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WALTER RICHARD MILES
1885—1978

A Biographical Memoir by
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Biographical Memoir

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Walter R Miles

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March 29, 1885–May 15, 1978

BY E. R. HILGARD

WALTER MILES grew up in a self-reliant Quaker family that had moved west in stages from Indiana to the Dakota Territory and on to Oregon. His maternal grandfather, Richard White, had been a prosperous farmer in Indiana, but he had made the mistake of guaranteeing the notes of neighbors and lost everything in the depression of the late 1870s. The family emigrated from Indiana to stake out a homestead in the prairies of North Dakota, where he was born on March 29, 1885. Walter's father, Thomas Elwood Miles, eventually sold his farm and bought a country store. Walter started his education in a one-room country school there. It stuck in his memory how the older boys always placed their revolvers and guns on a table in the front of the room.

The family moved again when Walter was eight years old, this time to the village of Scott's Mills in northwest Oregon, not far from Salem. There he found a new two-story schoolhouse and a new Friend's Church, complete with a church bell.

The extended family had moved together. Walter's father bought a two-story general store. His grandfather helped out in the store. His uncle rented and operated a nearby sawmill. Everything seemed to be going well until,

when Walter was twelve, a fire that started in a nearby building spread to the store, and it burned to the ground. The insurance had been allowed to lapse, so the venture was a total loss. With the help of friends and neighbors, his father was able to buy an empty building and start his store over again. Walter was able to find work after school and during the summers, and by the age of fourteen earned good wages in his uncle's sawmill, while continuing to assist in the store when needed. He remained in the local school through the highest grade offered, and then devoted the following year to saving enough money to complete high school elsewhere. In 1901 he entered the Pacific Academy, a preparatory department of Pacific College at Newberg, about thirty-five miles from home. He worked for room and board in the president's house. He graduated from the Academy in a year, and entered Pacific College in 1902. His desire to continue his education was encouraged by learning of the career of his cousin, Herbert Hoover, who had become a successful mining engineer after graduating from the first class at Stanford University a decade earlier. Walter graduated as valedictorian of his class at Pacific College in 1906, but he felt that he needed more education to fit him to become a teacher. He had read and enjoyed James' *Psychology: Briefer Course* as a senior, but otherwise his interests were unformed, except for his enjoyment of public speaking.

Appropriate to his Quaker background, and enhanced by the offer of a scholarship and the invitation from his mother's widowed aunt to work for her in return for room and board, he entered Earlham College in Indiana in the fall of 1906. There he found a small psychological laboratory and a young psychology professor who was in the midst of completing a Ph.D. in psychology at Cornell. Walter became an unpaid assistant to the professor. With another student he worked his way through one of Titchener's laboratory man-

uals in experimental psychology, and the fascination with laboratory apparatus grew on him. He graduated from Earlham in 1908 and went home to Oregon for the summer. He had the good fortune to receive the offer of a teaching position in psychology and education at Penn College in Iowa to fill a temporary vacancy. With the prospect of a year's salary of \$700 if married (\$600 if unmarried), he and his Pacific College sweetheart, Elizabeth Mae Kirk, exchanged vows and set off the next day for Oskaloosa.

While at Penn College, he was personally recruited by Carl E. Seashore, a psychologist and Dean of the Graduate College at the University of Iowa, and invited to come there for graduate study. During the first term, still thinking of the need to prepare himself to earn a living, he took a master's degree in education. With his family enlarged by the birth of a son, he supplemented his scholarship during that year by selling insurance and doing some tutoring. His master's thesis, published in 1910 and the first printed record of his scientific endeavors, brought a commendation and a gift of books from Professor Edward L. Thorndike, of Teachers College, Columbia University.

By his second year, Seashore had succeeded in directing him toward psychology. He gained financial security by accepting a pastorate in the Friends Church of West Branch, Iowa, to which he could commute by train. From then on he was a psychologist.

He completed his doctoral degree in 1913 with a dissertation on the accuracy of the voice in simple pitch singing. He was delighted with Seashore's tonoscope, which he used in his investigation, and his fascination with gadgetry, earlier initiated by Titchener's manuals, was fixed for life.

He was now ready to begin his long career in teaching and research. The career is best divided into five epochs: the first, at Wesleyan University in Connecticut and the Carne-

gie Nutrition Laboratory in Boston; the second, at Stanford University; the third, at Yale University; the fourth, at the University of Istanbul in Turkey; and the fifth, at the U.S. Naval Submarine Medical Research Laboratory, New London, Connecticut. He retired from the Laboratory in 1965 at the age of eighty, but lived until May 15, 1978. When he died at the age of ninety-three, he was the oldest living past president of the American Psychological Association.

