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Palaeoseismology – Historical and Prehistorical Records of Earthquake Ground Effects for Seismic Hazard Assessment, edited by K. Reicherter, A.M. Michetti & P.G. Silva Barroso, 2009. Geological Society of London. Hardback, viii +324 pp. Price GBP 90.00; fellows price GBP 45.00; corporate affiliates price GBP 72.00; other societies price GBP 54.00. ISBN 978-1-86239-276-2.



Among the most devastating natural events, earthquakes certainly deserve a place, particularly because of the processes that they can trigger, such as tsunamis and mudflows. In modern society, we have a good overview of the various natural disasters that occur on our planet, and this has made Mankind realize that it is worthwhile to get a better insight into the processes that take place before, during and after high-magnitude earthquakes. Such an insight should be based on the analysis of as many events as possible. Unfortunately, the number of earthquakes that occurred in history is large (some with truly devastating effects, such as the 1556 earthquake in China that probably resulted in some 800,000 casualties), but even the fairly high frequency of earthquakes is insufficient to provide all the data that are required for risk assessment and for a reliable and effective hazard analysis.

More research into “old” (prehistoric and older) earthquakes is therefore required. This is done in practice almost exclusively by studying either ruptures (faults) or sediments that have been affected by earthquakes. Such sediments consist as a rule of a layer or a set of layers (called “seismite”) that show(s) soft-sediment deformation that have been caused by processes resulting from the earthquake-induced shock waves that pass by. Seismites are a “hot” topic nowadays, and numerous publications deal with soft-sediment deformation that the researchers ascribe to seismic activity; unfortunately, many deformations that are ascribed to seismic activity “by lack of other plausible causes” can be explained much better by other processes; many researchers have no idea how complicated the genetic analysis of soft-sediment deformations can be!

This book comprises numerous careful observations, interpretations and conclusions, and is therefore most welcome. It is regrettable, however, that the seismic events under study are restricted to historical times and prehistory; attention to “old” seismites would have resulted in much valuable additional information: well studied examples of seismites, for instance, date from as long ago as the Paleoproterozoic. The lack of information on such old seismites seems also in contradiction with the main title of the book, although the subtitle mentions the restriction in time. This restriction in time is only partly logical, as the contributions to this book are not only a spin-off of the “3000 years of earthquake ground effects in Europe” session of the 2006 meeting of the European Geological Union in Vienna, but also of the 2006 ICTP/IAEA workshop (Trieste) on seismic hazard analysis for critical facilities.

After a foreword by John Clague, an introductory chapter follows, authored by the three editors. They provide a short overview of problems, progress and prospects, followed by a short description of the other contributions (not really interesting and, in my opinion, superfluous), to end with an appendix that gives full data on the Environmental Seismic Intensity (ESI) 2007

scale, that relates intensities (not to be confused with earthquake magnitudes!) to effects. It is regrettable that no structural attempt is presented to relate environmental intensities to the well known magnitude scale. The introduction is followed by 17 chapters that deal with specific (pre)historical earthquakes, sometimes – but too rarely considering the scope of the book – with convincing attention for the effects as expressed on the ESI 2007 scale (but particularly the chapter by Tatevossian et al. does so quite well); most chapters just mention the number on the ESI scale without precise details about the features on the basis of which they come to this ranking. Even less attention is, unfortunately, paid to seismic hazard assessment, which subject is presented as one of the main items of the book. An example is the contribution by Mörner about “Late Holocene earthquake geology in Sweden”. The chapter is well documented, several events and their effects are described thoroughly, and it is concluded that the earthquakes were not distributed over time in a random way. This all seems to provide an ideal basis for seismic hazard assessment, but no such item is dealt with: a missed chance. In my opinion, the editors – who did a great job overall – should have forced the various contributors to devote more attention to hazard assessment.

The book does, because of all the above reasons, not really fulfil the expectations that I had. This does not imply, however, that I regret that I spent quite some time reading the book. I was not aware of the ESI scale, and it is in many respects an eye opener, but – as mentioned above – an eye opener that does not become a truly integrated part of this book. There are more eye openers, for instance in the form of studies of old human constructions that have undergone earthquakes. Hardly any geologist will be aware that remnants of old civilisations can provide a wealth of data about geological processes in the past. When I was a student, geological mapping meant by definition mapping of all types of rocks, lithified or not, but without the Quaternary. This book made me realise this once again that much interesting information gets lost this way.

Almost all books published by the Geological Society are well-published, and this volume is no exception. It seems even a bit special, considering the truly numerous figures in colour. Amazing, considering the cost for the authors (at a conference that I attended recently, contributors were sought for another GSL book, and they were informed that they would have to pay GBP 460.00 – over 700 US\$! – for the first colour figure. Even though the following colour figures would be cheaper (but still expensive!), these prices bring colour figures out of reach for many scholars, particularly in times of economic recession. Indeed, one of the two chapters in this book that do not contain colour figures, comes from Russian authors. The Geological Society could – and should – do better. Like they do with the index of this book, six pages with well-chosen terms.

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