



## RALPH EDWARD GIBSON

(1901 - 1983)

Ralph Edward Gibson was truly a “Man for All Seasons” – a distinguished scientist, inspiring teacher, leader in the application of technology to the solution of important national problems, trusted counselor to public officials, expert gardener, organist, and choir director. To the end, his interest and enthusiasm were as boundless as ever, his mind just as incisive, his vision undimmed, and his dry wit just as keen.

Born in King’s Lynn, Norfolk, England in 1901, R. E. Gibson was educated at George Watson’s Boys College and the University of Edinburgh, where he earned a B.Sc. (*summa cum laude*) in 1922 and a Ph.D. in chemistry in 1924. While an undergraduate, he was awarded the Crum Brown Medal and the Hope Prize Scholarship in Chemistry. During 1923-24 he was a research fellow of the Carnegie Foundation.

Dr. Gibson’s first professional career – that of a research scientist – covered a span of some 17 productive years at the Geophysical Laboratory of the Carnegie Institution of Washington, between his arrival in the United States in 1924 and the outbreak of World War II. His pioneering and definitive research on the physical chemistry of solutions at very high pressures was marked by imagination coupled with insistence on scientific rigor. Its excellence was recognized by the award of the Hillebrand Prize of the Chemical Society of Washington for 1939.

During much of that time he lectured as adjunct professor at the George Washington University. One of his students recalls that R. E. Gibson characteristically based his rigorous teaching of thermodynamics directly on the original works of J. Willard Gibbs.

Dr. Gibson’s second professional career – the direction of research and development – began in 1941 when he joined the National Defense Research Committee as vice chairman of Section H, Division A, which was set up to apply rocket propulsion to military weapons. Through the good offices of R. C. Tolman, I came to work for him as a technical aide in June of 1942 and had the privilege and pleasure of being his assistant, colleague, and close friend for the ensuing forty-one years.

When Dr. Gibson undertook the development of solid propellants for rockets, the factors controlling propellant combustion were virtually unknown, which accounted for the highly unpredictable and frequently catastrophic behavior of rockets. He therefore established a vigorous, scientifically based research program to gain fundamental understanding

of rocket interior ballistics and the combustion process. Being a scientist, Dr. Gibson was dissatisfied with the accepted procedure of measuring only the peak pressure developed in the rocket chamber. Told that it would be useless to measure the complete time-history because there existed no theory to interpret it, he responded “and there never will be until we measure it.” During the next three years, the group of scientists that Dr. Gibson established and directed at the Allegany Ballistics Laboratory developed a body of theory and experiments that provided a scientific foundation for the design of solid propellant rockets. Besides its notable wartime contributions, this fundamental work laid the basis for the tremendous post-war extension of solid rocket technology to propel missiles like Polaris and Minuteman for thousands of miles.

When World War II ended, R. E. Gibson foresaw the need for continuing a strong research program in behalf of the nation’s security. So he and I, together with three other young scientists who had led his wartime research team – W. H. Avery, R. B. Kershner, and F. T. McClure – joined the staff of the Applied Physics Laboratory of the Johns Hopkins University. During the war, APL had developed the extraordinarily successful radio proximity fuze and was then starting on a major research program to develop guided missiles for Fleet air defense. Within two years, Dr. Gibson became the Laboratory’s director, and led it for the ensuing 21 years.

Under his leadership, APL pioneered in establishing the basic technologies necessary for developing guided missiles and applied them to provide the Fleet with a family of powerful anti-air weapons. In the sixties, APL’s mission was extended to include the Navy’s Polaris program, the development of space technology, and the application of its expertise to the solution of such urgent civil problems as transportation, energy, and medical diagnosis and health care.

During his long tenure as director of APL, he literally molded this remarkable institution into one embodying his philosophy. Scientific understanding must go along with and be a basis for practical development, a symbiosis that he infused with a spirit of adventure that fostered creativity. He approached the direction of research in this same scientific spirit, studying its principles and publishing the results. It is largely due to Dr. Gibson’s leadership that, almost alone among university laboratories started during the World War II emergency, the Applied Physics Laboratory is today both a vigorous, productive na-

tional resource and an integral part of Johns Hopkins.

Recognition for Dr. Gibson's contributions to his adopted country has come in many forms. He was asked to serve on numerous advisory committees for the Department of Defense, on nearly half of them as chairman. Among his more significant awards were the President's Certificate of Merit in 1948, the Navy Distinguished Public Service Award in 1958, the Captain Robert Dexter Conrad Award of the American Institute of Aeronautics and Astronautics in 1960, and the Department of Defense Medal for Distinguished Public Service in 1969. In 1966, he was appointed Honorary Commander of the Most Excellent Order of the British Empire (CBE) by Queen Elizabeth II in recognition of his accomplishments in promoting scientific cooperation between the U.S. and Britain in guided missile development.

Throughout his career he played a leading role in the intellectual life of Washington. He was president of the Chemical Society of Washington in 1930, of the Philosophical Society in 1940, and of the Washington Academy of Sciences in 1956. But of all his associations, the longest and most prized was the Cosmos Club. R. E. Gibson held the distinction of being the youngest member at the time of his election to the Cosmos Club in January 1926 at age 24. He

was on the Board of Management from 1951 through 1957 and was president in 1956.

Dr. Gibson's third career began in 1969 when he retired as director of APL. Not only had he been a very active director emeritus, but also, as professor of biomedical engineering at The Johns Hopkins University School of Medicine, he applied his unique store of experience to many of the complex problems of the Johns Hopkins Medical Institutions. In 1972, that work was recognized by The Johns Hopkins University by the very special award of an honorary degree of Doctor of Medicine. His contributions to government continued through the Governor's Science Advisory Council of the State of Maryland, on which he served continuously since its inception in 1963.

In the library of the Applied Physics Laboratory, dedicated in his honor upon his retirement in 1969, hangs a plaque with the inscription taken from that in St. Paul's Cathedral in tribute to its architect, Sir Christopher Wren:

*Si monumentum requiris, circumspice*

ALEXANDER KOSSIAKOFF

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