

PEOPLE OF SOVIET SCIENCE

ON THE SIXTIETH BIRTHDAY OF ALEKSEI VASIL'EVICH LYKOV



Aleksei Vasil'evich Lykov celebrated his sixtieth birthday on September 20, 1970. He is the Director of the Order of Red Labor Banner Institute of Heat and Mass Transfer of the Academy of Sciences of the Belorussian SSR, Director of the Department of Thermal Physics of the Belorussian State University, a full member of the Academy of Sciences of the Belorussian SSR, a State Prizewinner of the USSR, and Honored Scientist and Technologist of the RSFSR.

Aleksei Vasil'evich Lykov was born in Kostroma, the son of a local engineer. After graduating at the Department of Physics and Mathematics of the Yaroslav Pedagogical Institute in 1930, he worked at the Drying Laboratory of the F. É. Dzerzhinskii All-Union Heat Technology Institute. Here, the young engineer and physicist carried out his first studies on the kinetics of drying and on the development of methods for determining the thermophysical parameters of moist materials. As a result of his work on the drying of porous materials under variable pressure, he was awarded his first author's certificate under the title "Variable-Pressure Dryer."

In 1932 Lykov published his well known work on the theory of evaporation surfaces during the drying of solids. In the same year, he became an Aspirant of the Scientific-Research Physics Institute of Moscow State University, whose staff then included such eminent scientists as A. K. Timiryazev, A. P. Mlodzeevskii, I. V. Luzin, A. S. Predvoditelev, I. E. Tamm, and others, who had a profound influence on the creativity and subsequent work of A. V. Lykov.

During 1932-1935 A. V. Lykov carried out extensive and very productive work on transfer problems in colloidal, capillary, and porous bodies. He developed a new method of determining the thermophysical parameters of humid materials. In 1935 A. V. Lykov discovered a new phenomenon, the thermal diffusion of moisture in capillary-porous media and used it to elucidate the mechanism responsible for the cracking

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of humid materials and the transfer of water-soluble materials during the drying process. This fundamental work of the young scientist became widely known, both in the USSR and abroad. It was reported to the Royal Society in London and was published in its Proceedings. In the literature the phenomenon has since been called the Lykov effect. In 1935 A. V. Lykov successfully defended his candidate thesis on the same subject.

In the course of his work on heat and mass transfer, A. V. Lykov was concerned with the theory of thermal conduction and the development of effective methods of solving time-dependent heat-transfer problems by the Heaviside-Bromwich operational method. This was one of the first studies in this area and was published in a British journal in 1936.

In 1938 A. V. Lykov wrote two monographs, one on the kinetics and dynamics of drying processes and the other on thermal conduction and diffusion.

In 1939 A. V. Lykov defended his doctoral thesis at the Moscow Power Institute. In 1940 he was given the title of Professor and, in 1942, became the Director of the Department of Physics of the Moscow Technological Institute for the Food Industry. Here and in the Department of Physics of the Moscow Institute for Chemical Engineering, of which he was also the Director, A. V. Lykov established research laboratories on molecular physics and the theory of heat in which extensive and well known studies were carried out on the heat and mass transfer in dispersed and capillary-porous colloidal media during phase and chemical transformations, as well as research work on radiative heat-transfer phenomena in ultrahigh vacuum. A. V. Lykov also directed other work which resulted in the development of drying equipment for nuclear photographic emulsions. This was exhibited in Brussels and Geneva in 1958.

His far-reaching theoretical studies on drying by sublimation were used by A. V. Lykov to design, construct, and bring into general use in 1955 a sublimation drying plant, whose capacity was the largest in the world.

Work on heat and mass transfer, and on the thermophysical characteristics of nonmetallic materials, involving the development of new methods of determining transfer coefficients, proceeded at an accelerated rate after A. V. Lykov began his work at the Power Institute of the Academy of Sciences of the USSR in 1954, where he was the Director of the Laboratory of Molecular Physics and Mass Transfer.

In 1956 A. V. Lykov became the Director of the Power Institute of the Academy of Sciences of the Belorussian SSR, which was subsequently redesignated the Institute of Heat and Mass Transfer. At the same time, he was elected a full member of the Academy of Sciences of the Belorussian SSR.

