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WALTER JOSEPH MEEK  
*1878—1963*

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*A Biographical Memoir by*  
CHANDLER MCC. BROOKS

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*Biographical Memoir*

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## WALTER JOSEPH MEEK

*August 15, 1878–February 15, 1963*

BY CHANDLER McC. BROOKS

WALTER J. MEEK belonged to the generation of exclusively American-trained biomedical scientists that first demonstrated the competence of American scholarship and raised the level of American attainment in physiology to rival that of any other nation of the Western World. He was a member of the distinguished group of scientists who founded the University of Wisconsin's School of Medicine and established its high repute. At present and in the future, all who review the accumulated knowledge of the heart, especially the origin of the heartbeat, will refer to papers bearing the names of Walter J. Meek and his students and associates. Those who have written of Dr. Meek and their acquaintance with him have emphasized, rather than his scientific accomplishments, his extraordinary qualities of intelligence, industry, integrity, warmth of personality, and loyalty to family, medical school, friends, and his profession. He was held in respect and affection by his colleagues young and old.

Walter Joseph Meek was born in Dillon, Kansas on August 15, 1878, the son of William E. A. and Mary Hester (White) Meek. He was of Scottish, English, and Irish ancestry. It is not known exactly when the ancestors of the Meek family emigrated to America, but it is known that in 1750 they resided in northern Virginia. After the Civil War they emigrated by

way of North Carolina and Knoxville, Tennessee to a homestead in east Kansas, near Abilene. Initially they had great difficulty raising crops because of grasshopper plagues.

The cattle drives from Texas to Abilene had stopped by the time Walter Meek was born, but Kansas was still "frontier" country—that period, now so romanticized, had not yet ended. Walter's sister—he had two brothers and a sister—was reputed to have been escorted home from a dance by Wild Bill Hickock, the marshall. When rather young, Walter accompanied a relative on an expedition into Indian territory to bring back an escaped prisoner; he slept out on the prairie by a campfire each night. (Later in life he continued to enjoy trips into the mountains and wild country. He took one such excursion with Herbert Gasser in 1933 or 1934, in an aircooled Franklin car, to the Southwest. They were among the first 5,000 or so visitors to see Rainbow Bridge, and in order to get there they had to ride part of the way on horseback and sleep out overnight in the open.)

Walter was much younger than his brothers and sister; he was an uncle at the age of six. His father died when he was only eight and his mother a few years later. Subsequently, he was brought up with his first cousins under a rather strict, conservative, puritanical regime. Later in life he became a staunch Republican and recounted with pride that the Eisenhowers lived in the town where he grew up. He and his cousins learned, he said, never to pick fights with the Eisenhowers because of their combative ability.

His cousins evidently helped cultivate his educational aspirations. One of them, Eli Sawtell, attended the University of Kansas and became very proficient in Greek and Latin. Dr. Meek told his son that he thought if Eli could graduate from college, he could too. Eli encouraged him, and he graduated from the University of Kansas in 1902. Although he had been president of the senior class and editor of the school paper,

he still managed to graduate with the highest average attained at the University up to his day. He was a founding member of the Alpha Tau Omega Chapter of the University. He was elected to Phi Beta Kappa and was the first undergraduate to become a member of Sigma Xi. As a student he much prized his Phi Beta Kappa key and wore it continually, even when he was working summers in the wheat fields. Eventually he lost his key in those fields, but a man working in a grain elevator in Minneapolis found it in the wheat and returned it to him.

After graduating from Kansas, Walter Meek studied at Penn College in Iowa and the University of Chicago, obtaining a Ph.D. degree in physiology from Chicago in 1909. He taught at Penn College in Oskaloosa, Iowa from 1903 until 1908. He had attained the rank of professor of biology there when he was invited to join Joseph Erlanger at the University of Wisconsin. Erlanger's statement of purpose in offering an instructorship noted that he wished Dr. Meek: "To assist me with organization of, and the teaching in the laboratory." Dr. Meek served Wisconsin as instructor in physiology (1908-1910), assistant professor (1910-1912), associate professor (1912-1918), and professor (1918-1948).

