Professor Harold M. Westergaard (1888 – 1950)

See:
https://en.wikipedia.org/wiki/Harold_M._Westergaard
http://archives.library.illinois.edu/archon/?p=collections/controlcard&id=2365
http://www.worldcat.org/identities/lccn-n86-862302/

Biography (from Wikipedia, The Free Encyclopedia):
Westergaard graduated in engineering from Copenhagen Danmarks Tekniske Højskole in 1911. He continued his practice in reinforced concrete in Hamburg, London, Göttingen, and prepared his written dissertation at Königlich Bayerische Technische Hochschule München in 1915. He obtained a PhD at the University of Illinois in Urbana in 1916 and was appointed lecturer there for theoretical and applied mechanics. In 1921 he became an assistant professor, associate professor in 1924, and full professor in 1927 at the University of Illinois. For his published paper on the theory of the reinforced concrete, together with W.A. Slater, he received the Wason Medal of the American Concrete Institute (ACI) in 1922. Westergaard worked as technical expert to the Bureau of Reclamation on the design of Hoover Dam. In 1936 professor Westergaard was appointed to the Gordon McKay professorship for structural engineering at Harvard University. Between 1937-1946 acted as dean of the Graduate School of Engineering.

Selected Publications (from the Wikipedia biography):
On the resistance of ductile materials to combined stresses in two or three directions perpendicular to one another, (1920)
Moment and stresses in slabs, (1921)
Buckling of elastic structures, (1922)
Anwendung der Statik auf die Ausgleichsrechnung, (1925)
Stress in concrete pavements computed by theoretical analysis, (1926/1)
Computation of stresses in concrete roads (1926/2)
One hundred years advance in structural analysis, (1930/1)

Computation of stresses in bridge slabs due to wheel loads (1930/2)
Water pressures on dams during earthquakes, ASCE (1933)
General solution of the problem of elastostatics in an n-dimensional homogeneous isotropic solid in an n-dimensional space, (1935)
Bearing pressures and cracks, (1939)
Theory of elasticity and plasticity, (1952)

Biography (from Karl-Eugen Kurrer, The History of the Theory of Structures from Arch Analysis to Computational Mechanics, Ernst & Sohn, 2008, 848 pages):

*9.10.1888 Copenhagen, Denmark,†22.6.1950 Cambridge, Massachusetts, USA

Westergaard came from a family of scholars. His grandfather was professor for oriental languages at the University of Copenhagen, and his father was professor for economics and statistics at the same university. Westergaard studied at Copenhagen TH, where he worked under Ostenfeld, and completed his engineering studies in 1911. He maintained contact with Ostenfeld until the death of this great structural engineer in 1931. Following practical experience in reinforced concrete construction in Copenhagen, Hamburg and London, he inhaled the spirit of the Göttingen school around Felix Klein, studied atthat university under Ludwig Prandtl and by 1915 had prepared the written edition of his dissertation at Munich TH with the help of August Föppl. However, World War 1 prevented him from finishing his doctorate work in Munich; the oral examination could not take place until September 1921, with Sebastian Finsterwalder and Ludwig Föppl, and the written edition of Westergaard's dissertation did not appear until 1925 [Westergaard, 1925], which meant that his Dr.-Ing. title could not be recognised until after that date. But by then, Westergaard had already made a name for himself in structural engineering in the USA. With the help of a research scholarship provided by the American Scandinavian Foundation, he was able to attain a PhD at the University of Illinois in Urbana in 1916 and on the strong recommendation of his mentor, Prof. Ostenfeld, was appointed lecturer for theoretical and applied mechanics at that university. He became assistant professor there in 1921, associate professor in 1924 and full professor in 1927. And Westergaard would not disappoint the university. Together with W. A. Slater, he published a paper on the theory of reinforced concrete plates as early as 1921 [Westergaard, 1921], which earned him the Wason Medal of the American Concrete Institute (ACI) in that same year. One year later, he published a paper on buckling theory [Westergaard, 1922], which he would later expand. In 1926 he investigated the mechanical behaviour of concrete pavements for roads [Westergaard, 1926], which would soon become the basis of the relevant regulations. The first systematic work on the history of the theory of structures appeared in 1930 [Westergaard, 1930/1] and that started the historical study of the theory of structures in the USA. He worked as an adviser to the US States Bureau of Reclamation during the building of the Hoover Dam and also published a much-quoted paper on this [Westergaard, 1933]. Westergaard, with his original scientific findings, also acted as an adviser to the US Navy Bureau of Yards & Docks and the US Bureau of Public Roads (see, for example, [Westergaard, 1930/2]). In 1936 he was appointed to the Gordon McKay professorship for structural engineering at Harvard University and one year later became dean of the Graduate School of Engineering, a post he held until 1946. It was during these years that he turned more and more to the fundamentals, his work on fracture mechanics [Westergaard, 1939] bearing witness to this. He served as a commander in the Civil Engineer Corps of the US Navy during World War 2 and was a member of a commission set up to assess the effects on structures of the atomic bombs dropped on Hiroshima and Nagasaki. It was in the spring of 1949 that Westergaard began to summarise his scientific life's work spread over nearly 40 papers. He fought hard against his severe illness, but was only able to complete the first part of his manuscript on elastic theory, which was published posthumously [Westergaard, 1952]. His death meant the loss of a first-class personality in American structural analysis during its invention phase (1925 – 50). "Westergaard was a striking figure, intellectually brilliant and physically strong ... He loved art and music, and although

somewhat shy, he was warm and thoughtful of others" [Newmark, 1974, p. 874].
Main contributions to structural analysis: Moments and stresses in slabs [1921]; Buckling of elastic structures [1922]; Anwendung der Statik auf die Ausgleichsrechnung [1925]; Stresses in concrete pavements computed by theoretical analysis [1926/1]; Computation of stresses in concrete roads [1926/2]; One hundred years advance in structural analysis [1930/1]; Computation of Stresses in bridge slabs due to wheel loads [1930/2]; Water pressure on dams during earthquake [1933]; General solution of the problem of elastostatics of an n-dimensional homogeneous isotropic solid in an n-dimensional space [1935]; Bearing pressures and cracks [1939]; Theory of Elasticity and Plasticity [1952]