Professor Maria Esslinger (1913 – 2009)

IN MEMORIAM

Prof. Dr.-Ing. Maria Esslinger died at the age of 95 in January of this year. She was an “engineer” (as she liked to call herself) who gained an international, lasting name in the development of the analysis of steel bridge decks and research into the buckling of cylindrical shells. She was a very dedicated scientist, fascinated by the possibility of describing the behaviour of real structures by means of mathematical-mechanical models and also by expressing them in computer programs.

She was four years old as her father, the lawyer Dr. Ludwig Esslinger, was killed in the war in 1917. In the Höhere Töchterschule and the Realgymnasium in Nuremberg she was educated among girls only. At the technical universities of Danzig (Gdansk) and Berlin (four semesters in each) she was almost the only “girl” among all the students of ship and aircraft construction. Her diploma thesis of 1936 dealt with the design of a sporting airplane.

After her diploma she worked in industry as a construction engineer with great commitment. At the Dingler-Company in Zweibrücken (1937–44) her projects covered wind tunnels (also for the Deutsche Versuchsanstalt

der Luftfahrt DVL – now the German Aerospace Centre – in Berlin and Braunschweig), pressure pipes and welded steel structures. She asked Professor Prandtl in Göttingen for the theme for a doctor thesis. He declined and recommended instead the theory of shells by Wilhelm Flügge.

At the structural steelwork company Seibert, firstly in Aschaffenburg and from 1948 onwards in Saarbrücken, she added experimental research, bridge-building and stability problems to her knowledge. She submitted the results of experiments and analyses for boiler bottoms as a dissertation to Professor Kurt Klöppel at Darmstadt Technical University, who met her for the first time on the day of her doctorate examination in 1947. Director Seibert took her under his wing by encouraging her to write papers about her professional results, by granting and paying for leave for one semester at the Ecole Nationale des Ponts et Chaussées in Paris (afterwards many of her papers were written in French) and by supporting her habilitation at the University of the Saar Territory in 1953 with a thesis on multihanger girders.

Thus, Maria Esslinger advanced to become fully engaged in the analysis of bridges, firstly (1955–58) at MAN in Mainz-Gustavsburg, and then at Gollnow in Düsseldorf (1958–60). Together with W. Pelikan she published a book on the analysis and construction of orthotropic steel bridge decks. This book gained her an international reputation. Working with Prof. Klöppel, she learned how to design and analyse suspension bridges. In 1959 she was offered the "venia legendi" for steel bridge decks and in 1967 appointed "Professor Extraordinarius" at Darmstadt Technical University. For two years she received a stipend from the German Research Foundation DFG (programmes for the analysis of suspension bridges).

In 1962 Professor Wilhelm Thielemann asked her to join him in Braunschweig for a research project investigating the buckling of thin cylindrical shells at the Deutsche Forschungsanstalt für Luft- & Raumfahrt DFL/DLR (now the German Aerospace Centre). It was here that Maria Esslinger became an internationally renowned expert on experimental and analytical research into buckling shells, not only for computer programming but also for slow-motion films of experimental behaviour. Her reputation is high from Stanford to Israel. She was very often the only woman in the masculine world of structural mechanics. And after being appointed a member of the Braunschweig Academy of Sciences in 1978 she was the only lady among all the professors.

Maria Esslinger worked at the DLR on a consulting contract and with her own team well beyond retirement age (1978–95). She was involved in conferences and working groups, e.g. codes for the design of thin shells at the German Steel Construction Committee. She was a determined, ambitious, occasionally argumentative scientist and engineer of great repute. At a great age she wrote her memoirs "Windkanal des Lebens" (the wind tunnel of life), in which her way of thinking and her approach to the ups and downs of life are reflected, too.