When Erlanger resigned his position at Wisconsin to go to Washington University in St. Louis, J. A. E. Eyster, then professor of pharmacology at the University of Virginia, was appointed in his place. Eyster's primary interest was in research. He was not as outgoing as Dr. Meek was, and he was not a popular lecturer. He and Meek were quite congenial, however, and collaborated in research on the cardiovascular system for thirty years. Eyster was an excellent physiologist and deserves much credit for their mutual success.

Meek was a skilled administrator and students liked his lectures. On Meek's retirement, President Elvehjem said Dr. Meek was "the best classroom teacher under whom he had

studied." Very soon Eyster and Meek exchanged jobs, and Meek remained chairman of physiology until his retirement in 1948. Eyster then reassumed the chairmanship and retained it until his own retirement in 1952. The first Eyster and Meek article was published in 1912. It was quite appropriate that William H. Howell, one of the founders of *Physiological Reviews*, should, and did, solicit an article from them for the first issue ("The Origins and Conduction of the Heart Beat," 1 (1): 1, 1921).

The first students to receive Ph.D. degrees from the Department of Physiology at Wisconsin were K. K. Chen, Chauncey D. Leake, and Ethel Ronzoni (Mrs. George H. Bishop). By 1952 some thirty-eight persons had received that degree. Dr. Meek's last student was Eleanor M. Larsen. The attainments of the department in Dr. Meek's time are described in a chronicle of the University of Wisconsin, Medical School, 1848-1948 (Paul F. Clark, *The History of the University of Wisconsin* [Madison: University of Wisconsin Press, 1967]).

In 1920 Meek became assistant dean of the Medical School. His interest in students made him an effective advisor. Among those he advised were premedical students from the University. It is said that at times he became briefly unpopular for advising some leading athletes to minimize their physical efforts and study more if they wished to become doctors. Some of them did just that, to the detriment of an occasional team record. In addition to advising premedics, Dr. Meek for many years was in charge of admissions to the Medical School. He found this selection quite taxing because some students he thought would make only average doctors turned out to be superb, while others he thought would be superb turned out to be mediocre. He continued to meet these responsibilities, however, and held the posts of assistant dean of medicine from 1920 through 1942, acting dean from 1942 through 1945, and associate dean from 1945 until his

retirement. He was also trustee of the Madison General Hospital, a service he performed without remuneration for many years, and a member of the Governor's Advisory Committee on Medical Education.

Dr. Meek held the commission of major in the Chemical Warfare Service during the first World War. A chemical warfare unit was set up at the University, and from 1917 to 1919 Eyster and Meek were responsible for much of the work carried on there. Many of the initial investigations on the biological effects of mustard gas, lewisite, and phosgene were made by this unit. In order to facilitate their work the army was asked to provide a chemist. They sent a young drill sergeant who had majored in chemistry at Princeton, Chauncy Leake—called "Sarge" by the Meeks. This association started Dr. Leake on his career as a pharmacologist.

On December 26, 1906 Dr. Meek married Crescence Eberley. He met her on shipboard during his first trip to Europe. They had three children: Joseph Walter Meek, born May 2, 1912, professor in the Law School of the University of New Mexico, died 1954; Mary Crescence Meek, born May 20, 1917, served as a stewardess for American Airlines for many years; and John Sawyer Meek, born August 12, 1918, became professor of chemistry at the University of Colorado. One gathers that Dr. Meek and wife were a very congenial and adventuresome couple. Their travels took them to Switzerland several times to hike over the high passes. They also attended the Passion Play, where Dr. Meek took many photographs on glass slides; after developing them he colored them for lantern slide projections, which followed notes written by Mrs. Meek detailing the costumes and their colors. Dr. Meek had climbed Pikes Peak at an early date, before there were auto roads to ascend, and in 1902 he visited Yellowstone. Mrs. Meek also found pleasure in such outings, and in 1914 the family spent the summer in Glacier National

Park. According to their son John, Mrs. Meek learned to drive a car long before Dr. Meek, but he was only the third professor at Wisconsin to own an automobile. After 1920 the family took many trips around the country. Dr. Meek occasionally (1926 and 1927) left them to vacation and explore the East Coast alone while he attended international meetings in Europe, but usually the whole family took their vacations together.

