

## **THE INNOVATIVE ENGINEER-SCIENTIST CSABA GYENGE (1940-2021) (summary)**

The Transylvanian Museum Society has united representatives from various fields of science from generation to generation. The association consistently focused on documenting scientific career paths, working conditions, and achievements, collecting, storing, and processing data related to oeuvres and life trajectories. The Transylvanian Digital Database has opened a Scientists' Repository, where documents originating from the legacies of individual scientists have been deposited. This includes manuscripts and catalogues of completed works, along with bibliographic information. This initiative gave rise to the series launched by the present volume, titled "Scientists' Portraits".

The first issue of the series encompasses the life and oeuvre of Csaba Gyenge (1940-2021), a mechanical engineer, technical writer, external member of the Hungarian Academy of Sciences, professor emeritus at the Technical University of Cluj-Napoca, vice president of the Transylvanian Museum Society and former president of its Technical Sciences Department, professor at Sapientia Hungarian University of Transylvania – an educator, researcher, industry developer, doctoral supervisor, mentor of multiple engineering generations, and a defining figure in engineering science cultivation.

He was born in Războieni-Cetate (Alba County) as the scion of a Reformed minister's family. He completed primary and secondary school in Simeria, then obtained a degree in mechanical engineering from the Technical University of Cluj-Napoca. His engineering career, which began in the industry, as well as his later activities as a high school teacher and university lecturer, were shaped by broad interests and continuous research. The primary aim of this research was the effective implementation of theoretical knowledge into practical applications. Continuously updating his skills, he pursued postgraduate training at both domestic and foreign universities, focusing on the latest techniques and advancements. Even in his role as a university lecturer, he returned to his former workplace at the Cugir Mechanical Engineering Company, initiating collaborations. He significantly contributed to the international recognition of the city of Cugir, and his work was honoured by the city in 2016 with the title of honorary citizen. He continuously built professional connections

with both domestic and international universities. During his university teaching career at the Technical University of Cluj-Napoca, he taught subjects related to manufacturing. Additionally, his name is associated with significant laboratory developments. He also taught at affiliated departments of the university in various cities across the country. He is a co-author of textbooks, university notes, and example collections.

In 1979, he defended his doctoral dissertation titled *Contributions to Increasing the Accuracy of Duplex Gear Cutting Hobs*. His main research area was the theory of gearing and gear cutting tools. His interest extended to related areas, including the optimization of special (Duplex, Cavex, and hypoid) gears, competitive manufacturing, environmentally friendly technologies, CNC gear cutting, and the optimization of technological processes.

His scientific activities were closely tied to both industry and education. He led numerous research projects, realized through collaborations both domestically and internationally. Distinguished as a visiting professor at renowned European universities, he served as a regular lecturer at Budapest University of Technology and Economics, University of Miskolc, Comenius University in Bratislava, University of Košice, and ETH Zurich, delivering lectures on subjects closely related to his research. Four of his registered patents (Thread drill with combined flutes, patent no. 61004/1975, Trapezoidal thread finishing device, patent no. 64301, Device of grinding by rolling, patent nr.82003, Device for gear teeth rounding, patent no. 86533) have been successfully implemented in industrial practice.

He successfully collaborated in university scientific research with institutions such as the University of Braunschweig, University of Toulouse, University of Magdeburg, Trent University in London, and many others. He was an enthusiastic organizer of conferences and a conscientious and meticulous editor of conference proceedings, including DAAM, FMTŰ, MTeM, and numerous other conferences.

Generations of engineers have utilized his university notes and textbooks, notably mentioning works such as *Manufacturing Technology of Machines* (Editura Didactică, 1981), *Design of Technological Processes for Automatic Lathes* (Editura Tehnică, 1979), *Manufacturing and Assembly Design* (Alma Mater, 2003), *Production Planning* (Alma Mater, 2004), *Optimization of Machining Processes* (Editura Cărții pentru Știință, 1995), *Manufacturing Technology of Gears* (Miskolc, 1995), and *Assembly Technologies and Equipment* (Cluj-Napoca, 2015).

Since October 1, 1990, he has held the right to supervise doctoral students. Under his guidance, 19 researchers obtained their doctoral degrees.

He devoted time, energy, and tireless effort to everything that was important to him. As a true educator, he explained everything with expertise, conveying knowledge with a smiling face, determination, and conviction, orchestrating the rhythm of explanation with a typical hand gesture. Csaba Gyenge was also an organizer and caretaker of the Transylvanian Museum Society's professional network, a leading figure in scientific organization, and a creative engineer scientist.