# Stepanov, Vyacheslav Vassilievich | Encyclopedia.com

(b. Smolensk, Russia, a September 1889;

d. Moscow U.S.S.R.., 22 july 1950)

*mathematics*.

Stepanov was the son of Vassily Ivanovich Stepanov, who taught history and geography at high schools in Smolensk; his mother, Alexandra Yakovlevna, was a teacher at a girl's school. An honor graduate of Smolensk high school in 1908, Stepanov entered the department of physics and mathematics of Moscow University later that year; his scientific supervisor was Egorov. In 1912, when he was about to graduate, it was suggested that he remain at the university to prepare for a professorship. After spending some time at Göttingen, where he attended lectures by Hilbert and E. Landau, Stepanov returned to Moscow and became lecturer at Moscow University in 1915. At that time he published his first scientific work, an article on Paul du Bois-Reymonds' theory of the growth of functions.

From the first Soviet years, Stepanov participated in the organization of new types of university work, especially in the training of young scientists at the Research Institute of Mathematics and Mechanics, established at Moscow University in 1921. He was director of the Institute from 1939 until his dead. He was also one of the most influential and active leaders of the Moscow Mathematical Society. owing, among other things, to his exceptional erudition and memory. In 1928 Stepanov became a professor, and in 1946 he was elected corresponding member of the Academy of Sciences of the U.S.S.R.

Stepanov's scientific interests were formed first under the influence of Egorov and Luzin, founders of the Moscow school of the theory of functions of a real variable. In works published in 1923 and 1925 Stepanov established the necessary and sufficient conditions under which a function of two variables, defined on a measurable plane set of finite measure greater than zero. posses a total differential almost everywhere on that set. These works laid the foundations for the studies of I. Y. Verchenko, A. S. Cronrod, and G. P. Tolstov in the theory of functions of $n$ variables. In his most widely known works, Stepanov treated the theory of almost periodic functions, introduced a short time earlier by H. Bohr; he also constructed and investigated new classes of generalized almost periodic functions.

Stepanov's interest in applications of mathematics and his work at the State Astrophysical Institute in 1926–1936 led him to study the qualitative theory of differential equations. In this field his principal works are related to the general theory of dynamic systems that G. D. Birkhoff elaborated, extending the work of Poincaré. Besides writing articles on the study of almost periodic trajectories and on generalization of Birkhoff's ergodic theorem (which found an important application in statistical physics), Stepanov organized a seminar on the qualitative methods of the theory of differential equations (1932) that proved of great importance for the creation of the Soviet scientific school in this field.

# BIBLIOGRAPHY

I. Original Works. Stepanov's writings include "Über total Differenzierbarkeit," in *Mathematische Annalen*, **90** (1923), 318–320; "Sur les conditions de l'existence de la différentielle totale," in *Matematicheskü sbornik*, **32** (1925), 511–527; "Über einige Verallgemeinerungen der fast periodischen Funktionen," in *Mathematische Annalen*, **95** (1925), 473–498; also in French in *Comptes rendus . . . de l'Académie des sciences*, **181** (1925), 90–94; "Uuml;ber die Räume der fast periodischen Funktionen," in *Matematicheskü sbornik*, **41** (1934), 166–178, written with A. N. Tikhonov; "Sur une extension du théorème ergodique," in *Composition mathematica*, **3** (1936), 239–253; *Kachestvennaya teoria differentisalnykh uravneny* (Moscow, 1947: 2nd ed., 1949), written with V. V. Nemytsky, translated into English as *Qualitative Theory of Differential Equations* (2nd ed., Princeton, 1960, 1964): and *Kurs differentsial-nykh uravneny* ("Lectures on Differential Equations"; Moscow, 1936: 6th revised ed., 1953), translated into German by J. Auth *et al*. as *Lehrbuch der Differentialgleichungen* (Berlin, 1956).

II. Secondary Literature. See P. S. Aleksandrov and V. V. Nemytsky, *Vyacheslav Vassilievich Stepanov* (Moscow, 1956); *Istoria otechestvennoy matematiki* ("History of Native Mathematics"), I. Z. Shtokalo, ed., III-IV (Kiev, 1968–1970), see index; *Matematika v SSSR za sorok let* ("Forty Years of Mathematics in the U.S.S.R."), 2 vols. (Moscow, 1959), see index; and *Matematika v SSSR za tridtsat let* ("Thirty Years of Mathematics in the U.S.S.R." Moscow–Leningrad, 1948), see index.

A. P. Youschkevitch