In many of his nonprofessional activities, Dr. Meek's puritanical work ethic and ingenuity probably made him somewhat overwhelmed. He was a bookbinder; for many years he bound all the journals to which he subscribed. As mentioned previously, he was an enthusiastic photographer, doing all his own developing and enlarging. One of his accomplishments was to make hand-colored portraits of his children. Among the characteristics that impressed his son John as unique were Dr. Meek's tremendous memory and his great enthusiasm for anything he undertook. He was an avid gardener and a naturalist, a member of the Society of American Naturalists.

In 1924 Mrs. Meek inherited some pewter that had belonged to her great-grandmother. She thought it would be nice to have a table setting of pewter, so they began to collect old pieces. Some of their purchases were found to be defective, so Dr. Meek learned to repair them. Soon he was making molds, casting plates, and producing beakers, porringers, mugs, jewel boxes, and the like. Their collection became famous, at least locally. Once they had enough pewter to serve twelve people, Dr. Meek decided it should be used on an antique table. Next, it was decided that the table should stand on old-fashioned rugs. The couple began to hook rugs, fifteen minutes every morning and every evening. Gradually their house in Madison was filled with antique furniture they had purchased, repaired, and refinished. All this blended



well with the copper fixtures they had themselves made for the house when it was built in 1912.

In the 1930s the youngest son, John, became interested in collecting stamps. This attracted his father's interest, with the result that Dr. Meek made albums, borders, and display cabinets lined with velvet. They soon were looking for plate shifts, double transfers, odd cancellations, and so forth. Everything was so well organized for display that when occasions for competitive display came, they usually obtained "best of show" awards. This interest in collecting and in hobbies never died. When Dr. Meek retired to Florida he became involved in collecting shells. Again, he made display cabinets and labeled each specimen with its scientific name and where he had found it.

Dr. Meek's daily schedule was: Up at seven, off to work at eight, home for lunch at twelve-thirty. He had trained himself to lie down at one, go to sleep instantly, and awaken at one-thirty. He then went back to work in his laboratory but returned home at five-thirty.

Dr. Meek, though not a sportsman, did play golf left-handed. When asked by his son why he did that when he was really right-handed, his father explained that when he was a student at Kansas some athletic activity was required. He had refused to work out in the dusty old gym, so he was told he had to engage in some physical activity if he expected to graduate. He was not a large man, so it was decided that golf would be acceptable. A professor who was left-handed gave him a set of clubs; that was the way he learned to play the game.

During the depression of the 1930s, a steam laundry in town failed, and Dr. Meek evidently had made an investment in it. Consequently, he became a member of the new board of managers and ultimately became the director and manager.

His administrative skills were brought into play and before long the business again became solvent. As far as is known, this was the only business venture undertaken by Dr. Meek.

Another avocation was the study of history. The well-known historian, Erwin H. Ackerknecht, and Dr. Meek's associate, Dr. R. C. Herrin, have written extensively in praise of Dr. Meek's contributions to the study of the history of medicine. His bibliography of 110 titles contains only six medico-historical papers, but Professor Ackerknecht states that they do not reveal the full extent of his contribution. He wrote or prepared papers chiefly about those who had contributed to physiology, including the following titles: "Franz Joseph Gall" (1915), "Charles Bell" (1916), "Albrecht VonHaller" (1917), "English Medical Guilds" (1920), "Beginnings of American Physiology" (1921), "The Gentle Art of Poisoning" (1922), "A Medical Reformer" (1923), "T. Rabelais" (1924), "The American Physiological Society" (1925), "Johannes E. Purkinje" (1927), "Carl Ludwig" (1931), "Du Bois Reymond" (1932), "Ernst Bruecke" (1933), "Fabricius, A Man Who Missed His Opportunity" (1935), "John Call Dalton" (1938), "Claude Bernard" (1939), "Richard Lower" (1940-41), "Medical References in Shakespeare" (1942), "The Endocrines" (1945-46), "Walter B. Cannon" (1948-49), and "The Adrenals" (1952-53). Most of these and other such papers were delivered at William Snow Miller's seminars on medical history at the University. Professor Ackerknecht regrets that many of the papers read in these seminars were not published but he states that the group of individuals to which Dr. Meek belonged did initiate a revival of interest in medical history in America.

