Sonin, Nikolay Yakovlevich | Encyclopedia.com

(*b*. Tula, Russia. 22 February 1849; *d*. Petrograd [now Leningrad], Russia. 27 February 1915)

mathematics.

The son of a state official who later became a lawyer. Sonin received his higher education at the Faculty of Physics and Mathematics of Moscow University (1865–1869). His first scientific work was a report on differentiation with arbitrary complex exponent (1869). After defending his master's thesis in 1871, Sonin was appointed *Dozent* in mathematics at Warsaw University in 1872 and, after defending his doctoral dissertation in 1874, was promoted to professor in 1877. He taught at Warsaw for more than twenty years, was twice elected dean of the Faculty of Physics and Mathematics, and was an organizer of the Society of Natural Scientists. In 1891 Sonin was elected corresponding member of the Russian Academy of Sciences and, in 1893. academician In pure mathematics. In connection with the latter rank he moved to St. Petersburg, where from 1894 to 1899 he was professor at the University for Women, from 1899 to 1901 superintendent of the Petersburg Educational District, and from 1901 to 1915 president of the Scientific Committee of the Ministry of National Education. With A. A. Markov, Sonin prepared a two-volume edition of the works of Chebyshev in Russian and French (1899–1907).

Sonin made a substantial contribution to the theory of special functions; the unifying idea of his researches was to establish a few convenient definitions of initial notions and operations leading to broad and fruitful generalizations of these functions. Especially important were his discoveries in the theory of cylindrical functions, which he enriched both with general principles and with many particular theorems and formulas that he introduced into the contemporary literature. He also wrote on Bernoullian polynomials, and his works on the general theory of orthogonal polynomials were closely interwoven with his research on the approximate computation of definite integrals and on the various integral inequalities; in the latter area he continued Chebyshev's research. Also noteworthy are Sonin's works on the Euler-Mac-laurin sum formula and adjacent problems.

BIBLIOGRAPHY

I. Original Works. Sonin's writings include "O razlozhenii funktsy v beskonechnye ryady" ("On the Expansion of Function in Infinite Series"), *in Matemati-cheskii sbornik*, 5 (1871). 271 –302. his master's thesis; "Ob integnrovami uravneuy s chastnymi proizvodnymi vtorogo poryadka" ("On the integration of Partial Differential Equations of the Second Order"), *ibid*., **7** (1874), 285–318, translated into German in *Mathematische Annetten*, **49** (1897), 417–447. his doctoral dissertation: "Recherches sur les functions cylindriques et le déloppement des fonctions continues en seáries," *ibid*., **16** (1880). 1–80; "Sur les termes complémentaires de la formule sommatoire d'Euler et de celle de Stirling," in *Annales scientifiques dv I École normale supéeure*, **6** (1889), 257–262; "Sur les polynômes de Bernoulli;" in *Journal für die reine und angewandte Mathematik*, **116** (1896), 133–156; "Sur les fonctions cylindriques," in *Mathematische Annalen*, **59** (1904), 529–552: see also *Issledovania O tsilindricheskikh funktsiakh i o spetsialnykh polinomakh* ("Research on Cylindrical Functions and on Special Polynomials"), N. I. Akhiezer, ed. (Moscow, 1954).

II. Secondary Literature. See N. I. Akhiezer, "Raboty N. Y. Sonina po priblizhennome ychisleniyu opredelennykh integralov"("The Works of N. Y. Sonin on the Approximate Computation of Definite Integrals"), in Sonin's *Issledovania tsttindricheskikh funktsiakh*, 220–243; A. I. Kropotov, *Nikolay Yakovlevichi of Sonin* (Leningrad, 1967), with complete bibliography of Sonin's works, pp.126– 130; and G. N. Watson. *A Treatise of the Theory of Bessel Functions* (Cambridge, 1922).

A. P. Youschkevitch