



Pieter C. Tobias de Boer

May 21, 1930 – May 2, 2016

Pieter Cornelis Tobias de Boer was born in Leiden, The Netherlands, on May 21, 1930 and died on May 3, 2016 in Ithaca New York at the age of 85. Known to friends, family and colleagues as Tob, he finished his undergraduate and master's degrees at the University of Delft in 1954. In a 2013 video interview, Tob said that his first interest was mathematics but that he did not want to 'swim in his own small pond'. Physics was his next choice, but he was dissuaded by a Dutch physicist who told Tob 'in physics you will not have your own car'. So he chose mechanical engineering at Delft, studying with Professor Johannes Martinus (Jan) Burgers.

Burgers brought math, physics and experiments to the study of fluid mechanics, and Tob adopted this model for the rest of his career.

Tob served in the Dutch military, rising to the rank of lieutenant. In 1956 Tob married Joan Lieshut. The newly married Joan and Tob moved to the United States, where Tob earned his Ph.D. in 1962 in physics under Professor Jan Burgers, who had moved to the University of Maryland. During this time the de Boer's three children, Maarten, Claire, and Yvette were born.

The de Boers arrived in Ithaca in 1964 where Tob took a position in the Graduate School of Aerospace Engineering at Cornell as an assistant professor. Bill Sears had just finished his directorship of the Aero School, and his successor Ed Resler made Tob the offer.

In the Cornell Aero School of the late 1960's Tob's faculty colleagues included Shan-Fu Shen, Don Turcotte, Peter Auer, Dick Seebass, Al George and Terry Cool.

Tob initially studied the physics of shock waves in fluids. His first teaching course was Advanced Kinetic Theory of Fluids. The 1960's were exciting times in fluid mechanics especially since President Kennedy had put the U.S. on a path to the Moon making space sciences all the rage. In the 1966 Aero School research log book, thirty students and researchers are listed. In 1966 Tob was assigned advisor to students, William Condit, N. Hubbard, P.R.

Grimwood and R. Kinsinger and researchers Arnold Frohn and R.A. Johnson, with most of whom Tob would co-author his first Cornell research papers.

Tob was promoted to associate professor in 1968, and to full professor in 1974, two years after the formation of the Sibley School of Mechanical and Aerospace Engineering.

Tob took summer and sabbatical leaves at the Aerospace Corporation, the von Karman Institute for Fluid Dynamics, Ford Motor Company, General Electric,

Delft University of Technology, Centre National de la Recherche, the Jet Propulsion Laboratory and the National Institute of Standards and Technology.

Over the years, his research encompassed shock wave physics, fuel injection and engine emissions control. In later years, Tob's academic interests focused on thermodynamic analysis and optimal design of pulse-tube cryocoolers, which emerged in the 1980s and are now used in semiconductor fabrication and other industrial and military applications. Another area of recent interest was the rupture energy of pendular rings, with application to the attachment strength of thin films in microelectromechanical systems (MEMS) devices.

In the October 1 1974 notes of the fluids group research log book is an entry; "Professor DeBoer introduced the possibility of using hydrogen as a fuel for internal combustion engines; advantages no CO, low NO_x etc. but there is the problem of flashback". As former Sibley School Director Al George has said, "Tob's research was way ahead of its time".

At various times, Tob taught courses in thermodynamics, fluid mechanics, combustion, and mathematics, with a particular fondness for teaching undergraduate thermodynamics. He was involved with student projects such as designing the world's fastest bicycle with colleague Al George in a Cornell project to break the human powered vehicles land speed record. Tob was a great mentor to new faculty. Professor Elizabeth Fisher who taught thermodynamics with him remembers; "Tob had a great appreciation for the fine points of thermodynamics. I think a lot of my love of teaching and of teaching this particular subject is due to Tob. I feel very fortunate to have had Tob as a colleague and I benefited from his warmth, his sense of humor, and his encouragement."

Tob served as Associate Director of the Sibley School from 1982 to 1991. He was also the school's "official or unofficial parliamentarian," said colleague and emeritus professor John F. Booker. "He knew Robert's Rules of Order inside and out, and we always turned to him for that," Booker said. "Tob was totally honest, totally without guile." As Associate Director, Tob also had the ability to convince reluctant faculty to teach large required courses. His colleagues valued his calm, sensible, and affable contributions to the department in many different ways.

Tob retired in 2000 and was an emeritus professor in the Sibley School following his retirement. In his retirement Tob taught freshman calculus thus completing the circle of his lifelong interest in mathematics.

For many years, Tob was a model for other faculty in balancing the demanding tasks of scientific research with a healthy active life. His athletic exploits in cycling, running and skiing set a standard that many younger men would strive to emulate in the following decades. In 1978 Tob had set a national cycling record at the age of 48 by riding 448 miles in 24 hours. In sports Tob was very competitive. Besides being a national ranked cyclist, Tob was also a distance runner, Nordic skier and triathlete, and participated in orienteering. He was president of the Finger Lakes Cycling Club and founding president of the Cayuga Nordic Ski Club. He was treasurer of Ithaca's Cascadilla Rowing Club.

Stuart Leigh Phoenix, professor in the Sibley School, remembered Tob: "He got me into cycling." "We went every day for quite a while and went around the Cayuga Lake many times. He was a fierce competitor, and probably instilled a lot

of that in me.” Outside of professional work and sports, Tob enjoyed reading and conversing in Dutch, English, French, and German and playing piano. Former Sibley Director Francis Moon has said of his colleague, “Tob was not only a model for the aging athlete, but he also encouraged me to study the history of technology. He had a great his sense of humor and a hearty laugh.”

Tob remained in close contact with family in the Netherlands, including some fifteen first cousins, returning to visit nearly every summer for fifty years. He was predeceased by his sister Willemina. He is survived by his wife Joan, his son Maarten (Pittsburgh, PA), and daughters Claire (Hershey, PA) and Yvette (Ithaca), and five grandchildren, Cobus, Ilona, Willem, Rowan and Ayla.

Francis Charles Moon, chair; Elizabeth Fisher and Albert George