

THE EARTHQUAKES OF THE INDIAN ARCHIPELAGO
UNTIL THE YEAR 1857

BY

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IN UTRECHT.

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Because the faltering of the ground must be counted among the most impressive phenomenon, it should not astound that primitive peoples have attempted to create an image of the nature of ground movements. As varying as is the character of the peoples inhabiting the Indian Archipelago, they still consistently agree, that they ascribe to the earth the form of a plane that rests on a snake, a steer, a pig, or any fabulous monster and that, through the movement of said animal, is affected 1). It should then be thought, that the various tribes, as far as they are in possession of a written language, would have made diligent records, at least about the most destructive natural phenomenon, but this is not the case. Only in Javanese chronicles are found several statements that are, however, unusable for a scientific chronology. For reasons to be cited below I have not allowed myself to forgo an account, from which, apropos, their fabulous character immediately emerges. As further concerning the *Buch der Könige* (Book of the Kings), according to a statement of the publisher, J. BRANDES, in principle, it merits trust 2). The records in the same elude examination, as far as this concerns the subject addressed by us; moreover, the names of the cited territories are today no longer known, and finally, we are not certain, whether in the statements an earthquake, an eruption, or a landslide is the subject

as for all these three terms the same word, namely “guntur” (thunder, rumbling) is used.

The first, actually authenticated earthquake was observed in 1538 on Ternate. The first, however, who made regular records, though restricted to the Banda Islands, was JOH. SIGISM. WURFFBAIN, whose journal kept there spans from 1632 to 1638 1). Furthermore, as was not to be expected otherwise, G. E. RUMPHIUS had also occupied himself with the earthquakes. He is not only credited with the statements about such events, of which he himself was a witness, but he also did not pass up the opportunity to gather communications about the vibrations that had taken place before his advent on Amboina, as well as the from neighboring islands. With the exception of one report about the great quake in 1674, 2) his communications were first published a few years ago 3). However, they had become known almost two hundred years ago through FRANCIOS VALENTIJN, to whom the writings of RUMPHIUS were available. VALENTIJN, apropos, had the merit of having informed us of earthquakes that were observed by him himself, and by others in the archipelago 4).

Additionally to be mentioned is that J. C. M. RADERMACHER in his description of the violent earthquake on Java in 1780, included in his index of all the earthquakes since 1684 that he became aware of 5). Lastly, there are yet records that H. COLDENHOFF made on the Island of Ternate during the period of 1824-1835 6).

Beside the named, little-comprehensive collections, there is access to a considerable number of

individual records from officials and travelers whom mere chance brought them to witnesses such events.

Beginning with the appeal by FRANZ JUNGHUHN in 1844 to the inhabitants of the Dutch Indies, an attempt was made to achieve regular records of the observed earthquakes 1). His efforts had, however, such little success, that his request had to be repeated a year later 2). In the meantime, he himself diligently collected passed-over reports from earlier times, and thus already in 1845 could publish his first chronological overview of the earthquakes known to him from 1506-1844 3). Although, as usual, the interest of the masses began very quickly to slacken, but nonetheless, his endeavors were not in vain. Not only through his doing was a series of observations retained for the ensuing ages, but there was also imitation of the example given by him. It was thus that J. HAGEMAN compiled overviews about the vibrations having taken place from 1845- 1848, particularly on Java 4), which he then continued until 1857 5). In addition, when the “*Natuurkundige Vereeniging van Nederlandsch-Indie*” (Association of Natural History of the Dutch Indies), created on 19 July 1850 in Batavia, decided to publish a journal, they did not neglect to grant a special place for the volcanic phenomenon that, of which observation had been possible, including earthquakes. Although the editorship had restricted itself in the beginning to reprinting the news of the daily papers, the incompleteness gave the same occasion, to call upon the readers for further communications, which was successful 6).

A third period was introduced through a letter ALEXIS PERRY, directed to the *Natuurkundige Vereeniging* in Batavia

on 24 August 1855, in which he made a request for the consignment of communications about the earthquakes occurring in the archipelago. In a second letter, from 25 November 1857, he expressed the wish, also to be provided with communications from earlier times 1). As far as the first point is concerned, the Assoc. of Natural Science had beaten him to it, inasmuch as before the purchase of the Perrey Letter on 12 February 1857, they had already set in their agenda an as-complete-as-possible compilation of the earthquakes and volcano eruptions occurring in the Dutch Indies 2). Furthermore, the time had come, to direct a petition to the government with the request to instruct civil servants about the earthquakes of which they were aware, and to report on the volcanic phenomenon as well. This motion was satisfied in the form of an ordinance, still valid today, for all residents 3). A further, important measure in accordance with the wishes of PERREY consisted of extracting all the reports that were taken up since their Collection (1810). It was A. W. P. Weitzel 4), M. Th. Reiche 5) und W. F. Verstreg 6), who themselves participated in filling gaps to complete the work.

The head of the organization had to validate the yearly collection of individual reports in chronological order, in which the beginning had been handled by the head residents. With authority, in the end, one soon saw the continuous characteristics of the archipelago structure. From 1863 on, it was included in the yearly *Tijdschr. Der Naturrk.* (Journal of Natural Science). To present day, the association is one of the forerunners of today's earth science catalog. M. Th. Reiche wrote the reports for (1860-62). Following him, W. F. VERSTEEG (1863-1865), G. A. DE LANGE (1866), P. A. BERGSMA (1867-80), J. P. VAN DER STOK (1881-82), and P. VAN DIJK (1883). For the years 1884-1885 (1st half year),

the handling of it happened with another purpose, which was through S. FIGEE and H. ONNEN(1885- 2nd half of 1895), and 1896-97 by S. FIGEE alone. From the year 1898 on the Royal Magnetic and Meteorological Observatory in Batavia took over the continuation of the reports.

Which were, then, the successes of the organization tackled in 1857? For the time from 1806-1844 JUNGHUHN was only able to discover 57 earthquakes altogether. In the following years, there came to his attention: 1845-19, 1846-18, 1847-14, 1848-19, 1849-10 and 1850-14 quakes. In the chart below are compiled the results of the observations for the period from 1858-1883.

Year	Days of Earthquakes	Year	Days of Earthquakes
1858	52	1871	69
1859	67	1872	62
1860	35	1873	62
1861	102	1874	58
1862	43	1875	60
1863	56	1876	57
1864	96	1877	78
1865	100	1878	63
1866	68	1879	38
1867	70	1880	41
1868	88	1881	55
1869	64	1882	44
1870	71	1883	54

It may rightly be claimed that the establishment signified great progress. The numbers are of course not directly comparable, as in one year earthquakes can occur more frequently than in another, but *a connection between the number of observers and the number of vibrations is unmistakable*. But, as is the norm, the initially demonstrated zeal soon abated. Thus it was that W. F. VERSTEEG felt the need, occasioned by his

earthquake statistics for the year 1864, to write: “There are more than twice as many quakes that were known of, than during 1863. It need not be established whether indeed the number of the same were truly that much larger, or whether observation was more careful...., yet it cannot be overlooked that a third of all the records do not hail from official sources, rather were extracted from daily papers” 1). P. A. BERGSMA indicated further in 1871 that since February 1868 not one report from the Banda Islands nor from the locality of Menado—both recognized quake areas—had not come in 2).

The high number of earthquake days in 1884, vis-à-vis the prior years, is probably ascribable in part to the strong impression that the Krakatau Eruption (28 August 1883) engendered. It was such a powerful one that the number of volunteer observers, without special commission, rose considerably directly following it. The eruption itself was not, as R. D. M. VERBEEK was able to emphasize, attended by any vibrations worthy of mention 3). But he gave occasion in the *Natuur Vereeniging* to gain new circles for earthquake observation. After the meeting of 15 May 1884, a commission consisting of P. VAN DIJK and J. J. POORTMAN was named in order to work out proposals for the measures to be taken 4), they were able to submit a resolution at the meeting on 17 July 5). The result was the remittance of 2500 circular letters that contained a call to collaboration, with an instruction attached, worked out by P. VAN DIJK, in which precise indications as to place, time, direction and intensity of the earthquake were identified as especially desirable 6). The success exceeded all expectations, as not fewer than 865 affirmative declarations came in 7). In another circular letter, this time issued by S. FIGEE, H. ONNEN and J. A. SCHUURMAN, attention was again

directed to a few important points, among which the suggestion, which is very worthy of heed, should be emphasized, to also grant receipt of records, when the location in question had been earthquake free.

The outcome of that effort is shown in the chart below, in which several of the previous years have been considered for comparison.

Year	Days of Earthquakes	Reports from Officials	Reports from Private Persons	Total Report Count
1879	38	-	-	71
1880	41	-	-	77
1881	55	-	-	86
1882	44	-	-	60
1883	54	-	-	81
1884	82	97	50	147
1885	177	181	357	538
1886	144	163	235	398
1887	125	138	189	327
1888	120	144	202	346
1889	100	87	119	206
1890	118	160	172	332
1891	108	121	115	236
1892	102	122	72	194
1893	103	101	68	169
1894	99	94	31	125

It leads to the outcome that as the number of report compilers grows, so does the number of earthquake days, though not proportionally. Such a relation appears already to be excluded for the reason that the dispersion of Europeans, and thus the possible earthquake observers, is a very uneven one. While they count into the thousands on Java, there are only a handful of them resident on the four-times-as-large Dutch share of Borneo. After the great swelling in 1885, one sees simultaneously with the count of earthquake days, the count of observers constantly receding. Their temporary increase during the years 1888 and 1890 is without doubt due to the fact that at that time on Java, and partly also on Sumatra, that is, on the islands most inhabited by whites,

numerous and wide-spread vibrations manifest themselves. As an example of how quickly the interest died down, may yet be noted that in 1893 68 reports came in from private sources, which originated from 18 persons. That was the residue of those who were declared collaborators 8 years earlier. The criticism not to be dismissed without consideration that the reduction could be a result of a decrease of earthquakes is to be rebutted with the fact that transmission of negative reports was also requested, for the purpose of the determination of quake-free areas. The number of the observers would have, under consideration of the inevitable reduction, fallen to a much lesser degree.

This fact of the decline could not elude either the publishers of the earthquake reports at that time, S. FIGEE and H. ONNEN. Thus they again issued the request not to let up in zeal. They were able to show proof that at times also official reports, even from wide-spread quake areas, has been missed as well. Thus it was that *on 8 October 1888 an earthquake took place, which was felt on all of Java with the exception of the localities of Krawang and Batavia. Despite this demonstrable fact, there came in from not less than 6 localities, namely Madiun, Kediri, Kedu, Surabaya, Probolinggo and Besuki, no official communications – and it is work noting that according to the research at the time, the epicenter lay in Madiun and Kediri 1).*

From the year 1867 on, the respective director of the Meteorological Observatory was one of the publishers of the annual reports about the earthquakes and volcano eruptions that took place in the Indian archipelago. From the year 1898 on, the publishing occurred – as already mentioned – officially through the observatory, although its publication – at least of the macro-seismic activity – occurred through the *Natuurkundige Vereeniging*.

With this connection came the great benefit, that the institute occupied itself in more detail with the earthquake observation, and thus at the same time could bear the progressions of the scientific calculation. Already *in the year 1891, a seismograph was installed* by J. A. EWING. 2), but it

could not be claimed of that instrument, that had corresponded to expectations. ***Many very well-felt vibrations were not registered by it at all.*** 1) J. P. VAN DER STOK described and made images of its recordings during the quakes on 29 October 1891, 20 September, 20 October, and 29 December 1895, as well as on 26 January 1896. 2) Of far greater significance was that the observatory was equipped with instrumentation, for aid in recording ***micro seismic activity***, which led in a new period of earthquake observation in the Indian archipelago, and in elsewhere.

The first apparatus of this type was JOHN MILNE's seismograph, which was installed in the end of May 1895, and then was activated on 1 June. 3) It was joined in 1899 by REBEUR-EHLERT's horizontal pendulum seismometer 4), the installation of which, however, was not entirely satisfactory and thus it had to be returned to Strasburg. Also, after its return in the year 1902, it was seen that the recording apparatus did not yet correspond with demands and that final installation could first take place in 1903, after the improvements were made. 5) In the beginning, the seismograms obtained from this instrument after the passage of each month were sent only to the center location in Strasburg. 6), from 1904 on, the recordings reached publication along with those of the Miln seismographs, but separated from them. 7)

While C. CH. LAU, whose observations were able to be rejected for the year 1904 by E. RUDOLPH, was taking a private pension in Kota Radja in Atjeh (North Sumatra),

a Strasburg horizontal gravity pendulum from J. and A. BOSCH was installed on the Island of Amboina in 1905, occasioned by the observatory in Batavia 2). In the following year was noted that it worked in a satisfactory wise, but that the regular gait of the clock left something to be desired. The further installation of a gravity pendulum occurred in 1906 in the garrison lazarett in Padang on the west coast of Sumatra. 3), however, the publication of the recordings of the last two named stations are omitted. On the contrary, at the end of 1911 both of the instruments were taken out of commission, as their sensitivity compared with those introduced from other nations was too low, to impart their recordings with a special worth. 4)

In the meantime in the main station in Batavia – on 6 December 1908 – an Asian pendulum seismometer from E. WIECHERT was set in commission 5), and its installation was the reason to take the REBEUR-EHLERT instrument out of activity on 20 April 1910, and to put it aside in case the WIECHERT would fail 6). Until now, this case has not occurred 7), and the recordings, starting with 28 December 1908, have been published in an uninterrupted series at the end of each month 8).

Finally, it may yet be mentioned that in July 1911, in the flat of the principle official of the Malabar plantation (Dist. of Bandjaran, Bur. of Bandung) in the Preang regencies, R. A. BOSSCHA managed to have an Asian seismograph installed from SPRINDLER and HOYER 9).

After the preceding historic retrospection, a few comments about the earthquake reports shared in this index

will now be appropriate. As everywhere else, for ages, those on the Indian archipelago had been for the most part dependent on the reports of laymen. It may be said to their credit that their information may be trusted, although verification is in the most cases impossible. Where, however, it was possible, they have proven to be fully correct. Though in earlier centuries, details were not heeded, the communication of which appears desired in these days, still, in comparison with those of modernity, the older observations are in no way to be seen as of lesser worth. To the contrary, *it is incredible to think of the great care that at times was practiced. For instance, the records made from 16 August to 11 September 1754 about the vibrations on Amboina and the Uliassers far exceed in exactness those which were written down during the destructive quake on the first-named islands from 6 January to 17 February 1898.*

Further, as far as the indication of location, its exactness frequently leaves something to be desired. A reliable and only to some degree full register does not exist, and the outstanding, 25 volume Imperial Gazetteer of India (Oxford 1907-8) has nothing similar in the Dutch Indies. Trying to make up for this sad situation, names of the localities or of the island, as well as an indication about the geographic latitude and longitude have been added in the earthquake reports of the last decade. There is a village on the east coast of the NE peninsula of Celebes named Lintong that is at the same time the headquarters of the Postenhalter managing the bureau of Banggai. From this, the erroneous, but nearly correct conclusion was drawn, that this location was on the Island of Banggai, when it only makes up a part of the same-named bureau.

