



Claude P. Seippel

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1900-1986

By Kenneth A. Roe

Claude P. Seippel was a brilliant scientist, engineer, inventor, educator, and leader. His greatest impact on engineering came from his activities in almost every important field of turbomachinery. His inventions led to the granting of thirty-eight major patents, and he wrote some fifty significant publications. He died in Switzerland on August 1, 1986, at age eighty-six.

Claude was born on June 14, 1900, in Zurich, Switzerland. He was graduated from the Swiss Federal Institute of Technology in 1922 with an M.S. in electrical engineering.

He started his distinguished career in 1923, joining Brown Boveri Company (BBC) in Baden, Switzerland. He left the company to spend several years in the United States, and rejoined BBC in 1928. His career with BBC can logically be divided into four periods.

From 1929 to 1940, Claude managed the development, design, and testing of a multistage axial-flow compressor, which he patented. This compressor led to the evolution of the gas turbine and had its first implementation as a charging set for the Velox boiler. His first commercial gas turbine unit was a four-megawatt generator for the city of Neuchatel in Switzerland. In addition to the patent on the axial-flow compressor, Claude received patents covering turbocharging, gas turbine governing, and the pressure

wave exchanger. His more significant publications during this period dealt with the Velox steam generator, the axial-flow compressor, and heat flow in the blade foot of a gas turbine.

In the second period of Claude's career, from 1941 to 1954, he continued development work on the gas turbine. But he also was responsible for significant improvements in steam-turbine blading design and in combined cycles. He discovered and announced an important limitation to the second law of thermodynamics; the importance of his discovery was not recognized by the experts until years later when the definition of "exergy" was introduced. His discovery is even more significant today with the current emphasis on energy conservation and environmental protection.

It was during this same period that Claude began working with young students, engineers, and scientists, encouraging them to devote their careers to research. The Swiss Federal Institute of Technology elected him to its board of directors, and Swiss Society of Engineers and Architects—the Swiss equivalent of the American Society of Mechanical Engineers—elected him to its governing Central Committee.

This period was a particularly productive one for Claude. His patent for an exhaust turbocharger in 1942 led to a new market, which became Brown Boveri's most important business. In following years, he received patents for a gas turbine for aeronautical use, a device to rotate the wheels of an airplane before landing, methods for mass production of centrifugal blowers for supercharging of combustion engines, a method for regaining mechanical energy, a steam power plant with a feedwater heating system using extraction steam and exhaust gases, a steam generator with pressure firing, and a governing device for turbomachinery.

It was also a highly productive period for Claude's technical publications. In 1945 he published a paper on the use of the gas turbine as a jet engine for airplanes, an early vision that would later lead to one of aviation's greatest technological advances. But his scientific mind was not so

preoccupied that he forgot the young engineers he loved so much; one of his articles published in 1953 detailed what industry wanted and expected from its engineers.

From 1955 to 1965, the third period of Claude's career, was his last decade as an active senior technical executive at Brown Boveri. He concentrated on important projects related primarily to energy, large steam and gas turbines, and nuclear energy. His patents during this period ranged from devices to prevent overpressure to methods for calculating the allowable operating hours of thermal machines, and from improved blading for axial-flow turbines to a method of apparatus for the operation of nuclear reactors.

His output of technical papers during this period was particularly prolific, most of them dealing with gas and steam turbines, but some particularly important ones concerned nuclear power. In 1958 he published *Geometric Flow Through Multi-State Turbines*, a thorough investigation of the performance of turbine blades. His analysis, done in an era when computers were not used for such complex calculations, was a major contribution to improved blading for turbines.

Although Claude retired in 1965 as an active senior executive at Brown Boveri, he continued as a consultant to the company in areas both scientific and managerial. During this fourth period in his career, he also continued both his research (which led to five significant patents in his first eight years of "retirement") and his writing; he wrote on complex subjects, such as the aerodynamic aspects of blading research, and on more basic topics, such as how to solve some of the problems involved in enlarging his beloved Federal Institute of Technology.

That same Institute, which had elected him to its board of trustees in 1947 and elected him vice-chairman of the board in 1957, awarded Claude its honorary "doctor honoris causa" in 1959 for his contributions in the turbomachinery field. In 1965 he was named chairman of the Institute's board, and he served in that capacity for many years.

During his long career, Claude gave unstintingly of his

time to organizations that were grateful for his ideas and inspiration. He served for eight years on the steering committee of the Swiss Institute for Nuclear Research, and for fourteen years he was a member of the Swiss National Foundation as the representative of the Federal Institute of Technology. He was active in the Swiss Society of Engineers and Architects and for eight years served on its Central Committee. He even found time for civic activities, serving as a member of the Commerce Court of Kanton Argau for sixteen years.

The American Society of Mechanical Engineers elected Claude an honorary member in 1982, and the author was immensely proud to be the one to nominate him for that honor. He was elected a foreign associate of the National Academy of Engineering in 1984. As a memorial to his achievements, Brown Boveri named its main research center at Daetwill after him. In the years before his death he was considered, in the words of a close associate, the "greatest living technical gray eminence of Switzerland."

The author is proud to have known Claude Seippel for many years, and feels privileged to have spent hours discussing with him his thoughts on gas turbines and Velox boilers.

Dr. Seippel's many contributions to the development of thermal power have earned him a lasting place in the history of technological development. The world is a better place because of his brilliance, foresight, perseverance, and dedication.

