



The earthquake of September 3, 1770 near Alfhausen (Lower Saxony, Germany): a real, doubtful, or fake event?

Günter Leydecker¹ & Klaus Lehmann²

¹ Isernhagen/Germany, guenter.leydecker@gmx.de

² Geological Survey of North Rhine-Westphalia, State Seismological Service, Krefeld/Germany, klaus.lehmann@gd.nrw.de

Abstract

In the weekly newspaper of Osnabrück (Germany) of November 3, 1770, a report about a local earthquake was published. Pastor Buck described ground motion effects in the manor 'Haus Horst', 1.5 km away from the village of Alfhausen: 'roof tiles rattled, a chimney fell down, inside the house the top of a stove was overturned, abraded chalk trickled down in all rooms; in the nearby villages, people felt the shaking, and especially the churches suffered noticeably'. The epicentral intensity was estimated to VII (MSK) by Ahorner et al. (1970), but later modified to VI (EMS) by Meier & Grünthal (1992) considering Buck's report in detail. Since this event is the only documented earthquake in this region, a reliable characterization of its parameters is important. Our re-examination reveals that some reported effects are quite inconsistent. Contrary to Buck's statement, no documents of damages on churches or costs of repairs could be found in the parish registers. As a result, the event appears to be a tectonic earthquake with an epicenter at Alfhausen / Haus Horst. Applying intensity-attenuation relationships, a revised value of the epicentral intensity of $I_0 \leq V$ (EMS-98) with a focal depth of $z \geq 2$ km was derived. A cavity collapse due to leaching processes as a cause of the effects can be ruled out here. However, several details given in the primary source turned out to be unrealistic or at least exaggerated. The tectonic earthquake on September 3, 1770 near Alfhausen should be classified therefore as uncertain or even doubtful.

1. Introduction

Strong earthquakes with major damage to buildings are rare events in Germany. In order to estimate the seismic hazard at a certain location, the occurrence of earthquakes in space and time as well as their strengths must be determined. The time period of denser and systematic instrumental observations began in the sixties of the 20th century and is far too short for this purpose. Therefore, it is essential to collect and to evaluate any written evidence available from historical reports on earthquake effects to determine characteristic parameters such as e.g. epicenter location, epicentral intensity, and area of perceptibility. However, historical sources must be reviewed very critically for an identification of potential exaggerations, false reports, pomposity, or even misinterpretation of other natural phenomena.

These considerations caused the re-examination of the seismic event of September 3, 1770 near Alfhäusen (district of Osnabrück, Lower Saxony, Germany). According to the current state of knowledge, no noticeable earthquake has occurred in this region since historical times (Fig. 1). Therefore, a reliable characterization of this event is very important. The result of this study has the potential to significantly refine the assessment of seismic hazard in the region of western Lower Saxony and northern North Rhine-Westphalia (north-western Germany).

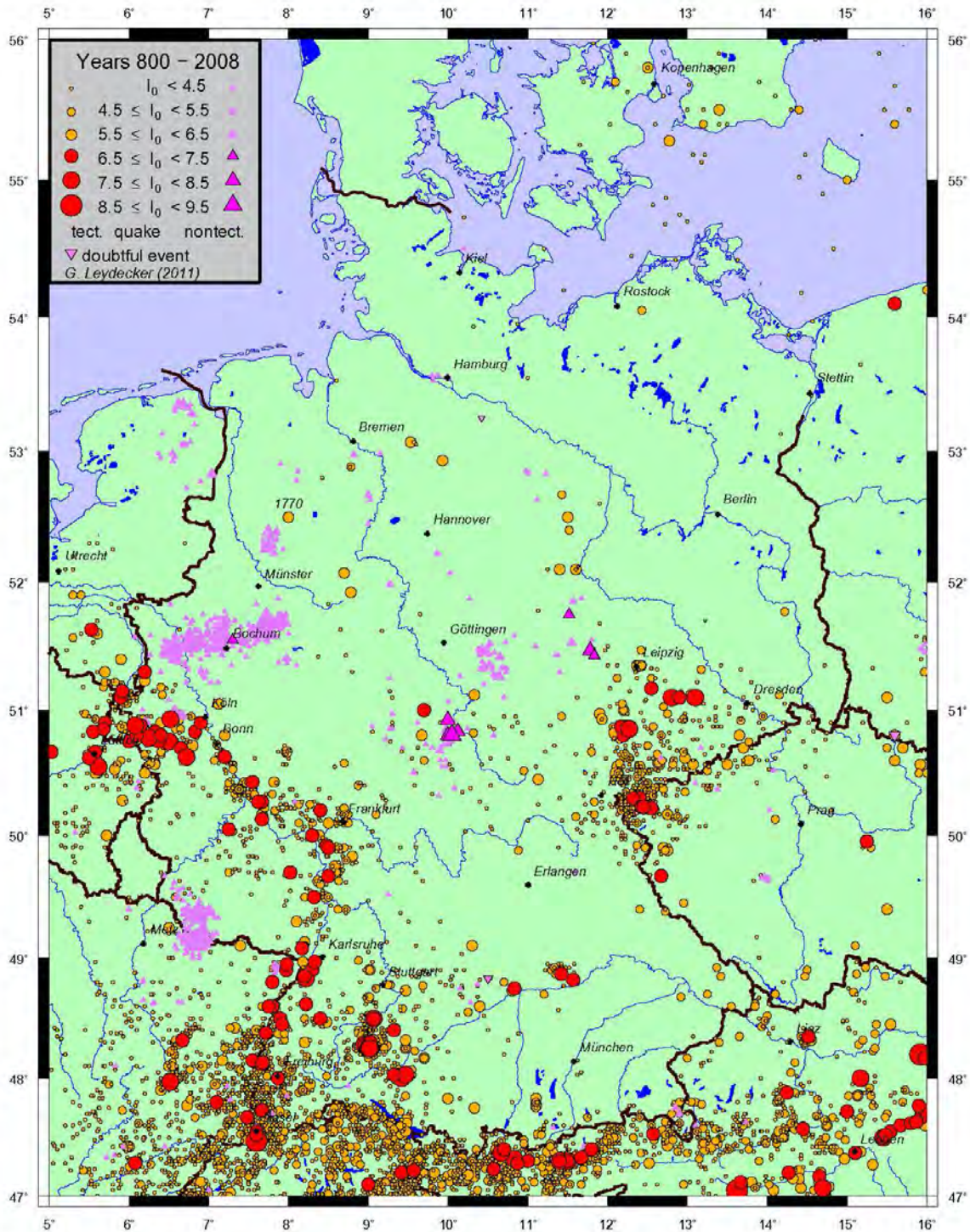


Figure 1. Map of earthquake epicenters in Germany and adjacent areas for the period AD 800 to 2008 (after Leydecker, 2011). The size of symbols is according to the epicentral intensity I_0 . The earthquake of Alfhäusen ($52^{\circ} 30' N$, $7^{\circ} 57' E$) is situated north of Münster and is marked with the year “1770”.

