Richard W Damon

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Eds. Paul Damon, Robert Halstead, Timothy Huemiller, and Robert Price [1]

Richard W. Damon distinguished himself in the research of microwave magnetic and acoustic phenomena; in management at Microwave Associates and Sperry Corporation; in professional activities as president of the Institute of Electrical and Electronics Engineers (IEEE); and in civic, church, and family activities in Schenectady, New York, and Concord, Massachusetts, where he was born May 14, 1923.

"When I was about ten, I decided that I was going to be a scientist" Dick Damon wrote. He formed a "Society of Science" at age eleven as a vehicle for him and his friends "to discuss astronomy and other subjects that might appeal to us." Starting with a deep interest in astronomy, he took up photography and then chemistry and electronics, building a radio transmitter as a hobby. Winning a full scholarship to Harvard, he felt the strongly competitive academic pressures there—indeed, Frederic de Hoffman, who along with Edward Teller conceived the hydrogen bomb in 1959, was his roommate. Following the shock of Pearl Harbor, they switched from chemistry to physics, and persuaded J. H. van Vleck, who in 1971 became a Nobelist, to teach them both halves of a course in electricity and magnetism at the same time.

[1] With contributions from additional family members and friends and material drawn from the personal memoirs of Dr. Richard W. Damon.

As a U.S. Navy ensign (later lieutenant junior grade), Dick was a senior officer in charge of installing shipboard sonar for the invasion of Japan. After the war, he returned to Harvard for graduate school. From attending "enthralling" lectures in electromagnetic theory given by Julian Schwinger, a 1965 Nobelist, Dick decided that he "really loved this stuff' and would go for "my Ph.D. so that I could do research."

Initially Dick's dissertation was to be in making a new measurement of the velocity of sound. This was interrupted, however, when he left school to gain hands-on competence in magnetrons at Raytheon. His thesis then switched to measuring for the first time the spin-lattice relaxation time of the ferromagnetic resonance. This work was made possible through his knowledge of magnetrons. Here Dick worked closely with Nicolaas Bloembergen, a 1981 Nobelist, who stimulated him with a series of vital insights leading to their joint discovery of spin-wave instability and of the band structure caused by spin-wave demagnetizing fields. The work involved many months of concentrated effort and several setbacks. The thesis "in addition to the improved theory developed at Bell Labs," Dick noted, "established the fundamental high power limitation of ferrite devices, such as isolators and circulators, and also pointed the way to new nonlinear devices such as frequency doublers, power limiters and, a few years later, a form of parametric amplifier."

Major portions of his landmark thesis have been presented in *Reviews of Modern Physics*, vol. 25, pp. 239–245, January 1953; and in his chapter in *Magnetism*, G. Rado and H. Suhl, eds., Academic Press, 1963. Another kind of parametric amplifier, based on spin waves in yttrium-iron-garnet (YIG) rather than in ferrite, was developed jointly with Herman van de Vaart, published in the *Proceedings of the IEEE* in 1965, and reported in the press. This was a sequel to investigations on microwave magnetostatic (MS) spin waves, and to the original exposition of surface MS waves, done with John Eshbach at General Electric and published in the *Journal of Physics and Chemimy of Solids*, vol. 19, p. 308, 1961. Dick was the first to observe bulk MS waves and make applications of them. He held a number of patents in these areas.

Dick Damon's initial leadership position in industry was with Microwave Associates (now M/A-COM) where in 1960 he was appointed manager of the Microwave Control Devices Department. But he had received numerous university teaching offers from the time of his first postdoctoral job at the General Electric Research Laboratory, where he had been since 1951. For Dick it was "hard to decide between industry and academia."

Dick's new company cooperated in enabling him to teach an intensive graduate course in solid-state electronics at Harvard in 1962. This was "the opportunity to see how much I enjoyed teaching," Dick observed. He found it to be "a challenging, exciting experience."

Dick next joined the newly formed Sperry Rand Research Center in Sudbury, Massachusetts, at the invitation of Karl Willenbrock, a Harvard faculty member and consultant and the 1969 IEEE president, and Roger Newman, the center's first manager, solid-state sciences. Dick progressed rapidly to become the director of the Applied Physics Laboratory. There he was in charge of research into semiconductor devices, tribology, gas discharge displays, magnetic disks, fiber optics, fingerprint identification, surface acoustic waves, and other advanced programs. For those who worked in Dick's laboratory, his warm personality and profound understanding of the scientific creative process, with all its highs and its lows, were a permanent source of support. In spite of his busy schedule, he was always ready to listen, encourage, and advise.

