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(*b*. Dallas, Texas, 14 November 1882; *d*. Austin, Texas, 4 October 1974)

mathematics.

Moore was the fifth of the six children of Charles Jonathan and Louisa Ann (Moore) Moore. His father had moved to the southern United States from Connecticut to fight on the side of the South during the Civil War and eventually settled in Dallas, where he established a hardware and feed store. Moore attended a private school in Dallas and the University of Texas (now the University of Texas at Austin), where he spent most of his professional life. In 1910 he married Margaret MacLelland Key of Brenham, Texas: they had no children.

According to the registrar's records, while Moore was at the University of Texas (1898–1902), he did very well in mathematics courses under George Bruce Halsted and Leonard Eugene Dickson. He obtained both the B.S. and the M.A. in 1901. He continued at the university as a fellow for the year 1901–1902. In one of his classes Halsted posed a problem that resulted in Moore's proving that one of the axioms in David Hilbert's *Grundlagen der Geometrie* (1899) was not independent of the other axioms. This was brought to the attention of Eliakim Hastings Moore (no direct relation), the leading professor of mathematics at the University of Chicago, who was able to provide R. L. Moore with a scholarship for graduate work at Chicago beginning in 1903. R. L. Moore was taking courses under Halsted in 1902, but when the university regents refused, over Halsted's protests, to renew Moore's teaching fellowship, Moore went to teach for a year (1902–1903) at a high school in Marshall, Texas. Halsted was himself fired by the regents in December 1902 for reasons that remain unclear.

In 1905 Moore received his doctoral degree at Chicago with a dissertation entitled "Sets of Metrical Hypotheses for Geometry" and supervised by Oswald Veblen. After Chicago, Moore held teaching positions at the University of Tennessee (1905–1906), Princeton University (1906–1908), Northwestern University (1908–1911), and the University of Pennsylvania (1911–1920). In 1914 he became an associate editor of *Transactions of the American Mathematical Society* and continued in this position to 1927. In 1920 Moore returned to the University of Texas as associate professor of mathematics and three years later was appointed professor.

By 1920 Moore had published seventeen papers making use of the axiomatic procedures then being developed by mathematicians under the influence principally of Veblen, E. H. Moore, and others at Chicago. He had, however, his own distinctive approach and took little interest in such topics as the logical status of the Axiom of Choice, a problem in the foundations of mathematics that interested many mathematicians during most of Moore's career. He seemed more interested in using axiomatics as a tool in developing a unique approach within set-theoretic topology or, as he termed it, point-settopology.

The first edition of Moore's only book, *Foundations of Point Set Theory* (1932), represented the culmination of the major part of his research to date. It also formed the basis of his subsequent work, which was expressed more through his teaching and his students than through publications: fifty of his total of sixty-eight publications appeared before 1932, and forty-one of his fifty doctoral students were awarded their degrees in the period 1932 to 1969. A revised edition of his book (1962) incorporated many of the results of his students and others in the field during the previous thirty years.

In his book Moore gradually reveals a collection of axioms and develops at each stage the consequences of the axioms admitted thus far. For example, chapter 2 is entitled "Consequences of Axioms 0, 1 and 2"; Euclidean space of any finite dimension and Hilbert space are examples that satisfy these axioms. By chapter 4, axioms 3, 4, and 5 have been added and, as Moore states in his preface, from these six axioms "it is possible to prove a very considerable portion of the well known to pological propositions of the plane." The fruitfulness of Moore's axioms lies in the fact that, however close they may appear to determine the Euclidean plane, a space satisfying them need not be metric and indeed may depart rather wildly from Euclidean space.

Though his courses followed his book in subject and axiomatic style. Moore told his graduate students not to read it or any other mathematically relevant literature, and he strongly discouraged any mathematical communication between students outside of class. He regarded his classes as research sessions in which students learned by presenting their work at the blackboard and by critically evaluating others' presentations. Moore presented possible definitions, axioms, and theorems, and the ground rules for the class, but otherwise took the role of a researcher himself. His technique has been much analyzed and imitated because, though its basic idea may not be original with him, in his hands it resulted in what is regarded by many mathematicians outside the Moore school as the most distinguished group of mathematicians in the United States to have been taught by the same person.

Most of Moore's students became research mathematicians and professors at universities and used some version of his teaching method. Some continued to make use of his axiom system in the study of abstract spaces and the structure of continua (F. Burton Jones, for example) or in the related area of set-theoretic topology (Mary E. Estill Rudin). Others entered related branches, such as algebraic topology (Raymond L. Wilder), analytic topology (Gordon T. Whyburn), and topology of manifolds (R. H. Bing).

The University of Texas regulations in 1953 allowed Moore to continue to teach beyond the usual retirement age of seventy, and he taught until he was eighty-six. Although willing to continue, he was then retired. His last official contact with the university occurred in 1973, when he sent his appreciation to the regents for naming the new building housing the departments of mathematics, physics, and astronomy after him.

Moore's career spanned the period of rapid growth in American mathematics that began at the turn of the century. He contributed a branch of topology and created an influential method of teaching mathematics. His honors included election to the National Academy of Sciences (1931); visiting lecturer of the American Mathematical Society, the first American to be so honored (1931–1932); and the presidency of the American Mathematical Society (1937–1938).

BIBLIOGRAPHY

I. Original Works. Moore's principal work, Foundations of Point Set Theory, appeared as volume 13 of the American Mathematical Society Colloquium Publications. The first edition (New York, 1932) was brought up to date in many details in a revised edition (Providence, R. I., 19620 that included a much more extensive bibliography. It was reprinted with corrections in 1970. A complete bibliography of Moore's articles can be found in Raymond L. Wilder's biographical article (see below).

The R. L. Moore Collection in the Archives of American Mathematics, University Archives, University of Texas at Austin, contains Moore's correspondence, personal papers, library, and other items from his home.

II. Secondary Literature. General biographical articles on Moore include R. E. Greenwood, "In Memoriam—Robert Lee Moore," in *Documents and Minutes of the General Faculty* (Austin, Tex., 1974–1975), 11653–11665, and "The Kinship of E. H. Moore and R. L. Moore," in *Historia Mathematica*, **4** (1977), 153–155; and Raymond L. Wilder, "Robert Lee Moore, 1882–1974," in *Bulletin of the American Mathematical Society***82** (1976), 417–427, which includes a bibliography of Moore's publications. D. Reginald Traylor, William Bane, and Madeline Jones, *Creative Teaching: Heritage of R. L. Moore* (Houston, 1972) includes the names and publications of Moore's doctoral students and of each successive generation of their students; it is reviewed by P. R. Halmos in *Historia Mathematica*, **1** (1974), 188–192. Moore's work is treated in Raymond L. Wilder, "The Mathematical Work of R. L. Moore: Its Background, Nature and Influence," in *Archive for History of Exact Sciences***26** (1982), 73–97.

Studies of Moore's teaching method include F. Burton Jones, "The Moore Method," in *American Mathematical Monthly*, **84** (1977), 273–278; Lucille E. Whyburn, "Student-Oriented Teaching—The Moore Method," *ibid*., **77** (1970), 351–359; and the fifty-;five-;minute motion picture *Challenge in the Classroom: The Method of R. L. Moore*, produced by the Mathematical Association of America in 1965.

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