2. Previous studies

The most common report available for the earthquake of Alfhausen on September 3, 1770 was the ‘earthquake chronicle’ of August Sieberg (1940). Here, the event is described as follows (p. 95, translation from the original in German):

“1770, September (or November?) 3, at 11³/₄ h. Earthquake in the Weser Hills [Weserbergland], in the small district of the Bishopric of Osnabrück: In Alfhausen, from Haus Horst a chimney, numerous roof tiles, and plaster from the walls and ceilings of all rooms fell down. In Merzen, Gerde, Neunkirchen, Bramsche, and Vörden, in particular the large and massive buildings, especially the church buildings, had suffered noticeably.”

The original source for this description could not be revealed from Sieberg’s report, since he cites only his own manuscript, the ‘Erdbebenkatalog der Preußischen Rheinlande, umfassend die Jahre 600-1895’ (earthquake catalogue of the Prussian Rhine Province, covering the years 600-1895), which has not been preserved. Sponheuer (1962) classified the strength of the 1770 event on the basis of Sieberg’s description (p. 34, translation from the original in German):

“In the North German lowlands, [...] epicenters can be found: that of the earthquake of Alfhausen in 1770 with the 6th degree of strength, [...]”

Sponheuer used the macroseismic ‘Mercalli-Cancani-Sieberg-Scale’ (MCS; e.g. Sieberg, 1923, pp. 102–ff.), in which the ‘6th degree’ is characterized by the short description ‘strong’. Ahorner et al. (1970) re-evaluated the epicentral intensity I_0 with a value of VII (‘damage to buildings’) according to the updated macroseismic scale ‘Medvedev-Sponheuer-Kárník’ (MSK 1964; Sponheuer, 1965). This value was also included in the German earthquake catalogue of Leydecker (1986).

In the course of extensive research by Meier & Grünthal (1992), a new source for the 1770 Alfhausen seismic event was revealed. The information given here was obviously used in the description by Sieberg. In the weekly newspaper ‘Osnabrückisches Intelligenz-Blate’ (Osnabrück Intelligence Newspaper), published in Osnabrück, the supplement ‘Nützlicher Beylagen zum Osnabrückischen Intelligenz-Blate’ (Useful Supplements to the ...) appeared on November 3, 1770 (Fig. 2) with an article, which was written by Pastor J.H. Buck (1770) from Neuenkirchen (approx. 6 km away from Alfhausen):

“Notice of the remarkable earthquake in the northern region of the Bishopric of Osnabrück on Sept. 3rd, 1770”.



Figure 2. Title page of the newspaper supplement ‘Nützlicher Beylagen zum Osnabrückischen Intelligenz-Blate’ (Useful Supplements to the Osnabrück Intelligence Newspaper), issue of November 3, 1770.

The full name of the author was identified with Pastor Johann Heinrich Buck (U. Braumann, Freiburg i.Br., pers. comm.). This text is reproduced, transliterated, and translated in the appendix.

Based on this report, Meier & Grünthal (1992) re-evaluated the seismic effects of this events with the epicentral intensity of VI ('light building damage') according to the scale EMS-92, a previous version of the actual 'European Macroseismic Scale 1998' (EMS-98, 1998). This intensity value was consecutively adopted in the updated earthquake catalogues of Leydecker (1997, 2011).

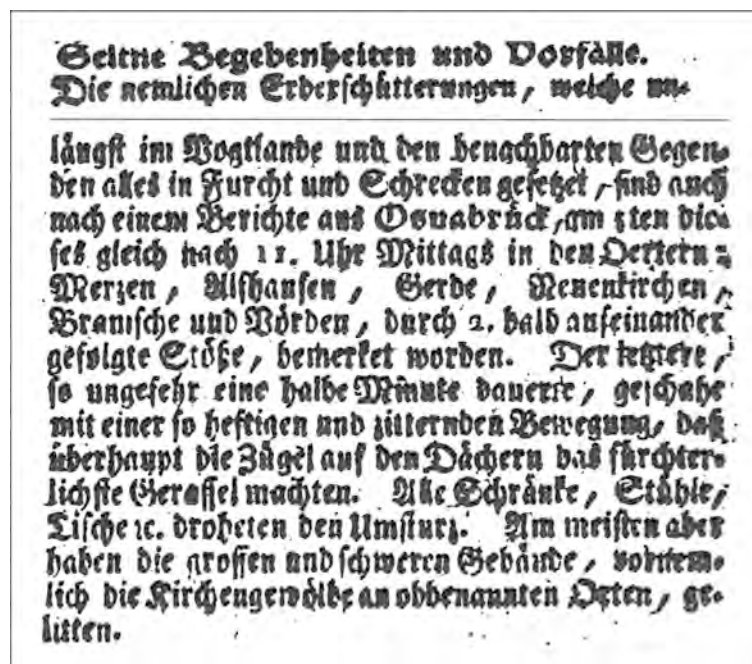
However, a detailed re-examination of all information available on the 1770 Alfhausen event raised fundamental questions. The aim of this study was therefore to check whether the earthquake – as it is currently interpreted – can be reliably verified, or whether the event has to be classified as doubtful or uncertain. Principally, a cause other than a tectonic earthquake must also be considered: the effects of a sinkhole in this region cannot be excluded *a priori*. All available information were used for a source-critical re-evaluation of the 1770 Alfhausen event.