WESLEYAN UNIVERSITY AND THE CARNEGIE NUTRITION
LABORATORY, 1913-1922

Miles was always attracted to experimentation that required specialized equipment. This interest was enhanced by his first position after receiving his Ph.D. Professor Raymond Dodge invited him to fill in for a year at Wesleyan University, while Dodge was on leave to work with F. G. Benedict at the Carnegie Nutrition Laboratory in Boston. Much of Miles' later career was based on his work with Dodge, and his acceptance of Dodge as his career model.

Although Dodge spent twenty-six years at Wesleyan University, a university with limited graduate instruction, before he moved to Yale in 1924 at the age of fifty-three, he had established himself strongly in the psychological profession. This was clear by the time Miles came to work in his stead, for in 1916 he was to be elected to the presidency of the American Psychological Association. Dodge had built an excellent, well-equipped laboratory at Wesleyan and had collected a first-rate research library. Much of the apparatus he had invented and built: the first eye-movement camera, the first mirror tachistoscope, and many ingenious chronometric and recording instruments.

Miles was fascinated with what he found, and he set to work experimenting with the equipment and assigning student projects that depended upon its use. The greater

resources at the Nutrition Laboratory permitted Dodge to use his inventive ingenuity on a larger scale, and most of the equipment found there was designed by Dodge. When Miles' year at Wesleyan was over, he replaced Dodge at the Nutrition Laboratory, where he remained from 1914 to 1922.

At the Nutrition Laboratory, much of Miles' work combined psychological and physiological measurements, as in his study of the effect of small doses of alcohol on performance. World War I directed his efforts to some war-related projects, such as the design of gas masks for comfort as well as efficiency, a study carried out collaboratively with Dodge. He also conducted a fairly elaborate study of the effects of severely restricted food intake. Later investigations included several psychological and physioanatomical studies.

STANFORD UNIVERSITY, 1922-1932

Upon the retirement of Frank Angell as the original head of the Department of Psychology at Stanford University, President Ray Lyman Wilbur transferred Lewis M. Terman from the School of Education to be the new head. Terman immediately launched a search for men who would complement his interests; he hired Calvin P. Stone in comparative psychology (after he was unsuccessful in bringing Karl S. Lashley, under whom Stone had studied) and, with the advice of his good friends Dodge and Yerkes, chose Miles to head the experimental laboratory. Miles, who had broad human interests, had found the research at the Nutrition Laboratory satisfying, but he missed the relationship with students, and the teaching offer attracted him.

The new life at Stanford opened up pleasantly for the Miles family. The three children, a son and two daughters, adjusted well to their new schools. They lived for the first years in one of the houses owned by the Hoovers while they waited for their newly planned house to be completed; it was

to face the foothills, near the Hoovers, Termans, and Strongs. Tragedy struck with the death of Mrs. Miles before the house was completed, in the summer before a semester in Berkeley. Dr. Catherine Cox, from a Quaker family known to the Miles, had been brought back from Cincinnati to participate with Professor Terman in his study of gifted children. The early friendship developed, and she became Mrs. Miles in September 1927. The family remained closely integrated. One daughter was born to the new marriage. The new Mrs. Miles continued her own distinguished career in psychology at Stanford, and later at Yale.

When Miles accepted the offer to move west, he persuaded Stanford to purchase copies of much of the equipment he had found useful at the Nutrition Laboratory. After he had left Stanford for Yale, and I had succeeded him in the laboratory position at Stanford, I found the open laboratory spaces literally packed with devices ready to be operated, reminding me of a modern science museum. I suppose I had been invited to Stanford because I had done my dissertation at Yale under Dodge's direction, and was quite familiar with the eye-movement cameras, tachistoscopes, and chronographs that had been invented by Dodge. In addition to the Dodge equipment, Miles continually invented demonstration and testing devices, including the Stanford Motor Skills Unit, identified more particularly with Robert H. Seashore, Dean Seashore's son, who had come to work as a postdoctoral student with Miles. These physical monuments to Miles' Stanford years told a great deal about his approach to psychology and to laboratory instruction while he was there.

