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OF

FLOYD KARKER RICHTMYER

1881–1939

BY

HERBERT E. IVES

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F. K. Richtmyer

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The sudden death of Floyd Karker Richtmyer on November 7, 1939 ended a career unique in American physics for versatility and service. In addition to a full record as a teacher and investigator Richtmyer had served as president of three of the member societies of the American Institute of Physics, was editor of two of its journals, had been vice-president of Section B of the American Association for the Advancement of Science, and had taken a leading part in most of the important committees and councils in his field. To replace him, it has been necessary, as one faced with part of the responsibility remarked, to "enlist an army."

In reviewing a life of such far flung activities a strict chronological record would be apt to obscure the continuity of interest and effort which characterized Richtmyer's work in each of his fields. It is better, therefore, to group his work under several heads, and speak of each in turn, although no one line of work ever entirely occupied his undivided attention. The first group comprises his teaching and associated academic work. Next is his career as a scientific investigator. Then his work as editor and writer. Finally the work in which he was pre-eminent, as an organizer and committeeman in the several societies and groups for furthering physics in this country.

Richtmyer was born October 12, 1881, in the rural community of Cobleskill, New York. After attending local public schools he entered Cornell University, and graduated in 1904. He at once entered the teaching profession, which he never left, despite attractive offers from several large industrial laboratories. For two years he taught physics at Drexel Institute in Philadelphia. He then returned to Cornell University as instructor in physics. He there took his Ph.D. degree in 1910, was assistant professor 1911-18, and professor 1918 until his death. He became Dean of the Graduate School in 1931 and

held this post also until his death. In addition to teaching at Cornell he was visiting lecturer in physics at the University of California in the summer of 1923, at Stanford University in 1925 and 1931, and at Columbia University in 1929.

Properly falling under his teaching career was his membership in associations concerned with the problems of teaching. He was active for many years in the American Association of Physics Teachers, and after serving on various committees and editorial posts was president of this association 1937-38. In the Association of American Universities, he was at the time of his death the general secretary and chairman of two of its committees.

Richtmyer's characteristics as a teacher are well displayed in his well known book "Introduction to Modern Physics," first published in 1928. This, containing the subject matter of his special summer lectureships and his senior and graduate courses at Cornell, is a masterpiece of clear and logical presentation, noteworthy for its clarification for the beginner of the physical meaning of recent revolutionary physical theories, tracing their historical and experimental origin. The subject is not presented as a closed book, but the difficulties and many incomplete and unsatisfying features of physical theory are fully dwelt upon, in a manner to inspire thought and further study.

Richtmyer's work as an investigator falls under two distinct headings. As a graduate student at Cornell he was influenced by the late E. L. Nichols, to whose encouragement and guidance he expressed his indebtedness. It was therefore natural that his first research problems should be in the optical field to which Nichols devoted his life. We accordingly find Richtmyer publishing a series of papers on the then new field of photoelectricity. His work was chiefly on the application of photoelectric cells to photometric problems, and contributed part of the groundwork for their present extensive utilization in this kind of work. From this he was led naturally to other problems in photometry and illumination. A series of papers with E. C. Crittenden covers work done partly at the Bureau of Standards during a summer appointment in 1915, on heterochromatic photometry and the precision of photometric measurements.

During the period of his interest in this line of work Richtmyer served as chairman of the committee of the Illuminating Engineering Society on Education in Illumination for Engineers, and was a member of the council of the Society.

Following the war, during which he served as a civilian radio engineer in the Signal Corps (in which he later was commissioned a Major in the Reserve), Richtmyer sought a new field of research in which to initiate a long period program. For this he selected X-rays, and after a sabbatical year at the General Electric Company laboratory at Schenectady in 1919-20, proceeded to build up a laboratory at Cornell for precision work. Here for several years his attention was directed to problems of X-ray absorption, the principal result of which was to establish the law that absorption due to ionization in a given shell in an atom is proportional to the cube of the wavelength of the X-rays and to the fourth power of the wave number.

In 1927, after several months study in Siegbahn's laboratory in Uppsala, Richtmyer turned his attention to the problem of the faint X-ray lines known as "satellites." In picking an apparently subordinate phenomenon for study, Richtmyer was inspired by his belief that the answers to the major problems of physics have often come from running down obscure or discrepant effects. He often mentioned in this connection Planck's discovery of the quantum of energy as a result of trying to clear up the "shape" of the radiation-against wavelength curve of the black body. Closely along these lines Richtmyer carried out or supervised a number of investigations on the width and shapes of X-ray lines. In his vice-presidential address to Section B of the American Association the choice of the topic "The Romance of the Next Decimal Place" shows again Richtmyer's belief in the importance of clearing up minor phenomena or discrepancies. The study of satellites did in fact occupy the rest of Richtmyer's years of active research. He proposed a theory for the origin of these lines, ascribing them to jumps made simultaneously by two electrons in an ionized atom. He later recognized that while his proposed mechanism might account for some, most of the observed satellites are probably due to a mechanism proposed earlier by others, namely to a one

electron jump in a doubly ionized atom. This all led, however, to the realization that the satellite problem was part of the broader one of the multiple inner ionization of atoms. His research program at Cornell, therefore, became a broad attack on this problem by studies of widths and shapes of X-ray lines and absorption limits, Auger transitions and their probabilities, and the relative intensities of satellite lines. With the increasing demands on his time for administrative work after 1930, Richtmyer's contribution to this program was increasingly one of inspection and supervision, but his mastery of technique and the guidance and experience he contributed played a dominant part in the productivity of those working in his laboratory.

