

Rufus Oldenburger (1908–1969)

(Only two months after he wrote the article "IFAC, from Idea to Birth" for the November 1969 issue of Automatica, Rufus Oldenburger died. Although he was seriously ill for a long period of time, he continued to work until the last day of his life. His life and his contributions are summarized below by Charles Concordia, a life long friend, a Fellow of ASME, and a member with Rufus Oldenburger, of its Automatic Control Division. Mr. Concordia is a well known authority on Power System Stability and control and he is affiliated with the General Electric Company in Schenectady, New York, USA—Editor).

RUFUS OLDENBURGER, one of the world's noted authorities on automatic control, died 22 November 1969, at the age of 61. With his death, the International Federation of Automatic Control has lost one of its outstanding founding members and a great leader. In addition to his many technical contributions to the field of automatic control and its understanding, Oldenburger was an extensive traveler and a firm believer that there are important benefits to be obtained from having engineers and scientists around the world get to know one another and their works better.

Throughout his entire career in education, industry and consulting, Rufus Oldenburger was vigorously active in seeking out applications of mathematical and engineering analysis in the solution of automatic control operations. As a result, his contributions to the solution of specific problems and his improvements in particular designs have been legion, too many to detail in this short space. In the field of automatic control, his writings have been voluminous and his patents numerous.

He traveled far and lectured widely in the USA and abroad and, recognizing as he did that "automatic control" is not a problem for a single branch of engineering or a single nation, he was a leader in organizing the American Automatic Control Council, of engineering societies, and the International Federation of Automatic Control. He served as the first president of AACC, 1956–60, and was a key figure with several others in the formation of IFAC in September, 1957.

Rufus Oldenburger's work has been recognized in many ways: the 1959 award of the International Federation of Automatic Control for "meritorious service"; the 1961 ASME Automatic Control

Division Award; the 1964 ASME Machine Design Award; and the 1964 ISA Award for excellence in documentation. He was a member of Phi Beta Kappa, Sigma Xi and of numerous societies of automatic control throughout the world.

Professor Oldenburger's continuous flow of outstanding contributions to the field of automatic control led the ASME Automatic Control Division to name its annual award the Rufus Oldenburger Medal, and to confer the first award upon him in 1968. In addition to the formal award, he also received from his many friends in the Division a certificate bestowing upon him the title of "Most Honored Member of the Automatic Control Division".

Born in Grand Rapids, Michigan, 6 July 1908, Dr. Oldenburger received an AB degree in Latin and Greek with a second major in mathematics from the University of Chicago in 1928. He graduated with highest honors and was elected to Phi Beta Kappa.

He received his master's and doctoral degrees in mathematics from the University of Chicago in 1930 and 1934, respectively, and then taught at the University of Michigan, the old Case Institute of Technology, at Illinois Institute of Technology, and at DePaul University before leaving the mathematics field to become a practicing engineer. In 1937–38 he was a member of the Institute for Advanced Study at Princeton.

From 1942 to 1956, Dr. Oldenburger was employed by the Woodward Governor Company, becoming chief mathematician and development engineer, and then director of research. He introduced there the scientific approach to governor invention and design.

Among his major mathematical achievements was solving the problem of the existence of an infinite power of a matrix. The solution to this problem is applicable to digital computation, optimal control, and other fields.

Among his engineering achievements are many contributions in the fields of prime-mover speed governors, in particular electric governors for hydraulic turbines, diesel governors with optimum non-linear control, and a new type of hydraulic governor without dashpots. He also developed a computer-type gas turbine control, a signal stabilization device, and a rapid method of finding

the roots of algebraic equations especially for the problem of control design. (As an aside, he also developed formulas for distinguishing suicides from those who fall by accident. These have been published in a police handbook.)

In 1953 he organized the ASME International Frequency Response Symposium, and edited the symposium proceedings. This meeting served three very important purposes: first, it highlighted the importance of the frequency response method of analysis to the understanding of mechanical dynamic controls; second, it brought to the attention of control engineers in the U.S. the existence and accomplishments of world leaders from other countries; and third, it showed, through Oldenburger's competent leadership, the desire of people in the field of automatic control in the US to be a contributing part of a world-wide effort in this technical discipline.

In 1956 he was named professor of engineering science and mechanical engineering at Purdue, later being appointed professor of electrical and mechanical engineering, and then professor of mechanical engineering in the School of Mechanical Engineering. He was also the founder and Director of the Automatic Control Center at Purdue.

It was in September of 1956 that Oldenburger attended the VDI/VDE Regelunstechnik (Automatic Control) Congress held in Heidelberg, Germany, and helped put in motion the idea from which IFAC was to emerge. As one of the founders of IFAC, Oldenburger was the US delegate to the formal organizational meeting in Paris in 1957. In

1960 he was the U.S. delegate to the first IFAC Congress in Moscow and, with Alexei Kosygin, gave the opening address.

His society memberships included the American Association for the Advancement of Science, the Swiss Association of Automatic Control, Japan's Mechanical Engineering and Automatic control, American Mathematical Society and the Institute of Electrical and Electronic Engineers. He was a Fellow of the American Society of Mechanical Engineers.

Author of two books and editor-co-author of five others, Oldenburger wrote some 110 papers. Forty of these were on pure mathematics devoted to higher dimensional determinants and matrices, higher degree polynomials and forms, and symbolic dynamics. He read and spoke eight modern languages and lectured abroad extensively.

He was a teacher cast in the mold of the "old school" but who fervently believed in the high value of research to education. He drove himself and set high standards for his students. Those of us who recognize and appreciate the benefits of *automatic control* are indeed fortunate that individual *men* such as Rufus Oldenburger have been able to conceive new structures of world organization and have been willing to work untiringly with others to make these organizations a contributing force for a better world. Oldenburger's presence and counsel are already missed by his many friends both within and outside IFAC.

CHARLES CONCORDIA
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