

LIFE AND ACTIVITIES OF TENGIZ MEUNARGIA

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Tengiz Meunargia was born on August 17, in the town of Zugdidi, into a family of a famous doctor, Valerian Meunargia and Tamar Shonia. He had an elder brother Vakhtang Meunargia and a younger sister Maia Meunargia. His parents did their best to ensure good breeding and education for their children.



In 1944 he entered the Zugdidi secondary school for boys which he finished in 1955 with a gold medal. His father wanted all his children to become physicians but Tengiz chose a career of a mathematician and in 1955 was enrolled at the mechanics-mathematics faculty of the Tbilisi State University. The same choice has been made by his sister Maya and as Tengiz used to say they both inherited this talent from their mother. As to the elder brother Vakhtang, he followed father's profession and became a famous specialist in medicine.

During his University years Tengiz was known as a capable and hard-working student. He took lectures from such distinguished scientists and teachers as Victor Kupradze, Nikoloz Vekua, Vladimir Chelidze, Archil Kharadze and others. In 1960 Tengiz Meunargia graduated from the University with honours and the same year was enrolled in postgraduate courses, specializing in the theory of functions of a real variable. After six months he went to Moscow to attend the seminars at the Lomonosov state University (P.Ulyanov's seminar) and the Steklov Mathematical Institute of the USSR Academy of sciences (Menshov's seminar). After returning to Tbilisi, in 1962 T. Meunargia began working as an assistant at the Physics faculty of Tbilisi state University and in 1964-1966 as an assistant at the TSU Cybernetics faculty.



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As is well known, in April of 1966, after two years of returning to Georgia, Academician Ilia Vekua became the Rector of Tbilisi State University. On his initiative and under his guidance many innovative ideas have been realized. In particular, several new faculties, new chairs and cabinets have been founded. In 1966 a Problematic Laboratory of Applied Mathematics was founded at TSU, with the most up-to-date technical equipment for that time. Among the first members of this

laboratory (Larry Gogoladze, Ivane Kiguradze) was also Tengiz Meunargia. And these years were marked by the beginning of his intensive studies in the mathematical theory of shells under the guidance of Ilia Vekua.

In 1968 when the Institute of Applied Mathematics was founded on the base of the Problematic laboratory, T. Meunargia was appointed first junior and then senior scientific worker of the Institute.

In 1973 T. Meunargia successfully defended his Ph.D thesis in mathematics. The subject of his dissertation was "On the theory of bending of shells with variable thickness". His scientific supervisor was Ilia Vekua. Since then till 1986 he has been working as a deputy head of the department of shell theory at the Institute of applied mathematics.

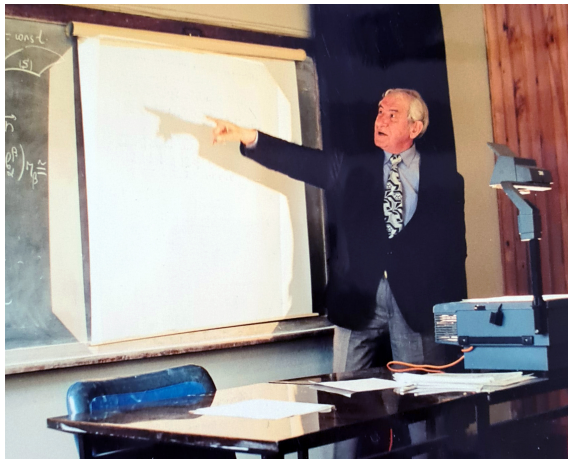


I. Vekua, T. Meunargia

In 1989 Tengiz Meunargia was appointed the head of the shell theory department at the I.Vekua Institute of applied mathematics of Tbilisi state University. For many years under his guidance several scientific and at

the department educational seminars have been conducted in shell theory, mathematical theory of elasticity, variational methods, tensor analysis. In the work of the seminars, alongside experienced members, actively participated young scholars.

In 1997 T. Meunargia successfully defended his doctoral thesis “Boundary value problems of the mathematical theory for elastic shells with rapidly changing geometry”. In this fundamental work of T. Meunargia, the shell theory, constructed by I. Vekua, does not contain the assumption about the shallowness of shells. Thus the class of those bodies the definition of whose stress-strain state became possible by means of the above theory, has been considerably broadened. Later T. Meunargia generalized I. Vekua’s method for geometrically as well as physically non-linear non-shallow shells.



the seminar (2015)

T. Meunargia had been working as a head of the shell theory department till 2006. In 2007, after the reforms, carried out at the Institute, he had been working as a senior scientific worker and was deeply involved in active scientific work.

