Preface

This special issue of Journal of Seismology, dedicated to Archaeoseismology, shows the current trends of research in this young branch of seismology.

The beginning of modern archaeoseismological practice during the 1980’s and the investigations made during the 1990’s were in many cases conditioned by the lack of cooperation among the specialists from different scientific disciplines. Numerous publications resulted from the work of archaeologists, in some cases in collaboration with experts in earthquake-geology or seismology, but rarely such work included a complete and multidisciplinary approach and in situ analysis of the evidence. In many cases, archaeoseismological studies were limited to the detection of traces of past earthquakes in archaeological remains without a seismological perspective aiming to derive quantitative parameters necessary to fully describe a past earthquake (magnitude, etc.). In other cases, such investigations were limited to the analysis of archaeological reports of excavations made years or decades earlier. A step towards the quantification of seismological aspects was represented by the “territorial” approach, trying to reconstruct a picture of an earthquake by detecting its signs over a wider region. This procedure was, however, limited by the scarcity and reliability of published or unpublished archaeological material, usually adopted without a critical review.

The convergence of different approaches in archaeoseismology was particularly evident in the paleoseismological analysis of archaeological remains displaced by activated faults; a problem addressed in several papers published in the 1990s and at the beginning of this century. Although the integration of different procedures of analysis was far from being fully adopted, a slow maturation of a sort of archaeoseismological methodology began during the 1990s through the publication of special issues and dedicated papers (e.g., S. Stiros and R Jones, eds., 1996, Archaeoseismology, British School at Athens, Fitch Laboratory Occasional Paper 7).

The need for a wider discussion on methodological aspects which may lead to the definition of an univocal procedure became evident in the last years, with the activity of the Working Group “Archaeoseismology”, operating within the framework of the European Seismological Commission. On this basis, and six years after the publication of the most recent volume dedicated to this subject (W.J. McGuire, D.R.
The archaeology of geological catastrophe, Geological Society Spec. Publ. no. 171, London), we present a collection of papers which summarizes the work, discussions and data exchange among the different experts within the framework of this Working Group.

The methodological aspect is addressed in the paper by Galadini et al. The integration of a number of approaches necessary to decide if an archaeological site experienced earthquake damage or not is a multidisciplinary field practice which implies analyses during the archaeological excavation. Different approaches and the experience matured in the field suggest that part of the archaeoseismological research has to be related to the wide disciplinary branch known as Geoarchaeology. Moreover, casting light on the occurrence of an earthquake at an archaeological site implies the improvement of knowledge on the site history, a typical archaeological target, and the better definition of the relationship between man and the environment. In this light, the archaeoseismological practice contributes to the wide cultural branch of Environmental Archaeology.

The multidisciplinary field approach is a trend evident in several papers appearing in this Special Issue: in the papers by Fäh et al. and Galli et al., by integrating the analysis of the local seismic response examined on the basis of different approaches with the archaeological data; in those by Korjenkov et al. and Haynes et al. by integrating archaeological and historical information with the paleoseismological analysis.

The architectonic stratigraphy is used to constrain the traces of past earthquakes and of their impact on edifices of southern France at the beginning of the 18th century in the paper by Poursoulis et al. Similarly, the analysis of a cluster of restoration of churches in Rhodes Island, Greece, permitted Stiros et al. to shed light on a previously unknown Greek earthquake of the 18th century.

Considering the increasing interest for this stratigraphic perspective, the article by Mistler et al., finally, seems fundamental, since it casts light on the seismic behaviour of a monumental edifice, the Aachen Cathedral.

Some important aspects of the present Volume are, first, that it is not limited to regions of high seismicity, but extends to areas of relatively low seismicity rates. And second, it shows a trend for a more extended use of archaeoseismological data in the seismotectonic perspective, as demonstrated in the works by Stiros et al., Decker et
This aspect, together with the fact that some works (Decker et al., Fäh et al.) report quantitative information about the energy of the archaeoseismic events, makes us believe that in a few years the archaeoseismological investigations will produce numerous data suitable for quantitative estimations of the seismic hazard.

In short, this volume summarises the current archaeoseismological main trends in the following points:

1) an increasing necessity to collect original field data by means of multidisciplinary investigations, especially during archaeological excavations;
2) an increasing effort to put the archaeoseismic evidence within a seismotectonic framework and to quantify the traces of the past earthquakes in order to obtain quantitative estimates of the parameters of the ancient earthquakes.

We are confident that these two lines of development, if properly followed by the researchers, will provide archaeoseismological data with a reliability comparable to that of the data produced by Paleoseismology and Historical Seismology.

F. Galadini
K.-G. Hinzen
S. Stiros