Concerning the determination of the time, upon which, frequently, no great worth was placed per se, the conditions on the Indian island are far less favorable than in Europe. *The errors of usual clocks here amount to only a few minutes, but there, far larger differences must be calculated, as no clocks there are able to escape permanently the spoiling effects of the tropical climate* 1). These unfavorable conditions have seen an essential improvement in modern times with the spread of the telegraph network.

In many cases, namely in those that has a recording by the seismograph in Batavia, a precise determination was possible after the fact. Originally, it was always the local time that was indicated, and this practice is also followed in this index. In the ones published from 1885 to 1889, one had deviated from this, in that all indications were set to Batavian time. This method did not persist. Firstly, errors in calculation, later barely detectable, were not precluded, and so through the numbers resulting from the calculation made it to appear as if with the original information, the time had been precisely observed. This practice was later abandoned for that reason, but in a special rubric the Batavian time difference was indicated (for greater convenience). For the observations of microseismic activity that were published since 1898, it was decided beforehand, as an international consideration, to set all time indications to Greenwich meantime 1). These are thus unable to be directly compared with the macroseismic ones without calculations.

The indications about the intensity of the quakes is frequently, as elsewhere, in statements kept very general. *Moreover, all of the scales do not help to get past the fact that the inhabitants of areas of habitual seismic activity, are far more indifferent to the movements of the earth than those who are residing in areas that are only seldom affected by vibrations.*

I tend not to impart too great a worth to the statements of the direction of a shock, unless other conditions confirm, such as the swaying of hanging lamps, etc. I do not believe that most people are able to make an objective judgment in this regard. It is telling that at times an indication of the vertical direction follows, under the same communication that the shock was horizontal. Most probably detectable would be the direction of a wave-formed shock. In the oldest of the earthquake indexes, the Indian islands had not been yet taken into account in any way, but even in those accounts that have appeared since the middle of the 18th century, they were granted a right stepmother-like treatment. While not a single person had yet come to know of ELIE BERTRAND 2), JOH.

FRIEDER. SEYPART was able to cite at least 3 in 1756 1), a number that was able to be increased to 7, 5 years later by PHILBERT GUENEAU DE MONTBELIARD. 2) The index of CHR. KEFERSTEIN can, as well as it was meant, only be marked as an unreliable and spotty accomplishment, all the more as he, just as his predecessors, neglected to indicate the sources he used. 3) The most thorough work was performed at that time was by K. E. A. VON HOFF, who was successful in detecting not less than 35 earthquakes for that time until 1805, and then again from 1821-1832, although many important sources were not available to him. 4) The compilation that was overseen by F. JUNGHUHN signified another progression and brought an increase of the count up to 57 for the time until 1844. 5) The index by ROBERT MALLET – reaching until 1842 – ultimately indicated 53 earthquakes. 6) Since that time, no more entire overview of the seismic phenomena has appeared, be it even only for the Indian archipelago. Only for its eastern and northern part, namely for the Molukken in the most open sense of the word, North Celebes, as well as the Sangi Islands, there exists a monograph compiled by ALEXIS PERRY. 7) Aside from this, I

gave a compilation of the earthquakes observed on Timor 1).

The count of those collections, which limit themselves to shorter or longer periods of time is far greater. In the 19th century the annual reports enjoyed some level of popularity; there are only 34 missing (1809-1817, 1831-1838, 1842, 1886-1900). That which has already been said about the indexes is with few exception valid for them. In the compilation by PIERRE COTTE for the period of 1774-1806 there is only one single quake from the Indian archipelago 2). A somewhat better outcome was delivered by the overviews by F. ARAGO (1818-1830) 3). The reports by X. MEISTER (1869-1871) 4), E. KLUGE (1855-56) 5), C. L. GRIESBACH (1867-69) 6) and F. DIEFFENBACK (1872) 7) are also very poor.

ALEXIS PERRY, in his feverish zeal not to be beaten by anyone, was the first one who in Europe recognized the significance of the Dutch Indies for seismology and during the long period from 1843 until 1871 was determined, to the best of his abilities, to procure himself information from there. As he first succeeded at this in the course of the years, his first annual records have shown numerous gaps 8) Their worth is only insignificantly

limited through PERRY's past work. For the years 1865 through 1885 C. W. C. FUCHS finally compiled reports whose main source was the Augsburger Allgemeine Zeitung. This record, published not long after the passage of the respective calendar year 1), were later re-worked and amended, under the most generous usage of the last 6 published by PERREY. 2)

Not until the beginning of this century did it again become possible to publish chronological overviews about the earthquakes that were observed, from then on with a much better base and in far greater completeness as all of their predecessors. The editing of the central office in Strasburg under commission of the International Seismological Association, is to be thanked for this result. The vision of compilation of the massive amount of material that came to it is a time consuming work, but already in 1907, EMILIO ODDONE was able to publish the index for the year 1904 3) The one for 1908, in comparison, appeared in 1917, under the least-favorable condition thinkable.

As the task in a work like the following, to relay the exact appraisals of all of the earthquake known of in the Indian Archipelago, it was thus an unavoidable challenge that, in order to distinguish the certain from uncertain, or wholly false, all records be gathered. *To silently omit*

any would have been impermissible, as a later researcher to whom the sources are not available, could easily think that an error on my part had taken place. Incorrect numbers that infiltrated by means of writing or printing errors are comparatively numerous, and were accepted by later editor without criticism, and thus were in danger of being perpetuated.

The following collection contains the known earthquakes for the period reaching until the close of the year 1857. Although in the course of the last 37 years most of the considerable works taken went through my hands, one or the other has likely slipped my view. Likewise, I am convinced that *in the archive of the Dutch East Indies Company, among the handwritten material buried there, many other usable observations can be found*. As was surmised in the publication by P. A. TIELE and J. E. HEERES. 1)

Unfortunately, the reports shared by officials of the East Indian Company only reach to the year 1648. Since the appearance of the third volume (1895) the last-mentioned publisher has not been heard from, so that one cannot plan on the continuation of the work within a foreseeable time.

I did not let the fact that many parts of the Indian Archipelago are not under Dutch sovereignty hold me back in giving the required attention to these – with one exception. I address namely the Philippines. There are for this area, important to earthquake observation, a series of works worthy of attention 2), but the difficulty, not to mention the impossibility, to always arrive at the sources, caused me to distance myself from such a task. 3)

Thus, not considering the named group of islands, the area covered in the work takes in all of the islands that are located from the north point of Sumatra and those towering over New Guinea in the east. Areas adjacent to earthquake, such as the Malay Peninsula, etc., have also been considered now and then.

The creation of an earthquake index covering the entire globe is still far, far off, but will come at some time, because it must come. Because, all of the material of observations, which is unfortunately all too frequently flawed, does not only serve as a partial reason for the coming and going of theories, but also to put the rule to the test. Before we can come closer to the realization of that ideal of codification, the majority of countries must review critically the existing material, until a flawless foundation for seismology can be created. *A series of building blocks have already been delivered and to increase the number of them by one has been the main purpose of this work.*

I am in great gratitude to Herr Dr. E. GOGARTEN in Zollikon near Zurich, who had the goodness of researching a series of works of periodicals that had at first been unattainable by me.

INDEX OF EARTHQUAKES

A.D.

- 88 [Çaka 10]. ¹) The surface of Java altered its form. ²)
134. Earthquakes and volcano eruptions on Java. ³)
296. Great vibrations on Java, Mountains formed and sink. ³)
- 416 (Çaka 338]. Earthquakes on Java and Sumatra, Eruption of the volcanoes of Krakatau Island. A thunderous rumble from Mount Batuwara ⁴) was answered by a similar [rumble] originating from Mount Kapi. ⁵) From the latter rose fire that reached the sky whereupon the entire world was shaken. Violent thunder, accompanied by rain and storm was observable. Finally **Mount Kapi collapsed and disappeared in the deepest depths of the earth. The water of the sea rose on the country east of Mount Kamula** ⁶), as well as westward until Radja Basa was **flooded and everything carried away.** After the water again receded Mount Kapi and the surrounding land towards sea and Java were at the same time divided into two parts. The city Samaskuta became a lake, which later received the name, Singkara.
- The preceding narration, taken from the Poestakaradja ⁷), which was translated in 1889 into English ⁸) and was in the named year reproduced by JOHN W. JUDD. ⁹), must, according a communication from H. KERN to

- K. MARTIN, be signified as a “pitiful literary fraud.”¹)
444. The Islands Nusa Baron and Nusa Kambangan are separated from Java.²)
- 1192 [Çaka 1114]. Palembang on Sumatra is split off from Java.³)
1200. Separation of Java and Sumatra under formation of the Sunda Strait.²)
- 1242 [Çaka 1164]. Pulu Mengari rises in the Sunda Strait out of the sea.⁴)
1254. Hantoro [Madura] is separated from Java.²)
- 1282 [Çaka 1204]. Bali is separated from the territory of Balambuang on Java.⁵)
- 1296 [Çaka 1218]. A serpent strikes the kingdom of earth.⁶)
- 1338 [Çaka 1260]. Gili [Pulu] Trawangan, in the NW of Lombok, is separated from Sumbawa.⁷)
- 1358 [Çaka 1280]. Selo Parang [Lombok] is separated from Sumbawa.⁸)

The preceding statements are, without exception, based upon legend. With regard to the principle content, according to J. BRANDES, the following index comprised of the years 1311 – 1481 C.E., should merit trust. The facts are,

however, of little worth for us, as we were unable to identify the accounted for localities on Java.

- 1311 [Çaka 1233]. Landslide in the Lungge-period. ¹)
- 1334 [“ 1256]. Banupindah landslide. ²)
- 1376 [“ 1298]. A new mountain forms. ³)
- 1385 [“ 1307]. Landslide in the Wuku Mata[ng]sila. ⁴)
- 1395 [“ 1317]. Landslide in the Wuku Prang-bakat.. ⁵)
- 1411 [“ 1333]. Landslide in the Wuku Julung-pujut. ⁶)
- 1450 [“ 1372]. Palindu, earthquake. ⁷)
- 1451 [“ 1373]. Pakuningan, landslide. ⁸)
- 1462 [“ 1384]. Palandep, landslide. ⁹)
- 1481 [“ 1403]. Pawatung, Landslide. ¹⁰)
- 1500 (ca). Java. Horrifying volcano eruption with earthquake and heavy dispersion of volcanic ash. ¹¹)
- 1538, April and September. Ternate. Earthquake. ¹²)
- 1546, September 29, morning. Ternate strong trembling, just as FRANÇOIS XAVIER read mass. ¹³)

- 1550, November or December. Galela, north peninsula of Halmahera. Violent eruption of the volcano Dukoma-Tala ["Tolo"], accompanied by an earthquake. The level of the Galela lake rose by more than 2 fathoms. ¹)
- 1554 [Çaka 1476]. Java Banupindah landslide. ²) 1564 or 1565ca).
 Eruption of Gam Kunora not far from the west coast of the north peninsula of Halmahera, accompanied by an earthquake. 1)

- 1578 Java. Earthquake. 2)
1584 [Çaka 1506]. Java. Violent earthquake. 3)
1586. Java. Eruption of Gunung Kelut. 4)
1586, Eruption of Gunung Merbabu, as a consequence the **whole island rumbled**. 5)
1586 or 1587. Java. Alleged violent eruption of Gunung Ringgit.
6) 1593. Java. Violent eruption of Gunung Ringgit at Panarukan on the north coast. "Upon the mountains and the higher summits of the same, several sulphur mines burst with such violent rumble, that the entire population was terrified. During a period of 8 days, nothing was perceived but thunder and rumbling and sheafs of fire, which broke forth from the mentioned mountains, named Gunos de Panarucan." 7)
1599, May 31 towards midnight on board of the ship "Utrecht"

On the Talangami Roadstead*, ¹) Island Ternate, “Last May there was a turmoil in Uytrecht, which made such a noise [thundering] that the regiment had to move. This happened around midnight.” ²) In this notice, it was merly a matter of a vessel haunting, especially as on the other vessels nothing of the kind was reported.

In earthquake literature the occurrence was recorded by GUENEAU DE MONTBELIARD with the comment, “that may come from agitations caused by an earthquake or the eruption of a volcano” ³), whereupon K. E. A. VON HOFF added, “a terrible rumble as the eruption or trembling of a volcano.” ⁴)

1606, October 13. On the Bantam Roadstead*, West-Java, “about midnight we had an earthquake, it continued not long, but for some time it was very fearful.” ⁵)

**A roadstead is a sheltered area outside a harbor, typically narrower than a bay or gulf, where a ship can lie reasonably safely at anchor.*

- 1608, July 1. **Tidal wave** at the Island Makjan in the Molukken. In a letter from PAULUS VAN CAERDEN from August 3 1608 it reads, "...on the first of July the ships Walcheren and China were wrecked and driven against the shore. The people on board, money, cannons, some of the ropes, and sails were saved, together with most of the provisions of the ship China and Walcheren. They lost victuals that were not of much worth. This loss of the ships didn't happen with a great storm, but through a rise of terrible running water and all the other ships were in very great peril." J. K. J. DE JONGE, who published this correspondence, noted rightly that this occurrence may have simply been a case of a seaquake (tsunami).¹)
- 1608, July 18 Ternate. "Between the 18th and 19th, at around the first watch, the mountain of Ternate made a terrible explosion. It was like 9 or 10 cannons went off, throwing out at the beginning nothing but fire and flames and thereafter a great amount of steam and smoke was turned up into the air"²)
- 1608, May 3 Banda. Three tremors.
-June 22, 2 a.m. Banda. A tremor.³)
- 1612, (No date indicated). Amboina. Three earthquakes in one day "it was so powerful and strong that it would appear unbelievable by those who didn't witness it." Not long after a trembling was again felt, one so powerful that the bell in Fort Victoria began to ring.

This tremor was felt at the same time on the ships lying on the roadstead.¹)

1616, July 20/31 [29/30].²) Seaquakes not distant from the Island Waigeu. “in the night, being a few miles away from ‘t Laut with a clear moon shining, we felt an earthquake in the ship, but it did not last long, nevertheless it disturbed the crew so that they sprang out of their cots thinking we had had punched them. The men threw out the plumbline and didn’t find any ground.”

1618, March 12 Banda-Island. Violent trembling.⁴)

1621, March 7 Atjeh, north west point of Sumatra. “Sunday the 7th around 1 a.m. before the sunrise there was a great shaking of earth, of which it seemed to those who were in the houses that the culmination overwhelmed them. I heard it said that ordinarily, every year, there are 3 or 4, every time there was 3 years that passed that there weren't any and more was said that their ‘Cady’ or ‘Euesque’ had predicted this quake 4 or five days ago and that it would come on the full moon, as for the fact that it came to pass I don't know if they are telling the truth or not; for in the past, one didn't speak of it; they make a big scene of this ‘Cady,’ saying that no one in Achen has seen a personage of such great knowledge’.” 5)

-Banda-Island. As K. E. A. VONHOFF⁶) and later ROBERT MALLET⁷) reported, in 1621 a volcano eruption had taken place alongside earthquakes. The report cited by them dated from the year 1621 states verbatim, “Since the surprise of Nero⁸) by

the Dutch ¹), there being a fearful Earthquake, the said Hill [Gonahpee] Gunung Api ²) cast forth such hideous flames, such store of cinders and huge steams, that it destroyed, burnt and brake down all the thick woods and mighty trees” ³). From the stated emerges merely that the earthquake and the eruption were observed by the Hollanders after the conquest (1615), but it is not claimed that this occurred in 1621.

