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★**The mathematics of nonlinear oscillations in the 1920s: a decade of trials and convergence? Examples of the work of Nicolai Minorsky. (English summary)**

Mathematical communities in the reconstruction after the Great War 1918–1928—trajectories and institutions, 227–251, *Trends Hist. Sci.*, *Birkhäuser/Springer*, *Cham*, [2021],

Nicolas Minorsky (1885–1970) was born in Russia and educated in both Russia and France; he defended his doctoral thesis in applied sciences in Petrograd in 1914. He emigrated in 1918 to the US, where he was an assistant to C. P. Steinmetz at the General Electric Research Laboratory in Schenectady, New York. The author shows that by 1922, Minorsky was drawing on the studies of devices exhibiting what were later known as self-excited oscillations, published by former students of Henri Poincaré working in wireless science and engineering in Paris, including Amédée Guillet, André Blondel and Henri Abraham. In 1923, Minorsky joined the Moore School of Electrical Engineering and Applied Physics at the University of Pennsylvania, where he analyzed the stability of triode amplifiers in DC circuits [J. Franklin Inst. **203** (1927), no. 2, 181–209, doi:10.1016/S0016-0032(27)92437-5], among other topics. The author does not cover Minorsky's activity at the Moore School, although he observes that his subsequent interest in the technology of ship stabilization was grounded in experience with devices newly available for use in control systems, along with expertise in applied mathematics, and an international education.

The author revises and updates his study in French of Minorsky's contributions to control theory, first in ship steering via PID control (1922), and then for roll stabilization in ships, from 1934 to 1950 [L. Petitgirard, Rev. Histoire Math. **21** (2015), no. 2, 173–216; MR3431942]. Much like Stuart Bennett [IEEE Control Syst. Mag. **4** (1984), no. 4, 10–15, doi:10.1109/MCS.1984.1104827], the author highlights Minorsky's understanding of ship stabilization as a *nonlinear* control problem during his time as a consultant with the US Naval Research Laboratory at the David Taylor Model Basin. In 1946, Minorsky joined Stanford's Department of Engineering Mechanics, where he lectured on nonlinear oscillations and published one of the first textbooks in English on this topic [*Introduction to Non-Linear Mechanics. Topological Methods. Analytical Methods. Non-Linear Resonance. Relaxation Oscillations*, J. W. Edwards, Ann Arbor, MI, 1947; MR0020689]. Minorsky retired from teaching in 1950, while remaining active in the field until the end of his life.

{For the collection containing this paper see MR4240584}

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