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June 19, 2009

## Professor Walter Ledermann: mathematician and algebraist

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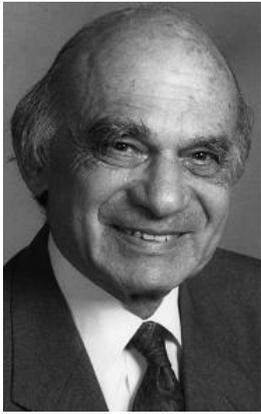
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Walter Ledermann was a distinguished mathematician who through his intellectual aptitude was able to quit Berlin during the beginnings of Hitler's oppression of the Jews and complete his studies in Britain, where he found a new and highly successful life as a researcher, university teacher and writer of textbooks.



Ledermann: he often said that he owed his life to the people of St Andrews

He was born in 1911 into a German Jewish family and was the second of four children; his father was a doctor. He was fortunate in attending the Leibniz Gymnasium, which — as it was named after the great German mathematician and co-discoverer (with Newton) of the calculus — took a pride in its mathematics teaching, as well as the more traditional Latin and Greek. He grew up musical, playing the violin and viola, and attending concerts and opera avidly from an early age. His school years were marked by the catastrophic financial collapse of postwar Germany, and by the resulting rise of Nazism.

Ledermann studied mathematics at the University of Berlin from 1928 to 1933. Here the professors were Erhard Schmidt, Ludwig Bieberbach (both analysts, the second a notorious Nazi) and the great algebraist Issai Schur (1875-1941), who was Jewish. He was also taught physics by Planck, von Laue and Schrödinger. Ledermann was influenced by Schur's work on the algebraic topic of group representations (abstract pure mathematics, that proved an essential tool for the then new subject of quantum mechanics), and by B. L. van der Waerden's book *Moderne Algebra* (1930), which he learnt from the topologist Heinz Hopf. The oral examination for Ledermann's state examination took place in November 1933, after the Nazis had been in power for eight months. Schur had been dismissed, but was temporarily reinstated, so he and Schmidt were the examiners; Bieberbach was also present, in Nazi uniform.

Ledermann had learnt from his brother that the students of St Andrews University had raised funds to support two studentships for refugees from Nazi Germany, one for a political and one for a Jewish refugee. He successfully applied for the second, and came to St Andrews in January 1934. Ledermann was always grateful for this opportunity, and often said that he owed his life to the people of St Andrews. He settled happily into the then small mathematics department at St Andrews, where there was one professor, H. W. Turnbull; he became a research student of Turnbull's, and received his PhD degree in 1938.

Ledermann moved to Edinburgh in 1938, where he worked under E. T. Whittaker and A. C. Aitken, and got his first teaching experience in a temporary post at Dundee. He acted as mathematical assistant to the Professor of Education, Godfrey (later Sir Godfrey) Thomson (1881-1955), for Thomson's pioneering book on factor analysis (a statistical method that he used for the analysis of intelligence) of 1939. Ledermann also collaborated with the great physicist Max Born (1882-1970): he was able to use his mathematical skill in matrix theory to resolve a dispute between Born and the Indian physicist C. V. Raman on the structure of crystals in Born's favour. In 1938 Ledermann returned to St Andrews as a lecturer, where he stayed until 1946; he obtained a DSc from Edinburgh in 1940, and became a Fellow of the Royal Society of Edinburgh in 1944.

In St Andrews Ledermann got to know the astronomer Erwin Freundlich (1885-1964), who had the distinction of informing Einstein that the mathematics needed for his General Theory of Relativity had been developed decades earlier by Riemann in his work on manifolds (Einstein did not believe this and called Freundlich a liar). The two both enjoyed music and Freundlich introduced Ledermann to Ruth (Rushi) Stadler. They were married in 1946; Rushi became a Jungian psychoanalyst.

Also in 1946, Ledermann moved to Manchester University, where under the leadership of M. H. A. (Max) Newman and Sidney Goldstein a mathematics department to rival any in the UK, including Cambridge, was then being developed. Here Ledermann had a fruitful period, collaborating with a number of colleagues, including G. E. H. Reuter, B. H. Neumann and P. J. Hilton. He became a senior lecturer in 1953.

The University of Sussex started in 1961, and its Falmer campus opened in 1962, when Ledermann moved to Sussex as a reader in mathematics. He became professor in 1965 and emeritus in 1978. In 1997 he and Rushi moved to Highgate in North London,

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to be closer to their son and his family.

While a fine research mathematician, Ledermann's special strengths lay in his talents for teaching, writing and editing. In his early years in St Andrews he was struck by the lack of good-quality, cheap, pocket-sized mathematics textbooks of the kind common in Germany.

He suggested such a series to his colleague D. A. (Dan) Rutherford. This initiative led to the highly successful series University Mathematical Texts (Rutherford asked Aitken to be the other editor, fearing for the effect that a German name would have in the climate of the times). At Manchester Ledermann repeated this success with the student series Library of Mathematics.

At Sussex he launched a third series, this time at a higher level, the Handbook of Applicable Mathematics. Two of his books — Introduction to the Theory of Finite Groups (1949) and Introduction to Group Characters (1977) — are classics. In addition, Ledermann was a fine teacher, considered by one highly distinguished professorial colleague as the best teacher he had ever met. His autobiography, Encounters of a Mathematician (2009), is full of interesting insights into his life and times in Germany, Scotland and England, and personal anecdotes of the many scholars he knew. Ledermann's widow, Rushi, died on June 15, 2009. He is survived by their son.

**Professor Walter Ledermann, mathematician and algebraist, was born on March 18, 1911. He died on May 22, 2009, aged 98**

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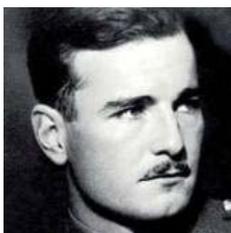
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