- 1625, (no date). The Banda-Islands were beleaguered by violent storms and earthquakes. This information from M. A. VAN RHEDE VAN DER KLOOT has until now received no confirmation. 4)
- 1626, August (no date). Assahudi on the north coast of West Ceram. Earthquake just as the chief KETJIL ALI arrived with his prau fleet, for which of his endeavor nothing good was foretold. 5)
- 1629, August 1 9:30 p.m. Banda-Islands. A half hour after the termination of a violent seismic shock there formed in the sound between Selamo and Banda Neira, at that time called “Gat van Celamme 6), a **high mountain of water**. The tidal wave rolled westward straight against fort Nassau on Banda Neira, as well as the village on the beach of Neira, where it achieved a height of 9 fathoms [15.3m] above the springtide stand. The mole build of stone before the fort was beaten away and the water penetrated into the fort with such force, that a 3500 lb. (1600 kg) heavy mass of iron was displaced by 36 feet [11.3m].

1) The Dutch fleet under General-Governor Gerard Reijnst appeared on 22 March 1615 at the Banda Islands, and the eruption took place shortly beforehand on the 16th (P.A. Tiele. *De opkomst van het Nederl. Gezag* (2) 1. 's Gravenhage 1886, p. 149).

2) Read Gunung Api. This mountain, which bears the same name as the island, is also the only active volcano of the island group.

3) Samuel Purchas l.c. pag. 697. From the last-mentioned note, it seems that the report can only concern the eruption from 1615, given that the subsequent eruption occurred as recently as 24 December 1632.

4) *De Gouverneurs-Generaal en Commissarissen-Generaal van Nederl. Indie*. 's Gravenhage 1891, p. 38. --- R. D. M. Verbeek (*Opgave van geschriften over geologie en mijnbouwkunde van Ned. O. Indie. Verhandel. v. h. geolog. mijnbouwk. Genootsch. 1*. 's Gravenhage 1912, p. 180) believes that it should be 1629 or perhaps 1615 instead.

5) G. E. Rumphius. *De Ambonsche Historie I. Bijdr. t. d. T. L. en Vk.* (7) 10. 1910, p. 66.

6) It is now called the “Oostgat” or “Gat van Neira.”

houses lying on the beach were swept away, while others were **laid to rubble**. The ship “Briel” anchored in the roadstead was lifted by a wave and rolled thrice in circle, yet without taking damage. Eastwards the tidal wave crashed on the west beach of the island Lonthor, where likewise a stone mole was washed out. It achieved here a height of 13 feet [4m]¹), and a prau, which lie in the Huk Mandjangin was thrust on land beyond the guard building. Because at the time of the event the fishers upon the open sea had not noticed in the slightest the tidal wave, RUMPHIUS surmised that the quake must have had its origin in the Banda canal, viz the parts of the sea located between Banda Neira and the northern part of Lonthor.²) *May have been far enough offshore to not notice the tsunami. The shoreline is very steep.*

1629 August 1 Amboina. Presumably an earthquake occurring at the same time as that on Banda.³)

1) Reinier de Klerk indicated a height of 25 feet (C.A.M. van Vliet. Belangrijk bericht over den staat van Banda....'s Gravenhage 1894, p. 67) and R. Semon, who (mis)placed the event in the year 1690, actually 25 m (Im Australischen Busch und an den Küsten des Korallenmeeres. Leipzig 1896, p. 541), which R.D.M. Verreek has already criticized (Jaarboek van het Mijnevezen. 29. 1900. Batavia 1901, p. 19). Semon had probably gathered his information from Report on the Scientific Results of the Voyage of H. M. Challenger. Narrative 1. 2. London 1885 p. 562, wherein they say that at the time of an eruption “the sea is said to have risen 25 feet above the level of high water at springs.”

2) G. E. Rumphius. De Ambonsche Historie I. Bijdragen tot de T. L. en Vk. (7) 10. 's Gravenhage 1910, p. 69—70. The oldest account is from F. Valentijn (Ond eu Nieuw Oost Indien 3. 2. Dordrecht---Amsterdam 1726, p. 37), who had taken it from Rumphius' manuscript without naming the source. --- Through Reinier de Klerk, though he did not specify a date, one learns that the evening's quake took place at 9:30 (C.A.M. van Vliet. Belangrijk bericht over den staat van Banda en omliggende eilanden door Reinier de Klerk (1756). 's Gravenhage 1894, p. 66).

A description of the earth- and seaquake can also be found with Seyger van Rechteren (Journal gehouden op de reyse ende wederkomste van Oost-Indien. 2de druk. Zwolle 1639, p. 37---38), however, it is vain nonsense when he claims that the event happened at the time of his presence on the Banda Islands (1630---31). His arrival did not occur until 20 January 1630. The false information, found with Gueneau de Montbeliard (Collection academique, 6 de la Partie Etrangere. Dijon---Paris 1761, p. 562), that the Banda Islands were devastated in 1630 or 1631 by an earthquake during which the earth opened up and the sea breached its shores, may find its beginning with this description from Seyger van Rechteren, the more so as his travelogue was also included in the collection of R.A. de Constantin de Renneville (Recueil des voyages qui ont servi a l'etablissement et aux progres de la Compagnie des Indes Orientales 9. Rouen 1725, p. 150---151) and was thereby more broadly accessible.

3) G. E. Rumphius (l. c. pag. 70---71) gave expression to this conjecture because, according to tradition, during the stay of Ketjil Ali, who in January

- 1630, June 14 2p.m. Banda-Islands. Earthquake
 -July 17 (no time indicated). Banda-Islands. Earthquake ¹).
1632. Banda-Islands. Multiple earthquakes during the months
 April, May, June, July, but particularly am the 16th of
 December as "In the night, fire fell out of the heavens of
 which they first took for cannon fire and thereafter and
 after several rounds of muskets, where on the 24th the same
 province experienced a horrible earthquake, which
 damaged the normal, as well as the special houses. Gunung
 Api threw rocks out as large as small houses, and many
 overhanging rocks fell down on the women's island
 through this terrific shaking that lasted two days" ³).
- 1633, September 14 Banda Neira. Weak earthquake.
 -September 24 Banda Neira. Weak earthquake.
 -September 24 Banda Neira. Weak earthquake ⁵).
- 1635, January 10 Banda Neira. Weak earthquake ⁶).
 -December 3 Banda Neira. Weak earthquake ⁷).
- 1636, May 5 Banda Neira. Weak earthquake ⁸).
 -August 23 Banda Neira. Weak earthquake ⁹).

1629 arrived on Amboina coming from Ceram (l. c. pag. 67), an earthquake took place. Valentijn took down this statement also. About this see also F. de Haan. Rumphius en Valentijn als geschiedschrijvers van Ambon. Rumphius-Gedenkboek 1702---1902. Haarlem 1902, p. 20.

1) Seyger van Rechteren l. c. pag. 32. Reprint in Begin ende Voortgaugh van de Vereenigde Oost Indische Compagnie 2. Amsterdam, 1646, No. 20, p. 31, where however, just as in the careful French translation by R.A. de Constantin de Renneville (Recueil des voyages etc. 9. Rouen 1725, p. 145), the incorrect date 24th instead of 14th is written.

2) The native name is Krakah.

3) G. E. Rumphius. De Ambonsche Historie 1. l. c. pag. 91. Valentijn published the account first (l. c. 3. 2. 1726, p. 17), although also taken from Rumphius' manuscript. In the faulty new edition of his work through S. Keijzer (3. 's Gravenhage 1858, p. 18), the date for the quake that occurred on December 24th was wrongly indicated as the 11th. The remarks of R.D.M. Verbeek, who apparently used this addition, also deal with this (Geologische beschrijving der Banda-eilanden. Jaarboek van het Mijneuzen in Ned. O. I. 29. 1900. Batavia 1901, p. 19).

4) Joh. Sigmund Wurffbain. Vierzehn Jährige Ost-Indianische Krieg- und Ober-Kaufmanns-Dienste. Stulzbach-Nürnberg 1686, p. 78.

5) L. c. pag. 85.

6) L.c. pag. 93.

7) L. c. pag. 94.

8) L. c. pag. 97.

9) L. c. pag. 101.

- 1636, October 5 and 11 Banda Neira. Earthquake, both times beginning weak and ending with two strong shocks. ¹⁾
- 1637, February 14 Banda Neira. A quake ending with rather strong shocks. ²⁾
- October 6 Banda Neira. Weak earthquake. ³⁾
- 1638, January 29 and 31 Banda Neira. Each time a weak trembling. ⁴⁾
- February 21 Banda Neira. Violent shock. ⁵⁾
 - (no date). Timor. "The fear of the mountain and the other on the Island, named Picus, elevation so great that it was visible, and fiery in this case, to the top from 300 miles in the sea; the year 1638 an earthquake shook the foundations together with the island was swallowed up by a horrible thing, that had left behind nothing but a huge lake. Thus reference Annals Soc. Jesus" ⁶⁾

Despite many-fold attempts it has not been possible to procure for myself the volumes of *Litterae annuae* taken into account, in order to understand the original relation. I can thus only repeat ⁷⁾ that the record sounds very improbable, as there is no volcano known on Timor. Despite the exaggeration ⁸⁾ it is still possible that this is a case of a mix-up.

- 1638 (ca). Java. At the time when the Pangeran TAWANG-ALUN was ruling over the kingdom of Matjan Putih (Java), the population was alarmed for seven days and seven nights by a terrifying rumbling that seemed to hail from Gunung Raung. It was just as if thousands of cannons were being fired simultaneously. The entire land of Matjan Putih found itself experiencing constant ground motion and the earthquakes were so violent that one could barely stand upright. ⁹⁾

1641, January 3 and 4. Violent eruption of Gunung Awu, more properly Burudu Awu¹), on the island Sangi, about which we have receive news exclusively from the Philippines. According to the original report²), which was conveyed in a literal translation by F. JAGOR³), it was said that twice in 1640 ashes fell in Zamboangan (SW Mindanao) that covered the fields and surroundings lightly as frost and on the 3rd of January in the evening at 7 o'clock a lively rumbling was perceived that sounded as musketeer and gunfire. After the assumed gunfire had increased on the morning of the 4th towards 9 o'clock, a mighty cloud of ash rolled in from the south and caused a lasting darkness until 2 o'clock.

A Spanish squadron that was located on that day not distant from the Cape of San Agustin, the south point of Mindanao, brought news that it had reached the vicinity of an island whose volcano had erupted.

The bearing of the island has been much disputed (Sanguiz, Sanguil, Sanguir) and most authors have believed that the Volcano must itself be placed on Mindanao. Without going into details at this point, it may be noted that ALEXIS PERRY⁴), because of the above cited source which he had in a re-print of a work by J. E. NIEREMBERG, demonstrated convincingly that concerning the volcano addressed

only Gunung Awu could have been meant. Even several demonstrated translation errors by VON JAGOR could not change this. The report of the squadron is key. The objection of VON JAGOR that G. Awu lies (3 41'N., 125 27'O.) southwest and not south of Zamboangan (6 55'N., 122O.) cannot be viewed as sound as the direction of the ash cloud would be controlled by air streams. The general impression was that it came from the south. Even the lack of communications from Dutch sources indicates nothing, as the East-Indian Company did not maintain regular traffic with the Sangi islands at that time. When the governor ROBERTUS PADBRUGGE arrived in Sangi in 1677 he was informed that the G. Awu had had an eruption twice within living memory 1). Under the assumption that one of these was the eruption that took place at the turn of 1640-41, there remains still one more about which until today nothing has been discovered. Just as unsound is the argument of GEORGE F. BECKER that, without getting into an investigation of sources, agrees with the opinion of VON JAGOR by saying that the volcano should be found on Mindanao, because the population in the south most part of the island made use of the Sangi language 2). Apparently, it remained unknown to BECKER that those people were subject to Sangi and that their land belonged to the East-Indian Company 3). Their legal successor, the Indian government, had tacitly left it to the Spanish crown.

1641. Collapse of Mount Adiksa on Java, through which **many were killed** 4).

- 1643, April 12 shortly after 5:30a.m. Seaquake felt on board the ship "Heemskerck" commanded by ABEL JANSZ. TASMAN, halfway between the Willaumez Peninsula on New Pomerania and New Hanover " turns into the day watch, we received such an earthquake that not one of our people , however deep in sleep, remained laying in the cots, but everyone in surprise ran on deck, thought that the ship was grounded; it was as well, as if the keel scraped over coral cliffs, however, dropping the lead we found no ground. Afterward, we noticed several more movements from an earthquake but nothing as large as the first." 1).
- 1643, June 15-17. Ternate. Erroneously, A. A. BRUZON DE LA MARTINIERE misplaced the earthquake accompanying the eruption of Pik from 15-17 June 1648 on the mentioned date.
- 1644, May 12 and 13 Amboina. "While the people here are fighting each other, God the Lord in his fury stirred the Elements, and created **an earthquake never experienced in these provinces**, on Thursday, 12 May, early in the morning, however, particularly that night around 8 with rain, thunder, and lightning, which was hardest around the **fort Victoria**; it appeared as if the heavens and the earth would pass away. It continued the whole night through so that no one inside nor outside the fort dared sit under a roof" The fort in particular had suffered. Not just that its **walls in places were extremely cracked, but also parts of the same had fallen**. The official residence of governor GERARD DEMMER located in the fort had taken countless cracks on both gable walls; the roof had partially fallen in. Outside the fort it was the wall of the townhouse, the rectories, as well as the hospital on the Hative Beach that had suffered so greatly

that their collapse was expected at any moment. From the Chinese to the Mardijker quarter and farther in the mountains of Leitimor to the foothills of Nusanive fissures had formed all over, yet the loss of life was not lamented anywhere.

- 1644, May 17 Amboina. While the rubble was still being cleared, there occurred on the 17th a very violent quake that, among other things, cause the **almost entire collapse of the governor's residence**. During four or five days no one dared enter his house, but for the most part, the entire ground was in lasting movement for 8-10 days. Also the Baguala and Hila Forts suffered damage this time. Though the quake manifest itself likewise in a violent manner on the Island of Haruku, in Kambelo and the Peninsula Huwamuhul (Ceram) and other outer posts it occurred only weakly 1).
- 1646, July 19, 20 and 21 Island of Makjan (Molukken). Violent eruption of the volcano accompanied by a strong earthquake. In the first release about this event an anonymous writes, "The year 1646 the mountain of the island of Machian cracked with horrible noises and frightful crashes from a terrible earthquake; much damage, which is strongly ordinary in this land. So much fire came out from this opening that is consumed several " négreries " with the inhabitants and all that was there. The year 1685, one saw again this marvel crack and apparently it still remains. One named it the Groove of Machian, because it descends from the top to the bottom of the mountain like a path which had been dug, but which from afar doesn't appear to be anything but a rut." 2) All information from this record is found as well in the volcano catalog, however, it has not remained undisputed.