His works have been published in local, all-union as well as international scientific high ranking journals. He had been delivering lectures at many local, all-union and International

Symposia, and was often the member of the Organizing Committee of these forums. He was in the editorial board of the journals of I.Vekua Institute of Applied Mathematics – Proceedings of I. Vekua Institute of Applied Mathematics; Seminar of I. Vekua Institute of Applied Mathematics – REPORTS; Reports of Enlarged Session of the Seminar of I. Vekua Institute of Applied Mathematics.

T. Meunargia had been carrying out not only intensive scientific work but he was very active as a teacher. In 1977 he was elected assistant professor of Tbilisi state University, and since 1977 he had been the professor of this University. For many years he had been reading lectures (higher mathematics for economists, foundations of tensor calculus, equations of mathematical physics) at different faculties of TSU. At the same time, since 1994 he had been delivering lectures at the newly founded Zugdidi

University as well as at the Zugdidi branch of TSU. All those who attended his lectures and seminars, will agree that is they have been marked by high professionalism and creativity.

Under his scientific supervision five students have defended Ph.D in the field of mechanics of deformable solids and mathematical modeling.

Alongside his professional field, he had many hobbies, was attracted by sports – played basketball, volleyball, football, was very good at chess. But his greatest and most favourite hobbies were literature and singing. He was very fond of Georgian folklore and Georgian folk songs. He had excellent



memory and could recite whole pieces of poetry by heart. He had enormous charm and a great sense of humour.

He had a wife, Dodo Gegechkori and three children – Valerian, Tamar and Vakhtang. They are all well educated and successful in their profession and have their own families and children.

We will survey in short Tengiz Meunargia's scientific results, concerning the most important problems of the mathematical theory of shells.

T. Meunargia's first works have been devoted to the solution of specific boundary value problems according to I.Vekua's theory. He has analytically solved the problem of stress concentration problems for infinite plates with a circular hole in the case of different approximations of I.Vekua's theory. After that he has been working on problems of stress concentration for anisotropic plates. The problems have been solved by means of various refined theories of plates (Vekua, Reissner, Ambartsumyan) and the obtained results have been compared to each other as well as to the corresponding results, obtained by means of the classical theory.

T. Meunargia used I. Vekua's method for reducing the basic equations of the three-dimensional couple-stress theory. The results, obtained in this direction, have been summed up in the monograph "The development of I. Vekua's method for three-dimensional problems of the couple-stress theory of elasticity", issued by Tbilisi University Press in 1987. Taking into account the fact that the study of elastic bodies, composed of micropolar media has attained great importance recently, this book may have become even more actual these days.

In almost every version of shell theory there is an assumption about shallowness of shells. In his works Tengiz Meunargia has developed I. Vekua's dimension reduction method for non-shallows shells which allowed to con-

sider the changes of the metric in the direction of shell thickness.

The further step was the generalization of the obtained results for geometrically and physically non-linear cases.

For solving the boundary value problems for non-linear differential equation, the so-called method of a small parameter is often used when the sought quantities are expanded into a power series with respect to a certain small parameter. T. Meunargia used this method for non-shallow and non-linear shells.



From the left: J. Rogava, D. Gordeziani, T. Meunargia, N. Khomasuridze, G. Devdariani, Z. Siradze, T. Vashakmadze, R. Janjgava

I.Vekua's well-known monograph "Shell theory: General methods of construction" which was published in Moscow in 1982 and soon translated into English by Tsitsino Gabeskiria (published in London by Pitman Publishing Company), was translated into Georgian by T. Meunargia and published by Tbilisi University Press in 2007 for the centenary of I. Vekua.

By his distinguished personal qualities, his loyalty to the chosen profession and Georgian scientific traditions, Tengiz Meunargia gained great authority among his friends, colleagues and members of the scientific circles. Tengiz Meunargia died on December 2, 2021 at the age of 84. He was a recognized specialist in shell theory and has considerably developed in

this field the scientific heritage of his teacher, famous scientist, Ilia Vekua.

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