A characteristic feature of the work of A. V. Lykov and his school is a combination of deep physical insight, technological solutions of the various problems, and extensive practical applications.

In 1951 his monograph, "The Theory of Drying," published in 1950, was awarded the State Prize (Class 1), and in 1957 his major services to science and technology were recognized by the award of the title, Honored Scientist and Technologist of the RSFSR.

In 1957 A. V. Lykov was elected a Member of the Academy of Building and Architecture of the USSR as a specialist in thermal physics as applied to building.

The Institute of Heat and Mass Transfer of the Academy of Sciences of the Belorussian SSR, of which A. V. Lykov is the director, is carrying out extensive work on the transfer of energy and matter during phase and chemical transformations. Theoretical studies of this problem are being successfully used to obtain practical solutions useful in many branches of industry and especially in chemical and food technology, power engineering, the building industry, and so on. A. V. Lykov has built up a world-famous school in an important branch of thermophysics, namely, heat and mass transfer in capillary-porous media during phase and chemical transitions. Its distinguishing feature is a comprehensive approach to the transfer of heat and mass in their interaction. This is a very progressive approach which has been fully confirmed by many theoretical and experimental papers.

A. V. Lykov's scientific activity has been unusually extensive, many-sided, successful, and creative. His current work is largely devoted to important problems in modern thermophysics, i. e., the theory of heat and mass transfer, the theory of thermal conductivity, especially phenomena in capillary-porous media and rheologic systems, the thermodynamics of irreversible processes, and experimental methods for the determination of thermophysical parameters.

An important contribution is provided by the studies carried out by the Lykov school on thermal convection waves and the aerodynamics of light conductors. His colleagues abroad value very highly his contributions to modern science, and have shown their admiration by contributing to the present issue of this journal their fundamental papers on heat and mass transfer and rheologic physics.

During the 40 years of scientific research, A. V. Lykov has published over 200 papers and 16 monographs, including *The Thermal Conduction in Nonstationary Processes*, *The Theory of Drying*, *Transport Phenomena in Capillary-Porous Media*, *The Theory of Thermal Conduction*, *The Theory of Transfer of Energy and Matter*, and so on. Lykov's books have been published and translated throughout the world, including the USA, Great Britain, France, and other countries.

123 Candidates of Science have so far been directed by A. V. Lykov and he has supervised 21 doctoral theses.

A. V. Lykov is the organizer and Editor-in-Chief of the present journal and a member of the editorial board of the *Énergiya* publishing house. He is Chairman of the Committee on Drying of the All-Union Council of Scientific and Technical Societies. In 1959 A. V. Lykov was nominated by the USSR as Editor of the *International Journal on Heat and Mass Transfer*. A. V. Lykov has been very successful in his post as Director of the Institute of Heat and Mass Transfer of the Academy of Sciences of the Belorussian SSR. During his occupancy of this post, a small establishment has grown into a famous scientific center for thermophysics. It has successfully generated the Institute of Nuclear Power Engineering, Hydrologic Problems and the Belorussian Branch of the All-Union Power Institute. For major scientific achievements and successes in teaching, the staff of the Institute was given in 1969 the major Government award, the Order of Labor Red Banner.

In 1969 A. V. Lykov was elected a Foreign Member of the Polish Academy of Sciences (Society of Engineers).

For his distinguished work, A. V. Lykov was awarded in 1951 the Order of Znak Pocheta and, in 1967, the Order of Lenin. In 1969 the Academy of Sciences of the USSR awarded him the I. I. Polzunov Prize for his monographs on the theory of thermal conductivity.

A. V. Lykov is the Chairman of the All-Union Scientific Council of the State Committee of the Council of Ministers on Science and Technology with Special Reference to Mass and Heat Transfer in Technology.

A. V. Lykov is not only a famous scientist, but is also a social activist. Since 1963 he has been a Deputy of the Supreme Soviet of the Belorussian SSR. During the Twenty-Sixth Congress of the Communist Party of the Belorussian SSR, A. V. Lykov was elected a Member of the Revisional Commission of the Communist Party of the Belorussian SSR.

A. V. Lykov approaches his sixtieth birthday at the height of his powers. We wish him good health and further creative success.