3. Further research on available sources

New research showed that the report in the 'Osnabrückisches Intelligenz-Blate' was also taken over by the newspaper 'Staats-Relation derer neuesten Europäischen Nachrichten und Begebenheiten' (State Relation (newspaper) of the newest European news and occurrences) from the city of Regensburg (Bavaria, Germany) in its issue of November 30, 1770 (Fig. 3, translated):

“The earth tremors, which have recently frightened everyone in the Vogtland region and the surroundings, have also been noticed, according to a report from Osnabrück, on the 3rd of this [month, i.e. November] soon after 11 o'clock at noon in the villages of Merzen, Alfhausen, Gerde, Neuenkirchen, Bramsche, and Vörden, by 2 immediately successive shocks. The latter, which lasted about half a minute, happened with such a violent and trembling movement that the tiles on the roofs made a very terrible rattling. All cupboards, chairs, tables, etc. threatened to overthrow. But most of the large and massive buildings, especially the church vaults in the above-mentioned places, had suffered.”

Figure 3. Article on the 1770 Alfhausen earthquake in the Regensburg newspaper 'Staats-Relation', issue of November 30, 1770.



It is obvious that the text literally adopts individual formulations of the Osnabrück article. The descriptions of the Alfhausen event, however, are interpreted here as an effect of the earthquake series

in the Vogtland region (Saxony, Germany) which lasted from September to November 1770 (cf. Rabe, 1771, p. 61; Sieberg, 1940, p. 95). Because of these formulations, Sieberg's doubt about the month in which the event occurred ("*September (or November?)*") appears to be understandable.

The 'Augsburgische Extra-Zeitung' (Extra Newspaper Augsburg) contains a further report in its issue of December 11, 1770 and copies entire passages from the Osnabrück article (a facsimile of this article is printed in Leydecker & Lehmann, 2019a). Here again the 3rd of September is mentioned as the day of the event. However, the late publication date and the mistake with the spelling of the village names ("[...] *Mergen, Ahlhausen, [...]*" instead of Merzen, Alfhausen) clearly identify the article as an adaptation.

The message was also taken up in the 'Meteorologische Beobachtungen' (Meteorological Observations) for November 1770 by Johann Georg Rabe (1771), but instead of the third day of the month the fifth is mentioned here, probably due to a transcription mistake. Here, the earthquake is described as a local event (p. 61, translation from the original in German):

"In the Osnabrück region, on the 5th of this [month, i.e. November] noon, 1 quarter past 11 o'clock, in Merzen, Alfhäusen, Gerde, etc., two successive earth tremors were felt; the last of them was so violent that cupboards, tables, and chairs in the homes threatened to be overturned, and even the church vaults in the named villages had suffered noticeably."

In the latter publication – as well as in Bucks's report and in the compilation of the Augsburg newspaper – the event time is formulated with the term "*ein Viertel auf Zwölfe in der Mittagsstunde*" (translated literally: "a quarter 'on' twelve at noon"). Uwe Braumann explained, that people at that time understood with this description: "a quarter past eleven at noon", or 11:15 (pers. comm.). Therefore, the time "*soon after 11 o'clock at noon*" in the newspaper 'Staats-Relation' of Regensburg is consistent with the original description. In contrast, since Sieberg (1940), the event time has been fixed with 11:45 in German earthquake catalogues.

From the early 20th century, an additional brief mention of the event was found in the 1911 report of the 'Naturwissenschaftlicher Verein zu Osnabrück' (Osnabrück Society for Natural Sciences). Again, the earthquake of 1770 is regarded as an effect of a distant earthquake (translation from the original in German):

"Mr. Freund, railway secretary, reports on earthquakes observed according to the Osnabrückische Anzeigen [Osnabrück Newspaper] in earlier times in our region, so [...] on a heavy one on September 3, 1770 in the area of Merzen, Alfhausen, Gehrde, Neuenkirchen, Bramsche. [...] In all cases it is probably a matter of effects from catastrophes that had their epicenter elsewhere. There have been no serious accidents in our area."

Although the date and time has been confused several times, all these sources are probably directly or indirectly based on Buck's article. However, additional details of the seismic effects cannot be derived. The report in the newspaper 'Osnabrückisches Intelligenz-Blate' is thus the only known primary source for the 1770 Alfhausen event.

An evaluation of the principal reliability of articles published in the supplement 'Nützlicher Beylagen zum Osnabrückischen Intelligenz-Blate' could not be carried out within this study. But it is clear, that the article on the 1770 event has the character of a letter to the editor. There is no indication that the contribution was revised or even proven by the editorial office of the newspaper 'Osnabrückisches Intelligenz-Blate'.

Further research showed that there is no report about earthquakes to be found in the available church registers of the villages in the vicinity of Alfhausen. There is also no mention of an earthquake in a list of important events which was included in the parish register of the nearby village of Gehrde (U. Braumann, Freiburg i.Br., pers. comm.). As a result, our knowledge of the 1770 Alfhausen event is based exclusively on the individual report of Pastor Buck.

4. Earthquake effects and geological conditions

The details of the damage and the perceptibility are analyzed intensely and discussed critically. The geological conditions are also considered in order to identify potential site effects. This information forms the basis for our re-evaluation of the earthquake report.

Pastor Buck mentions in his article “*Merzen, Alfhausen, Gerde, Neuenkirchen, Bramsche, and Vörden*” as places where the earthquake was felt. In addition, he describes the seismic effects at the “*noble Haus Horst near Alfhausen*” in detail. ‘Haus Horst’ is a detached manor, about 1.9 km northeast of the village of Alfhausen (Fig. 4). All other places mentioned are located within a radius of approx. 10 km around Haus Horst (Fig. 5) in the district of Osnabrück (Lower Saxony, Germany).



Figure 4. Topographic map (detail) of the surroundings of ‘Haus Horst’ (*H. Horst*) (von LeCoq, 1805).

4.1. Earthquake damage and effects at Haus Horst

For the manor Haus Horst, the following observations and damage are mentioned as being caused by an earthquake:

- A chimney fell from the roof.
- Inside the house, in a large hall, the top of the oven was overturned.
- At the cross-beams of all rooms, lime is rubbed off the ceiling.