Dick's final position before he retired from Sperry was his most influential one, as corporate director of technology. There he had oversight of $500 million in research and development programs annually. He became an adjunct professor at the Gordon Institute after his retirement, and he also served as director of the Matec Corporation.

Dick was deeply committed to public service and served the Institute of Electrical and Electronics Engineers in many ways. He was on the editorial board of the *Proceedings of the IEEE* for eight years, was the IEEE National Microwave Lecturer in 1969, and became known for many other contributions to technical

and local chapter activities of the IEEE. As a result, in 1971 he joined about a dozen other IEEE Boston Section members who met as the "Rivers committee." This committee, put together by Bob Rivers, considered how to make the IEEE a more effective advocate for engineers and for public understanding of the engineering profession. The Rivers committee had a substantial influence on the 1972 IEEE constitutional amendment to initiate such activities. The committee also adopted a set of seven goals including "a lifetime engineering career with adequate compensation" and "public support for engineering in solving society's problems" that became the basis for the program of the IEEE U.S. Activities Board with which Dick held numerous positions from 1977 through 1984.

Through these activities Dick earned increasing recognition, serving on the IEEE's board of directors in 1977–1978 and later on the IEEE fellow selections committee. He earned respect too: a 1979 letter from Bruno Weinschel, who became the IEEE president in 1986, states, "I believe you are one of the most capable and knowledgeable directors I have ever seen.... In 1979 you are not engaged in any IEEE activity. Considering your abilities, past performance, talent, and wealth of knowledge, this appears to me almost sinful." Still, Dick little realized where the path that began with the Rivers committee would soon lead.

In 1980 Dick, nominated from the floor at an IEEE board of directors meeting, became the directors' official nominee for the IEEE presidency. "I can't say no," was his modest explanation for running for president of the IEEE, the largest engineering society in the world. Dick ran unopposed but campaigned anyhow, to encourage the spirit of volunteerism that he saw as the IEEE's lifeblood.

Dick's objectives for the IEEE included, of course, excellence in its technical and educational activities. "But," he stated, "competent technical performance is not enough!" He worked for the objectives first enunciated by the Rivers committee, and was particularly passionate in supporting improved pension rights for working engineers. He also argued for more applications-oriented papers in IEEE conferences and publications and advocated strengthening the IEEE's visiting lecturer programs.

He urged the IEEE to develop publications and other means to enhance public understanding of engineering and technology. In speeches to engineering students, he challenged them to consider policy positions in business, industry, and government as well as the traditional engineering roles. Clearly, Dick lived up to his own advice.

In addition to travels throughout the world for the IEEE, Dick long rendered public service on important U.S. government committees. He also was a fellow of the American Physical Society and of the American Association for the Advancement of Science. In 1989 Dick was elected to the National Academy of Engineering.

Dick had a broad range of interests in his personal life as well. From an early age he was an avid outdoorsman and was committed to his local community, church, and family. Throughout his life he displayed his talents for helping and leading others.

Concord, Massachusetts, still a rural community in the first half of the century and where Dick grew up, was a perfect place for developing an interest in the outdoors. Boy Scouts was an important part of his life with the weekly hikes and community service activities. His talent for helping others was also evident here. In 1938 at age fifteen, he saved the lives of two friends who had fallen through the ice on a local pond. He represented his local community at the National Jamboree in Washington, D.C., in 1937, and went on to become an Eagle Scout. Throughout his life Dick enjoyed hiking, fishing, and skiing.

Dick contributed his leadership talents throughout his life in his local community, his church, and his family. He served as senior class president in high school and served the community on various working committees of the town of Concord. While living in Schenectady, New York, he served the First Methodist Church as chairman of the Education Commission and the board of stewards, and subsequently he was the lay leader, the top lay position in the church. In his later years he served as a trustee of the West Concord Union Church. His family and their heritage were always important to him. He and his wife, Anna, had three children and five grandchildren. In 1963 he bought the Damon home in Concord, which was built as a wedding

present for his grandparents in 1884. In 1977 he and a partner bought the Damon Mill in Concord, renovated it, and converted it into office space. The Damon Mill had been built by Dick's great grandfather in the 1860s.

These, then, were his accomplishments, his life. Giving of himself to his research; to his management responsibilities; to his professional societies; and to his community, church, and family, Dick Damon accomplished much in his life, contributing right up to the end. He died on February 15, 1991.