

Geoffrey Stuart Stephen Ludford

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Geoffrey S. S. Ludford was professor of applied mathematics in the Department of Theoretical and Applied Mechanics. He developed his deep interest in applied mathematics after he had left the University of Cambridge to work with Richard von Mises at Harvard University. The work resulted in his thesis, "Three Topics in the Mathematical Theory of Compressible Flow," for which he was awarded a Ph.D. degree from Cambridge. The association with von Mises was extremely stimulating and had a lasting influence on Geof's approach to mathematics. In 1951, at age twenty-three, he became assistant professor of mathematics in the Department of Mathematics at the University of Maryland. In 1952 his appointment was made joint with the Institute for Fluid Dynamics and Applied Mathematics. The institute provided a fruitful environment for his research. He collaborated extensively with Joseph R. Diaz and with a number of other people, including Monroe H. Martin, the director of the institute. After von Mises's sudden death in 1953 Geof was invited by Hilda Geiringer (von Mises's wife) to cooperate with her in completing the book *Mathematical Theory of Compressible Fluid Flow*. Von Mises had written the first three chapters of the book; Geiringer and Ludford added a fourth and fifth chapter, as well as many notes and addenda. Published in 1958, it has become a classic in the field. After serving a year full-time in the Institute for Fluid Dynamics and Applied Mathematics, Geof moved in 1959 to the Department of Aeronautical Engineering of the University of Maryland as a full professor. During the next year he was visiting professor of applied mathematics at Brown University. He came to Cornell in the fall of 1961 as professor of applied mathematics in the Department of Mechanics and Materials (currently the Department of Theoretical and Applied Mechanics). Shortly before his death he was also elected professor in the Department of Mathematics. He was a member of four graduate fields. Soon after his arrival at Cornell Geof established a series of graduate courses that represented his strong convictions on how applied mathematics should be taught. Ever since then those courses have provided a firm mathematical foundation for doctoral students from all over the university.

Besides paying careful attention to teaching, Geof was a prolific and creative researcher. His research interests centered on the application of mathematics to fluid phenomena. These included not only the area of compressible flow but also magnetohydrodynamics and combustion. He became interested in magnetohydrodynamics during a sabbatical year at Harvard University in 1958 working with Sydney Goldstein. Although other areas of interest occupied him during the last ten years, he continued to play an active role in international meetings on the subject.

He established a reputation as one of the leading theoreticians in combustion. Of particular importance to the

latter area is his book *Theory of Laminar Flames*, co-authored with his former student John D. Buckmaster and published in 1982. He was the author of more than 160 research papers and four books. He supervised over thirty Ph.D. students, many of whom are now on the faculties of leading universities.

Many awards and honors recognized the value of his work, including a Guggenheim Fellowship, a Fulbright-Hays Fellowship, a Senior U.S. Scientist Award from the Alexander von Humboldt Foundation (Federal Republic of Germany), and a U.K. Science Research Council Visiting Fellowship. In 1982 he was professeur associé at the Université de Provence and the following year at the Université de Paris-Sud. He was a longtime Fellow of the Cambridge Philosophical Society and had been an editor of *Physica D* since 1982. The NATO advanced research workshop “Colloque sur la Modélisation Mathématique en Combustion et ses Applications,” held in Lyon this April, was dedicated to him. Special tributes were paid to the memory of both Geoffrey and Arthur Shercliff at the fifth International Beer Sheva Seminar on MHD Flows and Turbulence in Israel this March.

One of Geof's major achievements was his success in organizing the effort to obtain the five-year grant from the Army Research Office that resulted in the creation of the Mathematical Sciences Institute at Cornell. He was the first director of the institute and was instrumental in setting the basic policies to be followed. In particular he insisted that a large part of the funding be dedicated to the encouragement and support of young mathematicians. The institute currently provides support for eighteen to twenty graduate fellows and ten to twelve postdoctoral fellows, as well as stimulates interaction among mathematical scientists by means of workshops and visiting appointments at Cornell.

Besides excelling professionally, Geof was a world-class athlete. He rowed for Jesus College in Cambridge and was a member of the 1947 Jesus crew that won the Grand Challenge Cup at the Henley Royal Regatta as well as the Scandinavian Championship in Bergen, Norway. He rowed for the winning Cambridge crew in the 1949 Oxford-Cambridge boat race. Geof held a firm conviction that one should not participate in competitive sports after age thirty. However, he maintained his excellent physical condition by a rigorous regimen of exercise and diet. His fitness was remarkable; even when in the hospital during his last illness (he suffered from a brain tumor), his lung capacity exceeded what could be measured by the instrumentation available.

Geof was also an accomplished singer. He always loved to sing, and he joined the Whiton chorale many years ago. He practiced conscientiously to develop his ability further. He was a regular soloist as a tenor in the chorale's performances.

Geof's calm and controlled demeanor gave no hint of the depth of his compassion for those less fortunate than himself. He adopted the causes of Russian refusenik colleagues with committed passion, writing letters of support and encouragement and sending scientific books, reprints, calculators, and money to them (bearing the expenses out of his own pocket). He went to Russia as part of the first large foreign delegation to the famous Moscow Sunday Seminars, a meaningful international expression of solidarity with the intellectually oppressed.

Geof's accomplishments and dedication have served Cornell well. His premature death at the height of his powers is a tragic loss for the university and for the large number of colleagues both at Cornell and around the world who benefited from their relationships with him. Much greater is the loss for his wife, Pamela, and for his daughters, Jennifer and Susan, and their families. Geof actively encouraged all three of them to go as far as possible educationally and was enormously proud that they were able to combine educational endeavors with raising families and activity in other areas.

His was an uncompromisingly high standard of scholarship; precision of thought and expression were central to his life. By his example and teaching, a substantial number of students left Cornell aspiring to develop and maintain these qualities, a legacy in which this university can take pride.

Philip J. Holmes, Sidney Leibovich, P. C. Tobias de Boer