Not entirely unrelated to these measurement devices was the large-scale study conducted during his last years at Stanford, for which, with the cooperation of Terman, Strong, and Stone, a grant had come from the Carnegie Corporation. He called the investigation the Stanford Later

Maturity Study. Some 2,000 subjects, aged six to ninety-five, participated; half the participants were over age fifty. Although there were some pencil and paper measures, such as the Otis Intelligence test, the apparatus found its use in reaction-time measures, studies of motor skills, and various anthropometric and physiological measures. Special studies were made of aging athletes and aging chess players. Several doctoral dissertations were involved. The study became the subject of Miles' presidential address before the American Psychological Association in 1932, the year he moved to Yale.

YALE UNIVERSITY, 1932–1952

Dodge had a few more active years before he was to retire in 1936, but he was suffering from Parkinson's disease and felt the need for someone congenial to take over his well-equipped laboratory. Miles, who continued to think of Dodge as his mentor, was a natural choice. He came to Yale for one year, 1930–1931, returned to Stanford in 1931–1932, and took up residence at Yale on a permanent basis in 1932. His appointment was primarily in research, in what was known as the Laboratory of Physiological Psychology, Department of Psychiatry and Mental Hygiene, Yale University School of Medicine. Although the space was contiguous with that of the Department of Psychology, the affiliation with the Medical School may have colored his research to some extent. Unfortunately, the excitement and stimulation of a group of graduate students working under his supervision, which he had known at Stanford, was not to return. His most prominent Ph.D. was Neal E. Miller, whom he had brought from Stanford as his first research assistant. Miller had already worked with him at Stanford, while obtaining his master's degree there. He received the Yale Ph.D. in 1935.

Apart from some studies on the effect of alcohol on the behavior of rats (done collaboratively with Miller), Miles

devoted much of the time of his first years at Yale to preparing articles and handbook chapters on the Stanford Later Maturity Study. He intended to write up the study in greater detail, and he had held up the publication of the accompanying doctoral dissertations until they could become part of a large volume that he intended to edit. This never happened, much to the chagrin of the young Ph.D.'s who had careers to get started during the years of the Great Depression (Roger G. Barker, Paul Bутtenwieser, Charles Marsh, Jr., Bronson Price, Floyd L. Ruch, Albert Walton, and a postdoctoral fellow, Keith Sward). My surmise is that the failure to get around to this task, which became increasingly distasteful, must have both inhibited other work and demoralized Miles, who had a deep sense of responsibility to fulfill his commitments. The published studies from the first few years at Yale, based on research data collected there, were minor and highly specialized, such as studies of the reaction time of the eye and the steady potential of the human eye. Another research assistant, Alphonse Chapanis, completed a dissertation under his chairmanship in 1943.

When America entered World War II, Miles was again in his element as a problem-solver. He became interested in aviation psychology and made one of his best-known contributions: he discovered that red goggles could be worn by aviators while waiting to be called, without interfering with their normal activities. The goggles served to produce dark adaptation, so that the flyers would be ready immediately for night flying when the emergency call came. During and after the war years, Miles was busy with many committee and board obligations. For instance, during the years 1939 through 1944 he was president of the Psychological Corporation, established by J. McKeen Cattell as an agency to make psychological services of an applied sort available to schools and industry. From 1947 to 1954 he was chairman of the

Board of Directors of the American Institute of Research, founded and headed by John Flanagan.

After the war demands lessened, he returned to Yale for a few years before reaching mandatory retirement age in 1953. With a young instructor at Yale, Lloyd H. Beck, a field study was conducted on olfaction in honeybees, which reached publication in 1949. There were also several studies on the central zone of the human fovea.

THE UNIVERSITY OF ISTANBUL, 1954–1957

While I was serving as graduate dean at Stanford, word came of the desire for a visiting psychologist at the University of Istanbul. It occurred to me that this would appeal to Miles because of his widespread interests, his love of travel, and his recent retirement from Yale. When the offer came, he found it attractive. He served there for three years, supervised the dissertation of a young woman who was accepted on the teaching staff there, and edited a volume, to which he also contributed, entitled the *Istanbul Studies in Experimental Psychology*.

THE SUBMARINE BASE AT NEW LONDON, CONNECTICUT

1957–1965

Although he did not undertake his new responsibility until age seventy-two, as scientific director Miles exerted important influence, not only on the basic scientific work that was conducted, but also on the applied phases that required on-the-job studies as nuclear submarines were engaged in actual operations. In addition to the obvious work of studying problems connected with living together in cramped quarters, both in the submarine and in a specially constructed Sealab on the continental shelf, he extended the work to Antarctic research, which included the results of

long exposure to cold. He remained in this position for eight years, before his final retirement from active responsibilities.

