Michael K. Hoot

MICHAEL R. SFAT

1921–2012

Elected in 1994

"For initial studies on aeration in fermenters, novel developments in food biotechnology, and sustained industrial entrepreneurship."

BY MICHAEL SHULER

MICHAEL R. SFAT, a pioneer in biotechnology and bioprocess/biochemical engineering and former president of Bio-Technical Resources in Monitowoc, Wisconsin, died on October 16, 2012, at the age of 90.

Mike was born in Timisoara, Romania, on October 28, 1921, as Mircea Radu Sfat. He arrived in New York City on March 28, 1924, with his mother Emilia; his father Peter had preceded them. Because of a mix-up in paperwork Mike and his mother had to leave, go to Canada, and then reenter the United States in September 1924. Because his legal entry was after July 1, 1924, he was not eligible for US citizenship and during the first part of World War II was classified as an enemy alien. He became a naturalized citizen in 1944 while serving in the US Army.

Mike entered Cornell in September 1938 at the age of 16 with a full scholarship to study metallurgical engineering in the School of Chemical Engineering (a five-year program). The curriculum was tough and the department director, Fred (Dusty) Rhodes, was somewhat dictatorial. Survival in the program was difficult and only about a third of entering students graduated in the program. Mike reported almost quitting to transfer to the University of Michigan, but decided

to stay at Cornell. One benefit of Rhodes' direction was his foresight of the potential role of chemical engineers in food and biological processing. He allowed a few selected students to take courses and projects in food science (which at the time included a microbiology laboratory). Mike was one of these students and did his senior project on the design of food freezers.

Because of his enemy alien status Mike could not secure a job in the chemical industry after graduation, so he began his career as a research associate in Cornell's School of Nutrition. In that position he provided analytical support on projects involving freezing and dehydration of food for military use.

He entered the US Army on August 3, 1944, as a second lieutenant in the Corps of Engineers and later served as a special agent in the Counter-Intelligence Corps in occupied Germany. He became a naturalized US citizen and changed his name to Michael Rudolph Sfat. He was discharged in September 1946 and returned to Cornell, where he received his master's degree in chemical engineering the following year.

In 1947 he joined Merck as junior microbiologist in Rahway, New Jersey, where he worked with Bill Bartholomew, an influential chemical engineer, and Ed Karow, a microbiologist (Karow had worked with Selman Waksman at Rutgers who received the Nobel Prize for his role in the discovery of streptomycin). Antibiotic fermentations were exciting new technology, but batch-to-batch variability was problematic. Mike and Drs. Bartholomew and Karow began working with Richard Wilhelm, head of chemical engineering at Princeton, to define the physical characteristics essential to establish routine, successful factory fermentations. Mike made key contributions to enable the accurate scale-up from 5L laboratory fermenters to predict the performance of commercial-scale fermentations. This was his most critical contribution to engineering as it solved a difficult challenge in antibiotic fermentation.

Mike began his PhD studies with Wilhelm at Princeton in 1949 but had to abandon them in 1951 when he was transferred to Merck's Danville, Pennsylvania, facility. Nonetheless, while

working with Wilhelm he coauthored two very influential papers on oxygen transfer and agitation in fermentations ("Oxygen transfer and agitation in submerged fermentations: Mass transfer of oxygen in submerged fermentation of *Streptomyces griseus*" and "Oxygen transfer and agitation in submerged fermentations: Effect of air flow and agitation rates upon fermentation of *Penicillium chrysogenum* and *Streptomyces griseus*," both published in 1950 in *Industrial and Engineering Chemistry*, vol. 42). These articles addressed major problems in achieving effective, reproducible fermentations and are classical papers in the field.

In 1952 Mike left Merck for Pabst Brewing Co., where, as director of the company's development pilot plant, he became involved in improving the brewing process and initiated work in what is now known as biotechnology. In 1954 he moved to the Rahr Malting Company in Nanitowoc, WI, and rose to vice president for research and development, a position he held from 1960 to 1969. In 1966 he received the Schwartz Prize for Brewing Technology for his innovations in the malting process.

In 1962 he was asked to be president of a spin-off, Rahr Bio-Technical Laboratories (RBTL). While initially focusing on the brewing industry, this new venture expanded its interests to a broad range of activities that constituted what became known as "biotechnology" (the term did not come into common use for another 20 years).

In 1969 RBTL was reorganized as Bio-Technical Resources (BTR) and Mike resigned as vice president at Rahr to become president at BTR. Processes pioneered by BTR under Mike's leadership include the development of a single-cell fermentation process to convert glucose to sucrose and the manufacture of various enzymes, particularly alkaline protease, which is now used in most detergents. In many ways, BTR was ahead of its time in pioneering biotechnological processes.

Mike retired as president in 1989 but continued to provide his wisdom and experience as president emeritus until 1996. He received the Distinguished Service Award from the College of Engineering at the University of Wisconsin in 1993.

His daughter Gail Ziemer wrote:

> My father was an avid golfer, tennis player, jogger, downhill skier, and wind surfer and loved his life. He said many times that he felt so lucky as all of his goals for life had been met. He was truly self actualized. It may have sounded arrogant, but really it is very admirable as we all strive for that don't we? His passion was his career and that was his life. I know very few people who have such a passion for anything let alone [their] career. He made many contributions to his beloved Cornell as he felt the education attained was what lifted him to the heights his career took him. We buried him with his class jacket from Cornell and put a book of Cornell songs in the coffin with him.
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> Another passion was he incubated and developed barns. My daughter, nieces, and sister remember the seemingly endless trips in Wisconsin looking for a barn for him to buy! He finally found one near Manitowoc, bought it, and restored it together with the house and several other buildings. He then scouted for another building to bring on to the property. He added an event building that was used by a self-sustaining community education organization to which he donated the property. A room in the farm house is dedicated to my father in which hangs a bronze relief him.

Mike is survived by daughters Gail and Mary Anne Bauer and grandchildren Elizabeth Sergent (Gail's daughter) and Carolyn and Emma Bauer. His first wife, Jane, passed away in 1997.