For a brief period Dr. Meek taught medical history in the University. Incidentally, he treasured the fact that he was born the year Claude Bernard died. He never studied abroad but few had a greater interest in the physiologists of Europe.

His son reports that he was delighted to meet Pavlov at an International Congress and considered it a great privilege. It is surprising that he could accomplish so much and sustain such a variety of interests when he had a heavy teaching load dealing with physiology for the medical students. For some years he also lectured to home economics students. Initially he had only 100 such students in the course, but numbers quickly increased to over 160. He could describe the most complicated functions in such a way that all could understand. In the course for first-year medical students he chiefly taught neurophysiology. Another of his special duties relative to teaching and research was that he had charge of procurement of all dogs used in the medical school. At many sessions of the state legislature Dr. Meek had to appear and justify the use of animals to offset the criticisms and actions of the antivivisectionists. For many years he also prepared the questions in physiology for the Wisconsin State Board licensure examination in medicine.

In addition to all these other responsibilities and activities, and without much technical help, Dr. Meek managed to accomplish much in a number of fields of research. He published 110 scientific papers, many of these with J. A. E. Eyster. He conducted some early studies with A. J. Carlson on the limulus heart. He was the first in this country to employ the method of primary negativity in tracing the origin and course of the excitatory process in the heart. He detected shifting of the pacemaker during vagus stimulation and when the sinoatrial node was destroyed. He used timed X-ray exposures to study events of the cardiac cycle and the output of the heart. He was interested in the effects of exercise, hemorrhage, and plethora. His studies of the significance and consequence of the enlargement of the heart in athletes still receive attention.

Probably the most clinically relevant contribution made by

Dr. Meek was the discovery, in collaboration with Maurice H. Seevers and Ralph M. Waters, that catecholamines cause ventricular fibrillation in dogs anesthetized with cyclopropane. Further studies of the effects of catecholamines on ventricular irritability, conducted in cooperation with Orth, Murphy, Stutzman, and Allen, provided information concerning the mechanism of this action; they identified epinephrine congeners that did not produce serious ventricular irritability. Dr. Meek eventually chose phenylephrine as the best vasoconstrictor agent for producing a rise in blood pressure without a resulting paroxysmal atrial tachycardia. This work, which he described in a Harvey Lecture delivered March 20, 1941, "Some Cardiac Effects of the Inhalation Anesthetics and the Sympathomimetic Amines," was of much interest to both pharmacologists and anesthetists.

Meek's later work was concerned with gastrointestinal physiology. He studied chemical transmission of vagal effects on the small intestine, the influence of intestinal distension on gastric motility, and the actions of adrenalin and general anesthesia on intestinal function. He studied the causes of intestinal obstruction and ulceration. Some summaries state that his work dealt mainly with the heart, circulation, gastrointestinal tract, and autonomic nervous system. He clearly studied other matters as well, as revealed by his bibliography. In *American Men of Science* Dr. Meek listed circulation, shock, and the effects of anesthetics on the heart as his three main areas of research.

