VLADIMIR KOSMA ZWORYKIN

1889–1982

BY JAMES HILLIER

VLADIMIR K. ZWORYKIN, often called the father of television, died in Princeton, New Jersey, on July 29, 1982. At the time of his death, Dr. Zworykin held the special title of Honorary Vice-President of the Radio Corporation of America (RCA), having officially retired in 1954 as Vice-President and Technical Consultant to RCA Laboratories.

Dr. Zworykin was one of the giants among the early architects of our electronic age. While he always shrugged off his designation as the father of television, nevertheless his inventions and developments during the 1920s brought the concept of electronic television within the range of practicality and provided the technical foundations for all modern television systems. His “flash of genius” was the combination of electron beam scanning and the concept of signal storage at the picture element level in an image sensor he named the “iconoscope.” His signal storage concept made it possible for the level of illumination required on the subject to be reduced by several orders of magnitude and, for the first time, to be brought within a practical range.

Dr. Zworykin was much more than an inventor. He was a visionary who dedicated much of his career to using technology to extend the human senses. He was a leader with an extraordinary ability to select competent research workers and then to inspire them to perform at levels far beyond their own expectations. While he never assumed the role of entrepreneur, he was a very persuasive exponent
of the value of electronics technology to the entrepreneurs of his time.

Born in Mourom, Russia, in 1889, Dr. Zworykin received his undergraduate education at the Petrograd Institute of Technology, graduating with the degree of electrical engineer in 1912. At the institute he met and worked with Professor Boris Rosing, who, as early as 1906, believed that cathode-ray tubes would ultimately provide the solution to practical television. By the time Dr. Zworykin left the institute, he took with him an intense conviction that Rosing's thesis was the one to pursue.

In 1912 Dr. Zworykin entered the College de France in Paris, where he engaged in X-ray research under Paul Langevin. These studies were interrupted by World War I when he had to return to Russia to serve as an officer in the radio communications branch of the Russian Army. The disruption and confusion caused by the Russian Revolution ultimately resulted in his arriving in the United States in 1919.

Soon after arriving here, he joined the research staff of the Westinghouse Electric and Manufacturing Company where he undertook research on photoelectricity. In reality, and largely on his own initiative, he was continuing the development of electronic television. While he appears to have had the freedom to do this, it also seems clear that the management had little enthusiasm for the future of the work. While at Westinghouse he was also a graduate student at the University of Pittsburgh, where he acquired his Ph.D. in 1926.

His association with RCA came as the result of a corporate rearrangement. It began in 1929 when he was transferred to RCA as Director of the Electronic Research Laboratory in Camden, New Jersey.

By the time of his transfer to RCA, Dr. Zworykin had developed working versions of his iconoscope and had demonstrated a television receiver incorporating his "kinescope," a cathode-ray display tube embodying the concepts that are still fundamental to all modern picture tubes. At RCA he found a kindred spirit in David Sarnoff, who could provide both the entrepreneurial expertise and the financial support that were needed to complement his technical achievements and bring television to the general public.
Throughout his working career Dr. Zworykin never lost interest in the key elements of the television system. His laboratory was the source of a stream of major developments that continually enhanced the performance of both the pickup tubes and picture tubes. Of particular note among these were the “Image Orthicon” that provided another major improvement in the sensitivity of the pickup tube; the “Vidicon” that led to compact, portable, and inexpensive television cameras for all purposes; and the “shadow-mask” concept that is fundamental to the operation of every type of picture tube used in present-day color television receivers.

As Dr. Zworykin’s influence and staff grew, his interests also broadened, but they always did so within his central theme of using technology to extend or aid human senses. Among the diverse products of his laboratory in this facet of his career were infrared image tubes that became the key elements in “Snooperscopes” and “Snipperscopes,” used primarily in military operations; television systems for the remote guidance of aerial torpedoes; secondary emission photomultipliers that were ultrasensitive photocells with a multitude of applications; and the electron microscope. Each was a major contribution in its field.

Dr. Zworykin’s recognition of the potential of the electron microscope led to his support of its development from a laboratory demonstration to a readily available commercial instrument. Also, his observation of the impact of the electron microscope on biological and medical research inspired him to dedicate his retirement years to developing interdisciplinary cooperation between physical and life scientists.

As a by-product of such extensive technical achievements, Dr. Zworykin was the holder of more than 120 patents, the author or coauthor of 4 monographs and innumerable technical papers, a fellow or member of all the relevant technical societies, and the recipient of a large number of significant awards, only a few of which are mentioned here. He was a member of the National Academy of Sciences and was among the earliest group to be elected to the National Academy of Engineering in 1965. Among his more outstanding awards were Chevalier of the French Legion of Honor (1948), the Faraday Medal of the British Institution of Electrical Engineers (1965), the U.S. National Medal of Science (1966), the
Founders Medal of the National Academy of Engineering (1968), and induction into the National Inventors Hall of Fame (1977).

In his professional career his dedication to technical work and to the future was exclusive and absolute. Invitations to serve on committees were invariably refused, but his response was usually accompanied by an offer of the services of a very appropriate member of his staff. His climb through the management ranks at RCA was more honorific than real. He never allowed his management responsibilities to grow to the point where he could no longer give individual, personal attention to the members of his staff. At the same time, he was a very human and compassionate individual, always ready to help members of his staff solve their personal problems.

In his personal life Dr. Zworykin was one of those rare individuals who truly “left his job at the office.” He was a thoughtful and considerate husband and father and a frequent and gracious host. He enjoyed a wide range of non-technical personal interests and had numerous friends who paralleled those interests: writers, artists, musicians, philosophers, and politicians. Many were leaders from the immigrant Russian community. Then there were hunting companions, tennis partners, and more. He was a dedicated hunter, and at home he was always accompanied by a well-trained bird dog. To be his friend was an enlightening and exhilarating experience.

Dr. Zworykin has passed on. He died a happy man, having lived long enough to see the realization of his early great vision—to have technology take our eyes where our bodies cannot follow. While the profuse ramifications of the technology he initiated are still unfolding, it is clear that the whole world is already much richer for his having lived.