Ernst Leonard Lindelöf

Born: 7 March 1870 in Helsingfors, Russian Empire (now Helsinki, Finland)
Died: 4 June 1946 in Helsinki, Finland

Show birthplace location

Main Index   Biographies index

Ernst Lindelöf's father Leonard Lorenz Lindelöf was professor of mathematics in Helsingfors from 1857 to 1874. Helsingfors, today Helsinki, was controlled by Sweden and Russia at various times in its history. Finland had been ceded to Russia in 1809. At the time that time Lindelöf's father was appointed professor of mathematics at the university, the main building of the university on Senate Square had recently been completed. Helsingfors was a town of only 20,000 at this time and under Russian control. By the time that Lindelöf went to study mathematics at Helsingfors University in 1887 his father was no longer the professor there. The city was still under Russian control but it had undergone a rapid expansion and by then had a population of 60,000.

Lindelöf spent the year 1891 in Stockholm, and the years 1893-94 in Paris returning to Helsingfors where he graduated in 1895. He then taught there as a docent, visiting Göttingen in 1901. He returned to Helsingfors where he became assistant professor in 1902, becoming a full professor the following year. Helsinki was still under Russian control and indeed the Russians had implemented a policy of Russification in reply to the national movements which had arisen. By 1904 the rapidly growing city had a population of 111,000 and was the centre of activists working for an independent Finland. This was proclaimed in 1917.

Lindelöf remained as professor of mathematics in Helsinki until he retired in 1938. It was a time of rapid economic growth for the new country and the university flourished and rapidly expanded. Lindelöf supported his new country undertaking his university duties with great enthusiasm. From 1907 he served on the editorial board of *Acta Mathematica*.

Lindelöf's first work in 1890 was on the existence of solutions for differential equations. It is an outstanding paper. Then he worked on analytic functions, applying results of Mittag-Leffler in a study of the asymptotic investigation of Taylor series. In particular he was interested in the behaviour of such functions in the neighbourhood of singular points.

He considered analogues of Fourier series and applied them to gamma functions. He also wrote on conformal mappings. His work on analytic continuation is explained in a well-written book *Le calcul des résidus et ses applications à la théorie des fonctions* Ⓣ (Paris, 1905). Oettel describes the contents of this treatise in [1]:-

In it he examines the role which residue theory (Cauchy) plays in function theory as a means of access to modern analysis. In this endeavour he applies the results of Mittag-Leffler. Moreover he considers series analogous to Fourier summation formulas and applications to the gamma function and the Riemann function. In addition, new results concerning the Stirling series and analytic continuation are presented. The book concludes with an asymptotic investigation of series defined by Taylor's formula.

This work was translated into several different languages, including German and Finnish and Swedish and ran to several editions.

Later in his life Lindelöf gave up research to devote himself to teaching and writing his excellent textbooks. In addition to the 1905 work referred to above which is largely on his own research, he wrote the textbook *Differential and integral calculus and their applications* which was published in four volumes between 1920 and 1946. Another fine textbook *Introduction to function theory* was published in 1936.

Another important role which Lindelöf played in Finland was the encouragement of the study of the history of mathematics in that country. For his outstanding contributions to Scandinavian mathematics he was honoured by the universities of Uppsala, Oslo, Stockholm, and Helsinki.

Article by: *J J O'Connor* and *E F Robertson*

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List of References (3 books/articles)

Mathematicians born in the same country

Cross-references in MacTutor

1. Finnish Mathematical Society
2. 1900 ICM - Paris
3. 1936 ICM - Oslo

Other Web sites

1. Dictionary of Scientific Biography
2. Mathematical Genealogy Project
3. MathSciNet Author profile
4. zbMATH entry
5. ERAM Jahrbuch entry

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