Without going into a discussion, E. W. A. LÜDEKING indicated, due to hand-written records, the 13th of July 1648 1); also F. S. A. DE CLERCQ had the same date, but he doubted that something of that manner had occurred in 1646 2). Seemingly, this view found support first in a transcript published just a few years ago by G. E. RUMPHIUS. It states that on the 13th of July 1648, "A big earthquake occurred and thereby a horrific breaking of the mountain, and the whole island was in such a manner broken and canyons were made that through the middle of the mountain, a road wide enough for several wagons to go through and from whereabouts many fiery vapors can still be seen today, through which 1/3 of the Nagul trees are thrown over and buried, which has caused a great unhealthiness on the same island." 3) This communication exhibits such great agreement with that of the above mentioned anonymous that both must have been referring to one and the same event. Because the information of VON RUMPHIUS rightly claims great reliability, the date cited by him would have to be addressed that the closest to the truth, were it not the case, that an official and contemporaneous report is available, which removes all doubt that the occurrence took place from 19 to 21 July 1646. In this report from CORNELIUS VAN DER LIJN of Batavia, dated 21 December 1646 it states namely that the ships "Maastricht" and "Amboina" from Ternate had brought 9092 lbs. of cloves along from Makjan, which, however, came from the harvest of the previous year. In the coming days, little was expected, as the island had been hit by such a terrible earthquake that its entire demise was feared and the inhabitants had already come to accept the view, that it would have to be abandoned.

Likewise, the circumstance was pointed out that many of clove trees were broken off and numbers of others were infested to the point that they ostensibly wouldn't produce again. 1) Finally, it might be pointed out that GUENEAU DE MONTBELIARD mentioned an eruption taking place, "shortly before 1659". 2) The source is, in any case, the work of WOUTER SCHOUTEN in which, occasioned by his visit paid to the island in 1659, states that, "not long before" an eruption had happened. 3) It can in this case as well only be a matter of the event of 1646.

- 1648, February 2 Fort Henricus on the north coast of the island of Solor. After the mid-strength vibrations of the preceding days a particularly powerful earthquake arose on 2 February. A **part of the walls collapsed**, but also in the mountains the effects were manifest in the form of gaping fissures. Moreover, boulders crashed down. In the course of the following days the shocks repeated, however they were weaker. In the surroundings of Larantika on the east coast of Flores the quake had likewise been felt violently and also there deep fissures were caused in the ground. 4)
- February 29 Amboina, "A great earthquake around the fort which made a roaring noise as if coming from a powerful stormy sea, which came, but went without creating noticeable damage" 5) From the preceding record it is seen that the subject was not an actual earthquake, but **a flood wave that formed in the bay and rolled against Fort Victoria**. With VALENTIJN the record received a different meaning. 6)
 - May 24 Island of Solor. Violent earthquake. In the walls of Fort Henricus cracks were again formed. 7)

- 1648, June 15-17 Ternate. Eruption of the volcano, "Of that type, a village of 'Mores' called the Sula was consumed. The island was in continual movement, during all this time, and one hear a terrifying noise in the underground caves similar to the blacksmith foundries and from time to time like cannon blasts."2)
- 1649, Seaquake between Kaimor and Tajando, which belong to the Kei Islands. "Similarly, in **1649 a small island was born** between the islands Kouw and Tyandi, located approximately 30 miles from the Island of Great Banda (Lonthor). The island was exhumed 45 to 50 or even more Klafters (length unit ?) from the periphery. The ground of the island was clayey mixed with lots of burned rocks." 3)
R. D. M. VERBEEK probably made the place that shoal is, which appears on the sea map under the name Huisman-Klippe (5° 28' S, 132° 12' E). It is also perhaps one of the places on which, occasioned by the violent earthquake and seaquake on 26 November 1852, a small island was formed. 4)
- 1651, April 2 at night. Makassar, Celebes. Three successive shocks. 5)
- 1656 or 1657. By the information from GUENEAU DE MONTBELIARD, PHILIBERTO VERNATTI had observed multiple earthquakes on Sumatra. 6) In reality his statement is, however, entirely different. VERNATTI had conveyed that in Batavia, earthquakes were frequent, that in 1656 or 1657

one day in the city, in the afternoon around 2 o'clock, black ash had precipitated that was said to have originated from a mountain at Indrapura on Sumatra. 1) The subject was never an earthquake.

- 1659, November 9 Island on Teon [Tijau], southwest islands. Violent vibrations accompanied by rumbling that sent the indigenous peoples in flight to the islands of Nila and Damar. On the 11th a great eruption of the volcano Funuweri occurred. The rumbling caused by such, similar to canon thunder, was heard on Amboina and the Banda Islands. In the Bay of Amboina a **flood wave** was observed that achieved a height of 3-4 feet. 3)
- 1659, December (no date). Island of Buru. Violent Earthquake and seaquake, "through which not only the low beaches, but also the high mountains seemed to be made of a moving substance" The vibrations were also felt on Amboina and other, unindicated islands. Moreover one reads, "Yes, even the ships anchored offshore at 30 or 40 fathoms depth lay through God's mysterious power through the unsettledness of the sea. The ship rocked as if on lee shore, or as if it hit rocks and sand bars" 4)
- 1660, February (no date). Island of Teon, southwest islands. Violent eruption of the volcano Funuweri. 5)
- 1664, July (no date). At the delta of the Wai Mala in the Elpaputi Bay on the south coast of Ceram a piece of land located between the two arms of the river sank. During an equally strong rainstorm an earthquake was felt. 6)

1666. Java. Earthquake and eruption of a volcano according to K. E. A. VON HOFF, 1) under appeal to T. S. RAFFLES who elsewhere 2) makes no mention about it. It may yet be mentioned that JOHN CRAWFORD cites an eruption of Gunung Merapi on Java from the year 1664, 3) however even there the subject of not an earthquake.
- 1671, 17 October in the evening, 18 and following days. Island of Saparua east of Amboina. Very strong vibrations that reach a climax in the night of the 17/18. Not only was **Entrenchment Velsen at Hatuwana destroyed, as well as Fort Hollandia at Sirisori heavily damaged**, but in many places fell and fissures split open that were at times so deep that only the crowns of the sunken in coco palms protruded. The beach of Hatuwana sank by a foot, the reef before the village of Paperu even more. In the course of an entire month there was no day on which the ground stood still and isolated shocks continued to be felt now and then during the whole year. On Amboina and Haruku the vibrations on the 17/18 were felt in a lesser degree. On the south coast of Ceram they were also perceived; in addition, not far from the south coast, a seaquake took place under thunder and lightning. 4)
- (no date indicated). Batavia. "Several weeks after this we had again a strong earthquake and two foolhardy fellows made at the selfsame time a pact with the devil that he bring them upon a green cover to Germany." 5) The previous earthquake, which is referred to, has in the meantime not found any mention whatsoever.

- 1672 [Çaka 1594]. Java. Unusually strong eruption of a volcano.
- 1)
 - (no date). Amboina. Allegedly very strong earthquake that caused multiple landslides which buried villages under their rubble. Fissures formed of 20-30 fathoms of depth. 2) There is in any case a mistake with the occurrence of 12 July 1673.
 - July 12, about 6 p.m. Amboina. Multiple strong shocks. Before noon a violent storm had unloaded over the city. 4) Unfounded, R. D. M. VERBEEK declared this date as false. 5) The date indicated by F. JUNGHUHN 6) and C. A. L. VAN TROOSTENBURG DE BRUIJN (12 June) is incorrect. 7)
 - August 12, between 10 and 10:30 p.m. Ternate. Violent quake. Pik is said to have split open on the south side from the bottom to top. **Masses of rock sank away and houses also collapsed. A flood wave crashed with such force against the beach** that shipwrecks were feared. An eruption of the volcano is not reported. The vibrations subside on into September. 8)
- 1674 (*Should be 1675*) February 17, around 7:30 p.m. Amboina. **The most violent earthquake that the island of Amboina had experienced in living memory** and that spread itself out over the neighboring islands. The most powerful shocks that arose without any

previous warning and continued during the night, accompanied by a rumbling like that of canon thunder. In the city of Ambon there were **79 fatalities due to the collapse of buildings**. On the two peninsulas Leitimor and Hitu fissures opened and many landslides occurred, especially on the mountains Wawani 1) and Manusau. Unusually large were also the fluctuations of the groundwater level. In deep wells water rushed so far up that it could be drawn by hand, just to sink back down again. In the ramparts to the east of Wai Tomo water mixed with bluish sludge sprayed up from the cracks formed in an 18-20 foot high stream. At Hutumuri on the south coast of Leitimor the seawater sprang forth in a hole dug not far from the beach a **flood wave appeared on all coastal areas** of Amboina. It was mostly of insignificant extent, only on the coast of Hitu a great “**mountain of sea**” came on with great rumbling and crashed against the beach, through which **2243 persons, amongst them 31 Europeans, were killed**. 2)

On the three little islands of Nusa Tello [Pulu Tiga]m near the northwest coast of Amboina the wave was seen coming on thrice; the **smallest island was fully flooded over**.

On Haruku, Saparua and Nsualaut – the so-called *Uluassern* – the shocks were also violent and still felt during the night. Moreover, on the beach of the first-named island a flood wave manifest itself that reached a height of 6 feet above the normal water level.

On Buru, Amblau, Manipa, Keland as well as Buano

both the quake and the flood wave were perceived. On Ceram these occurrences were limited to the western peninsula, Huwamuhah.

On the Banda Islands only a weak earthquake was felt; the **flood wave** was also minor. 1) 1674, February 21, about 11 p.m. Said [Seit], west of Hila. Powerful shock accompanied by a whistling sound. 2) How long the effects of the quake continued may be deduced through the following recordings that I have taken from the "Dagregister van 't Kasteel Victoria," found in the parliamentary archive in the Haag. 3)

- February 26, 4 a.m. A rolling rumbling in the mountains was heard. 1 p.m. a weak shock occurred.
- February 27 from 3:30 a.m. on, a 6-7 times repeating, rolling rumbling, apparently coming from the SE. No vibrations.
- February 28, 10 a.m. A rather strong shock out of the SW, following which, shortly after 10 a.m. a vertical shock occurred. 7 p.m. weak vibrations.
- February 28 – March 1. At night, four weak shocks.
- March 2, 2, 2:30 and 3:30 a.m. each time a shock.
- -3, 11p.m. weak vibrations between 11:30 p.m. and
- -4, 12:30 a.m. strong shock coming from the SE. 10 p.m. weak shock.
- -5, just after 1 a.m. weak shock; after 11 a.m. a stronger shock coming from SW;
12:30 p.m. short shock, 11:30 p.m. weak shock.
- -6, 6:30 p.m. weak shock. 1674,
- -7, 2 a.m. weak movement; 1:20 and 2 p.m. each time a strong shock.
- -8, 3:30 a.m. and 9 p.m. each time a strong shock.
- -10, 8:30 p.m. a rather strong shock

- 1674, March 11, 1:20 a.m. and 4 p.m. each time a weak shock
- -14, 9 a.m. weak movement.
 - -15 During the past night a strong rolling was heard twice in the mountain but no earthquake took place. 3 o'clock, shortly after 6:30, 10:30 and 12p.m. strong shocks, with the exception of that which occurred at 10:30 p.m., which was only weak.
 - -16 about 4:30 a.m. rumbling in the mountains which was followed by a weak vibration.
 - -24, 1:30 a.m. weak vibration.
 - -30 Shortly before 1 p.m. a "usual" shock.
 - April 4 Shortly after 4 a.m. and 5:39 a.m. each time a strong shock. At night ground movements were again perceptible
 - -5, ca. 2:30 a.m. Strong shock accompanied by a rumbling as of a cannonade.
 - -13, ca. 2:30 a.m. Violent shock coming from the west and somewhat north accompanied by a lasting, rolling rumbling.
 - -14, shortly after 1 a.m. and towards 1:30 am Strong and long-lasting shocks. 5 a.m. and 6:30 a.m. each time a weak shock.
 - -17, after 9:30 a.m. Weak, long, sustained quaking.
 - -19, between 4 and 7 p.m. again weak shocks. --27, between 4:30 and 5 a.m. in the north twice a subterranean rumbling without vibrations.
 - -29, between 8:30 and 9 a.m., weak shocks.
 - May 3, between 11:30 a.m. and 12 noon, violent and long-sustained quaking.
 - -6, 4:30 a.m. Mid-strength shock accompanied by rolling rumble coming from the Hitu mountains. In the Bay of Amboina a weak **flood wave**, that ran in and out three times. Shortly before 6:30 a.m. violent and long-lasting quaking, the strongest since 27 February. After 5:39 p.m. a weak shock 1) and at 8:30, as well as 9, each time a shock. At 11:30 a.m. a powerful movement. 12 noon a weak shock. At 4, 5, 9 and 10 p.m. each time a shock. Since the past

night the ground had hardly been still a moment.

1674, May 7 During the past night a rolling rumble was heard, however no earthquake was felt.

- -8, 1:30 a.m. Shock. --10, 10:30 a.m. Weak shock.

1675, November 14 Taruna, west coast of the island of Sangi. Short but violent quake. 1) 1680, January 22 CHR. KEFERSTEIN mentions an earthquake taking place in this day on Java, yet apparently there is a confusion with that of 22 January 1780. 2)

- May. Island of Krakatan. A seaquake preceded the eruption of the volcano that was heard in the Sunda Straight, another 10 miles distant from the island. 3)
- (no date). In Minahassa, the north most parts of the north peninsula of Celebes, eruptions of several volcanoes occurred, going off paired with earthquakes "landbound in the middle of the narrow swathe of land of the Kemas or great *Austerbergen* 4) all the way to Gorontalo." 5) In the territory of Mongondou, where a volcano eruption also took place, it was said to have raged particularly heavily.

- 1681, November 2. Batavia. Weak Earthquake, “whereby I meant, that the house, in which I lived, would fall to a pile, about which I was, in the beginning, not un-frightened.” 1)
- December 11 West coast on Sumatra. Violent earthquake. “The sky-high mountains [were] shaken and shifted.” 2) At the same time a seaquake took place, which was observed by the two ships, “Nieuw-Middelburgh” and “Delfshaven”, while underway to Painan. 3)
- - 17. During the continued trip of the mentioned ships, a seaquake again took place, however weaker than on the 11th. 4)
- 1683, October 16-30. Banda Islands. Violent earthquake that began on 16 October 8 a.m. and then raged until 30 October. The mountains sustained cracks and fissures. **While most houses became rubble heaps**, the ramparts suffered relatively little, with the exception of the entrenchments Morgenster and Cuilenburg as well as the walls of fort Revengie on the seaside. Also during the last months of the year these were numerous vibrations to be recorded. 5) E. CHR. BARCHEWITZ reports still of “such a terrifying quake upon Banda that even the strongest boulders were broken to pieces. Additionally, as I have been told by old inhabitants of Banda, Gunung Api allegedly began to burn; previously it is said to have been covered with trees.” 6)
- (no date). Island of Serua, southwest islands. Supposedly, as a consequence of a violent quake, half of the island with the indigenous inhabitants thereof

sank into the sea, while the remaining part of the population took flight to the Banda Islands. 1)

1683 (no date). Amboina. The earthquake that according to CHR KEFERSTEIN took place on the island, 2) is the result of a confusion with the one from Serua.