Reports on the management and administration of Haus Horst for the years 1754–1917 are preserved in the so-called ‘Lager Buch’ (stock-book). They describe the relevant events concerning the manor in detail, also for the period around 1770. At that time the property was managed by an estate administrator, who was obliged – in his own interest – to inform the owner about all incidents. However, the ‘Lager Buch’ does not contain any references to the earthquake nor to damage or possible repair costs (Meier & Grünthal, 1992, pp. 72 f.). Therefore, it can be deduced that, either damage could be repaired at low cost and was not worth mentioning, or the extent of damage was strongly exaggerated by Buck.

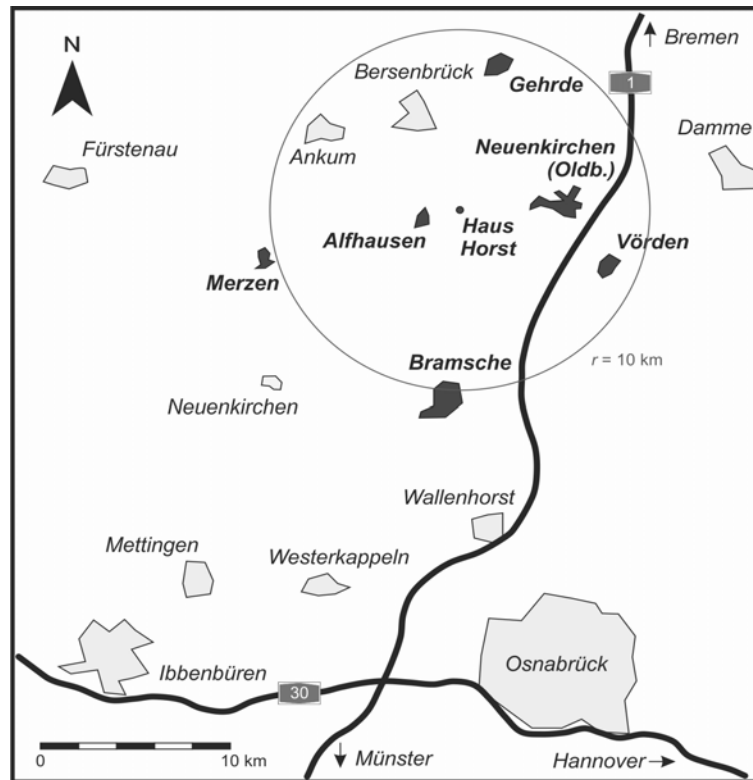


Figure 5. Locations where the earthquake of 1770 was perceived (names of villages in bold letters) according to the report of Pastor J.H. Buck.

Pastor Buck summarizes the damage in the surrounding villages with the description that “[...] especially large and heavy buildings, in particular the vaults of the churches at most of the abovementioned villages, had suffered noticeably”. It remains unclear, which effects are specifically meant by the term “suffered noticeably”: it would generally appear to designate clearly visible damage. In this case, it is surprising that Pastor Buck describes meticulously the damage in Haus Horst but does not mention at all any damage at his own church in Neuenkirchen (about 6 km east of Haus Horst). Additionally, there is no further evidence of serious damage to the church buildings mentioned in other sources.

The extensive investigations by Meier & Grünthal (1992) have also shown that neither the holdings of the Regional Archive of the Protestant Church nor those of the Diocesan Archive of Osnabrück contain any evidence of the earthquake, of damage, or of the respective repair. Mr. zu Hoene, who has worked up the history of Alfhäusen (zu Hoene, 1977), carried out further investigations, but did not discover any indication of damage in the church registers. Also, the preserved bills of the catholic parish church St. Johannis in Alfhäusen show no expenses for repair works in the respective time period (Meier & Grünthal, 1992, p. 74).

Despite intensive research in the surroundings of Haus Horst, further damage caused by the earthquake could not be substantiated. According to the available information, the description of the overturned chimney and of the lime abrasion on the cross-beams in all rooms of Haus Horst remains singular. According to the macroseismic scale EMS-98, this condition does not really permit an intensity assessment.

In addition, it should be noted that the structural condition of the farm house at that time may have favored the extent of the reported damage. Since the contemporary building had been pulled down and was subsequently replaced in 1885 (Steinwachs et al., 1996), further evidence of the damage does not exist anymore.

4.2. Perceptibility of the event and effects in the environment

The area affected by the earthquake of 1770 is described as “[...] *the area from west to east, doubtless 3 miles in length and 2 in width, namely the villages of Merzen, Alfhausen, Gerde, Neuenkirchen, Bramsche and Vörden* [...]”. Applying the ‘Prussian mile’ or a related measure with a value of 7.5 km, this description corresponds to an area of about 20 km by 15 km. According to the statement of Pastor Buck, the earthquake was explicitly not noticeable in the ‘Artland’ (“*Orth- or Arthland*”), i.e. in the area of the landscape about north of the villages of Ankum and Bersenbrück (see Fig. 5).

The following facts support this assumption:

- (1) The earthquake happened on September 3, 1770. The report was written by Pastor Buck on October 9 and published in a supplement to the weekly newspaper ‘Osnabrückisches Intelligenz-Blate’ on November 3. This is not in accordance with a far-reaching and heavily perceptible event that had to be immediately reported.
- (2) In the introduction to the article, the author mentions that some persons were surprised that the earthquake had not been reported in the public newspaper so far. Even if the event was felt only weakly (intensity III) in Osnabrück (in a distance of some 25 km), this remark would certainly not have been necessary. In this case, at least a supplementary description of Buck’s report or a hint about what happened in Osnabrück could have been expected.

It is reported in Buck’s description that the church vaults in most of the above-mentioned villages “*suffered noticeably*”.

Additionally, it is stated that the roof tiles rattled “throughout” and furniture in the houses were heavily shaken. All the inhabitants (“everyone”) were frightened and fled from their houses. It is not clear, whether the author relates these effects and the people’s reaction to the entire area which he describes to be affected.

4.3. Geological conditions

In the Alfhausen region, the geological unit ‘Münder marl’ (Upper Jurassic) gets in contact with the groundwater. Leaching processes of these ground layers have already led to subsidence and the occurrence of sinkholes in the northern foreland of the Wiehen mountains (‘Wiehengebirge’, cf. Tüxen, 1986). Such events were documented since the 16th century (e.g. Grahle & Schneekloth, 1963). However, there is no evidence that these events were accompanied by any noticeable shaking.

