

PREFACE

Earth tremors, crustal fractures and fissures are the signs of a living Earth with which our late colleague Aykut Barka had an intimate relationship. In the trials of the numerous destructive earthquakes that affected Anatolia and surrounding regions during recent centuries, one may find the useful lessons of natural phenomena. Therefore, it is fitting that Turkey became the land of Earthquake Geology, where its scientific fundamentals and practices have been developed. This volume of scientific contributions is dedicated to Aykut Barka because he was a pioneer and our leader in earthquake seismology and the related field expression of active deformation along major continental faults.

The volume titled '*Up-to-date Studies in Active Tectonics in Turkey*' comprises seven selected contributions presented in the 62nd Geological Congress of Turkey. Topics are related to rupture segments of the North Anatolian Fault, and surface faulting of individual earthquakes. Fault geometry and rupture propagation from the Hersek section of the 1999 İzmit earthquake are documented by Kozacı *et al.*: the article combines offshore and onshore active tectonics (shallow geophysics, geomorphology and palaeoseismology) and includes Coulomb modelling to characterize an earthquake rupture barrier. The study of the western termination of the 1999 İzmit faulting by Uçarkuş *et al.* offers an opportunity to study the offshore fault scarp morphology, using ultra-high resolution bathymetry (0.5 m) and geophysical data collected during the MARMARASCARPS Cruise. The long-term behaviour of the Karadere segment of the North Anatolian Fault is analysed by Dikbaş & Akyüz through the palaeoseismology of the 1999 İzmit earthquake, where five large earthquakes since AD 31 – 407 are documented in trenches. The giant earthquake of 17 August 1668 (that covered the 1942, 1943 and 1944 earthquake segments) is explored by Zabcı *et al.* using palaeoseismic trenching across the North Anatolian Fault in the Kelkit Valley segment. The trace of historical earthquakes in AD 417 and since the 7th century AD in SW Turkey is identified through geomorphology and archaeoseismology along the Fethiye-Burdur Fault Zone by Karabacak. Near İzmir, historical earthquakes are investigated by Özkaymak *et al.* using palaeoseismology across

the Manisa fault zone, where three past events are identified, including the most recent AD 1845 earthquake. The seismotectonics of the 06/09/2009 moderate earthquake (Mw 5.4) in Eastern Albania are analysed by Kiratzi, using broad-band seismic waveforms; the potential for a future large event is identified as a NNE–SSW-trending normal fault in this border region with the Federal Yugoslav Republic of Macedonia.

The increasing number of studies of earthquake ruptures in the eastern Mediterranean has enriched the active faulting database. In this volume, detailed investigations in palaeoseismology provide new seismic parameters that characterize the long-term behaviour of active faults and their geometric and seismotectonic complexities. The heritage of Aykut Barka is alive in this volume, since most contributions are presented by his former colleagues and students. The preparation of this volume reminds us Aykut Barka, with his sharp field observations combined with his extremely modest character. He deserves the dedication of this volume and we hope there will be many others.

'I died as a mineral and became a plant,

I died as plant and rose to animal,

I died as animal and I was Man.

Be like the earth for the modesty and humility'

Mevlânâ Celaleddin-i Rumi

(1207 – 1273)

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