It is said of Dr. Meek that he seemed to have the power of anticipating trends of scientific development. This was manifest in his association with the American Physiological Society. Dr. Meek became a member of the APS in 1908. He was elected to the Council in 1915, and served as secretary from 1924 to 1929 and president from 1930 to 1932. After his presidency he returned to the Council for four more

years. In 1933 he was appointed chairman of the newly founded Board of Publication Trustees, which has controlled the business and editorial policies of all publications sponsored by the American Physiological Society since 1935. At the forty-ninth meeting of the Society in Memphis (1937), he proposed establishment of *The Annual Review of Physiology*; this recommendation was approved. He served on the Board of Publication Trustees for most of his life and was to a large degree responsible for the Society's very effective publication policies and actions. His unusual powers of organization were frequently used by the Society. He was chairman of the Centennial Committee for the fiftieth annual meeting held in 1938. Dr. Meek also served in collaboration with Drs. W. B. Cannon and A. J. Carlson as chairman of the committee for selection and nomination of honorary members for the APS. He was one of the leaders of American physiology for half a century. He participated actively in scientific sessions held at annual meetings of the Society. Among the many papers he presented before the Society, the following were of greatest interest: "The Origin of Fibrinogen in the Liver," "The Initiation and Course of Cardiac Excitation," and "Distension as a Factor in Intestinal Obstruction."

I became a member of the American Physiological Society in 1934, a year after Dr. Meek's term as president had ended. I never had a conversation with him, but I observed his actions and I knew him through his friends. Dr. Meek was always busy, surrounded by friends, and thus less accessible than was Joseph Erlanger, for example, who always appeared to be alone and available to lunch with younger unknown men. I also knew many of Walter Meek's other famous associates better than I knew him: Herbert Gasser, George H. Bishop, A. J. Carlson, K. K. Chen, Chauncy D. Leake, and Ethel Ronzoni. All of these held Dr. Meek in high esteem. The men I knew of my generation who worked with Dr.

Meek also made known their respect and affection: Warren Gilson, M. H. Seevers, R. C. Herrin, W. B. Youmans, Paul Cranefield, and many others. I did hear him discuss proposals at meetings of the American Physiological Society; he was cautious, conservative, and not always on the winning side, but his opinions were respected. I was not studying the heart when Dr. Meek was most active in that field but I knew of his work. For many years I used in my lectures on the autonomic system an illustration of acetylcholine assay by Meek—partially because it surprised me that he was doing such work at a time when the field was dominated by Sir Henry Dale. One of my strongest impressions of Dr. Meek's perception and kindness was obtained from an "Appreciation of Walter B. Cannon" that he wrote in 1933 for the *Texas Reports on Biology and Medicine*. Cannon did not always receive from some of Meek's contemporaries the respectful treatment he deserved in meetings of the American Physiological Society. Those of us who were of Walter B. Cannon's school much appreciated Meek's statement.

Dr. Meek retired officially in 1948. He remained at Wisconsin as a research professor for one more year. After that he gave some historical lectures at the University of Texas and served on a committee to make recommendations concerning establishment of the medical school at Gainesville, Florida.

Dr. Meek had several heart attacks before retiring but recovered with bed rest. He developed diabetes at the age of fifty-five, and it became increasingly hard to control. His death occurred quietly at his winter home at Fort Myers Beach, Florida on February 15, 1963 at the age of eighty-four. His ashes are buried with his wife's in her family's burial plot at Westfield, Pennsylvania. Mrs. Meek died in 1973 at the age of ninety-two. She was able to attend the dedication of "Meek House," a part of the Witte Dormitory at the

University of Wisconsin. The University also published a biographic *Memorial Resolution* in honor of their distinguished faculty member, Emeritus Dean Walter Joseph Meek.

Biographical accounts indicate that physiologists in his day were not members of so many societies as is now required. In addition to the American Physiological Society, he belonged to the Society for Experimental Biology and Medicine, American Zoologists, American Naturalists, and The Harvey Society. He was listed in *American Men of Science*.

Dr. Meek received many honors during his life and posthumously. There is a Meek Library and a Meek House at Madison. In 1944 he was awarded membership in the Wisconsin State Medical Society and was recipient of its Man of the Year award. The American Society of Anesthesiologists elected him to honorary membership. In 1948 he was awarded an honorary degree (D.Sc.) by the University of Wisconsin. In 1949, one year after his retirement, he received a Distinguished Service Award from the University of Kansas. The excellence of Dr. Meek's scientific contributions was recognized by his election to membership in the National Academy of Sciences in 1947. His principal contributions to science are here listed.

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