NIKOLAI GUR'EVICH CHETAEV

6 December 1902 - 17 November 1959

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*A biographical sketch**

N.G. Chetaev was born on December 6 (November 23 of the Gregorian calendar) 1902 in the village of Karaduli in the Laishevo district of the province of Kazan', the present Tartar Autonomous Socialist Soviet Republic, in the family of a village clerk and chanter, Gurii Ivanovich Chetaev. The mother of N.G. Chetaev, Vera Vsevolodovna Kedrova, had a predominant influence in bringing up her two children, the sons Nikolai and Arkadii.

Nikolai Gur'evich received secondary instruction at the Kazan' third High School (Gymnasium). After the Revolution he attended a second degree School, from which he graduated in 1919. In the secondary School Nikolai Chetaev was an outstanding pupil, passing from class to class with high honors. He was mainly attracted by natural science and the exact sciences.

After a short time spent in the village military commissariat (Chepchug, near Kazan'), in 1920 Nikolai Gur'evich entered the mathematical section of the Physico-Mathematical Faculty, the University of Kazan'.

The exceptional capabilities and diligence of N.G. Chetaev attracted the attention of the university professors. Physics was taught at that time by Professor D.A. Goldhammer and mechanics by Professor D.N. Zeiliger. Of the mathematicians Professors N.N. Parfent'ev and N.I. Porfir'ev may be mentioned. N.G. Chetaev studied with enthusiasm, inspiring also his friends. He presided over the well-known students' scientific circle named after N.I. Lobachevskii, and while a student published his first scientific work "Diffraction of light in nontransparent media".

Beginning with January 1926 Nikolai Gur'evich was enrolled as an aspirant in the graduate school and assigned to the Department of Mechanics directed by Professor D.N. Zeiliger. Evidently the origin of the deepest ideas and scientific projects of Nikolai Gur'evich, which later became the substance of his life's scientific programme, must be dated back to that time. During his graduate training, which he completed

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* On p. 238 of this issue of the journal an article is devoted to the scientific works of N.G. Chetaev. At the end of this article a list of the published papers is appended.

in February 1929, he carried out and published a series of investigations into the stability of the equilibrium figures of a rotating liquid mass, the equations of dynamics in the form of Poincaré, and other difficult problems of mechanics.

Due to his scientific achievements N.G. Chetaev was sent to Germany in March 1929 for one year's work at the University of Goettingen. In Germany, N.G. Chetaev made acquaintance with the then leading aerodynamical school of L. Prandtl. He spent much of his time in attending the seminars of this well-known scientist. At the same time he continued his investigations, mainly in the domain of the stability of motion.

After his return from Germany at the beginning of 1930 N.G. Chetaev was appointed docent at the University of Kazan'. According to tradition in the spring of 1930 he gave his inaugural lecture. These lectures were attended not only by students but also by professors, lecturers and aspirants of the graduate school.

In September 1930 Nikolai Gur'evich was appointed to the Chair of Mechanics in the Physico-Mathematical Faculty of Kazan' State University. This chair was left vacant after the departure from Kazan' of Professor D.N. Zeiliger.

In June 1931 an aerodynamical division was founded at Kazan' University, and almost at the same time reorganized into the independent Kazan' Aviation Institute. The soul of this undertaking, as far as its organization and scientific and pedagogical operation was concerned, was N.G. Chetaev. As a deputy director of the Institute he was in charge of the scientific as well as of the pedagogical sections.

After the establishment of the basic Chairs at the Aviation Institute, N.G. Chetaev returned to the staff of Kazan' University.