In the area of Alfhausen, the documented sinkholes have only a very small extent. In the section ‘3514 Vörden’ of the Geological Map 1 : 25 000 (GK 25, Mengeling 1986), 21 small-scale sinkholes were documented. The most recent one has been recorded in 1985 (status of 1995, pers. comm. K.-H. Büchner, Hannover). However, there is no (geological) evidence for local sinkholes at Haus Horst, nor in the reports of the above-mentioned ‘stock-book’. The Geological Map (GK 25, Landesamt für Bergbau, Energie und Geologie, 2018) describes the near-surface ground of Haus Horst as fluvial deposited middle sand (Weichsel glacial). The soil conditions immediately to the west and east of Haus Horst were investigated with two sounding boreholes. According to Steinwachs et al. (1996, p. 3) “[...] *relatively stable meltwater sands lie here at a depth of about 8 m and deeper*”. Additionally, the foundations of Haus Horst support the existence of a weak ground: “*According to the owner, the current building was founded on oak piles* [...]” (Steinwachs et al., 1996), built in the second half of the 19th century.

A Holocene peat area (‘Ueffelner Aue’) extending in north-south direction is situated directly east of Haus Horst. This area is about 250 m wide and ends about 200 m northeast of the manor. A peat thickness of up to 2 m is known in this area, and a postglacial subsidence area due to leaching processes can be supposed there.

The underlying layer of the Saliferous Formation is assumed to be found at a depth of about 2 km. Tectonic earthquakes can therefore principally only occur below this depth. There is no indication of seismically active faults in this area.

5. Macroseismic evaluation

In all previous investigations, the epicentral intensity was derived solely from the seismic effects mentioned for Haus Horst. Form and extent of isoseismals or assumptions about the focal depth had not been considered. In contrast to the studies published so far, we think that the descriptions for Haus Horst are not reliable and thus not suitable for the determination of the epicentral intensity. Therefore, we try to combine all reported aspects for a plausible intensity assessment.

The intensity distribution of an earthquake principally depends on the epicentral intensity I_0 and on the focal depth z . Figure 6 shows the intensity-attenuation relationship for different values of z using two common models, derived for the area of Germany (Sponheuer, 1958) and for northwest Europe (Ambraseys, 1985), respectively. These relations are based on intensity values according to the macroseismic scale MSK 1964, but can also be applied in a first approximation to the actual scale EMS-98.

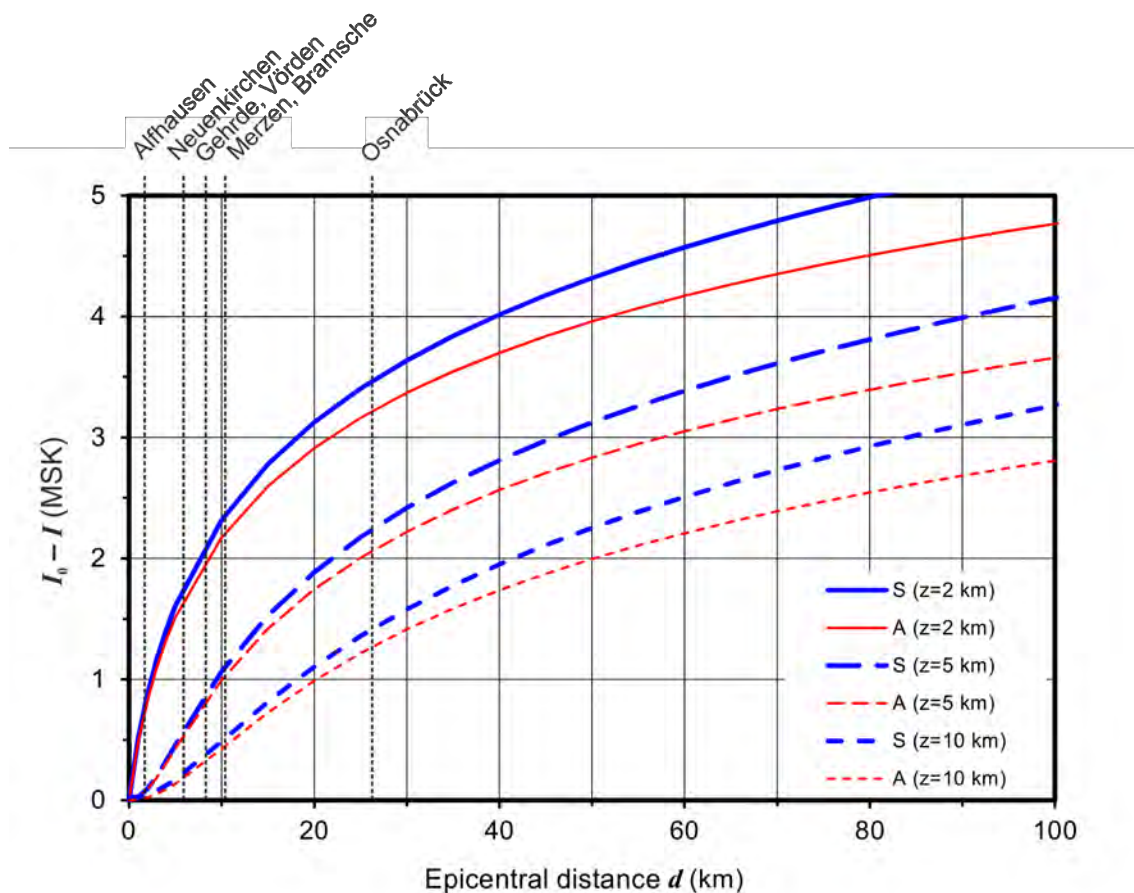


Figure 6. Intensity-attenuation relationship for different focal depths z after Sponheuer (1958, ‘S’, $\alpha = 0.002 \text{ km}^{-1}$) and Ambraseys (1985, ‘A’). I_0 is the epicentral intensity and I the intensity at a certain place in the distance d from the epicenter. Several distances are marked, for the villages, which were mentioned in the report by Pastor Buck, and for the city of Osnabrück.

