

**HILDA GEIRINGER** (September 28, 1893 – March 22, 1973)

by HEINZ KLAUS STRICK, Germany

HILDA GEIRINGER grew up in Vienna with her three brothers. Her father, a Jewish textile manufacturer, had the means to pay for all four children to attend high school and university. Hilda's special mathematical talent already became apparent at the *High School of the Association for Advanced Women's Education*.

After graduating from secondary school, she studied mathematics at the University of Vienna and received her doctorate in 1917 under WILHELM WIRTINGER on *Trigonometric Double Series* (Fourier series with two variables).

Through WIRTINGER's intervention, she then found a job in Berlin as an assistant to LEON LICHTENSTEIN, the editor of the *Jahrbuch über die Fortschritte der Mathematik* (Yearbook on the progress of mathematics) and the *Mathematischen Zeitschrift* (Mathematical Journal), which Springer Verlag had founded in 1918 in competition with the *Mathematischen Annalen* (Annals of Mathematics) of Teubner Verlag.

In 1921, HILDA GEIRINGER was employed as an assistant to RICHARD EDLER VON MISES at the *Institute for Applied Mathematics*. Her task was to design and supervise the exercises for his lectures.

In the same year she married FELIX POLLACZEK, who, like her, came from a Jewish family in Vienna. Her husband had completed his mathematics studies in Berlin. After receiving his doctorate in 1922, he took a job at the *Reichspost* – his area of responsibility was optimising telephone connections using mathematical methods.

HILDA GEIRINGER's marriage failed, possibly because she felt more attracted to VON MISES, who, however, did not share her feelings. She temporarily moved to her parents' house in Vienna with her newborn daughter, but then returned to her job in Berlin – with all the problems that a single mother had.

Her relationship with VON MISES was problematic, because he was not sure whether she was even interested in working in *applied mathematics* – and he let her know this.

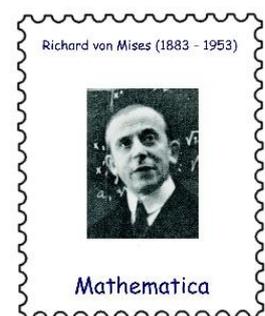
During her studies and doctorate, HILDA GEIRINGER only dealt with topics from “pure mathematics”. Now she had to familiarise herself with probability theory and statistics as well as *plasticity* (irreversible deformations of matter). However, she seems to have increasingly succeeded in this, because in 1925 she presented the faculty a thesis entitled *Über starre Gliederungen von Fachwerken* (On rigid structures of trusses), with which she hoped to achieve her habilitation.

VON MISES and LUDWIG BIEBERBACH were commissioned to carry out the assessment. BIEBERBACH, one of the most radical anti-Semites in higher education during the Nazi era, had been CONSTANTIN CARATHÉODORY's successor at the University of Berlin since 1921. In 1910 he caused a stir with his solution to HILBERT's 18th problem.

BIEBERBACH was extremely skeptical about *applied mathematics* and felt his assessment was confirmed by HILDA GEIRINGER's work. This contained a serious error that could not be corrected.



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She therefore had to choose a different topic and create a new work under great time pressure. The following year she presented *Charlier's Development of Arbitrary Distributions*, a topic from probability theory.

BIEBERBACH also found a mistake here, but this time it was easy to fix. However, he only agreed to her habilitation if the work was not classed as *mathematics*, but only as *applied mathematics*.

Finally, in November 1927, HILDA GEIRINGER became the second woman (after EMMY NOETHER) to be granted a *venia legendi* (teaching licence). As a private lecturer, she gave well-attended lectures on probability theory and plasticity and took part in international conferences. She also worked on the editorial board of the journal *Zeitschrift für Angewandte Mathematik und Mechanik* (ZAMM) (Journal for Applied Mathematics and Mechanics) that VON MISES founded.

HILDA GEIRINGER discovered the differential equations named after her, which can be used to describe the plastic deformation of metals. She was the only woman to be a member of the Scientific Examination Board for Mathematics Teachers.

