The seismic activity of northern Germany is very small. Nevertheless structural damages are reported due to earthquakes there. The only well investigated tectonic earthquake during the last 200 years is a local magnitude 4 event from 1977 (max = V). The strongest known events of this area after 1400 were subject of recent interpretations based on newly retrieved contemporary sources. The reinterpretations yielded both changes in their epicentral intensities (now lower but also higher values) and their epicentral positions. These historical key-earthquakes, the references of their reinterpretations as well as the main changes are:

- 1409, Aug. 24, Grünthal & Meier (1995) $I_0$ from VII to VI
- 1612, Nov. 07, Vogt & Grünthal (1994) $I_0$ from IV to VI-VII
- 1767, Jan. 19/20, Ahorner (1988) $I_0$ from V to V-VI
- 1770, Sept. 03, Meier & Grünthal (1992) $I_0$ from VII to VI

Before these reinterpretations were introduced the parameterization of the key-earthquakes was made mostly according to Sieberg (1940). The damage scenario for the 1409 could be traced back to Stein (1697), were a possible damaging character of the event was expressed very cautiously, while this was used by the group of authors based on Stein (1697) as certainty. Another family of authors, who did not rely on Stein (1697) did not mention any damages. The contemporary sources lead to a different epicentre, a correction of the date and a lower intensity. Additionally it can be calculated from the sources that a supposed earthquake in 1412 in the same area was in reality a strong storm.

The 1612 earthquake, formerly an intensity IV event, proved to be now, after considering contemporary sources, clearly a damaging one. Also the date and the epicentral position could be corrected. Among the contemporary sources is a very illustrative copper depicting obviously very realistically the earthquake effects.

The text by Sieberg (1940) dealing with the 1770 earthquake is without doubt based upon the contemporary source by Buck (1770), but contains in essential parts significant certainly unconsciously introduced exaggerations; e.g. let Sieberg (1940) the plaster fall down in nearly all rooms, while the contemporary wrote from falling of loose line at the crossbeams. Another effect was the terrible rattling of slates (Buck, 1770) while the slates fell down after Sieberg (1940). The worst effect was one broken chimney.

The epicentres of these events are shown in Fig. 1 in their revised form where they are marked with their year of occurrence.
Surprisingly the influence of these reinterpretations on the seismic hazard assessment is negligible. This is due to the fact that all these earthquakes belong to one and the same seismic source zone, wherein the new derived intensities of these events balance each other. Of course, the resulting hazard assessment would clearly be different, if only a part of these key-events would have been subject of the reinterpretations. Further aspects of seismic hazard assessments, among others also with respect to the influence of these historical key-earthquakes, are dealt with in Grünthal & Bosse (1996).

Fig. 1: Seismicity of the North German Plain depicted for those time intervals which are used for the statistical investigations and different versions of seismic source zone delineations. A central position in the study area has the source zone “Weserbergland/Altmark” (version b). Historical key earthquakes (1409, 1612, 1767, 1770) are depicted with the parameters after their recent reevaluation.

References*


* For the historical sources reference is made to the quotations mentioned above.