----------Heinz Duddeck, Braunschweig TU

Selected Publications (this list obtained from www.en.scientificcommons.org/m_esslinger I think many of the dates of the publications are incorrect.):

Esslinger,M., Geier,B., Buckling And Postbuckling Behavior Of Discretely Stiffened Thin-Walled Circular Cylinders, (1998)
Experimental results on the buckling and postbuckling behavior of stiffened thin-walled circular cylinders with large spacing of the stiffeners are presented. It is pointed out that the postbuckling...

Esslinger,M., Ahmed,S. R., Schroeder,H.-H., Stationare Windbelastung offener un geschlossener kreiszylindrischer Silos (Stationary Wind Loads on Open and Closed Circular Cylindrical Silos), (1998) Silos made of thin walled steel panels are susceptible to buckling. In operation they are subject to skin friction, internal pressure, and wind loads. During construction only wind loads have to be...

Esslinger, M., Geier, B., Poblotzki, G., Verification of computer programs by discussion of the results. (1991)

Esslinger,M, Poblotzki, G., Naeherungsrechnung fuer die Beullasten von Kegelschalen unter Axiallast und Innendruck im elastischen Bereich. (1991)

Esslinger, M., Poblotzki, G., Beullasten von Kegeln unter Aussendruck im elastoplastischen Bereich. (1991)

Esslinger, M., Poblotzki, G., Beulen unter Winddruck. (1991)

Esslinger, M., Flacheisenring an Zylindern unter Aussendruck. (1991)

Esslinger, M., Poblotzki, G., Spannungs- und Stabilitaetsrechnung von Rotationsschalen unter nichtaxialsymmetrischer, grossflaechiger Belastung im elastoplastischen Bereich. (1990)

Esslinger, M., Thaer, G., Weiss, H.P., Ein einfaches FEM-Programm fuer duennwandige Kreiszylinder die durch Laengsrippen und Ringe ausgesteift sind. (1983), KfK-CAD 207 (Mai 83)

Esslinger, M., Melzer, H.W., Berechnung der Spannungen und der endlich grossen Deformationen von Rotationsschalen ohne und mit Vorbeulen unter nichtaxialsymmetrischer grossflaechiger Belastung. (1982), KfK-CAD 192 (April 81)

Esslinger, M., Kerkhoff, H., Melzer, H.W., Taelmann, E.W., Berechnung der Beullasten von duennwandigen Rotationsschalen unter axialsymmetrischer Belastung im elastischen Bereich. (Theoretische Grundlagen des Programms FO4BO7). (1981), KfK-CAD 176 (Januar 81)

Esslinger, M., Thaer, G., Ein einfaches FEM-Programm fuer die Berechnung duennwandiger Kreiszylinder mit Laengsrippen. (1981), KfK-CAD 190 (Juli 81)

Esslinger, M., Kretschel, K., Melzer, H.W., Berechnung der Spannungen und der endlich grossen Deformationen eines idealen Kreiszylinders unter nichtaxialsymmetrischer Belastung. (1980), KfK-CAD 165(August 80)

Esslinger, M., Kerkhoff, H., Berechnung der Beullasten von ringversteiften Rotationsschalen unter axialsymmetrischer Belastung im elastischen Bereich. (1979), KfK-CAD 137 (Mai 79)

Kerkhoff, H., Esslinger, M., Meier, F., Spannungsrechnung von allgemeinen Rotationsschalen mit axialsymmetrischer Belastung und von Kreiszylindern mit unsymmetrischen Randkraeften. (1977), KFK-CAD 16

Esslinger, M., Meier, F., Berechnung der Spannungen in einer duennwandigen Rotationsschale mit axialsymmetrischer Belastung - Teil II: Grosse Deformationen. (1977), KFK-CAD 38 (Juli 77)

Esslinger, M., Kerkhoff, H., Meier, F., Berechnung der Aussendruckbeullasten von ringverstaerkten Zylindern mit abgesetzter Wandstaerke. (1976), KFK-CAD 04 (Dezember 75)

Esslinger, M., Kerkhoff, H., Meier, F., Berechnung der Spannungen von ringversteiften Zylindern mit abgesetzter Wandstaerke. (1976), KFK-CAD 05 (August 75)