

Obituary

Stephan Müller (1930–1997)

Stephan Müller passed away at the age of 66, only one and a half years after his retirement in 1995 from the chair of Geophysics and directorship of the Swiss Seismological Service at the Swiss Federal Institute of Technology (ETH) and from the chair of Geophysics at the University of Zurich. He incurred pneumonia after an intestinal operation.

He was born in Marktredwitz, Bavaria (Germany) and studied physics at the University of Stuttgart (Diploma in 1957) and electrical engineering at Columbia University in New York (M.Sc. in 1959). Wilhelm Hiller, a classical seismologist and head of the State Seismological Service in Stuttgart, aroused Stephan's interest in geophysics. After his studies at Columbia University, he completed a PhD thesis on Synthesis of Normally Dispersed Wave Trains by Means of Linear System Theory under Hiller, in close co-operation with Maurice Ewing in Lamont. The structure of the earth's lithosphere–asthenosphere system, and especially its seismic properties, dominated his lifetime research.

After 1962, Stephan spent two more years in Stuttgart with several extended research visits to the Southwest Center for Advanced Studies in Texas. Together with Mark Landisman, he postulated the widespread existence of zones with reduced seismic velocities in the continental crust during this time.

From 1964 to 1971 he was full professor and head of the new Geophysical Institute at the University of Karlsruhe. There Stephan worked with Karl Fuchs and Henning Illies on the structure and evolution of rifts, a topic that became another favourite in his broad spectrum of lithospheric research. He participated in the ongoing European co-operative deep seismic sounding experiments as part of the International Upper Mantle Project. He was one of the founders of the Black Forest Observatory (BFO) for the study of long period surface waves, free earth oscillations, and earth tides. He was also responsible for the operation of the new Seis-

mological Central-Observatory Graefenberg, Erlangen (SZGRF) in its critical initial years.

The next challenge for Stephan came in 1971 with the call from the Swiss Federal Institute of Technology (ETH) to succeed Fritz Gassmann as head of the Institute of Geophysics and Director of the Swiss Seismological Service. With his characteristically encompassing vision, he addressed in the following time almost all branches of geophysics. Following his initiative, a professorship of rock- and palaeomagnetism was created at the ETH. Besides his main responsibilities for the Swiss Seismological Service and Experimental Seismology, he built up research groups in geothermics and gravity. In 1977, he was also appointed full Professor of Geophysics at the University of Zurich. In 1992, thanks to his insistence, a third full professorship in applied geophysics was installed at the ETH. During this time he enthusiastically taught undergraduate students and supervised more than sixty doctoral theses in all fields of geosciences.

He vigorously pursued the installation of a seismic telemetry station network for the Swiss Seismological Service. His education in electrical engineering enabled Stephan to understand and promote advanced strategies for modern research and monitoring tools in earthquake sciences.

Stephan Müller's academic activities can hardly be separated from his scientific interests and achievements. Based on a large number of crustal deep seismic soundings, he developed in 1977 a basic model of the continental crust. Probing the earth from the surface to the upper mantle transition zone by refraction seismics and analysis of seismic surface waves in many different areas showed that lateral variability was obviously related to tectonic evolution in time and space. After years of analysing phase velocities of surface waves, Giuliano Panza, Stephan, and Gildo Calcagnile produced in 1980 the first map of lithospheric thickness and lithospheric and asthenospheric shear-wave veloc-

ities of Europe. They also documented the presence of a deep-reaching high-velocity body beneath the Alps.

To unravel the tectonic evolution of the Alps, Stephan, with other colleagues, initiated a coordinated Swiss National Research Project (NRP20) on the Deep Structure of the Swiss Alps in 1983. Near-vertical reflection seismic techniques were used for the first time to obtain continuous regional transects across an active continental collision zone. He supported and guided this national project actively throughout its twelve-year running time.

Supported by the European Science Foundation, in 1982 Stephan and Rudolf Trümpy initiated a project of integrated studies of the structure, physical properties, composition, and evolution of the continental lithosphere from northern Scandinavia to central Tunisia over a distance of 4600 km. This European Geotraverse (EGT) project became one of the most prestigious recent large-scale international earth science projects. The EGT investigated all processes through which continental crust is built up, maintained, and destroyed along provinces occurring in succession geographically as well as in time.

Stephan's broad interest appears again in his studies of crust–mantle evolution, structure, and dynamics of the Mediterranean ranging from Turkey to the Eastern Atlantic. In his capacity as Chief Project Scientist of the WEGENER-MEDLAS project in 1981–1991, he focused on the relationships between lateral variations of lithospheric structure, stress distribution, and ongoing crustal movements. He also contributed to the worldwide compilation undertaken by the working group on Continental Rifts: Evolution, Structure, and Tectonics (CREST).

Stephan united several talents in his person: a deep and broad scientific knowledge, the insight to define open scientific questions and the intuition to formulate future research directions, the ability to find appropriate methods to tackle these problems and to synthesise the results with other earth-science disciplines. Stephan had the capacity to bring scientists to work together and to mediate between ambitious scientific plans and constraints imposed by funding and administration.

The European Seismological Commission (ESC) elected him as President for the period 1972–1976. In this position, together with the long time Secre-

tary General Elie Peterschmitt, he took a major part in modernization of the ESC by significantly increasing the number of member countries. He established the politically difficult links between eastern and western European countries by fostering joint working groups and projects. It was his personality, with a strong sense for international relations, which helped him to develop the ESC into a successful and wellrecognized European organization.

Among the many national and international organizations over which he presided in his active life, the Governing Council of the International Seismological Centre (1975–1985), the European Geophysical Society (1978–1980), and the International Association of Seismology and Physics of the Earth's Interior (1987–1991) should be mentioned. He was a member of the Executive Committee of the Academia Europaea from 1988 to 1992.

Stephan Müller published more than 150 papers and served as editor and co-editor of a great number of important journals and books. His outstanding contributions to earth sciences have been acknowledged with numerous awards and honourable appointments. Among others, he was Elected Fellow and Foreign Associate of the Royal Astronomical Society; Honorary Member of the European Geophysical Society; Elected Fellow of the American Geophysical Union; Elected Member of the Deutsche Akademie der Naturforscher LEOPOLDINA; Honorary Fellow of the Geological Society of London; Personal Member of the Swiss Academy of Sciences; Gustav Steinmann Medalist of the Geologische Vereinigung; Alfred Wegener Medalist of the European Union of Geosciences; Bearer of the *Medaille de l'Ordre Grand-Ducal Luxembourgeois de la Couronne de Chene*.

Stephan Müller's work was characterized by his never ending scientific curiosity and his quest for a better understanding of the earth as a system. With this goal in mind he never forgot the human aspect and abilities of his students and colleagues. Many of us remember long fruitful discussions until after midnight with Stephan. We lost a remarkable scientist, a stimulating mentor and teacher, and last but not least a very good friend.

Stephan is survived by his wife Doris, two sons and their families.

JÖRG ANSORGE and DIETER MAYER-ROSA