Nekrasov, Aleksandr Ivanovich | Encyclopedia.com

Complete Dictionary of Scientific Biography COPYRIGHT 2008 Charles Scribner's Sons
5-6 minutes

(*b*. Moscow, Russia, 9 December 1883; *d*. Moscow, 21 May 1957)

mechanics, mathematics.

Nekrasov graduated from the Fifth Moscow Gymnasium in 1901 with a gold medal and entered the mathematical section of the Faculty of Physics and Mathematics at Moscow University. In 1906 he graduated with a first-class diploma and received a gold medal for "Teoria sputnikov Yupitera" ("Theory of the Satellites of Jupiter"). Nekrasov remained at the university to prepare for a professorship. At the same time he taught in several secondary schools in Moscow. In 1909–1911 Nekrasov passed his master's examinations in two specialties, astronomy and mechanics. In 1912 he became assistant professor in the department of astronomy and geodesy of the Faculty of Physics and Mathematics at the university, and in 1913 he was appointed to the same post in the department of applied mathematics (theoretical mechanics) of the same faculty. From 1917 until his death Nekrasov taught and conducted research at Moscow University, the Higher Technical School, the Central Aerohydrodynamics Institute, the Sergo Orjonikidze Aviation Institute, and the Institute of Mechanics of the Academy of Sciences of the U.S.S.R.

In 1922 Nekrasov was awarded the N. E. Zhukovsky Prize for "O volnakh ustanovivshegosya vida na poverkhnosti tyazheloy zhidkosti"("On Smooth-Form Waves on the Surface of a Heavy Liquids"). For his distinguished scientific services he was elected corresponding member of the Academy of Sciences of the U.S.S.R. in 1932 and an active member in 1946. He was awarded the title Honored Worker in Science and Technology in 1947 for his services in the development of aviation technology. Nekrasov was a brilliant representative of the trend in the development of precise mathematical methods in hydromechanics and aeromechanics that is associated with Zhukovsky and S. A. Chaplygin. He published basic works on the theory of waves, the theory of whirlpools, the theory of jet streams, and gas dynamics.

Nekrasov's *Tochnaya teoria voln ustanovivshegosya vida na poverkhnosti tyazheloy zhidkosti* ("A Precise Theory of Smooth-Form Waves on the Surface of a Heavy Liquid"), on classical problems of hydromechanics, was awarded the State Prize of the U.S.S.R. in 1951. In an extensive monograph on aerodynamics, *Teoria kryla v nestatsionarnom potoke* ("Theory of the Wing in a Nonstationary Current"; 1947), he presented a systematic and detailed account of all the basic scientific works dealing with the theory of the unsmooth motion of a wing in the air without allowing for its compressibility. He not only systematized material published earlier but also analyzed and compared it, in a number of cases providing a new mathematical treatment of the subject. Other important works in aerodynamics are *Primenenie teorii integralnykh uravneny k opredeleniyu kriticheskoy skorosti flattera kryla samoleta* ("Application of the Theory of Integral Equations to the Determination of the Critical Velocity of the Flutter of an Airplane Wing"; 1947) and *Obtekanie profilya Zhukovskogo prinalichii na profile istochnika i stoka* ("Flow on a Zhukovsky Cross Section in the Presence of a Cross Section of the Source and Outflow"). Besides his work on aerohydrodynamics Nekrasov published an excellent two-volume textbook on theoretical vector mechanics (1945–1946).

Nekrasov's works also enriched mathematics. Among his contributions are the first fruitful investigations of nonlinear integral equations with symmetrical nuclei, the books *O nelieynikh integralnykh uravneniakh s postoyannymi predelami* ("On Nonlinear Integral Equations With Constant Limits"; 1922) and *Ob odnom klasse lineynykh integro-differentsialnykh uravneny* ("On One Class of Linear Integral-Differential Equations"; 1934), and many investigations in an important area of aerohydrodynamics. The extremely varied mathematical apparatus that he used contains many original details developed by Nekrasov himself.

Nekrasov translated into Russian É. Goursat's *Cours d'analyse mathématique as Kurs matematicheskogo analiza*. To a substantial degree this project made possible Nekrasov's assimilation of the mathematical methods that he later applied so skillfully to the solution of concrete problems in aerodynamics.

A fully worthy disciple of and successor to Zhukovsky, Nekrasov enriched Soviet science with his scientific works and, through his work in education, aided the development of many scientists and engineers.

BIBLIOGRAPHY

Many of Nekrasov's writings are in his *Sobranie sochineny* ("Collected Works"), 2 vols. (Moscow, 1961–1962).

Secondary literature includes *Aleksandr Ivanovich Nekrasov* (Moscow-Leningrad, 1950); and Y. I. SekerzhZenkovich, "Aleksandr Ivanovich Nekrasov," in *Uspekhi matematicheskikh nauk*, **15** , no. 1(1960).

A. T. Grigorian