Because Althausen, respectively Haus Horst, is located in the center of the affected area, it can be plausibly associated with the epicentral area. However, it is noticeable that neither for the village of Bersenbrück nor for Ankum, situated inside the assumed affected area, perceptibility is reported (cf. Fig. 5).

The intensity-attenuation relationships do not permit any combination of epicentral intensity and focal depth which meet the following conditions: (1) damage to the vaults of the churches in the surroundings of Alfhausen (i.e. $I \approx V\text{--}VI$), a large number of inhabitants escaping from their houses (i.e. $I = VI$) at an epicentral distance of 10 km and – at the same time – (2) no perceptibility in only slightly larger distances (Artland: more than 10 km, Osnabrück: about 25 km). This leads to the conclusion that the description of the church vaults having “*suffered noticeably*” cannot be synonymous with the occurrence of damage and has to be classified to be by far exaggerated. Nor the description of the inhabitants’ reaction can be reliable, neither for the epicentral area nor for the entire affected region.

If we assume instead that the earthquake was at least clearly felt in the villages at an epicentral distance of 10 km ($I_{10} \geq III$), the difference between the intensities at a distance of 10 km and 25 km (Osnabrück: $I_{25} < II$), amounts to $I_{10} - I_{25} > 1$. Figure 6 shows that these conditions can only be met for focal depths of less than about 5 km. For focal depths of 2 and 5 km, the epicentral intensity I_0 reaches maximum values of V or IV, respectively. An epicentral intensity of VI, as derived by Meier & Grünthal (1992) (and also later confirmed by L. Ahorner, pers. comm., 1995) cannot be reproduced within this model. The earthquake would still have been felt with intensity III in Osnabrück assuming a very shallow focal depth (2 km), or even with an intensity IV assuming a depth of 5 km. It was already shown that this case is not plausible.

Seismic effects caused by relatively small sinkholes are in principle possible, but would only be felt in the immediate vicinity. An affected area comprising the seven villages mentioned by Buck cannot be explained by such an event. Theoretically, larger sinkholes due to subsrosion processes may explain the described ground motions. However, since there is no documented sinkhole in this area that had been associated with noticeable seismic effects, this explanation seems to be very unlikely.

As a working hypothesis, an earthquake near Alfhausen seems to be the only possible explanation as the cause of the reported effects. In this case, the epicentral intensity must be estimated with $I_0 \leq V$ at an assumed focal depth of $z \geq 2$ km. Only under these conditions an affected area with a radius of about 10 km and simultaneously rattling of the glasses and a trembling of the furniture ($I = IV$) in at least the nearby village of Alfhausen can be assumed to be plausible. The fallen chimney at Haus Horst cannot be used for intensity evaluation because the structural condition of the estate is unknown.

With the solution described here, Pastor Buck’s report can possibly be explained in its basic elements. In contrast, the effects mentioned for the surroundings of Haus Horst and the description of the effects in the affected area appear to be grossly exaggerated. Thus, the remark of the local historian Mr. zu Hoene is probably pretty close to the truth: “*Pastor J.H. Buck’s (Neuenkirchen) report seems to be somewhat sensational after all.*” (Meier & Grünthal, 1992, p. 74). Additional sources which enables us to decide whether Pastor Buck’s report can be rated to be basically trustworthy, are not known so far.

It must be noted, that the source material is quite sparse, and the solution presented here is based on many assumptions. Therefore, we recommend the earthquake of 1770 near Alfhausen to be classified as ‘uncertain’, or even as ‘doubtful’.

6. Conclusions

In this study, the information available on the earthquake of Alfhausen (Lower Saxony, Germany) of September 3, 1770 was examined in detail, and the literary source was critically discussed. The intensity of this event could be re-evaluated with regard to the documented seismic effects. The local ground conditions were also included in the interpretation. With the use of intensity-attenuation relationships, the extent of the affected area could only be explained if a shallow focal depth is assumed and the epicentral intensity has a lower value than in previous studies. Essential elements of the primary report by Pastor Buck can be confirmed in principle, but only on condition that all descriptions are rated to be grossly exaggerated.

A tectonic earthquake can be assumed on September 3, 1770 at 11:15 local time with an epicenter in the vicinity of Alfhausen. The parameters of this event are listed in Table 1 (see Leydecker & Lehmann, 2019b).

The possibility of the effects being caused by a collapse of a ground cavity seems to be extremely unlikely. Since all evaluations carried out are based on only one primary source, which does not seem to be reliable in significant points, we recommend the occurrence of a tectonic earthquake on September 3, 1770 near Alfhausen to be regarded as uncertain, or even doubtful.

Table 1. Parameters of the earthquake of September 3, 1770.

Date	September 3, 1770
Time	11:15 (local time)
Epicenter	Alfhausen / Haus Horst
Coordinates	52° 30' N, 7° 57' E
Focal depth	$z \geq 2$ km
Maximum intensity	$I_0 \leq V$ (EMS-98)
Radius of perceptibility	$R_S \approx 10$ km
Remark	Uncertain or doubtful event

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Appendix

A. Facsimile of the article of Pastor J.H. Buck (1770)

All issues of the weekly newspaper 'Osnabrückisches Intelligenz-Blate' (Osnabrück Intelligence Newspaper) with the respective supplements 'Nützlicher Beylagen zum Osnabrückischen Intelligenz-Blate' (Useful Supplements of the ...) of the year 1770 are collected in the central municipal library (Stadtbibliothek-Zentralbibliothek) of Hannover/Germany, bound in the volume 'ZsH 301 1770'. The pages of the newspaper have a size of ca. 20.5 cm in height and 16.5 cm in width, printed on both sides, and organized in two columns, serially numbered beginning with the first issue of January. The described earthquake report can be found in the columns 349 to 352 (Figs. A1, A2).

vorbenem Getreide, aus welchem schlechtes Brod gebacken ward, dessen Gebrauch einen andern Menschen in eben die Krankheit, die aber weit gelinder war, versetzte. Die Ursache der Krankheit war also im Korn zu suchen, welches, wie Dr. Wollaston bemerkt, schwarz und verdorben war. Müller hat, zwar unrichtig, aber doch vielleicht nicht ohne einige Wahrnehmung geglaubt, daß das Mutterkorn nicht geschadet habe, ohne daß der Brand (ustilago) mit dabey gewesen sey.

