

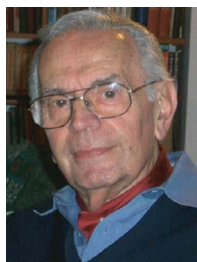
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IN MEMORIAM

Professor János Miklós Beér (1923–2018)



János Miklós Beér was born on February 27, 1923 to Sándor and Gizella (Trismai) Beér in Budapest, Hungary. His lifelong love of music started at age of five, when he began violin lessons. He enrolled at the Franz Liszt Academy of Music at the age sixteen and took great pride in playing all 16 of Beethoven's string quartets in Budapest. In the west, János played a lot of chamber music at Pennsylvania State University and later in the Sheffield University Orchestra. His love of rowing started at the age of 17 when he began to row competitively for ~4 years. His passion remained strong as he would often be rowing from MIT Boathouse on the Charles River in a single scull even at age 70.

During the WWII, Hungary, being adhered to the Tripartite Pact, was not occupied by the Nazi Germany until March 1944. To a large degree, before this, János managed to carry out his daily life activities unaffected. Starting in the Spring of 1944 the puppet new Hungarian government led by the Arrow Cross Party rapidly rounded up and transported hundreds of thousands of Hungarian Jews to Nazi concentration camps, where most died. At this humanity crisis of unprecedented scale, the most effective help came from a special envoy of the Swedish Embassy in Hungary. Raoul Gustaf Wallenberg, an architect educated at the University of Michigan, was a businessman and a diplomat. He created and issued Swedish Schutz (protection) papers to tens of thousands of Jews that saved their lives. In this one leaf document with the holder's picture, it was claimed that the owner is under the protection of the Swedish Government and when the war condition permits the owner could go to Sweden.

Through a friend who was working as a photographer in the Swedish Embassy, János was introduced to Wallenberg and immediately started working for him as his personal assistant. On the very first day of his work, he joined Wallenberg to a train station where Jews were stocked in cattle wagon waiting for deportation to concentration camps. With Swedish diplomatic emblems displayed, under the watch of the Nazi SS (Schutzstaffel), they asked the Jews if any of them had Swedish Schutz pass. If answered affirmative, they would take the person out of the wagon and send to

a house under the protection of the Swedish Embassy. When opportunity presented, János whispered to somebody asking them to pretend as somebody else whose name is on the list in the book of Swedish Schutz. Wallenberg issued and obtained several work certificates for János all with photos to use depending on the circumstances. It was estimated that about 70–80 people were rescued by János alone.

János switched to engineering, his real interest, in 1945 studying at the Technical University of Budapest, and he graduated in 1950 with first class honors. With his excellent credential upon graduation, János was immediately hired by the Heat Research Institute of Budapest. His talent in conducting research was soon noticed and he was promoted to the rank of section head. He published his first research paper in 1951 and also became an adjunct faculty member at the Technical University of Budapest. By October 1956, he had published a total of 8 technical papers.

On November 21, 1956, János and his wife, Márta Gabriella Csato, joined hundreds of thousands of people to leave Hungary after Russian tanks thundered on the streets of Budapest. They approached the border and were met by three Hungarian border soldiers who understood the situation. The soldiers them to just run no matter what they hear. So they ran up the hill to Austria with the soldiers shouting and aimlessly shooting in the air. They reached Austria and stepped on the land of freedom and liberty the next day. The only item János' had when he crossed the border was a briefcase with all his publications. He knew these would help him find a job as refuge. Indeed, he was interviewed and given a job at the research section of Babcock & Wilcox in Glasgow, Scotland. After working at B&W for a while, he decided to study under the guidance of Professor Meredith Thring, a leading authority in fuel science and Head of the Department of Fuel Technology and Chemical Engineering at the University of Sheffield, UK. This highly creative environment made János' research very fruitful. He designed and built the first "controlled mixing history furnace" (CMHF). The CMHF and tests conducted on it became the central piece of his dissertation. This work was later published in *Combustion and Flame* and attracted attention. Copies were made at Pennsylvania State University and elsewhere in the world.

Upon completing his Ph.D. in 1960, János was named as the new Head of Station at 'The International Flame Research Foundation (IFRF) in IJmuiden, Netherlands. Under János' leadership, IFRF conducted a series of very successful experiments with improved instrumentations and refurbished furnaces. All test results were carefully calibrated, analysed, and finally published. This is also where Norman Chigier worked with János on industrial furnace flames involving swirl flows. Together they were awarded the Lewis F. Moody Award by ASME for excellence in research.

Furthermore, work conducted at IFRF period laid down the foundation of publishing the monument book "Combustion Aerodynamics" that he co-authored with Chigier in 1972 that was subsequently translated in Japanese. It is here at IFRF where much of the fundamental understanding and diagnostics developed that led to improved understanding of industrial flames.

János joined Pennsylvania State University in 1963 and initiated the Penn State summer short course program on modern developments in combustion technology. Often he would give 3 lectures out of ~16 offered during the week. In addition he gave generously of his time and knowledge during discussions. He brought films from Ijmuiden which were of great interest while providing theoretical implications of the visual images.

In 1964, the University of Sheffield offered the chair vacated by Prof. Thring to János. Fuel science research at Sheffield had very well equipped research laboratories and workshops. In addition the University Buxton research site (in Derbyshire) had unique research facilities on plasma, supersonic mixing and combustion, acoustics, rocket engine, and gas turbine combustion. János served for 12 year as Newton Drew Professor and head of the Department of Chemical Engineering and Fuel Technology. Now with over 100 publications to his name, he established himself as one the foremost combustion scientists.

János joined MIT in 1976 with Ashwani Gupta and Malcolm Jacques. With the full support of his good friends at MIT, János set up a highly sophisticated and fully instrumented furnace, rated at 3 MW thermal having a 4 × 4-foot cross section. It was used extensively to develop high efficiency, low emission combustors using different kinds of fossil and alternative fuels. He also set-up a 0.75 MW fluidized bed combustor. Many of his research results, especially on burner designs, were transferred to and implemented in industry. János retired from MIT at age 70 in 1993. His expertise was still constantly sought by the U.S. Department of Energy and its Secretary, as well as many international organizations, such as

the World Bank, industry, and universities. Even at age of 90, he was actively involved with the World Bank's project building a coal fired generation station in Kosovo.

János authored/co-authored more than 300 scientific papers in the many areas of combustion science. He was also one of the leading voices promoting high efficiency generation technologies and has constantly emphasized their roles on a carbon constraint world. In 2006, in a paper published in *Progress in Energy and Combustion Science*, he systematically reviewed all high efficiency electric power generation technologies and the environmental and economic roles they play. The main conclusions of this paper were fully absorbed in the monumental work "The Future of Coal – Options for a Carbon-Constrained World" published in 2007 by a group of renowned academics, including himself, of MIT.

János, it has been our privilege to have known you for many years. Thank you for being such an inspiration and a visionary man; for being someone to whom we can look up to not only in the field of combustion, but in all aspects of life. You will always be remembered by the combustion community worldwide.

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