1684, February 13. Java. Earthquake. 3)

- (no date). Banda Islands. According to the data from REINER DE KLERK it seems that in 1684 the ground was also daily in motion. 4)

1686, October 26, between 11 and 1:30 p.m. Ternate. "Horrible" earthquake, "so violent that DAVID HAAK was flung from bed and his books fell from the shelf." 5)

1687, February 19-April 4. Amboina. In the evening around 6:30 a powerful shock, followed by a wave-shaped quake that persisted a quarter hour, took place. Around 8:30 a shock hit again, which was again connected to ground movement. Since this day until 4 April, when another shock was felt, daily small movements were observed. 6)

1688 (no date). Banda Islands. Multiple weak vibrations in the course of the year; on one of the islands – Pulu Ai – a very powerful one. 7)

- 1690, December 1. Makassar. Violent earthquake, such that the houses were shaken to and fro.1)
- (no date). Banda Islands. The ground, as in 1688, was allegedly daily in motion. 2) According to F.VALENTIJN an eruption of Gunung Api is to have taken place in the named year. 3) and in the works of the "Challenger" expedition is even mentioned that simultaneously a **flood wave had formed**, which however, as mentioned above on p.29, is incorrect. 4)
- 1691 (no date). Banda Islands. Violent eruption of Gunung Api, at the occasion of which the Watervliet **Entrenchment on Banda Neira 5) collapsed**. The statement in the work of the "Challenger" expedition that many indigenous took flight to Amboina and Celebes 6), is not confirmed by source writings.
- 1693, June 4. (supposedly). Violent eruption of the volcano of the island of Serua, accompanied by earthquakes which had already 6-7 weeks earlier been noticed. A part of the inhabitants took flight and turned to the Banda Islands. 7)
- 1695, May 11, 2 p.m. Banda Islands. " We were afflicted often by earthquakes and especially on 11 May, around 2 o'clock in the afternoon, we noted two strong shocks" 8)
- 1699, January 5. **Powerful earthquake in West Java and the southwest parts of Sumatra**. In Batavia under heavy rainstorms there arose at night around 1:30, after the preceding explosion, the vibrations lasting ca. 15 minutes, through which were caused the **collapse of 21 houses and 20**

barns with the loss of 28 human lives. In the north precipice of Pangrango [Gunung Gede] as well as Gunung Salak near Buitenzorg the quake manifest itself in a particularly violent manner that, notably, on the first mountain caused landslides the debris piles of which stopped up the rivers and produced flooding. The powerful masses of mud and wood crashed through the Tji Liwung at Batavia into the sea and were all but a calamity for this city.

In Bantam, where only a storage facility **collapsed**, there far less palpable shocks should have first been perceptible at 6 o'clock in the morning. While on the southwest coast of Sumatra, the quake was but weak, the vibrations in the Lampong-ian Districts were so violent, that, **“most all houses the bottom was thrown up.”** 1)

1699, January 29. The indigenous report, that in the mountains, namely on G. Gede as well as on G. Salak, vibrations were felt now and then. 2)

- March (no date). By the reports from 21 March of Tomungun PURBA NATA about the occurrences on G. Pangrango and G. Salak, he felt 40 shocks during a 19 day trip and another 208 after his return. 3)

1700, February 28. Batavia. Earthquake. 4)

1705, July 21 around midnight. Island of Salawati not far from the northwest point of New Guinea. Violent quaking that caused, however, no damages.

- 1705, July 22, 10 p.m. Salawati. Earthquake, but not as strong as the last. 1)
- September 27, before noon. Amboina. Quake, that took place at the same time as a court trial.
 - -28. Amboina. At the same hour and likewise during a court trial a shock repeated. The people saw therein an omen of heaven and directly a proof of the innocence of the defendant. 2)
 - October (no date). Amboina. Multiple vibrations in the course of the month that manifest themselves especially violently on Hitu and farther on Huwamuhah (West Ceram). Perhaps the following communication from WILLIAM FUNNEL refers to one of these quakes that lasted two days: "it did a great deal of mischief; for the ground burst open in many places, and swallowed up several houses and whole families. Several of the people were dug out again, but most of them dead and many had their legs or arms broken by the fall of the houses. The castle walls [Fort Victoria] were rent asunder in several places, and we thought that it and all the houses would have fallen down. The ground where we were swell'd like a wave in the sea; but near was we had no hurt done." 3)
- 1706, January 21. Batavia. Powerful vibrations. In Tandjung Priok the gables of the houses swayed. 4)
- 1708, November 28, between 10 and 11 p.m. Amboina. **A flood wave penetrated into the bay** with great rumbling, up into houses of Batu Merah, eastward from the city, to run back down again in a strong current so that it barely could still be seen. The coming and going lasted each time so long, that one could count to between 100 and 150. The

process repeated itself without stop until 3 o'clock in the morning on the following day. A similar appearance was perceived at 12 o'clock at night at the inlet located on the far side of the pass of Baguala. On the remaining parts of the coasts such appearances were noted. 1)

- 1710, February 15, in the morning, Amboina. Three hard shocks.
- - 16, 4 a.m. Amboina. A shock.
 - - Island of Haruku, east of Amboina. During the entire day, persistent vibrations.
 - - 17, noon. Amboina. Two shocks, which later were followed by two more. 2)
 - March 6 (approximately). "Five weeks before 10 April." Banda Neira. Powerful earthquake. 3) The communication of E CHR. BARCHEWITZ likely refers to this, that, "three years before a great and terrible earthquake, during which the ground and entire four weeks did not stand still. The ground now and then shift to such a degree that even the sea many times struck onto land up to Fort Nassau leaving fish before the water gate lying on dry land." 4) Further, REINER DE KLERK says, "the ground shook and shifted so fast and violent that most houses were damaged irreparably." 5)
- 1711, June 11, after 10:30 p.m. Amboina. Directly after a rain storm a weak, wave-shaped quake occurred that lasted longer than a quarter of an hour.
- September 5, between 10 and 11 p.m. Amboina. **Flood wave** similar to the one from 28 November 1708, lasted, however, until 6 September 8:30 .a.m. The water ran up and back in the bay three times within a half hour. In Kampong Mardijka the well ran empty.
 - - Island of Haruku. Violent earthquake at the same time as **flood wave** happened in the Bay of Amboina. On the neighboring islands of Sapurua and Nusalaut shocks were also noted. Upon the beaches of all these islands

a **flood wave** that ran in and out 13 to 14 times was observed.

- 1711, September 5. Banda Islands. Violent vibrations at the same time as the **flood wave appeared on Amboina**. 1)
 - December 10, after 1:30 a.m. Island of Sangi. A strong earthquake followed a violent thunder storm that directly preceded the eruption of Gunung Awu. 2)
- 1712, January 16. Island of Sijau, [Siau] Sangi Islands. Violent eruption of Gunung Api. "On 16 January 1712 it was heard that this mountain had burst, and that the blow was heard on Ternate, situated 40 miles from there" 3)
- 1714, November (no date). Island of Leti [Letti], southwest islands. A rather strong earthquake. 4)
- 1716, December 20. "We had on Lethy (Leti?) a terrifying earthquake, my house cracked and crackled as if it would fall to rubble and my bed swung now and again like a scale... The vibration happened from south towards north and two strong shocks came in succession. Yet the earthquakes were here nothing rare, rather such occurred here each year to this time." 5)
- 1720 [Çaka 1642]. Java. "It was as if the ground was in motion." 6)
- 1722, October (no date). 8 a.m. Batavia. Violent earthquake. Additionally, "the water in the roadstead thrust itself up just as if it were seized in the hottest of sod." In many places fissures formed. 7)
- 1737, (no date). Batavia. Strong earthquake. 8)

- 1739, July 22. Batavia. Earthquake. "The New Dutch Church of 1733 sustained a large crack." 1)
- 1743, (no date). Banda Neira, Banda Islands. Strong earthquake through which Entrenchment Storm and Fort Wayer were very damaged.
- 1750, May 10, 9:30 p.m. Banda Neira. Powerful earthquake and seaquake. 2)
- 1752, May 1. Java. Eruption of Gunung Kelut and not, as previously assumed, Gunung Lawu. The rumbling was heard up to Semarang. 3)
- 1754, August 18, 4) shortly after 3:30 p.m. Amboina and the Uliasser. The quake began with a wave-formed movement that was directly followed by a powerful shock. **The market hall (Pasar), which rested on 60 stone piers collapsed and several other buildings were destroyed,** though which four persons lost their life. In the remaining houses cracks formed. Also fissures of two fingers or more in breadth formed in the ground in many places. From the one occurring in Batu Merah, in the east of the city, a bluish, sludge-like water mixed with sand that spread a revolting stench, sprayed up in the form of fountains.

In Hutumuri on the south coast of the island, **a flood wave followed a powerful shock.** In Hila as well as at Hitulama on the north coast, the quake began at 4 o'clock with a great rumbling and caused damages on the wall. In Alang the shock occurred at 8 o'clock.

On the island of Haruku following the powerful shock came a **flood wave**, which, however, disappeared again quickly. In multiple places water shot, as with a fountain, out of the earth. Walls partially collapsed. On the island of Saparua the quake did no damage worth mentioning. A flood wave was also seen here. On the island of Manipa east of Buru, a strong quake was felt after 3 o'clock.

It is of interest to compare the course of the earthquake on the islands of Amboina, Haruku, and Saparua, for which exact records are available.

	Amboina	Haruku	Saparua
1754, August 18	3:30 p.m. violent quake from the evening into the night 14 shocks.	3:30 p.m. violent quake. 4:30 " 2 shocks. 5 " 1 shock. 5:30 " 1 " 6 " 2 shocks. 8:30 " 1 shock. 9(ca.) " 2 shocks. 9 " 1 shock. 9:30 " 1 " 11 " 1 " after 11 p.m. 2 shocks.	3:30 p.m. violent quake. In the evening and night 4 shocks.
19	14 shocks in Fort Victoria. In Larike a shock was felt at 10:30 a.m. In Hila 11 shocks were felt on the 18th and 19th .	12:30 p.m. 2 shocks. 1 " 1 shock. after 4 p.m. 2 shocks, aside from 15 shocks in quick succession	Early in the morning 6 shocks.
20	9 Shocks. 1:30 and 5:30 a.m. shocks at Larike. 1:30 p.m. Alang 1 shock.	7 a.m. 1 shock. after 7:30 " 1 " about 10:30 " 1 " " 11 " 1 " after 12 noon 1 " 1 p.m. 6 shocks, following each other directly 1:30 p.m.....4 shocks. about 2 p.m. 2 " at 2 " 5 " shortly after 3 p.m. 2 shocks at 3:30 " 4 "	3:30 p.m. violent quake. In the evening and night 4 shocks. 1:30 p.m. 1 shock 2:30 " 1 "

	Amboina	Haruku	Saparua
1754, August 20	after 4 p.m. 1 shock.	5 p.m. 1 shock. " 5 " 1 " " 7:30 " 1 " " 8 " 1 " about 9 " 1 " after 5 " 1 " at 9:30 " 1 " after 10:30 " 1 " at 11:30 " 1 " " 12 " 1 "	5 p.m. 1 shock
21	12:30 p.m. 1 weak shock.	after 12 a.m. 3 shocks. at 12:30 " 2 " about 1 " 3 " " 1:30 " 2 " after 1:30 " 3 " at 2 " 1 shock. after 5:30 p.m. 4 shocks. about 6:30 " 1 shock. after 8 " 2 shocks. " 10:30 " 1 shock. at 11 " 4 shocks. " 11:30 " 1 shock.	At noon a weak shock.
22	9:30 a.m... 1 shock. 12:45 p.m....1 " 4 " 1 "	after 1:30 a.m. 1 shock. " 3:30 " 2 shocks " 4:30 " 1 shock " 12:30 p.m. 1 " " 1:30 " 2 shocks " 2 " 1 shock " 3 " 5 shocks " 4 " 1 shock after 5:30 " 3 shocks " 6 " 2 " about 8:30 " 1 shock " 9 " 1 " " 9:30 " 1 " after 10:30 " 1 "	7 a.m. earthquake
23	shortly before 8 a.m. 1 shock 11 a.m... 1 " 3 p.m.... 1 "	after 1:30 a.m. 1 shock. 3 " 1 " 9 " 2 shocks 11 " 2 " 1:30 p.m. 1 shock. 2:30 " 1 " 3 " 2 shocks. 4 " 2 "	

	Amboina	Haruku	Saparua
1754, August 24	5:30 p.m..... 1 shock	from 24 August until 1 September 20 shocks	
25	10 p.m. 1 shock		around 3 p.m. earthquake
	11 p.m. 1 "		
27	1 a.m. 1 shock		
	10:30 p.m. on Alang 1 shock		
28	9:30 p.m. 1 shock		
	10 p.m. on Alang 1 shock		
29	6 a.m. on Alang 1 shock		6:30 p.m. 1 shock
			7:30 p.m. 1 "
30	shortly after 1:30 p.m. 1 shock		around 1 p.m. 1 shock
	8:30 p.m. 1 shock		
31	7:30 a.m. 1 weak shock		7 a.m. 3 strong shocks
			The supports of Hänser formed cracks. In the course of the morning, another 8 shocks followed, 2 or 3 so vigorously that the house crashed into their joints. From noon until the evening, 12 were still significant shocks, and finally 5 shocks were felt even between 6 p.m. and 11 p.m.
1-Sep			From 31 VIII. 11 p.m. through 1 IX 1 a.m. the earth did not stand still and the shocks were not being counted. At 3, 5, and 9:30 a.m. again new ground movements.

