



NAGUSH
KHACHATUROVICH
HARUTYUNYAN

(1922-1993)

On November 23, 2022, we are celebrating the 110th anniversary of the birth of Nagush Khachaturovich Harutyunyan, who was one of the founders of the Armenian school of mechanics. He was a prominent and distinguished scientist who has gained wide international recognition, one of the most energetic and skillful organizer of science and higher education in Armenia, a prominent political leader, academician of Armenian National Academy of Sciences. His name is connected with the formation and further

progress of a number of scientific directions in mechanics of deformable solid bodies, among them theory of elasticity, creep and contact mechanics. He formed several generations of scientists in both Armenia and other countries.

Harutyunyan was born in 1912 in Yerevan (Russian Empire, now the capital of the Republic of Armenia). For many years he lived with his grandfather - the famous historian Leo, whose huge scientific figure instilled in the young man respect for science. In 1930 he entered the Moscow Military Engineering Academy named after V.V. Kuybyshev. After graduating from it in 1936 and being qualified as engineer-hydroconstructor, he returned to Armenia. He started his professional career as a leading engineer of the construction company Sevan-Zangustroy. At the same time he taught at the Yerevan Polytechnic Institute. In 1937, Harutyunyan entered the postgraduate courses of the Leningrad Polytechnic Institute (now Peter the Great St.Petersburg Polytechnic University). Communication with the greatest scientists in mechanics like B.G. Galerkin, E.L. Nikolai, and A.I. Lurie played a decisive role in his future scientific development. Harutyunyan always had special love and respect towards the Leningrad school of mechanics, and his scientific contacts with this school have never been broken. After defending his first doctoral thesis (candidate of sciences) in 1941, he went to the front. His military service during the World War II was marked with the Orders of Patriotic War of I and II degree, the Order of the Red Star and medals.

Demobilized from the army in 1945, N.Kh. Harutyunyan returned to Armenia and started again his scientific and pedagogical activities. In 1949 in Moscow, at the Institute of Mechanics of the USSR Academy of Sciences he defended the doctoral thesis and was awarded the title of doctor of technical sciences. In 1950, he became the title of professor. In

the same year, he was elected a full member of the Academy of Sciences of Armenia and a member of the Presidium of this academy.

In 1952-55, his scientific activities continued at the Academy of Sciences, where he worked as the Academician-Secretary of the Department of Engineering Sciences. In 1955, Harutyunyan was appointed head of the newly created laboratory of creep and strength at the Institute of Mathematics and Mechanics. In 1959, he was elected Vice-President of the Academy of Sciences. In parallel with his scientific work, he is engaged in pedagogical activities. In 1945-51, he taught at Yerevan Polytechnic Institute, in 1951 - at Yerevan State University where he was the professor of the Chair of Theoretical Mechanics and in 1958 he became the head of newly created Chair of Theory of Elasticity and Plasticity (now Chair of Continuum Mechanics) and led it till 1978. In 1961, Harutyunyan was appointed Rector of Yerevan State University. Thanks to his efforts, the Chair of Biophysics, Nuclear Physics, Economic Cybernetics and the Joint Computer Center of the Academy of Sciences and YSU were established. In 1962, he was awarded the honorary title of the Honored Scientist of the Armenian SSR. For many years, he was a member of the USSR National Committee on Theoretical and Applied Mechanics and its Presidium. He was appointed the Editor-in-Chief of the journal "Proceedings of the Armenian SSR Academy of Sciences, Mechanics" and a member of the Editorial Board of "Proceedings of the USSR Academy of Sciences, Mekhanika Tverdogo Tela" (English translation Mechanics of Solids, now published by Springer).

N.Kh. Harutyunyan was actively involved in social-political and state activities. He was many times elected a deputy of the Supreme Soviet of the Republic and the Supreme Soviet of the USSR; in 1962-1975, he was the Chairman of the Presidium of the Supreme Soviet of the Armenian SSR and Deputy Chairman of the Presidium of the Supreme Soviet of the USSR. In the Soviet Union and abroad he adequately represented Armenia and its achievements in various fields of public life.

N.Kh. Harutyunyan's research activities developed mainly in two directions: the mathematical theory of elasticity and the theory of creep. His first works on elasticity theory were on torsion and bending of prismatic rods with polygonal cross-section, where he proposed an effective method for solving these problems, based on reducing them to the solution of infinite systems of algebraic equations. The method was applied in numerous studies and became classical. It was included in monographs and textbooks. Scientific results, obtained in this direction, were generalized. Finally, they were summarized in the fundamental book: "Torsion of Elastic Bodies" (authors N.Kh. Harutyunyan and B.L. Abrahamyan), published in Moscow in 1963. N.Kh. Harutyunyan had performed extensive scientific-research work in the field of elastic contact and mixed boundary value problems and obtained exact solutions classes of these problems together with his students. He also developed the scientific approach to contact problems concerning the load transfer to elastic solid bodies by means of thin-walled stringers.

N.Kh. Harutyunyan had made the greatest scientific contribution to the theory of creep. After analyzing the results of numerous experiments, N.Kh. Harutyunyan and G.N. Maslov concluded that in problems of strength and durability of engineering structures made, for

example, of concrete, plastics, soils, glass-reinforced plastics, classical approaches did not work. In addition to the usual physical and mechanical properties of materials, one should also consider the properties due to the creep phenomenon, such as aging and heredity. This fundamental idea was a new mathematical theory of creep of aging bodies, developed by N.Kh. Harutyunyan, which later entered the science as the Maslov-Arutyunyan creep theory. Considering this theory, the existing standards for the calculation of strength and longevity of numerous construction structures and their elements have been changed. The fundamental results of Harutyunyan's theory of creep have been summed up in his fundamental monograph "Some Problems of Creeping Theory", which was published in Moscow in 1952. It was translated and published in England, France, and China. Some chapters were published in Germany, Poland, and Romania. In the formulations of the linear and nonlinear theories of creep Harutyunyan constructed contact and numerous other problems of theoretical and practical importance. In the nonlinear problems, he formulated the superposition principle of generalized displacements.

In the last two decades of his scientific activity, Harutyunyan considerably generalized and developed his original theory of creep, having worked out the theory of creep of inhomogeneously aging bodies and created a new scientific direction: the mathematical theory of growing deformable bodies. The scientific results are summarized in numerous monographs and scientific papers. In 1975, N.Kh. Harutyunyan moved to Moscow and started to work at the Institute for Problems in Mechanics of the USSR Academy of Sciences as the head of the Department of Viscoelastic Body Mechanics. During the years of his stay in Moscow, his scientific and personal relations with Armenia did not weaken. He was also the head of the Department of Theory of Viscoelasticity at the Institute of Mechanics of the Armenian Academy of Sciences.

Nagush Kh. Harutyunyan died on January 18, 1993 in Moscow and remained devoted to science until the end of his life. He left a huge scientific heritage, including seven fundamental monographs, around two hundred original works, a scientific school, numerous students and followers in Armenia and abroad. His scientific ideas and results will undoubtedly serve as a basis for new ideas and creative achievements of young scientists and a wide range of researchers.