

MEN OF SOVIET SCIENCE

ON THE EIGHTIETH BIRTHDAY OF ALEKSANDR SAVVICH PREDVODITELEV



In September 1971, Aleksandr Savvich Predvoditelev, Professor, Doctor of Physicomathematical Sciences, Corresponding Member of the Academy of Sciences of the USSR, Government Prize laureate, and Director of the Department of Molecular Physics of the M. V. Lomonosov Moscow State University, celebrated his 80th birthday.

Aleksandr Savvich Predvoditelev was born on September 11, 1891 into a poor peasant family in the village of Bukrino, Pronskii District, of the former province of Ryazan.

Predvoditelev obtained his primary education in a country school, after which he studied in the Pronskii and Ryazanskii city schools and then entered high school. Upon moving to the upper classes of the high school young Predvoditelev began to give private lessons.

After successfully completing high school in 1910 Predvoditelev entered the first-year course in the Physicomathematics Department of Moscow University. Already in the first courses of the University Predvoditelev was taking part in active scientific investigative work. In addition, he was devoting much time and energy to the broadening of learning and general culture. After finishing the University as one of the top students Predvoditelev was retained within the Department to prepare for the rank of Professor.

In 1915 Predvoditelev was enrolled as a young assistant in the practice of physics at Moscow University. He worked in this post until 1919, at the same time conducting scientific investigations in the area of optics and molecular physics.

In 1919 A. S. Predvoditelev passed the Master's examination, and after reading two trial lectures he obtained the right of independent teaching in the Physicomathematics Department of Moscow University, with which his entire life was firmly connected.

After 1919, working as a senior assistant, Predvoditelev also taught a number of special courses mainly under the separate headings of optics and molecular physics. From 1928 Predvoditelev worked as vice chairman of the subject committee, then as Vice Dean of the Physicomathematics Department, and finally, from 1937 to 1946, as Director of the Scientific-Research Institute of Physics, Moscow University, and as Dean of the Physics Department of Moscow State University.

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The training of specialists in thermophysics was organized for the first time in our country on the initiative of A. S. Predvoditelev in 1929. In 1930 Predvoditelev became a Professor and the Director of the Department of Heat Physics, which is now called the Department of Molecular Physics. He still heads this Department at the present time.

From 1920 to 1923, along with work at the University, A. S. Predvoditelev taught physics at the N. Bauman Higher Technical College, where he conducted lecture courses and practical pursuits. From 1919 to 1930 he worked as a senior physicist (now a senior scientific worker) in the Scientific-Research Institute of Physics and Biophysics. From 1928 to 1932 A. S. Predvoditelev worked in the physics laboratory at the All-Union Institute of Labor Protection, while during 1929-1952 he worked as a consultant and then as Scientific Director of the Physicotechnical Laboratory of the F. E. Dzerzhinskii All-Union Thermotechnical Institute. In 1938 A. S. Predvoditelev was invited to work at the Institute of Energetics, Academy of Sciences of the USSR, where he established and headed until 1967 the Applied Laboratory of the Physics of Combustion.

The achievement of the State Commission on the Electrification of Russia plan and the creation in the years of the first Five Year Plan of native power machinery construction required the expansion and deepening of the theoretical bases of heat technology.

One of the principal scientific centers in which these problems were solved was the Physicotechnical Laboratory of the Dzerzhinskii All-Union Thermotechnical Institute (ATI). Predvoditelev was its scientific director. Broad studies in the area of the combustion of solid fuel, on the thermodynamic and transport properties of water and water vapor, on the hydrodynamics of biphase systems, on gas dynamics and heat exchange, on methods of cleaning stack gases, and on other thermophysical problems were conducted in this laboratory on his initiative. The problems raised here were broad, with a deep penetration into the physical essence of the phenomena studied, characteristic of the creative style of Predvoditelev's work.

The experimental and theoretical developments carried out in the Physicotechnical Laboratory of the ATI and in the Krzhizhanovskii ENIN allowed Predvoditelev and the collectives which he directed to create the diffusion-kinetic theory of the combustion of carbon presented in the monograph *The Combustion of Carbon*, honored by a State Prize in 1950. The principal conclusions of this work are widely applied by Soviet and foreign specialists in the solution of various problems in the combustion and gasification of solid fuels.

Studies in the area of thermodynamics, heat exchange, hydrodynamics, and gas dynamics were broadly developed subsequently in the work of the Institute. Studies of the thermodynamic and transport properties of water and water vapor conducted at the ATI and other organizations of the Soviet Union have obtained wide international recognition.

A. S. Predvoditelev is a distinguished Soviet scientist because of his characteristically wide circle of scientific interests, deep scientific and general learning, and many-sided public activities. His name is widely known both in our country and abroad and a number of his brilliant and profound studies in different areas of physics have entered into the storehouse of science.

He has obtained the most fundamental results in the solution of problems of the composition of materials, hydrodynamics, the physics of combustion and explosions, solid state physics, the physical acoustics of low and ultimate amplitudes, physical chemistry, and the physics of disruptive processes.

A. S. Predvoditelev has written about 200 scientific works.

He is the creator of a scientific school, developing its activities in many of the scientific and science-teaching institutions of our Motherland. This school was characterized first of all by the setting on a physical basis of problems advancing the interests of the development of our national economy. Their investigation and solution in practice is combined with a deep theoretical analysis of the physical bases of each given problem. As an example one can cite the work on the investigation of physicochemical processes during heterogeneous combustion conducted by A. S. Predvoditelev together with his colleagues.

Secondly, many scientists of A. S. Predvoditelev's school subsequently started new independent collectives, groups, and directions. Their activities were developed under the influence of those ideas which they received in laboratories under the guidance of A. S. Predvoditelev.

A. S. Predvoditelev is a talented teacher of scientific specialists. He skillfully fostered the development in scientific workers of creative initiative and independence. A well developed sense of rigor and of fundamental principles and profound scientific analysis promote the scientific-technical growth of the collectives and numerous colleagues led by him.

Predvoditelev trained over 120 highly qualified scientific workers holding educational degrees and titles. Among them about 30 people hold doctoral degrees and the title of professor, two are corresponding members of the Academy of Sciences of the USSR, one is a member of the Academy of Pedagogical Sciences of the USSR, one is an Academician of the Belorussian Academy of Sciences, and one is a corresponding member of the Academy of Sciences of the Ukrainian SSR.

Colleagues and Students of Predvoditelev have sent their articles to this issue of *Inzhenerno-Fizicheski Zhurnal*. This further illustrates his contribution to modern science.

Predvoditelev devotes serious attention to the problems of the history and methodology of physics, being the author of numerous essays and articles illuminating the role of native scholars in the development of the fundamental concepts of modern physics. *Essays on the History of Physics in Russia*, for which he wrote a number of articles, was issued on his initiative in 1949. He is the editor of a two volume collection *The Development of Physics in Russia*, published in 1970.

The government has put a high value on the scientific, pedagogical, and public organizational activities of A. S. Predvoditelev, awarding him the Lenin Prize, four Red Badges of Labor, an Order of the Red Star, and many medals, among them medals For the Defense of Moscow and For Valiant Labor in the Great Patriotic War of 1941-1945.

We wish dear Predvoditelev health, many years of life, and many creative successes.