	Amboina	Haruku	Saparua
1754, September 1			12
2	In Larike		7:30
			12:39
			3
3			4
			7:30
			7:00
			7:30
6	1		
7		Between 12 and 12:30 a.m.	
8	7:30		
	12 noon 1 shock		
10	10:00 AM		
11	between 10:30 and 11		

- (no date). Batavia. "Among other things, it was noted at this time 2) in Batavia several ground tremors on the island of Java." 3) 1755, [Çaka 1677] (no date). Java. "It rained ash. A voice of thunder was heard in the world."¹)
 - November 7. Mana. Locality of Bengkulen. Sumatra. See under November 3 1756.
 - - 18. Bengkulen. West coast of Sumatra.²)
- 1755, November 3 until December. Mana, Locality of Bengkulen. Powerful shock. In the course of the following days until 3 December another 12 shocks were felt. Since this time, but still within the course of the month, two further powerful earthquakes took place that likely extended over all of Sumatra. The walls of the Cumberland House, the administration building in Fort Marlborough in Bengkulen, and other buildings, suffered heavy damages. The same was the case with houses in Lais, Mana, as well as on a sugar plantation located 5-6 miles away from Bengkulen. In the area of Mana several villages were also destroyed. On the Bengkulen River [Ajer Bangkulu], or more precisely at the delta and also farther upriver, the ground opened and a great amount of water gushed forth with "sulphureous earth that spread an unbearable stench. At the same time on Pablo Point [Cape of Si Abung] numerous cracks and fissures formed."³)
- 1757, August 24, around 2 a.m. Batavia. Powerful, wave-shaped quake five minutes in length. Five minutes after 2 o'clock, at the time of the strongest shocks, a wind coming from the north arose. The water of Tji Liwung, which discharges at Batavia, shifted up and down up to

- two meters above the usual level. ¹)
- 1758, May Java. Earthquake. ²)
- 1760, September 22. Island of Makjan. Eruption of the volcano, which was accompanied by a violent earthquake that was felt as far as Ternate.. ³) On Makjan itself the shocks were allegedly already noticed several days before the eruption. ⁴)
- 1762, April 3, 5 a.m. Chittagong and other localities in Assam. Extremely powerful shock that persisted 4 minutes, accompanied by up to 15-count, strong, canon thunder-like explosions. Further shocks followed at 5:12, 5:30, 7, and 10 p.m. In very many places fissures were formed, from which water sprayed forth. There occurred also eruptions of the mud volcanoes Ramri and Cheduda. Great stretches of land sank (3,072,000 yards ³) and the water of the rivers gained momentum. ⁵)
- 1763, September 12, around 5 p.m. Banda Islands. Violent earthquake that was followed by 16 shocks in the course of the evening and night. **Three-quarters of all houses of Banda Neira were transformed to rubble heaps.** From Papenberg great boulders crashed down. On the island of Lonthor the vibrations were especially palpable in Waier in the east coast and in Urin and on the island of [Pulu] Ai. On the islands of Pisang and Rosengain the earthquake was palpable in a lesser degree.” ⁶)

- 1763, (no date) Island of Nias on the west coast of Sumatra. Earthquake, by which a village was buried.¹)
- 1765, September (ca. Batavia. “Allegedly, a half year before my arrival [11 March 1766], was such a strong earthquake that no one could walk or stand.”²)
- 1766, End of the year. Banda Islands. “For some time the earthquakes have not been accompanied by negative repercussions.”³)
- 1767, December 8. Banda Neira. “ We were made greatly afraid through a violent earthquake.”⁴)
- 1768, June 7. Kajeli, northeast side on Buru. Shock.
- - 12. Kajeli. Shock.⁵)
 - - 22, around 10:30 a.m. Kambotoros Bay [Port Praslin] not far from Cape St. George, the south point of New Mecklenburg [New Ireland]. Multiple shocks, duration about 2 minutes. On the ships lying in the inlet the vibrations were also felt and the sea rose and sunk several times.⁶)
 - July 27. Kajeli, Island of Buru. Shock.⁵)
- 1769, January 25. Batavia. Earthquake.⁷)
- 1770, Ternate. Already in the beginning of the year, but particularly during the month of April, several shocks had manifest themselves in a right palpable way.⁸) Starting first in June, more frequent repetitions took place and from that time on more exact records were made.⁹)

1770, June 2. Ternate. Earthquake.

- - 10. Powerful shocks
- - 20. Multiple shocks.
- - 21. A powerful shock.
- - 22 and 23. Almost uninterrupted vibrations.
- - 24. A weak and four strong shocks.
- - 26. A powerful shock.
- - 27, 6 a.m. Three shocks in direct succession. During the last days of June the earthquakes became more frequent and 3-4 of them were counted daily. Beginning in the first days of July – especially mentioned are the 1st, 2nd, 4th, and 5th – the vibrations became more violent, following which, in the night of the 6th and 7th Pik, amidst rumbling, began to smoke more heavily and continued with this activity until the 8th.
- July 7, 10:30 a.m. A powerful shock.
- - 8, 10:30 a.m. A powerful shock. ¹)
- - 10 (no time indicated). A powerful shock was followed by another around midnight.
- - 12 In the morning. Powerful vibrations, that began again at 4 p.m.
- - 13. The vibrations increased in strength and shook the ground uninterrupted during the eruption that took place.
- - From 14-17 the volcano continuously active, without being accompanied by notable vibrations.
- - 18-19. By night, powerful eruptions accompanied by ground vibrations.
- - 19-22. Daily shocks.
- - 23-24 By night, a violent eruption accompanied by strong shocks.
- - 24. The condition become more grave in the course of the day. At noon a downright terrifying shock takes place, that is followed by an up and down movement of the ground.
- - 25. Persisting movements of the ground, between which, just before noon one, and just after noon 3 strong shocks. During the night another 3 occurred, followed by a groaning of the earth. Additionally,

a continual subterranean noise, like unto the boiling of water, was heard.

1770, July 26. Ternate. Fourteen powerful shocks.

- - 27. Thirteen powerful shocks, along with a continual shaking of the ground and a subterranean noise similar to boiling water.
- - 28. The vibrations increased in strength, such that no house remained undamaged.
- - 29. Thirteen powerful shocks. ¹)
- - 30. The earth did not stand still for the entire and 54 strong shocks were particularly discernible.
- - 31. Sixty one shocks. In the following night, because of the strong shocks and the simultaneously perceptible subterranean noise, distress was at its highest.
- August 2. Besides the continual shaking of the ground, 47 shocks could yet be counted, among them, an especially strong one at 9 a.m. That caused the **collapse of houses**.
- - 3. Eighteen shocks.
- - 4. Fifteen shocks.
- - 5. Six shocks that, while powerful, were not to be compared with the earlier ones. Hereupon the eruptions of the mountain began anew and persisted until the 23rd, and 4, 5, or 6 shocks were heard daily. ²)
- September 4. Four shocks. ³)
- - 5. Four shocks.
- - 15, 2:30 a.m. A shock.
- October 12. A shock.
- - 13. Six shocks in direct succession.
- December 19, 10 p.m. Two shocks following each other.
- - 20. A shock in the morning.
- - 21, a.m. Three shocks.

1770. December 23. Ternate. Five shocks. -(no date). District of Man, locality of Bengkulen. West coast of Sumatra. Very violent quake. A village was destroyed. The ground rose up and a fissure of a quarter mile [400 m] in length formed, 2 fathoms wide, as well as 4-5 fathoms in depth, from which a bituminous substance is said to have gushed forth. At the same time, near the delta of the Padang Gutji, likewise located in Mana, a piece of land was laid dry. Finally, a **flood wave occurred simultaneously with this quake.**¹)

Although no count of the year is indicated, it may have been that at this time in the place of Bengkulen, that the earthquake experienced by CHARLES MILLER occurred. "One particular since my arrival which was very violent and did much damage in the country. Volcano²) in sight of Marlboro³) which almost constantly emits smoke and at the time of the earthquake emitted fire."⁴)

- 1771, January 9. Ternate. Violent earthquake.⁵)
- - 10. Eruption of Gunung Kelut, Java, under explosions.⁶)
 - - 24. Ternate. A shock.
 - February 1. A shock.
 - - 8. A powerful shock.⁷)
 - - 9. A shock in the morning.
 - - 11. A shock.
 - - 17. a shock.
 - April 24. Seaquake at Ternate.
 - May 16. Multiple vibrations; the last (8 p.m.) persisted 5 minutes.
 - June 10, Around 3:30 a.m. A shock.
 - July 1. 2 shocks in the evening.
 - - 10, 8:30 p.m. Two powerful shocks.
 - - 22. In the morning. Two powerful shocks.

1771, July 24. Ternate. A powerful shock.

- - 26. A shock. ¹)
- September 23. A shock. ²)
- November 14, 10:45 a.m. Violent earthquake like unto that of 2 August 1770.
- November 15, 16 and 17. The ground was in continual movement, however, 7 shocks were especially discernible ³)
- November 24. A shock.
- -27. A shock.
- December 15. A shock. Pik had been in uninterrupted movement during the past 6 weeks.
- Java. Ground shocks. The ground allegedly rose in several places. ⁴)

1772, January 19. Midday. Ternate. Two weak shocks.

- 25, around 5 a.m. Very powerful bang originating from Pik. Between this time and 7 a.m. four shocks. ⁵)
- February 14-15, at night. Two shocks.
- - 27. A shock.
- March 5, 11:30 p.m. Two powerful shocks.
- - 29, in the morning. Three shocks. Pik was uninterruptedly active during the past night.
- May 8, 5 a.m. A shock.
- - 10, 7:30 p.m. A shock. Violent eruption of the mountain that had begun on the evening of the 9th. ⁶)
- May 10. Batavia. Earthquake. ⁷)
- June (no date indicated). Ternate. Still during the entire month Pik was uninterruptedly active, yet only isolated vibrations were perceived.
- July 6, 5 a.m. A particularly powerful shock.
- - 10, shortly before 5 p.m. A powerful band originating from Pik caused the whole island to tremble. ⁸)

- 1772, August 12, between 2 and 3 a.m. Violent eruption of Gunung Papandajan in the Preanger Regencies, Java, accompanied by vibrations. They were likewise observed during the entire, during midnight occurring, eruption of Gunung Tjerimai in the Regency Cheribon. ¹)
- October 5, 9 p.m. Ternate. Strong shock. At the same time powerful thunderings were heard from Pik. ²)
 - (no date). Regency Bandung, Preanger Regencies, Java. Violent quake at the time of the eruption of an unknown volcano. ³)
 - November 4, before 2 p.m. Batavia. Weak ground vibrations. ⁴)
 - - 13, in the morning. Ternate. A shock.
 - - 18, midday. Two powerful shocks.
 - - 19. Two powerful shocks.
 - December 7. Powerful shock.
 - - 19. Ground vibrations.
 - - 20. Ground vibrations. ⁵)
- 1773, February 21, in the evening. Ternate. Violent earthquake.
- March 25, 5:30, 8 and 10 p.m. Shocks, of which first was rather powerful. ⁶)
 - April 21, right after midnight. Semarang, Java. Earthquake of about 6 minutes duration. The simultaneously occurring noise resembled that of a cart crossing a bridge. ⁷)
 - October 21, 3 a.m. Ternate. Violent earthquake, which was followed by an eruption of Pik between 1 and 2 p.m.
 - - 25. Eruption of Pik, accompanied by a violent earthquake. Within 34 hours,

28 strong shocks were counted, among which two, that were so bad that, “the entire ground seemed to be sinking”.¹)

1773, November 17, around 2:30 p.m. Ternate. Violent earthquake. Duration of one and one half minutes.

- - 18. Two shocks.²)

- (no date). Seaquake not far from the coast of Borneo on the trip from the Sunda Strait to the Philippines. “By and by, this rumbling became ever stronger, and during the course of one and one-half hours so violent, as if 30-40 of the heaviest canons had been fired in the abyss. With every following, more and more powerful shock, the sea was also more strongly shaken; the water rose and resembled a mountain, the lower circumference of which was several miles, but the height more than 100 fathoms, and straightway sank back down again, by which in the surrounding areas the bodies of water were put in such heavy movement that, if we were a mile distant from the place where the effects of the shocks manifest themselves, our ship came into such a powerful rolling, that it easily could have sunk it into the abyss. At the same time, we also noticed how after every shock, and like the sea mounting up, a thick, sulfurous smoke of such a circumference rose up, as if an entire large city were burning. The smoke did not only spread itself through all the air, filling it with an unbearable stench, and causing already in the afternoon hours a 1 o'clock a thick darkness, but it also spread into the seawater...”³) Just as this portrayal already bears the mark of fabrication,

so is the entire travel record teaming with such untruths and should be looked upon as fictitious.

1774, March 7, 8 and 9. Ternate. Violent eruptions of Pik.

- May 20. Violent earthquake. 42 shocks were counted. Also on the ship “Vlissingen”, in the roadstead, the quake was clearly felt. ¹)
 - - The vibrations persisted during the day. A powerful shock occurred at 11:30 a.m. ²)
 - June 14 until after July 8. Again powerful shocks, of which some persons counted more than 80. Two of them were so strong that they resulted in damages to buildings. On 8 July the vibrations still had not ceased, but were weaker in the next months. ³)
 - October 8. Eruption of Pik. Within 24 hours 80 shocks were counted. ⁴)
 - (no date). Island of Moti, south of Ternate. Thomas Forrest wrote in November of the year, “On the land of Moir was lately a great eruption attended with an earthquake. I had an account of it from a Buggees, who during the eruption at Motir set off in his prow, into which he assured me some hot stones fell”. ⁵)
- 1775, January 4. Batavia. Earthquake. ⁶)
- April 19, around 1 a.m. Amboina. Powerful shock, attended by a muffled subterranean rumbling. Duration of 5 minutes. Direction SW-NE. The *Reismagazin* received

a crack. The ships anchored in the bay were flung to and fro.²)

- 1775, July 4, 8 a.m. Ternate. Violent earthquake.³) Until evening at 11 o'clock over 100 shocks were counted, of which 2 or 3 were so powerful that the ground seemed to sink away. Until 20 August, in contrast, only insignificant vibrations could be perceived.
- August 20. Several weak shocks, following which an ash eruption of Pik occurred under rumbling. In the evening a powerful bang was heard, which was followed again by an eruption.
 - September 5, 10 p.m. Continuous movement of the ground, after which between midnight and
 - - 6, 5 a.m. an eruption of Pik took place.⁴)
 - November 5 and 6. Again an eruption of the mountain accompanied by powerful vibrations.⁵)
 - (no date). Cheribon. Under the 31st of March 1777 THUNBERG wrote: "2 years ago an earthquake was felt. During the same the mountain [Tjerimai] spewed out a mighty amount of ashes, which covered the coffee plants in the vicinity."⁶)
- 1776, July 1. In the afternoon. Ternate. Weak earthquake under a cloudy sky and at the same time a high barometric level.⁷)
- 1777, March 30. (Easter Sunday) 9:30 a.m. Amboina. Violent earthquake in the direction NW-SE that was accompanied by a mighty rumbling as if thousands of trucks were rolling by.

- Duration of 2 minutes. After a pause lasting 4 minutes, a second, more powerful shock occurred. **The walls of the buildings took cracks, a few collapsed;** fissure in the ground also formed. Until 10:30 a.m. up to 10, from 12 until 2 p.m. again 10 shocks could be counted that were attended by a subterranean rumbling. During the night until 1777, March 31. in the morning 8 powerful shocks were observed, upon which in the course of the day uncountable weak vibrations occurred. Under the, in the meantime in isolation occurring powerful shocks, 2 were especially notable.
- April 1. The ground remained through the day in constant movement. In between, 2 powerful shocks occurred. During the night another 2 very short shocks were observed.
 - - 2. By day 5 weak, and by night 3 vibrations together with isolated perceptible shocks, accompanied by rumbling.
 - - 3. By day 3 weak vibrations and during the night 2 powerful shocks together with 3 vibrations.
 - - 4. By day 3 and by night again 3 vibrations, but no shocks.
 - - 5. During the day no shocks, only repeated vibrations. At night 3 weak shocks.
 - - 6. By day 3 vibrations, but no shocks. At night repeated, far more powerful and longer-lasting vibrations.
 - - 7. During the day as well as in the course of the night, repeated, but weaker vibrations.
 - - 8. By day 3 very powerful shocks, during the night, though, only a single.
 - - 9. During the day 3 very powerful, during the night a few weak vibrations.
 - - 10. Only isolated, weak movements of the ground were noticeable, however, an incessant subterranean rumble.
 - - 11. Three powerful shocks and vibrations.
 - - 12. Six, though weaker, shocks.
 - - 13. Two weak vibrations.
 - - 14. Not one noticeable movement of the ground was perceived, but there was a weak, subterranean noise.