Warum hat aber diese Familie vor andern diese Krankheit gelitten?

1) In Schlessien sind zwo ganze Familien gestorben, die also eine gewisse vorläufige schädliche Beschaffenheit des Leibes gehabt haben.

In Solagne lagen vor andern besonders zween Brüder daran krank. Zu Blois scheint nur ein einziger Mensch krank gewesen zu seyn. Andere Beobachtungen zeigen, daß einige Personen am leichtesten vom heissen Brande angegriffen werden i).

i) Quersnay de gangraena. 413.

Lausanne d. 28 Jun. 1764.

Nachricht von dem merkwürdigen Erdbeben im Nordlande * im Hochstift Osnabrück den 3 Sept. 1770.

Verschiedene selbst einsichtsvolle Patrioten, haben gelegentlich keine geringe Befremdung darüber geäußert, daß man von dem gewiß sehr fürchterlichen und schreckvol-

2) In Schlessien hat die Krankheit die Kinder besonders angegriffen. In Bretagne waren es junge Leute und eine Mutter, die vom Säugen schwach war.

3) Alle waren mager, und schwächlich, welches von einem verdorbenen Geblüte zeugt.

4) Man hat angemerkt, daß anderswo eine feuchte und eingeschlossene Luft, Schweinefleisch, Witzspeisen die Gewalt der Krankheit vermehrt haben, und alles dieses war in der downingischen Familie vorhanden.

5) Diese unglückliche Familie hat nicht allein schlechtes Brod, sondern auch schlechtes Hammelfleisch, schlechten Speck, schlechte Erbsen, wovon einige Dinge an sich gleich schädlich sind, genossen; alles das hat zu der Krankheit beygetragen.

6) Die Krankheit ist nicht ansteckend gewesen.

Leben Sie wohl. H. H. und nehmen Sie diese geringen Blätter gütig auf.

* Von einem hohen verehrungswürdigen Gönner bin belehret, daß der Norderwinkel des Hochstiftes Osnabrück in alten Documenten in das Nordland und Orth oder Urthland, wie es auch oft ausgedruckt wird, eingetheilet sey. Zu den letztern zählt man die äußersten Gegenden dieses Hochstifts an dieser Seite, und zu dem ersten die nächst angrenzende Seite und Dertter gegen Südosten; in jenem Striche hat man auch von dem jetzt beschriebenen Erdbeben keine Empfindung gehabt. B.

Figure A.1. First part of the article about the 1770 earthquake by J.H. Buck in the newspaper supplement 'Nützlicher Beylagen zum Osnabrückischen Intelligenz-Blate', issue of November 3, 1770, c. 349-350.

ringer ist der Zweifel, daß man der Nachricht hievon, in den gegenwärtigen Anzeigen, ihren Platz mißgönnen werde. Ohngefähr ein Viertel auf Zwölfe in der Mittagsstunde, der schon berührten Zeit, wurde der Strich von Westen gegen Osten, ohngefähr 3 Meile in die Länge und 2 in der Breite, und zwar namentlich die Orter Merzen, Alfhausen, Gerde, Neuenkirchen, Bramsche und Börden, durch zwei bald auf einander folgende Erderschütterungen, in das äußerste Schrecken versetzt. Mit der letztern, welche die heftigste war, und die, wie man will angemerkt haben, eine halbe Minute gedauert, und ohngefähr eine Minute auf die erste erfolgt sey, war eine so merkliche Bewegung und zugleich eine so zitternde Erschütterung verbunden, daß überhaupt die Ziegeln auf den Dächern, das fürchterlichste Gerassel machten, und alle sonst sogenannte Mobilia, Schränke, Tische und Stühle ihren Umfall, wie ein jeder in seiner Wohnung angemerkt, gedrohet haben. Mit wie vieler mit Angst und Furcht untermischter Bestürzung und Erwartung eines neuen schreckenvollen Besuchs dieses unterirdischen Orcans, ein jeder die Flucht aus seiner Wohnung ergriffen, läßt sich in der Kürze nicht leicht deutlich genug beschreiben. Ob

nnn gleich (dem Herrn, dem allerhöchsten Gebieter der Natur, sey herzlich Dank) diese zagenvolle Erwartung eines schleunigen allgemeinen Jammers nicht erfolgt ist; so haben doch besonders große und schwere Gebäude, vornemlich die Kirchengewölbe an den mehresten oben benannten Ortern, hiebey merklich gelitten. Nebst diesen verdienet hier unter andern das hochadeliche Haus Horst zu Alfhausen bemerkt zu werden. Nicht allein ein auf allen Zimmern besonders an den Querbalken abgeriebener Kalk, sondern auch ein umgestürzter Aufsatz eines, auf einem geraumigen Saale dieses Hauses, befindlichen Ofens, und vornemlich ein vom Dache herunter gestürzter Schornstein, wobey denn hohe Besitzer dieses Hauses, leicht ein Unfall zustossen können; eins so wohl wie das andere ist das deutlichste Zeugniß, von diesem gewiß sehr heftigen und merkwürdigem Erdbeben. Aus einer vom Erdbeben besonders entworfenen Geschichte erhellet, daß Westphalen, vor ohngefähr anderthalb hundert Jahren, diese höchst unangenehme Begebenheit merklich empfunden habe; der Herr gebe, daß der Erneuerung einer so schreckenvollen Erscheinung, künftig hin in keinen Jahrbüchern der Welt dürfe gedacht werden.

N. den 9 Oct. 1770.

J. H. B. P.

✂ [* *] ✂

Figure A.2. Second part of the article about the 1770 earthquake by J.H. Buck in the newspaper supplement 'Nützlicher Beylagen zum Osnabrückischen Intelligenz-Blate', issue of November 3, 1770, c. 351-352.

