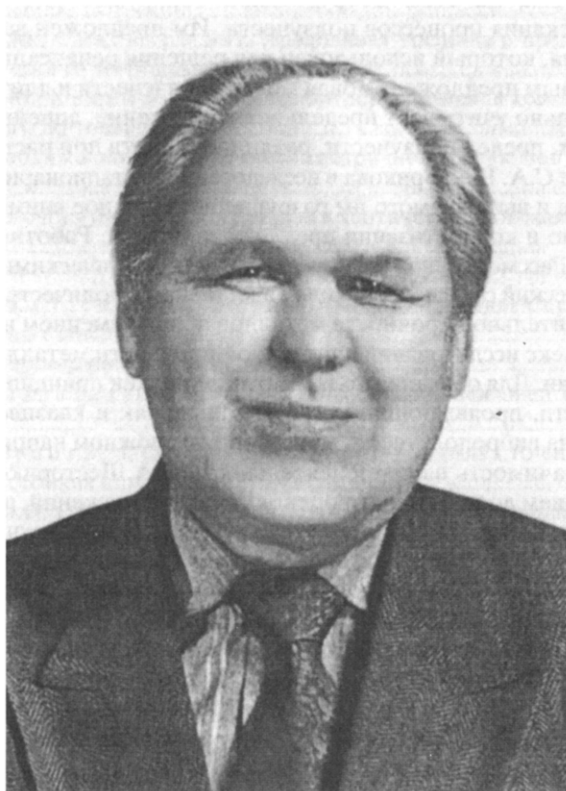


SERGEI ALEKSANDROVICH SHESTERIKOV†
(6 December 1930–6 July 2005)



The scientific community of Russia has suffered a heavy loss. Corresponding Member of the Russian Academy of Sciences, Sergei Aleksandrovich Shesterikov, the most prominent specialist in the field of the mechanics of deformable solids – in the creep theory fracture mechanics, stability, plasticity, etc. – passed away on 6 July 2005 at the age of 75. The basic results he obtain in the study of the features of deformation and fracture under extreme conditions of different types of materials and components of engineering structures are of scientific and practical importance. They are widely used in the design of turbine blades, in calculations associated with the process of the continuous casting of steels, in the design of oil-field equipment, in predicting the long-term strength of power-generating equipment, in calculations of heat-induced fracture of materials, etc.

His contribution to the development of the theory of stability during creep was considerable; in the world literature, the term “Rabotnov–Shesterikov stability” is commonly used. He developed methods for calculating the stability and bulging of rods, plates and shells and for determining the conditions of loss of bearing capacity of different structural components.

He conducted a complex experimental and theoretical investigation of the features of the creep under uniaxial and complex stress states. He put forward a series of fundamentally new formulations, developed

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new measurement techniques and created unique types of machinery for conducting tests under non-standard conditions; a number of previously unknown features of creep processes were discovered using this equipment. He proposed a variational method in the theory of strengthening that was used to solve relaxation problems.

He proposed a new model of creep and long-term strength that also took into account the limiting stress, linear creep under small stresses, the creep limit and the difference in properties under tension and compression.

His contribution to the study of transient heat conduction in a continuum and of the fracture caused by it was significant. He paid a great deal of attention to the development and definition of the kinetic theory of creep that was proposed by Yu. N. Rabotnov. The model he examined, which had two kinetic parameters and a clear physical meaning, made it possible qualitatively and quantitatively to describe the main features of the long-term strength of metals under variable loading.

He conducted a series of researches on the long-term strength of metals in a complex stress state. To describe creep, he proposed a fundamentally new parameter of damage that indicated both scalar and quasi-vector properties. He was the first to investigate the vibratory creep of metal in a complex stress state.

The practical importance of his scientific activity lay in his making estimates of the stress, strain, strain rate and damage fields in structures under creep considerably more reliable, the possibility of estimating actual safety factors with respect to long-term strength and also the development of standard documentation on methods for the strength analysis and testing of materials under creep conditions.

Specialists in many research and production organizations consider him to be their teacher and scientific mentor.

His whole life was associated with the (Lomonosov) Moscow University, from which he graduated with distinction in 1954. From 1960 to 2001 he was a laboratory manager at the Institute of Mechanics of Moscow State University (from 1975 to 1999 he was Head of Department), and from 2002 he was Director of the Department of Plasticity Theory of the Mechanics and Mathematics Faculty of the university. From 1972 he was a member of the National Committee for Theoretical and Applied Mechanics, and in the 1970s and 1980s he was Chairman of the Procedural Commission for the Preparation and Approval of Standard Documentation (attached to the Standards Committee of the USSR). In 1990, he was awarded a Russian Federal Socialist Republic state prize in the field of science and engineering and a Ministry of Higher Education prize. In 1999 he received the title 'Honored Scientist of the Russian Federation', and in 2000 he was made a Corresponding Member of the Russian Academy of Sciences. The team of scientists he led was recognized as a leading scientific school in Russia. Thirty of his students have become masters of science, and five are doctors of science. He published three monographs and over 150 scientific papers.

He was constantly engaged in a large amount of teaching in the Mechanics and Mathematics Faculty of the Moscow State University and in other colleges in Russia, and also gave a series of lectures and presented scientific papers at conferences in the USA, the UK, France, China, Poland, Bulgaria and other countries. He was a member of the editorial board of a number of academic journals (*Izvestiya RAN. Mekhanika Tverdogo Tela*, *Prikladnaya Matematika i Mekhanika*, the reference journal *Mekhanika* and others). For many years he was a member of examination boards overseeing doctoral dissertations in different organizations.

Sergei Aleksandrovich Shesterikov always led an active scientific and social life. He possessed a sharp mind, competence, friendliness, and correctness and soundness of judgement. His passing signals the end of a particular era in the development of the science of the creep of materials and rheological processes. His memory will live forever in the hearts of those who knew him well.

Translated by P.S.C.