- 1777, April 15. Amboina. While by day no movements whatsoever could be observed, a weak shock occurred in the course of the night.
- 18. In the evening a weak quake, which was followed at night by two somewhat more powerful vibrations.
 - 19. In the evening a short shock, which was followed by a weak vibration.
 - 20. Before noon a weak movement of the ground.
 - 21. By night a weak vibration as well as a shock.
 - 22. In the morning a palpable shock as well as a vibration.
 - 23. In the early morning as well as at 8 a.m. each time a powerful shock together with a vibration.
 - 24. In the morning one and during the night 2 vibrations.
 - 25. In the morning one, and in the afternoon another, but somewhat more powerful vibration.
 - 27. At noon two weak and at night a vibration.
 - 28. Two vibrations. On the day named, the news was received from the postmaster in Alang, on the north beach of the Bay of Amboina, that in Lileboi on Mount Hulikilang the ground had split open in a length of 12 feet and a breadth of 5 fathoms and the fissure created was of unknown depth, that further, in Alang proper, in the area of the ensign staff, a piece of land of 4 fathoms in length and 2 fathoms in breadth had been torn off and sunk into the sea as a result of the earthquake. Finally, boulders were to have fallen from the mountains.
 - May 2. Three weak vibrations.
 - 4. During the night two vibrations.
 - 6. During the night two vibrations in quick succession.
 - 8. In the evening a weak vibration.
 - 10. In the evening a vibration.
 - 16, between 1 and 1:30 a.m. two powerful vibrations.
 - 19. In the afternoon a weak vibration.
 - 20. In the morning a weak vibration.
 - 21. In the evening a vibration.
 - 29. In the evening a vibration.

- 1777, June 9 around 11 a.m. in Amboina. Subterranean rumbling,
followed by a shock.¹)
- 1778, February 12. Batavia. Earthquake.²)
- April 2. Banda Islands. Violent hurricane, accompanied by an earthquake as well as a violent seaquake, as never before observed. Pulu Ali suffered in particular, as out of 1000 nutmeg trees, as a result of the storm, not even 5 were left standing.³) The statement of F. JUNGHUHN⁴) that there also occurred an eruption of Gunung Api, is based on error.⁵)
- 1779, July 28. Batavia. Earthquake.⁶)
- 1780, January 22. **Earthquake that stretched out over all of Java and likely in a westerly direction over a part of Sumatra.**⁷) In Batavia at 2:39 p.m. a weak subterranean noise was heard, which was shortly followed by a rumbling resembling a heavy-laden lorry passing by. At the same time a wave-shaped quake took place in the direction of E-W that persisted until 2:42. In the city – in so-called *Zandsee* and the Moorish *Gracht* – 27 **sheds and houses collapsed.**⁸) Likewise in Buitenzorg

buildings were damaged. While on the east coast of Java, as well as in Cheribon, the vibrations were not powerful, they were therefore that much stronger in the territory of Bantam, the west parts of Java. On the ship “Willem Frederik”, that was located in the Indian Ocean before the entrance to the Sunda Strait, a seaquake was observed. From Gunung Salak at Buitenzorg a mighty bang was heard two minutes after the earthquake. Gunung Gede has smoked several times since this event.

- 1780, February 20, 11 p.m. Batavia. Weak quake. ¹)
- June 29, 7 a.m. Batavia. A shock.
- July 13, 2:30 p.m. Batavia. A shock.
- -- 15, 12:30 p.m. Batavia. A shock.
- -- 18, 8:15 a.m. Batavia. A shock.
- December 13, 11 p.m. Batavia. A shock. ²)
- 1781 (no date). Amboina. Violent earthquake that caused many damages on buildings. ³)
- -- Ternate. H. VON ROSENBERG claimed that a month before the alleged 1781 occurrence of an eruption of Pik that brought a lava flow to Batu Angus, an earthquake and seaquake took place and at the same time a piece of land sank that resulted in the formation of the Telaga Taliri Sea.
- ⁴) The preceding information is in its entirety unfounded.

Batu Angus on the northern stretch of Ternate was created in the year 1770¹), or by another indication 1737.²) Nothing became known of an earthquake and seaquake in the year 1781. About the time of the creation of the sea mentioned by ROSENBERG, usually called Sula Takuni di bawa, nothing is known. He may have meant the other sea, Sula Takuni de atas, the creation of which falls in the year 1775.

- 1786 (circa). Dieng Mountains and neighboring districts in Middle-Java. "After an earthquake which continued, at intervals, for the period of four months, an eruption forced its way."³)
1792. On Gunung Idjen, near the east coast of Java, resulting from the earthquake, "without smoke and fire," boulders fell that rolled into the sea.⁴)
- 1793.⁵) According to another reading 1794⁶) or 1795.⁷) Kupang on the Island of Timor. Violent earthquake. The **church and several buildings were destroyed**. The communications agree on almost exactly with the exception of the year number, so that it could be a matter of one and the same event. As the original source is nowhere cited, the correct year has not yet been discovered.
- 1795, November 18. Sumatra. Earthquake, through which the island was destroyed.⁸) A. PERRY, who shared this event from the "Memorial" of an unnamed author, says himself that the latter did not indicate his source and furthermore

- was often imprecise. ¹) There was indeed nowhere an indication of this quake to be found. It is possible that it is a matter of a confusion with the quake of 18 November 1755.
- 1795 (no date). In the vicinity of Gunung Merbabu, locality of Kedu, Java. Frequent shocks in accompaniment of an eruption “ of the melted materials that one saw seething at the bottom of its crater”. ²)
- February 10, around 10 p.m. West coast of Sumatra. The first vibration lasted a minute, following which a **flood wave immediately arose, which penetrated into the River of Padang with great force, such that the city was flooded.** ³) Afterwards, the water ran back out so far that even the riverbed was left dry. The process repeated itself three times. The village on the beach, Ajer Manis, was flooded and at the same time many huts were washed away. In Padang proper fissures of 3-4 inches of breadth were created, which, however, closed again after further vibrations. In the walls of most of the buildings, cracks were formed. During the entire night, as well as
 - - 11. during the entire day, the ground was in movement. Every 15-20 minutes a powerful vibration occurred. Still for an entire week the shaking of the ground was noticed. The pauses gradually became longer and longer. ⁴)
- As J. GRIFFITH reported, the earthquake had

spread over two degrees north and south of the equator. Moreover, the produced **flood wave** had also been felt on the Batu Islands.¹) J. ANDERSON mentioned, appealing to a record by S. C. CROOKE, a violent earthquake in the kingdom of Djambi, East Sumatra, “some 20 years before 1820”,²) and J. R. LOGAN believes that it is entirely possible that it took place in 1797, and simultaneously with the one in West Sumatra, to be precise.³)

1798, June, July and August. Ternate. Violent earthquake at the time of the besiegement by the English, through which, however, Fort Oranje was not damaged.⁴)

- (no date). Banda Islands. Earthquake and eruption of Gunung Api. This statement from F. OLIVIER⁵) is based on an error and R. D. M. VERBEEK supposed rightly a confusion with the event that took place in 1778.⁶)

1799 (no date). Sumatra. Earthquake and seaquake, about which the following reports are available: During the quake a **flood wave rose up along the coast, which achieved a height of 50 feet above the usual water level.** On this occasion, a reef was lifted, such that it became a danger for sea navigation. The discovery happened on 11 November 1799 by the ship “Bergen”. A shock felt at Palembang caused significant damages.⁷)

1801 (no date) Minahassa, North Celebes. Violent eruption of Batu Angus, located not far from the northeast corner.⁸)

- 1802, August. Amboina. In a writing dated 25 August, a violent earthquake is reported that shook almost all of the islands in the east of the Indian Archipelago. Direction S-N. "The sea was greatly swollen and caused much damage to the island coasts". ¹)
- 1803 (circa). Mampawa, west section of Borneo. Earthquake, according to the tradition of an indigenous. ²)
- 1806, May. Lumadjang [Lumadjaung], locality of Pasuruan, Java. The ground shook as a result of an eruption of Gunung Lamongan. ³)
- 1807 (no date). Batavia. Earthquake. ⁴)
- 1808 (no date). Island of Bali and Banjuwangi in the eastern parts of Java. Earthquake that attended the eruption of Gunung Agung [Karang Asem]. ⁵)
- 1810, December 5, 7:30 p.m. Batavia. Powerful vibration of the ground. Direction apparently S-N. ⁶)
- 1811, February. Ternate. Eruption of Pik that was attended by ground vibrations. ⁷)
- (no date). Banda Islands. Very violent earthquake, traces of which were still perceptible on Banda Neira in 1817. ⁸)
- 1812, Bengkulu, west coast of Sumatra. During the time (January until 8 March) that the ship, "Harleston" was anchored, an un-violent eruption [of Gunung Dempo] took place and several un-strong shocks were felt. ⁹)

- 1812, October 14, around 11 p.m. Buitenzorg, Java. A powerful shock.¹)
- October 21, 4 a.m. Termant. Powerful vibrations.
 - December 11. Ternate. Violent vibrations.²) -(no date). Gunung Raung, East-Java. Eruption of little significance, during which much ash was spewed out and at the same time ground vibrations were noticed. The rumbling coming from the mountain was heard until 1814.³)
- 1813, January. Ternate. 4 Shocks.⁴)
- (circa). Padang highland, Sumatra. WILLIAM JACK wrote in 1823:⁵) “The small lake noticed by MARSDEN, which should also have placed to the northward⁶) was dried up about ten years by the effects of an earthquake.”
- 1814, March 24, between 11 and 12 p.m. Batavia and surrounding, also Buitenzorg. Ground vibrations. The most powerful shock occurred shortly before midnight. The quake was attended by a rumbling, especially loud where the vibration, as in the city quarter of Jakarta, was at the same time strong. In the city quarters Rijswijk and Weltevreden, however, it was weaker.⁷)
- (no date). Kupang, Timor. Earthquake that simultaneously produced **a flood wave that penetrated into the Bay of Kupang.**⁸) A mudslide also took place, through which Pulu Burung, a crag not far from the north shore of the Bay, was made an island.
- 1815, April. Simultaneous with the known **eruption of Gunung**

Tamboro on Sumbawa, which was likely the most violent that has been observed in history in the Indian Archipelago, ground vibrations took place, but nothing in the degree that has been supposed up to now. The explosions were heard, however, in the uncanny expanse of Bengkulen (Sumatra) to Ternate – in straight line 1745 km –, but it is unproven that the “tremulous motions”, as THOMAS STAMFORD RAFFLES writes, spread across such a distance. On 1 April, at 10 o'clock in the evening, there was first a cannonade heard that, resembling distant thunder, repeated itself from time to time until 9 o'clock in the morning on the 2nd. The first ashes began to fall on the morning of the 3rd, but not until the eruptions taking place on the evening of the 10th were actual vibrations caused.

- 1815, April 10. Banjuwangi “but on the night of the 10th the explosions became truly tremendous, frequently shaking the Earth and Sea violently.” Surakarta and Rembang “and in several situations, particularly at Solo and Rembang, many said, that they felt a tremulous motion of the Earth.” Sumenep [Sumanap] in the eastern part of Madura... “on the evening of the 10th the explosions became very loud, one in particular shook the Town.” -- 11. Banjuwangi... “towards the morning they again shakened, and continued to lessen gradually till the 14th, when they ceased together”. Sumenep... “At 7 p.m. the tide being about ebb, a rush of water from the Bay occasioned the River to rise four feet, and it subsided again in about four minutes.” Makassar, west coast of Celebes “during the night the firing was again heard and towards the morning so heavy that they shook the ship, as they did also the houses in Fort Rotterdam.” Bima, Island of Sumbawa. By night a **powerful flood wave** broke, which achieved at Sangar the height of 12 feet. ¹)

On the Island of Flores in April there were allegedly also ground vibrations perceived.¹)

As the ship "Prince Regent" was located at the level of the Island of Rotti, a canon thunder-like rumbling was heard. On the 12th in the morning at 10 o'clock until the 14th ash fell onto the deck of the ship.²)

Banda Islands. At the time of the eruption of Tamboro the natives felt shocks. Noon. Ternate. The explosions originating from the eruption were clearly felt.

1815, April 11 or 12. Amboina. Violent quake. "In the ground of a gentleman near the Government-house, the earth was observed to open, to throw out a gush of water, and immediately after to close."³) In Haruku. On the west coast of the Island of Haruku located east of Amboina, the fort as well as the government house of the resident were nearly destroyed. The ground in the vicinity opened, spewed out fire and water. The sea became greatly agitated during the two days. Within 2 minutes it reached flood level, just to sink back to the low water level.⁴) According to tradition, there were supposedly also ground vibrations felt in the southeast part of Borneo.⁵) From the Island of Banka, it is reported, in contrast, that only a rumbling was heard.⁶)

- (?). Island of Kisser, Southwest Islands. G. W. EARL reports, incidental to a visit of this island, that the natives are still able to recall an **earthquake that caused the collapse of the fort walls** and other damages. He believes that this event may have taken place at the time of the eruption of G. Tamboro.⁷) It

appears not probable to me that the named eruption could have triggered such a strong earthquake so far east, far more I would believe that it was connected to the quake reported from Timor in 1814.

- 1815, shortly before the middle of August. Gempo on the Bay of Sumbawa. Violent earthquake of 5 minute duration.
- 15-16, by night. Bay of Sumbawa. At the place, where the destroyed village of Tamboro had stood, incessant weak movements of the ground were noted. ¹)
 - August. Ternate. In the course of the month 32 shocks were perceived. The quake on 4 August was the most violent of the entire year. ²)
 - November 22, about 11 p.m. Surabaja, Java. Powerful shock. Duration of 30 seconds.
 - -, about 10 p.m. Buleleng, north coast of Bali. Utmost violent quake that persisted almost an hour and was attended by strong, incessant rumbling, which seemed to come from a mountain that erupted, "with a tremendous explosion". A part of the same crashed into the sea and caused **a wave that flooded the land** to a considerable extend and **wiped out over 1200 human lives.** ³) As H. ZOLLINGER opines, a breach of Danau Tamblingen, lying between Tabanan and Buleleng, was triggered as a result of the earthquake and the spilling out waters of the sea caused the flooding. ⁴) Similar is a report shared by H. G. J. G. VRIESMAN from domestic sources, which states that after the previous earthquake and rain, Pik of Buleleng [Selangdjana] split, to crash down and in its fall to bury Singaradja and Buleleng, as well and Kampong of Bugis. Also the sea was agitated greatly as a result

and there were 7 claps of thunder heard. By a stream of mud, **10,253 persons perished.**¹) As ZOLLINGER indicates, the quake occurred powerfully on Lombok also.

1815, October and December. Ternate. During said months three shocks were counted.²)

- November. Bima on Sumbawa. Earthquake.³) Apparently the shocks had occurred contemporaneously with those noticed on the 22nd on Bali and Lombok.