The well-known *Vermutungsseminar*, organized by N.G. Chetaev, apparently following the example of the Goettingen seminars, was the center which united in the thirties of the present century almost all creatively working mechanicians and certain mathematicians of Kazan' University and the Aviation Institute. The seminar was concerned with problems of stability of motions in analytical dynamics and qualitative methods in the theory of differential equations. Besides the aspirants of N.G. Chetaev, an active part in the work of the seminar was taken by the mathematicians (at that time docents) I.G. Malkin and K.P. Persidskii, and also N.G. Chebotarev. At the seminar papers were given without any calendar planning. Of great importance for the seminar were the reports on work left incomplete because of the insurmountable difficulties involved and reported on by their authors during the process of their investigations. This fact added to the studies of the seminar a particular quality of

closeness in discussions, mutual aid and scientific competition, which was wisely and tactfully directed by N.G. Chetaev as the moderator. The work of the seminar was reflected in the papers published in the "Trudy Kazansk. Aviats. Instituta", "Uchenye Zap. Kazansk. Gos. Universiteta" and the "Izvestiia Kazansk. Fiz. Mat. Obshchestva".

Thus in mechanics a new trend was created which became known as the Kazan' school of the stability theory.

In the works of the seminar the mathematically rigorous results of Liapunov were developed further and, in addition, their practical significance was made clear.

The development of science and technology showed how important it was to anticipate the necessity of investigating this new domain of mechanics, the significance of which had been obscure, to initiate these investigations and to attract youth to this field.

At Kazan', both in the University and the Aviation Institute, various lecture courses were given by Nikolai Gur'evich to students as well as lecturers and aspirants. These courses included general mechanics, hydrodynamics, theory of aerofoils, special chapters of analytical mechanics, stability of motion, theory of the Kronecker characteristics, integral invariants, special theory of relativity, and other subjects.

In 1940 N.G. Chetaev was invited to work in the Academy of Sciences of the USSR. He left for Moscow and became director of the section for general mechanics in the Institute of Mechanics, the Academy of Sciences of the USSR. From 1945 to 1953 he was director of this Institute. During recent years N.G. Chetaev held the Chair of Theoretical Mechanics at Moscow State University.

In Moscow Nikolai Gur'evich concluded many of his works, which according to their contents were connected with the Kazan' period of his activity, wrote a series of new articles, and also a monograph on the stability theory.

As in Kazan' he directed a seminar in the Institute of Mechanics, the Academy of Sciences of the USSR and at Moscow University. His activities became wider, and the domain of mechanics, headed by him, penetrated into various branches of technology. The methods of Liapunov and Chetaev were applied to the solution of problems of automatic control, the theory of gyroscopes and the guidance of flight vehicles.

Beginning in 1945 and to the end of his life N.G. Chetaev was the chief editor of the journal "Prikladnaia matematika i mekhanika". In this capacity he earned esteem by his judgements on points of principle and by his objectivity in evaluating the papers.

N.G. Chetaev generously shared his ideas and knowledge with the younger scientists, was benevolent towards them, trained them affectionately and carefully, and allotted much of his time to the direction of seminars for students and aspirants, and to lecturing in general.

In science N.G. Chetaev was an enemy of useless words and easy success. He always stood for rigorous statements of new problems in mechanics, and for the creation of rigorous methods for their solution. At the same time he opposed excessive generalizations of problems in mechanics, which deprived them at times of their practical meaning. He was against unjustified hypotheses, introduced frequently in the course of the solution of a problem by short-sighted or selfish desire to "solve" it. This neatness of approach Nikolai Gur'evich had inherited from Liapunov whom he always followed and whose ideas he tended to transmit to his pupils.

The sudden death of Nikolai Gur'evich, caused by heart disease, occurred in Moscow on November 17, 1959.

The Government and the scientific community highly esteemed the activity of N.G. Chetaev. In 1940 he was given the title of a merited worker in science of the Tartar Autonomous Socialist Soviet Republic. In 1943 N.G. Chetaev was elected corresponding member of the Academy of Sciences of the USSR. In 1945 the order of the Red Banner of Labor and in 1953 the order of Lenin were conferred on him.

The memory of Nikolai Gur'evich Chetaev, an outstanding scientist and citizen, a man of high morality, crystal honesty, exceptional modesty and kindness, a patriot of his native country, will be preserved for a long time by the people who knew him.

Translated by E.L.