HIS INVESTIGATORY STYLE

The styles of life and work of scientists who achieve distinction vary greatly from one to another. Some cling to an all-encompassing theoretical position and design experiments and write essays defending it; others eventually find a place for themselves by becoming experts in some restricted field of inquiry. They push back the frontiers of knowledge by driving a narrow wedge into the unknown. Walter Miles fitted neither of these styles. He showed little interest in grand theories, and, except for the study of the abilities of the aged, did little in the way of systematic programmatic research after leaving the Nutrition Laboratory. Even the study of later maturity, for which he is justly famous, scarcely qualified him as a specialist in gerontology. Instead, Miles's work was characterized by a tremendous interest and curiosity about many topics, whether narrow or broad in scope, basic or applied in their significance. As he attacked a fresh problem, his work always showed great inventiveness and ingenuity, but by the time it reached publication he was likely to be off on something else.

Some of his quite secondary interests resulted in informative publications. For example, after leaving Stanford for a semester at the University of California in Berkeley, to temporarily replace George M. Stratton, he returned to Stanford, curious about the maze learning of rats. He had invented, while in Berkeley, a narrow-path elevated (trestle) maze to supplement the traditional enclosed maze. After returning to Stanford, he employed Harry F. Harlow, then an undergraduate English major, to run rats in the Miles garage, comparing the elevated maze with a conventional one. Harlow went on to become a distinguished psychologist

in the area of primate development. Miles had no intention of continuing as a comparative psychologist, but his curiosity was piqued to find out where the white rats came from that were so widely used by American psychologists. After initiating correspondence with those he thought might know, he traced the ancestral rats to a small colony that Adolf Meyer, the distinguished psychiatrist, had brought with him from Switzerland. As another illustration, he had long enjoyed the motion picture camera that he invariably took with him on his travels. He happened to discover that some early work had been done in photographing Senator Stanford's race horses to establish that a trotting horse sometimes has all four feet off the ground at the same time. The result was a thorough study of the development of motion pictures and a plaque on the Stanford campus commemorating the Stanford-Muybridge motion pictures of 1878–1879.

Because of his early years at the Carnegie Nutrition Laboratory in Boston and the many studies of physiological responsivity over the years, he could well be described as a psychophysiological, but such a designation would not do justice to his range of interests. He had begun his career as a student of musical performance, and one of his students later had studied eye movements in reading music. The animal work occupied considerable attention for several years. There were many studies of vision and the photographing of eye movements; the chance discovery of the utility of red goggles in preparation for night flying was the most dramatic of the visual results, but not the one calling for the greatest experimental ingenuity. If one looks for a common thread in his work, the importance of measuring differences with calibrated devices looms large, whether in the difference in color vision associated with color blindness; the study of handedness or eyedness; or, in his largest single cooperative study, of the individual differences in skill and

psychophysiological functioning associated with aging. In other words, it is not possible to describe his productive career by any specialist label. He did not engage in controversy; he was curious to answer whatever question came up, and he preferred an experimental demonstration to an argument.

A visitor to his office or laboratory would always be shown something entertaining in the way of a reversible perspective, an unexpected visual illusion, or how the slit pupils of the eyes of a baby alligator would remain vertical no matter how you rotated the alligator's head and body. These informative, playful demonstrations continued to fill his office in his later days in New London. The devices used were not merely toys, however, for he was always teaching through these demonstrations some aspect of psychology, particularly visual perception or its psychophysiology.

HONORS AND RECOGNITIONS

Miles was able to take satisfaction from the recognition that his many contributions received from his psychological colleagues, as well as from the scientific community generally. His election to the presidency of the American Psychological Association has already been noted. He was early selected to be a member of the prestigious Society of Experimental Psychologists, and received its Warren Medal in Experimental Psychology in 1949. He was awarded the Gold Medal of the American Psychological Foundation in 1962, for a lifetime's contribution to psychology. The recognition by non-psychologists came in the form of election to the National Academy of Sciences in 1933 and to the American Philosophical Society in 1944.

THE PREPARATION of this memoir has been aided by his autobiography in E. G. Boring and Gardner Lindzey, *A History of Psychology in*

Autobiography, (vol. 5, pp. 223–52, New York: Appleton-Century-Crofts, 1967) and by a three-volume collection of his printed papers deposited in the Stanford University Library. Acknowledgment is made also to a biographical memoir by Neal E. Miller, *Year Book 1979 of the American Philosophical Society* (Philadelphia, 1980, pp. 89–94).

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