At the beginning of 1933 she was recommended by her faculty for an associate professorship. Nothing seemed to stand in the way of this until the anti-Jewish Civil Service law by the Nazi government came into force on April 7th. After her dismissal from the civil service, she went to Brussels with her daughter, where she could work at the *Institute of Mechanics*.

When, at the end of 1933, VON MISES received an offer from the University of Istanbul to take over a chair in *Pure and Applied Mathematics* there, he ensured that HILDA GEIRINGER was also employed there as a lecturer.

As part of the reforms of the Turkish President MUSTAFA KEMAL ATATÜRK, the previous (only) university in Turkey, *Darülfünun* (literally: House of Sciences), was dissolved on July 31, 1933 and replaced by the re-establishment of the University of Istanbul. While the previous university was autonomous, the government was now able to intervene directly in its administration and also influence the political direction of teaching. Two thirds of the previous university members were dismissed and replaced mainly by German emigrants.



In addition to VON MISES, the newly appointed mathematicians at Istanbul University included WILLY PRAGER, who was of Jewish descent and previously director of the *Institute for Applied Mathematics* at the University of Göttingen and full professor at the *Chair of Technical Mechanics* in Karlsruhe.

HILDA GEIRINGER took over the beginners' lectures, initially in French and after three years in Turkish. She published her lectures on analysis in book form – in Turkish. She also continued her research on plasticity theory and the application of statistics in *Mendelian genetics* and wrote several articles on this subject.

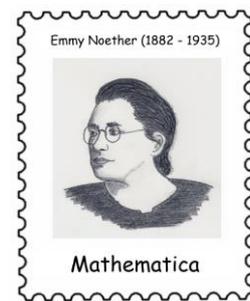


After ATATÜRK's death in 1938, German exiles in Turkey no longer felt safe. Many of the positions that were previously filled by foreign scientists were eliminated and among other things, HILDA GEIRINGER's contract was not extended and she had to leave the country. Annoyed, VON MISES then terminated his contract and accepted an offer of a professorship at Harvard.

Concerned that HILDA GEIRINGER would not be able to find a way to emigrate to the USA, both of them thought about a *pro forma marriage*.

In Lisbon, the now stateless mother and her daughter waited for a visa to enter the United States until they finally received an offer of a temporary, but unpaid, position as a lecturer at *Bryn Mawr College* for Young Women (where EMMY NOETHER had also previously held a position).

In 1942 she took over lectures on the geometry of mechanics at *Brown University* in Providence (Rhode Island), where WILLY PRAGER had in the meantime found a permanent position as a professor.



In 1943 RICHARD VON MISES and HILDA GEIRINGER married. All efforts to find a suitable position at a university for the highly qualified scientist proved futile. In a letter to HERMANN WEYL, who also stood up for her, she resignedly stated *that the time was probably not yet ripe for women in higher education*.

Even at non-university colleges, there were few positions for women. HILDA GEIRINGER had to be content with a position – this time permanent – at *Wheaton College* in Massachusetts, 45 miles from Harvard. She was disappointed to find that the student council only consisted of her and one other person. Since she wanted to continue working scientifically, she lacked the opportunity to interact directly with other mathematicians. At least this way she could talk to her husband on weekends about her current research projects, which she continued unimpressed by the prevailing gender discrimination.

After her husband's death in 1953, HILDA GEIRINGER – in addition to her teaching position at *Wheaton College* (until 1959) – took over the organization of her husband's scientific legacy, which she handed over to the archives of Harvard University.

Before his death, VON MISES had tried in vain to obtain the pension and compensation to which he was entitled from the German authorities. All the more surprising was the appointment of HILDA GEIRINGER as *Associate Professor Emeritus* with full retirement salary by the *Free University* in (West) Berlin in 1956 – a late attempt at compensation.

The irony of the story: LUDWIG BIEBERBACH was also questioned as a witness because of missing documents and he confirmed HILDA GEIRINGER's unlawful dismissal.

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<https://www.spektrum.de/wissen/hilda-geiringer-eine-mathematikerin-die-um-anerkennung-kaempfte/2195331>

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