B. Transliteration of the article of Pastor J.H. Buck (1770)

Nachricht von dem merkwürdigen Erdbeben im Nordlande im Hochstift Osnabrück den 3 Sept. 1770.*

Verschiedene selbst einsichtsvolle Patrioten, haben gelegentlich keine geringe Befremdung darüber geäußert, daß man von dem gewiß sehr fürchterlichen und schreckenvollen Erdbeben, welches das Nordland im Hochstift Osnabrück den 3 September d. J. betroffen, in öffentlichen Blättern, die öffentliche Anzeige vermisset hat. Um desto geringer ist der Zweifel, daß man der Nachricht hievon, in den gegenwärtigen Anzeigen, ihren Platz mißgönnen werde. Ohngefähr ein Viertel auf Zwölfe in der Mittagsstunde, der schon berührten Zeit, wurde der Strich von Westen gegen Osten, ohngefähr 3 Meile in die Länge und 2 in der Breite, und zwar namentlich die Oerter Merzen, Alfhausen, Gerde, Neuenkirchen, Bramsche und Vörden, durch zwei bald auf einander folgende Erderschütterungen, in das äußerste Schrecken versetzt. Mit der letztern, welche die heftigste war, und die, wie man will angemerket haben, eine halbe Minute gedauret, und ohngefähr eine Minute auf die erste erfolgt sey, war eine so merkliche Bewegung und zugleich eine so zitternde Erschütterung verbunden, daß überhaupt die Ziegeln auf den Dächern, das fürchterlichste Gerassel machten, und alle sonst sogenannte Mobilia, Schränke, Tische und Stühle ihren Umfall, wie ein jeder in seiner Wohnung angemerket, gedrohet haben. Mit wie vieler mit Angst und Furcht untermischer Bestürzung und Erwartung eines neuen schreckenvollen Besuchs dieses unterirdischen Orcans, ein jeder die Flucht aus seiner Wohnung ergriffen, läßt sich in der Kürze nicht leicht deutlich genug beschreiben. Ob nun gleich (dem HErrn, dem allerhöchsten Gebieter der Natur, sey herzlich Dank) diese zagenvolle Erwartung eines schleunigen allgemeinen Jammers nicht erfolgt ist; so haben doch besonders große und schwere Gebäude, vornemlich die Kirchengewölbe an den mehresten oben benannten Oertern, hiebey merklich gelitten. Nebst diesen verdienet hier unter andern das hochadeliche Haus Horst zu Alfhausen bemerket zu werden. Nicht allein ein auf allen Zimmern besonders an den Querbalken abgeriebener Kalk, sondern auch ein umgestürzter Aufsatz eines, auf einem geraumigen Saale dieses Hauses, befindlichen Ofens, und vornemlich ein vom Dache herunter gestürzter Schornstein, wobey dern hohe Besitzer dieses Hauses, leicht ein Unfall zustossen können; eins so wohl wie das andere ist das deutlichste Zeugniß, von diesem gewiß sehr heftigen und merkwürdigem Erdbeben. Aus einer vom Erdbeben besonders entworfenen Geschichte erhellet, daß Westphalen, vor ohngefähr anderthalb hundert Jahren, diese höchst unangenehme Begebenheit merklich empfunden habe; der HErr gebe, daß der Erneuerung einer so schreckenvollen Erscheinung, künftighin in keinen Jahrbüchern der Welt dürfe gedacht werden.

N. den 9 Oct. 1770.

J.H.B. P.

** Von einem hohen verehrungswürdigen Gönner bin belehret, daß der Norderwinkel des Hochstifts Osnabrück in alten Documenten in das Nordland und Orth- oder Arthland, wie es auch so oft ausgedruckt wird, eingetheilet sey. Zu den letztern zählet man die äußersten Gegenden dieses Hochstifts an dieser Seite, und zu dem ersten die nächst angrenzende Seite und Oerter gegen Südosten; in jenem Striche hat man auch von dem jetzt beschriebenen Erdbeben keine Empfindung gehabt. B.*

C. Translation (attempt) of the article of Pastor J.H. Buck (1770)

Notice of the remarkable earthquake in the Nordland of the Bishopric of Osnabrück on Sept. 3, 1770*

Various reasonable patriots have occasionally expressed their utter astonishment at the fact that any public report has been missed in public newspapers of the really very terrible and frightening earthquake which affected the Nordland of the Bishopric of Osnabrück on September 3, this year. The less is the doubt that one will grudge the news a place in the actual newspapers. A quarter past eleven at noon, on the already mentioned date, the area from west to east, roughly 3 miles in length and 2 in width, namely the villages of Merzen, Alfhausen, Gerde, Neuenkirchen, Bramsche and Vörden, was heavily frightened by two earth tremors soon following each other. The latter, which was the most violent, and, as one believed to have noted, lasted half a minute, and which happened approximately a minute after the first, was accompanied by such a noticeable movement and, at the same time, such a trembling shock that the tiles on the roofs rattled in the most terrible way, and in addition all the so-called Mobilia, cupboards, tables, and chairs threatened to fall down, as everyone noted in his home. With how much fear and anxiety, mixed with dismay and expectation, of a new frightful visit to this underground storm everyone was fleeing from his home, cannot easily be described clearly enough in the brevity. Whether this timid expectation of a sudden general misery has not been met (to the Lord, the supreme lord of nature, be cordially thanked); yet especially large and massive buildings, in particular the vaults of the churches at most the above-mentioned villages, had suffered noticeably. Additionally, among others the noble Haus Horst near Alfhausen deserves to be noticed. Not only a lime rubbed off in all the rooms, especially on the cross-beams, but also an overturned top of a stove in a spacious hall of this house, and especially a chimney fallen down from the roof, which could have easily caused an accident to the noble owner of this house; the one as well as the other is the clearest testimony of this certainly very violent and remarkable earthquake. From a story especially dealing with the earthquake it becomes clear that Westphalia, one and a half hundred years ago, had noticeably felt this most unpleasant incident; the Lord may give that in the future, no renewal of such a frightful phenomenon may occur which has to be remembered in any yearbooks of the world.

N., Oct. 9, 1770.

J.H.B. P.

** I was informed by a noble venerated patron that in old documents the Norderwinkel of the Bishopric of Osnabrück is divided into the Nordland and the Orth- or Arthland, as it is often called. The outermost regions of this bishopric on this side belong to the latter one, and the next adjoining side and villages towards southeast belong to the first; in that area one had no perception of the earthquake described here. B.*

Editor

Dr. rer. nat. Diethelm Kaiser
Bundesanstalt für Geowissenschaften und Rohstoffe,
Hannover, Germany

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Lehrstuhl für Geomechanik und Geotechnik
Ludewig-Meyn-Strasse 10
24118 Kiel

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