



Harold E. Edgerton

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1903-1990

By Gerald L. Wilson

Professor Harold E. Edgerton of the Massachusetts Institute of Technology, the inventor of high-speed photography, the man whose genius transformed the strobe light from a laboratory curiosity into an important tool for science, industry, and the military, died at the age of eighty-six on January 4, 1990.

At the Massachusetts Institute of Technology (MIT), where he had been a faculty member since 1932, his official rank was institute professor, an honor bestowed on only a handful of faculty. His unofficial title—one he bore as proudly as the loftier one—was simply Doc. He was called that by nearly everyone, from first-year undergraduates to MIT's incumbent president, who had been one of Doc's students in the early 1950s.

An internationally eminent electrical engineer, Dr. Edgerton also was known for developments in sonar technology, which he applied to geology, archaeology, and undersea explorations.

It was as a photographer of the "unseen" that Dr. Edgerton was best known to the general public. Millions of people have seen his stop-action photos, which have frozen the rapidly fluttering wings of a hummingbird, "stopped" a bullet as it shattered a light bulb, or revealed the power and grace that underlie athletic competition.

He lived by a credo that is easy to state, but difficult to follow. A Boston newspaper, published the morning of the day he was to die, quoted it in reporting yet another honor for him from a professional organization. "Work like hell, tell everyone everything you know, close a deal with a handshake, and have fun."

He was born in Fremont, Nebraska, April 6, 1903, and grew up in Aurora, Nebraska. While in high school, Professor Edgerton worked as a janitor, meter reader, coal handler, and lineman for the local power company, and he planned to make a career in the power industry. After graduating from the University of Nebraska with a degree in electrical engineering in 1925, he joined General Electric Company in Schenectady, New York.

But after a year there and at the urging of his father, a lawyer and newsman who was well-traveled and had a high regard for the northeast and its academic institutions, he went to MIT for graduate work. Professor Edgerton received an M.S. in 1927 and became a research assistant in what then was called the Department of Electrical Engineering. He earned his Sc.D. in 1931 and was appointed to the faculty the next year.

It was while working on his doctoral thesis that Professor Edgerton first turned to stroboscopic photography. Needing to determine the exact position of the armature of the synchronous motor he was studying, Professor Edgerton rigged a mercury vapor lamp so that it would flash at the same speed as the rotating armature. He succeeded in taking excellent pictures of less than ten microseconds duration.

The first flash picture—using a spark—had been made in 1851, very early in the history of photography, but the technique had been treated as a curiosity until Edgerton came along.

Captivated by the success of the armature picture, Dr. Edgerton and one of his students, Kenneth J. Germeshausen—both enthusiastic amateur photographers—began making still and motion pictures of all kinds of objects in rapid motion.

Dr. Edgerton also made many advances in high-speed motion picture techniques. He devised a system by which action is photographed at a rate of many flashes a second with an open shutter. The exposures are made by strobe flashes on a continuously moving film.

During World War II, Dr. Edgerton was asked to devise a strobe system for nighttime aerial photography of ground targets and operations. He developed the necessary apparatus and traveled to Italy and England to supervise its installation and testing. It was used effectively in the Normandy invasion in 1944. After the war, Edgerton, Germeshausen, and Herbert E. Grier, another former student of Edgerton, were asked to photograph the first peacetime test of an atomic bomb. From that project the company got involved in developing the high-speed circuits that triggered such explosions.

In 1952, when the National Geographic Society asked Dr. Edgerton to develop an underwater camera for Jacques Cousteau, the MIT professor began a collaboration with the famous French explorer that continued for many years. Cousteau's crew called Edgerton Papa Flash.

Professor Edgerton's pioneering work with side-scan sonar included development of equipment that could reveal not only the existence of objects on the ocean bottom, but also their shapes. With such apparatus, Dr. Edgerton and Cousteau explored parts of the Mediterranean. They located the *Britannic*, a hospital ship sunk by a mine in the Aegean Sea during World War I, and various ancient wrecks. With the same group, he made a successful archaeological survey in Lake Titicaca, near the Inca Temple of the Sun. In 1973 Dr. Edgerton helped find the remains of the Civil War ironclad *Monitor*, which sank in a storm off Cape Hatteras.

In 1983 MIT dedicated the five-story EG&G Education Center, designed for teaching and conference purposes. Dr. Edgerton gave the first lecture in the hall bearing his name on a subject on which he was an unquestioned authority, the "History of Strobe Photography."

Dr. Edgerton was married in 1928 to Esther May Garrett. They had been childhood friends in Aurora, Nebraska. Their children are Mrs. Mary L. Dixon of Hickory, North Carolina, and Robert F. Edgerton of Pontiac, Michigan.

In 1986 he was inducted into the National Inventors Hall of Fame for his invention of ultra high-speed photography. The patent for the specific invention cited, "Stroboscope," was issued August 16, 1949.

Other awards and honors included the Certificate of Appreciation from the War Department and the National Medal of Science, 1973.

His memberships included the Academy of Applied Science, Academy of Underwater Arts and Sciences, American Academy of Arts and Sciences, American Philosophical Society, and Boston Camera Club (honorary). He was elected to the National Academy of Engineering in 1966.

Dr. Edgerton was a fellow of the Institute of Electrical and Electronics Engineers, Photographic Society of America, Royal Photographic Society of Great Britain, and the Society of Motion Picture and TV Engineers.

For all of his long career, accessibility to students was a hallmark of Professor Edgerton. His office door was always open, and although he might tell a visitor that he had "just five microseconds," he would spend hours with students, especially freshmen, sharing the excitement of a new experiment. Professor and Mrs. Edgerton often entertained students at their Cambridge apartment where a strobe light was used to flash a welcome at the door.

Not long after his death, the MIT student newspaper published a letter from a student who had graduated in 1989. She wanted to relate an incident that had involved her and Professor Edgerton, "one of the most warm-hearted people I have ever met." Her letter captured the essence of MIT's beloved Doc.

The student wrote that she encountered Professor Edgerton one day in 1988 when she was walking along the campus in tears over a personal incident. They had not met before.

He invited her to his home, introduced her to his wife, and they shared their dinner with her.

At this point in her letter there is a memorable passage, more touching perhaps because the writer is not a native speaker of English.

"After the dinner, he went under the dining table and asked me to come under as well. I wondered if he liked to rest under the table after meals, but I soon found out why. There were a lot of writings on the reverse of the table. Many of them were the signatures of people who had visited, some with greetings. He gave me a pen and I wrote my name in Japanese After that day they invited me over several times. Some times they would give me take-home food so I could have it for breakfast. Dr. Edgerton told me that I was his first Japanese granddaughter . . . In our lives we seldom meet people who really touch our heart . . . I greatly miss my beloved Grandpa Edgerton, like those who were also touched by his warmth during his life."