

Walter Ledermann

In the summer of 1962 a sweet and gentle little man taught a course at the University of Notre Dame to students in a National Science Foundation Institute. The subject was group theory, the textbook was *Introduction to the Theory of Finite Groups*, a tiny book from the University Mathematical Series, written by the professor, **Walter Ledermann** (March 18, 1911 -), in 1948 while at the University of St. Andrews in Scotland. Students found this charming man a friendly, understanding, and delightful teacher. His lectures were masterfully presented and though challenging for high school teachers with no previous exposure to abstract algebra, the privilege of being classmates of such a distinguished mathematician was a considerable honor.



Ledermann was born in Berlin to a Jewish family. He excelled in the study of the classics at the Kölnisches Gymnasium and the Leibniz Gymnasium. It was at the latter school that Ledermann became fascinated with mathematics and decided to make a career of it. In 1928 he entered the University of Berlin to prepare to become a secondary school mathematics teacher. There, he was taught by many outstanding mathematicians, including Issai Schur, whose lectures became the basis of Ledermann's book. When Hitler came to power in 1933, Ledermann was nearing the end of his studies and had prepared a dissertation, *On the various ways of expressing an orthogonal matrix in terms of parameters*. His oral examination was conducted by Schur, who maintained his post due to a technicality in the Civil Service Law which removed Jewish teachers from universities, and Ludwig Bieberbach, an ardent anti-Semitic dressed in a Nazi uniform. Bieberbach always tried to analyze the differences between "German and Jewish mathematics," in an effort to make the latter seem inferior.

Ledermann realized that he would have to leave Germany to escape the persecution of the Jews. He won a scholarship to study at St. Andrews, where Herbert Turnbull supervised his doctoral studies, and was awarded a Ph.D. in 1936. The quality of Ledermann's work led to him being awarded a D.Sc. from Edinburgh University in 1940, the same year he became a British citizen. In 1937, he became a temporary lecturer at Dundee but returned to St. Andrews in 1938, staying until 1946. Ledermann's wife Rushi was a psychotherapist and the couple wished to move to a bigger city so she could pursue her work. He accepted a post at the University of Manchester where he remained for sixteen years. In 1962 he accepted a position with the newly established University of Sussex, which he held until his retirement in 1978.

Besides his group theory book, Ledermann also produced other excellent textbooks *Complex Numbers* (1960), *Integral Calculus* (1964), *Multiple Integrals* (1966), *Introduction to Group Theory* (1973) and *Introduction of Group Characters* (1973). He served as the editor of the *Journal of the London Mathematical Society* (1968 – 1971) and of the *Bulletin of the London Mathematical Society* (1974- 1977). In addition, he was the chief editor of the nine volume *Handbook of Applicable Mathematics*. The project consisted of numerous articles on various mathematical topics written for those in need of brief explanations and expositions. Ledermann was an amateur violinist who loved chamber music and played in string quartets in his home for his enjoyment.

He claims to have written his book *Introduction to the Theory of Finite Groups* sitting in the same seat that had been earlier occupied by Karl Marx. During the summer that Ledermann taught at the University of Notre Dame he arranged for his publishers, Oliver & Boyd, to send copies of his book from Edinburgh. When the package containing the books arrived in the U.S. the customs officers who inspected it became suspicious. Looking at the strange symbols in the book only made them more suspicious. They decided that the “groups” must refer to ‘groups of communists’ and so they had the books confiscated. It took the combined efforts of Arnold Ross, the chair of the mathematics department of Notre Dame, and Indiana Congressman John Brademas to get the books released for purchase by the students. The book cost \$2.25 and has held up quite well these past forty years.

Students exposed for the first time to mathematicians with international reputations tend to be a bit in awe and apprehensive about taking a course from those who not only understand mathematics but have actually created it. Perhaps they believe that a great mathematician cannot be a good teacher of mathematics because they will not have patience with those who are slower to understand. While there are many examples of outstanding mathematicians unable to explain mathematics to lesser thinkers, many of the individuals featured in this chronicle, including Ledermann, were inspirational teachers.

Success in teaching mathematics is not totally dependent upon brilliance in mathematical thinking. Rather it depends upon an unbelievable desire to share with students the wonders of the subject and Ledermann possessed this virtue. One of his colleagues at Sussex, David Tall, spoke of Ledermann as “a much-loved professor who had perfected his courses over many years.” Ledermann encouraged Tall to write his first textbook, counseling him to say what was necessary to help the student understand. Ledermann added that it was not necessary to tell the whole truth but one should never lie.

Quotation of the Day: “The notion of a “group” viewed only 30 years ago as the epitome of sophistication, is today the one mathematical concept most widely used in physics, chemistry, biochemistry and mathematics itself.” – Alexey Sosinsky
[This must have pleased Ledermann. Although his life work was with abstract ideas, he had a preference for ‘concrete’ mathematics and disliked ‘abstraction’ for its own sake.]