained as an experimental psychologist and worked with Dick to develop sensitive tests that indicated change in the exploratory activity of young rats that had been malnourished.

Important findings were that the effects of early malnutrition resembled those of environmental isolation and that animals that have been malnourished are less accessible to training. Evidence was also obtained that environmental stimulation may reverse or diminish the adverse effects of early malnutrition on behavioral development.

Although most widely recognized for his research, Dick became interested in the 1970s in nutrition policy and the translation of scientific studies into public policy. His work on various committees, including the Food and

Nutrition Board of the National Academy of Sciences National Research Council, and his consulting work reflected these new interests.

From 1959 to 1969 Dick was editor of the *Journal of Nutrition*, and the editorial office was in Savage Hall.

Dick made outstanding contributions to a number of professional organizations. He was chairman of the Division of Biological Chemistry of the American Chemical Society from 1951 to 1953. During 1968-69 he was president of the American Institute of Nutrition, and during 1973-74 he was president of the American Societies for Experimental Biology.

Honors conferred upon him included the Borden Award of the American Institute of Nutrition in 1967 and the Conrad Elvehjem Award for Public Service to the American Institute of Nutrition in 1975. Also in 1975, a special symposium was held in Dick's honor at Cornell, at which outstanding investigators in the field of malnutrition and mental development were brought together.

Dick maintained a deep interest in his graduate students and kept up a lively correspondence with many of them after they completed their studies at Cornell.

His wonderful family life was an inspiration to all of us who visited him in his home. He died on November 16, 1978, after an extended illness most bravely borne. He is survived by his devoted wife, Marjorie, their three daughters, Kyle, Anne, and Lisa, and four grandchildren.

Michael C. Latham, Donald B. McCormick, Daphne A. Roe