

## PERSONALIA

### Aleksandr Savvich Predvoditelev (obituary)

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The prominent Soviet Physicist, Corresponding Member of the USSR Academy of Sciences, USSR State Prize Laureate, Doctor of Physicomathematical Sciences, and Moscow University Professor Aleksandr Savvich Predvoditelev died on December 27, 1973.

Predvoditelev was born on September 12, 1891 into an impoverished peasant family in the village of Bukrino in the former Ryazan' Province. He received his primary education at the Pronsk public school and then at the Ryazan' gymnasium. He entered Moscow University in 1912, enrolling in the physicomathematical faculty, in which he was retained after graduation to prepare for a professorship.

Predvoditelev's scientific career began during his education at the University. He took his first scientific steps in the former laboratory of the famous Russian physicist P. N. Lebedev under the guidance of Academician P. P. Lazarev. From 1919 through 1930, he worked as a senior scientific staff member in the scientific Research Institute of Physics and Biophysics headed by Lazarev. His scientific investigations during this phase were principally of experimental nature and concerned with problems of optics and molecular physics. For example, he performed subtle experimental studies of the extrinsic photoeffect, photochemical reactions, and measurement of the momenta of molecules of water of hydration from hydrated salts.

During these years, in which he was steeped in creative activity, Predvoditelev gave a great deal of time to scientific teaching work at Moscow University. He supervised exercises in the students' physics laboratory and taught a number of specialized courses in specific aspects of optics and molecular physics. He was named a professor in 1930 and made head of the department of thermophysics, to which he devoted his entire life. The thermophysics laboratory that he organized at the same time developed research in three trends: study of transport phenomena in condensed media, study of explosive combustion, and study of chemical reactions in solids acted upon by slow electrons.

In 1937, he became dean of the physics department and director of the Moscow State University Scientific Research Institute of Physics, a post that he held until 1946. He did a great amount of work on the development of promising scientific research projects and on the organization of the teaching process; at his initiative, a number of new chairs and laboratories were set up in the department, including the chair of mathematics. At that time, the MSU Institute of Physics consisted of laboratories headed by prominent physical scientists.

Predvoditelev was elected a Corresponding Member of the USSR Academy of Sciences in 1939.

During the Second World War, when the MSU was evacuated to the cities of Ashkabad and Sverdlovsk, Predvoditelev managed under difficult conditions to



organize the efforts of a staff of physicists with productive results. He mobilized all members of the physics-department staff for scientific work closely related to the war effort. Predvoditelev's wartime work and that of the team that he headed were acknowledged with gratitude more than once in decrees of the State Defense Committee and a number of ministries and agencies.

Before and after the war, Predvoditelev did important and significant work at the USSR Academy of Sciences Power Engineering Institute, in which he headed the problem laboratory for combustion physics from 1938 through 1967. His monograph "The Combustion of Coal," which was published in 1948, was recognized with a USSR state prize in 1950. A method proposed by Predvoditelev for solving problems of homogeneous combustion has proven highly productive. In it, Predvoditelev expanded on the known views of V. A. Mikhel'son concerning the process of flamefront propagation in combustible media. Predvoditelev's work connected with the launching of the first artificial satellites and spacecraft was of great value. Among the results of this effort were detailed tables of the gasdynamic and

thermodynamic variables for air up to 20 000°K and pressures from 0.001 to 1000 atm, which were published in 1957–1962. They were very well received.

During his many years of scientific activity, Predvoditelev actively and very successfully developed a broad range of problems bearing on molecular physics, gas- and fluid dynamics, the physics of heat, and theoretical physics. Back in 1928, he advanced the idea of collective interactions in condensed media, proposing various continuous models of thermal motion. He derived a generalized equation of state that has been tested successfully on a large amount of factual material. The possibility of applying his education of state in the critical region is particularly important.

Predvoditelev's papers on wave processes in acoustics and optics are of fundamental nature, a method that he developed for description of acoustic dispersion in liquids and gases has proven highly effective in solution of many physical-acoustics problems.

Predvoditelev accomplished much in the area of the methodology and history of physics, setting forth in the role of Russian scientists in the development of science and organizing and planning scientific research projects. Predvoditelev was the motive force behind the publication of the "Sketches from the Development of Physics in Russia" and the author of a number of articles in that collection.

Predvoditelev was the founder of a major scientific school. It numbers 130 Doctors and Candidates of Sciences at work in various republics and cities of the Soviet Union. His high scientific sophistication and erudition, his perfectionism and principles, his profound physical intuition, unquestionable natural gifts and his high human and moral qualities contributed to the growth and success of the groups that he directed and the work of his numerous students.

Predvoditelev devoted much effort to scientific instruction and social activity both at Moscow University and outside its walls. He turned in a highly constructive performance as a Deputy of the Moscow Metropolitan Council and the Krasnopresnensk District Council of Deputies of Labor.

Predvoditelev's scientific, teaching, and social activity won wide recognition. He was awarded two Orders of Lenin and four Orders of the Red Banner of Labor, and Order of the Red Star, and many medals.

He was an ardent patriot and devoted all his strength and knowledge to the development of Soviet science.

His numerous students and friends and all of his acquaintances will forever cherish the memory of this outstanding scientist and memorable human being.

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