Concurrently with his teaching and research work, Richtmyer had a distinguished career as an editor of scientific journals, and of a series of scientific text books—"The International Series in Physics," published by the McGraw-Hill Book Company. His active editorial work began with his assumption in 1922 of the business managership of the combined Journal of the Optical Society and the Review of Scientific Instruments. This combined journal was the result of a movement to establish a high grade scientific instrument journal in the United States which should be comparable in its influence with the German Zeitschrift für Instrumentenkunde. In this movement the Association of Scientific Apparatus Makers of the United States of America took a leading part, and the project was partly underwritten by the National Research Council. It involved many considerations of policy and careful consideration of advertising and other sources of income. In the launching and guiding of this journal, Richtmyer, whose interest in instruments was always intense, applied himself unremittingly through the ten years of its existence, and in 1932, when the Review of Scientific Instruments became a separate journal under the Institute of Physics, he became the editor in chief, which post he retained until his death.

Beginning with the inception of the Optical Society of America, Richtmyer was an associate editor of its journal; was assistant editor during the period of its combination with the Review of Scientific Instruments, and from 1932 until his death

was the editor in chief. The great responsibilities of the editorship of these two journals did not, however, prevent him from accepting work as associate editor in other journals of the Institute of Physics. He was thus in continual active touch with practically the whole field of publication in American physics, and his experience, judgment, and constructive practical ideas were important and highly valued by all connected with these enterprises.

During the last ten years of his life Richtmyer's time and energy were largely devoted to administrative work in the several societies and important committees in the field of physics. His career as society official indeed began before this, with his term as president of the Optical Society in 1920, and as president of Sigma Xi, 1924-26, but from the date mentioned he was occupied continuously in a range of executive and committee-work which was not only unique, but to anyone less energetic, enthusiastic and resourceful, would have become quite impracticable. He used to quote with approval the saying: "If you want to get a job done, ask a busy man to do it," and exemplified the saying in his own actions. He was repeatedly in demand for important posts, and his attitude was always to see if he could find a way to undertake the new job, and he usually did. There was no indication that his application to any one of these undertakings suffered by the number of commitments he made. On the contrary the experience and point of view of one was carried over to another, which probably simplified his own labors and certainly coordinated the work of the many organizations he served.

A listing of his offices can give an idea of their number but not of course of the constructive work he did in each. In the American Physical Society he served on the council from 1934 to 1935, was vice-president in 1935, and president in 1936. He was a member of the Executive Committee of the American Association of Physics Teachers 1931-39, vice-president 1935-36, and president 1937-38. When the American Institute of Physics was founded to coordinate the activities of the several physical societies, he became an active member, serving on various committees, and as a member of the Executive Committee

1934-39. Richtmyer devoted years of labor to the work of the National Research Council, was a member of the Executive Board 1924-27, 1930-35, a member of the Fellowship Board 1930-37, of the Division of Physical Sciences, 1923-35, vice chairman of that division 1927-29 and chairman 1930-35.

In addition to these positions in the physical groups, he was a life trustee of the National Geographic Society from 1939, an active member of the International Association of Ithaca, of which he was president for several years, and a member and chairman of the Board of Trustees of the Unitarian Church of Ithaca. He was a member of the Cosmos Club of Washington and of the Greek letter societies Gamma Alpha, Sigma Pi Sigma, Phi Delta Kappa, Phi Kappa Phi.

Numerous honors for his scientific work included the honorary Doctorate of Science of Lehigh University, the Levy Medal of the Franklin Institute in 1929, membership in the American Philosophical Society, 1935, and the American Academy of Arts and Sciences, 1935. He was elected to the National Academy of Sciences in 1932, and was elected to the Council of the Academy in 1938.

Richtmyer's personality was most attractive. He counted a host of friends among his scientific colleagues, and among the many younger men whom he wholeheartedly counseled, encouraged and aided. His appearance was always very much that of a country lad, a rather gangling figure, loosely dressed, with an honest and rugged face. As a conversationalist he was seriously attentive to the matter in hand, but was blessed with a strong sense of humor. He always appeared master of his problems, undiscouraged and untiring, but frank and modest.

Surviving him are his wife, Bernice Davis Richtmyer, and three children, Robert D., Sarah (Mrs. Mann), and Lawson D.

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KEY TO ABBREVIATIONS

Amer. Phys. Soc. Proc. = American Physical Society, Proceedings
Elec. World = Electrical World
Franklin Inst. Journ. = Franklin Institute, Journal.
Illum. Eng. = Illuminating Engineer.
Illum. Eng. Soc. Trans. = Illuminating Engineering Society, Transactions.
Opt. Soc. Amer. Journ. and Rev. Sci. Instr. = Optical Society of America, Journal and Review of Scientific Instruments.
Phil. Mag. = Philosophical Magazine.
Phys. Rev. = Physical Review.
Rev. Modern Phys. = Review of Modern Physics.
Rev. Sci. Instr. = Review of Scientific Instruments.
Sci. Mo. = Scientific Monthly.
Sib. Journ. Eng. = Sibley Journal of Engineering.
Tel. & Tel. Age. = Telegraph and Telephone Age.
U. S. Bur. Standards, Bull. = United States Bureau of Standards, Bulletin.

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