concept of the camera was derived from medical x-ray equipment. The camera was test-flown in 1983 and scheduled for flight in the summer of 1985.

Horstman was a complete scientist, capable not only of building instruments, but also of interpreting his and other's experimental results and doing theoretical work. His research ideas were unconventional and always provocative; his spirit was always high. His strong sense of humor and rigorous honesty gave him a special place in the laboratory. A devoted teacher and a generous and patient collaborator, he will be missed by those who knew him—friends and students alike.

G. G. C. Palumbo
G. Pizzichini
Consiglio Nazionale Delle Richerche
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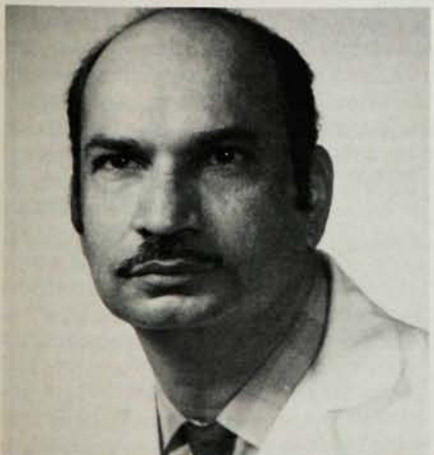
Gopinath Kartha

Gopinath Kartha died on 17 June 1984. He was born in Shertallay, Kerala State, India, in 1927, and received his PhD in physics from the University of Madras in 1953. In 1959 he joined David Harker in the Protein Structure Project at the Polytechnic Institute of Brooklyn, and later that year moved to Roswell Park Memorial Institute when Harker became director of the biophysics department there. Kartha held appointments as research professor in the Roswell division of SUNY at Buffalo and as research professor at Niagara University.

Kartha's primary research interest was the development and application of x-ray crystallographic techniques for investigating biological molecules. He developed experimental and theoretical techniques for solving the phase problem in the study of macromolecules, using large computers. In addition, he was active in training and guiding students in x-ray crystallographic research.

KARTHA



Kartha's scientific career was marked by a series of fine achievements; the earliest of these was the determination of the structure of collagen. The triple-helical structure of collagen, which Kartha and Gopalasamudram Ramachandran devised, can truly be said to form the foundation for all subsequent understanding of this most important protein. The combination of the x-ray derived structure and the chemically derived amino-acid sequence is a classic example of a fruitful combination of physics and chemistry in molecular biology.

Kartha then published important theoretical work on the determination of protein structure by isomorphous replacement and anomalous scattering. He was instrumental in resolving the structure of the protein ribonuclease, a pioneering work in this field. During this period he also published what is known as Kartha's method for the determination of scale factors.

In more recent years Kartha again turned his attention to molecules of medical importance. He made pioneering studies of steroid hormones; he elucidated the structures of antibiotics, antitumor agents, cardiac glycosides, amino acids, nucleic-acid components and vitamin derivatives. Most recently he worked on the structures of cyclic peptides and their complexes with metal ions, especially calcium.

Kartha's career was marked by a generous helpfulness to students and colleagues. He was devoted to the joy of research and scholarship.

Jake Bello
Roswell Park Memorial Institute

Sigmund W. Leifson

Sigmund W. Leifson of the University of Nevada in Reno died on 10 February 1984; he was 86. Leifson was born in North Dakota, but moved with his family to Norway in 1900, then returned in 1914. As a graduate student at the University of California at Berkeley he was one of the earliest researchers in spectroscopy of the vacuum ultraviolet. L. W. Hartman persuaded him to join the staff of the University of Nevada in 1925. Leifson, a quiet and unpretentious man, was active in improving the scope and quality of physics instruction there, and after World War II began adding staff. He gave much time and thought to careful planning. When he came to the University—and until after the Korean War—the physics and chemistry departments shared a single two-story building. When Leifson retired in 1963, each occupied a large, modern building and they shared a lecture and preparation complex. □