1816, April 29, around 2:40 a.m. Pulu Pinang [Penang]. Very powerful shock, especially in the northern and central parts of the island. Direction NW-SE, duration of 15-20 seconds. In several houses in the rooms, pieces of the plaster ceiling fell off.⁴)

In the night of the 31st (sic)⁵), as well as the two following nights, a shock was felt each time on board the brig "Helen". Upon reporting this event, the "simultaneous agitation of the water when affected by an earthquake" was emphasized.⁶)

- September 12. Batavia. Earthquake.⁷)
- October 8, 8 p.m. Banda Neira, Banda Islands. After a subterranean rumbling there followed powerful shocks, apparently in the direction NE-SW. They repeated several times until the morning of 9 October.
- - 11, 7 a.m. Banda Neira. After a repeated subterranean rumbling the vibrations began again and persisted intermittently for multiple days. On the Island of Lonthor {Great Banda} **multiple houses collapsed,**

while on Pulu Ai the earthquake was palpable in a far lesser degree.¹)

According to another report, the first shock occurred on 11 October, but the most violent not until on the 14th, lasted a good two and a half minutes, and caused **great devastations on Banda Neira**. Public as well as private buildings suffered such damages that a part of the same became uninhabitable. **Several people lost their lives**, others bore injuries. After the last-mentioned date, more or less sustained powerful shocks were still felt during a period of 3 months.²)

1816, (no date). In the Indian Ocean, in the area of Bengkulen, west coast of Sumatra, according to a tradition, a seaquake took place, similar to those of 1833 as well as from 17 February 1861.³) Apparently this communication concerns the quake from 18 March 1818.

1817, January 16. Banjuwangi, East Java. While heavy clouds of smoke rose from Gunung Idjen, a powerful rumble, as a cannonade, resounded and strong shocks were felt.⁴) After these phenomenon persisted, with a few interruptions, for 8 days, a violent eruption of the named volcano occurred as the ground rumbled in the night of 23-24 January. The rain of ash lasted 36 hours. Before and during, as well as for some time after the eruption, earthquakes were perceived.⁵) The rumbling during the eruption was also heard from time to time in Makassar.⁶)

- November 11, 3 a.m. While the frigate "Evertsen" lay at anchor in the Bay of Sapuruam, Island of Sapurua, the ship resounded so heavily that the rigging

was shaken to and fro. On the coast at Tiau the quake was so strong that the trees moved to and fro. The rifles, places as a pyramid, were thrown down. At 4 a.m. another shock occurred, which was, however, not as powerful.¹)

On board the frigate “Maria Reigersbergen”, which was located not far from the coast of the neighboring Island of Haruku, a shock was also felt, but the date of the happening is not indicated.²)

1817 (no date). Djokjakarta, Java. Earthquake.³)

1818, February 11. Ternate. A weak, barely noticeable groaning of the ground.⁴)

- March 17. Bengkulen. Shocks that repeated hourly.
- - 18. Bengkulen, Earthquake. In Fort Marlborough the most powerful shock occurred during the night, through which the report-compiler was thrown out of bed and a part of the wall in the room fell in. At daybreak it was noticed that the sea had pulled back to a far distance and all ships lying in the roadstead were now upon dry land. Soon after the seas returned, driving forth everything before it, with great force. On the ships “Northumberland” and “Sunbury” the shock was so strong that the sailors were thrown from their berths. The water flooded up over the bridge inland.

SIR THOMAS STAMFORD RAFFLES, who was on board the “Lady Raffles” on the way to Sumatra, noted, over 200 distant from the coast, vibrations.

- In Bengkulen the shocks repeated, which were still felt on 8 April, the date when the letter was sent.⁵)
- - 29, between 2:30 and 3 a.m. Djokjakarta. Powerful

ground vibrations that repeated three times and was accompanied by a noise that resembles multiple rolling wagons. Direction NW-SE.¹)

- 1818, May. Bengkulen. Rather **violent earthquake that caused many damages to buildings**. On board of the frigate “Wilhelmina” not far from the coast a strong shock was felt, which was followed by a shuttering motion.
- October 2, 1:30 p.m. Buitenzorg and environs. Powerful shock that was also felt in a weaker degree in Batavia.³) Stronger, in contrast, was the quake occurring in the localities located in the vicinity of Gunung Guntur: Trogong, Leles and Garut, bureaus of Limbangan, Preang Regencies, Java.⁴)
 - - 21, between 10 and 11 p.m. Trogong at Garut. Under powerful and very palpable shocks, the eruption of Gunung Guntut began.⁵)
 - November 8. Java. **Earthquake that spread across the entire island** and occurred especially violently in the eastern part (Banjuwangi and Pasuruan). In the Bali Straight a seaquake was also observed.⁷) In the city Pasuruan powerful shock, which was followed by 6-7 weaker ones, was perceived at 11:15 p.m. Duration of almost 4 minutes. Direction NNW-SSE. In Malang the shock was also felt. At night an eruption of Gunung Lamongan occurred.⁸)

- 1818 (no date) Bima, Island of Sumbawa. **Violent earthquake of 3 minute duration. The shocks were so strong that the people were not able to stand upright and all building built of stone collapsed. In the bay the level of the sea rose by 2 fathoms and a flood wave penetrated into the city.** 1)
- (no date) Ternate. In the course of the year 15 earthquakes took place, which were divided among the months January, May, June, July and December.
- 1819 (no date). Ternate. Three shocks during the month April and December. 2)
- 1820 June 11, 11:30 a.m. Banda Islands. Eruption of Gunung Api. At 2 p.m. powerful blows resounded, such that the houses on Banda Neira and even the ships on the roadstead shook. Blow after blow occurred and increased in intensity in the evening. At 7 p.m. a weak ground shock followed.
- 12. 1, 4 a.m. Banda Neira. Ground vibrations. The force of the eruption of G. Api and with it also the explosions, continued in the course of the day. 3)
 - (no date). Ternate. During the months August, September and October, 6 earthquake in all took place. 4)
 - December 29, 10 a.m. Makassar. **Violent earthquake. Duration of two and a half minutes; it was also felt in other places of the southwest peninsula. A flood wave followed** this vibration, which repeated and crashed against the south coast in an especially powerful manner, which destroyed numerous beach villages far west from Banthain to east from Bulekomba and numerous persons lost their lives. Concerning the happenings in the last-mentioned location,

there exists a report compiled by Leut. HEINTZEN.¹) According to this, there was after a weak shock, vibrations becoming gradually more powerful, such that the flat of the commandant in Fort Bulekomba fluctuated to and fro. The six-pounders set up in bastion number 2 hopped from their mountings. After the 4-5 minute long quake, shots were believed to be heard in the west, coming from the sea. Barely had the sent envoy returned with the news that ships were nowhere to be seen, than did the sea, under a both whistling and thunder-like rumble, come in, **formed as a 60-80 foot high wall, and flooded everything.** The barracks in the fort were destroyed, likewise, as a result of the **flood wave** that penetrated 400-500 feet inland, the villages Nipa-Nipa and Terang-Terang. **400-500 persons drown,** among whom were 3 Europeans. Multiple vehicles located on the beach were flung onto the rice fields.

(no time indicated) Bima on Sumbawa. Violent quake of a good 2 minutes in duration, which was followed by a violent rumbling and then a **flood wave** that flung anchored ships far inland.²)

On the Island of Paloweh [Rusa Radja], in the Flores Sea, an earthquake also took place.³)

10 a.m. Sumenep [Sumanap], east side of the Island of Madura. Violent, one minute long earthquake that was followed at 3 p.m. (!) by a **flood wave**.¹)

1821, January 4, 9:45 p.m. Makassar. Weak earthquake.²)

- March 20-22. Bima, Sumbawa. Every 5-6 minutes a shock was felt, at the same time as intermittent spewing out of ashes and pyroclasts from Gunung Api on the not distant Island of Sangeang.³)

- September 4, 1 p.m. Ternate. A powerful shock.⁴)

- - around 25, 11 p.m. Locality of Semarang and Japara [Djapara] on Java. Powerful ground shocks. While in Semarang 3 shocks in short succession were counted, in the direction NE-SW, in Japara only one shock in the direction NE-SW was felt. The earthquake was preceded by a noise, that resembled that of an approaching thunder storm.⁵)

1822, October 1. West Sumatra. In the Padang highlands the vibrations were stronger than in the lowland, and especially powerful in the areas located between the mountains Talang and Merapi⁶). In Padang only three strong and a few weaker shocks were felt, while in the highland from 11 p.m. until the following morning

- - 2, with interruptions in one and a half hours each, shocks were still felt in accompaniment of a subterranean rumble that in Padang was heard merely during one shock.⁷)
- - 8, 1:30 p.m. Under powerful explosions that made that ground shake in the far surroundings of Gunung Galunggung [Geluiggung], which rises up in the Preang regencies on Java, a terrifying

mudslide of this volcano occurred, to which over 2,000 persons fell victim.

1822, October 12, 7 p.m. Repeated eruptions of the mountain, in accompaniment of a powerful shock that two others followed.¹)

- December 27, around 9 p.m. Locality of Kedu on Java. Earthquake. Direction E-W. The shocks repeated 18 times within a period of 30 hours. Several of the same, but especially the second to last on

- - 28, in the evening, were particularly powerful. At the same time, a rumbling coming from Gunung Merapi was heard, after which the mountain began to spew out stones. The actual eruption took place on

- - 29, 1:30 a.m. In the afternoon there followed a few shocks that became stronger at 6 o'clock, following which another eruption occurred.

- - 30, around midnight powerful ground vibration that was directly followed by another eruption. In the neighboring localities of Surakarta and Djokjakarta, earthquakes occurred in a similar wise. -- - by night. Batavia. Powerful shock that caused the inhabitants to abandon their houses.³)

- (circa). Sintang. West section of Borneo. According to the tradition, in 1822 an earthquake allegedly took place.⁴)

1823, January 3. In the Valley of Selo, locality of Surakarta. Powerful shocks.

- - 4. Valley of Selo. Again powerful shocks that this time were attended by an ash eruption of Gunung Merapi.⁵)

- - 30, between 11 p.m. and midnight. Island of Alond, or perhaps Along, on the coast of the Peninsula of Malaka.

- Powerful shock attended by a subterranean rumble.¹)
- 1823, February 9, 1:10 p.m. On board the ship “Winchelsea” in the Indian Ocean at 1 21’ N, 85 35’ E, “a strong tremulous motion” was felt. Duration of over a minute.²) At the same time an earthquake took place on Ceylon.
- April 22, between 5 and 6 a.m. Pulu Pinang [Penang]. Two shocks, of which the first was rather weak, while the second brought lamps and other objects into motion. Duration of the same, half a minute.³)
 - June 1. Island of Kisser, Southwest Islands. A shock.⁴)
 - July 23-24, by night. Patodja, district of Tjibiliung, Bureau of Tjaringin, Locality of Batam. “We had a violent earthquake that awoke us all from sleep”.⁵)
 - September 9, around 8 a.m. In Buitenzorg, south of Batavia, in the Preang regencies, as well as in the locality of Cheribon, an earthquake took place that manifest itself especially in the City of Cheribon and was accompanied by a rattling noise. At the same time the sea rose by a foot also.⁶)
 - October 19. Amboina. A shock.⁷)
 - December 7 around 4 p.m. Djokjakarta, Java. Powerful shocks, apparently in the direction E-W.⁸)
- 1824, March. Padang, west coast of Sumatra. Rather violent earthquake.⁹)
- May 3. A powerful ground vibration that continued for few minutes directly preceded the eruption of Gunung Api, Banda Islands. This information by J. OLIVIER is incorrect.¹⁰)

He himself was not at all witness of the event and in the numerous reports of the activity of the mentioned mountain it is not mentioned with a single word.

1824, May 13, around 4 a.m. Magelang, locality of Kedu, Java.

Powerful shock.¹)

- June 9, 14 and following days. Eruptions of Gunung Api, Banda Islands, which was attended by powerful, subterranean explosions.

- - 25. Banda Islands. After on 25 June an eruption of G. Api again had taken place, on the 26th occurred a very powerful ground vibration on Banda Neira. Direction E-W. Duration of over 3 minutes. Several houses received cracks. The waning activity of the volcano manifest itself through the spewing out of glowing stones and great amounts of ash, "and frequently lets the first one go hand in hand with thunders; which not only shake the houses, but also seeme to try and destroy the whole land".²)

- - 27, 4 p.m. Seaquake between Great Obi [Obi Majora or Obi Ra] and Ceram. On the corvette "Zwaluw" a powerful shock directed to the south was felt, which was followed a few moments later by a second and then still a third. On the sea a cross-swell coming from S-W was perceived, which had, however, already been noticed for three days.³)

1825, April. Eruption of the Volcano Tamboro on Sumbawa after eleven-day earthquake that was felt at the same time on Java, Borneo and Celebes. This information, also covered

in other works 1), hails from a writing error by L. F. VON FROFIEP²), as his informant – A. H. VAN DER BOON MESCH – mentions the event here addressed three times and indicated each time the correct year, 1815.³)

1825, May 4. Ngantang, Distract of Ngantang, Bureau of Malang, Locality of Pasuruan, Java. Four shocks, of which one was powerful.⁴)

1826, October 11, in the morning. Shortly before the eruption of Gunung Pakuadja and other craters in the Dieng Mountains on Java, a few shocks were perceived in Pekalongan and several other places in the bureau of Pekalongan in the same-named locality. In the eastern part of Java a powerful explosion coming from Gunung Kelut was heard. In several areas, not more closely indicated, ashes fell and shocks were felt.⁶)

1827 (no date). Ternate. In the course of the year were felt: in January 2, in February, March, June and October each 1, and in November 4 shocks.⁷)

1828, February 29, around 12 o'clock noon. Padang. Powerful vibration attended by might subterranean rumbling. Duration of a good 2 minutes. The damages caused to houses consisted mainly of the falling off of several roofing tiles.⁸)

- August 31. Fort du Bus on the Triton Bay, Southwest New Guinea. Two weak shocks that were also observed by several sailors on board the corvette "Triton".

- 1828, September 1, 4 a.m. On board of the same ship a powerful vibration was observed.¹)
- November 6, around 7 p.m. Powerful rumbling from Gunung Guntur in the Prang Regencies on Java. Previously, a few shocks had been felt, for which reason, an eruption was feared.²)
- (no date). Ternate. In the course of the year were felt: in April 1, in August 14 and in November 2 shocks.³)
- December 29, 10 a.m. Makassar and Bulekomba, South Celebes. Earthquake and seaquake.
- 1829, January 4. Makassar. Earthquake. The communication about these two quakes is based on an error; it must be 29 December 1820 and 4 January 1821.⁴)
- March 30 and 31. At the foot of Tangkuban Prah, on the border of the Preang Regencies and the bureau of Krawang of the locality of Batavia, powerful vibration were again perceived, accompanied by powerful rumbling, after the mountain had smoked heavily on the 29th. The eruption lasted until 4 April.⁵)
- (no date). In the first months of the year a strong shock was felt once in the territory of Amarasi, West Timor.⁶) - October. Bima and other areas on Sumbawa. Violent earthquake.⁷)
- May 25, Kokos or Keeling Islands. Quake.
- 1830, March 1, shortly after 1 a.m. Klaka on the foot of Gunung

Lamongan [Lemongan], locality of Pasuruan, Java.

Rumbling noise, which was followed immediately by an eruption that was accompanied by a rumbling resembling now a thunderstorm, now a cannonade.¹)

1830, March 28, around 10 a.m. Amboina. Violent, horizontal quake that persisted 20 seconds, direction E-W, and that was spread across the entire island. The **buildings, especially the block house in Larike, suffered heavy damages.** The vibrations were palpable, intermittently, until 7 April.²)

- April 26, before noon. Ava on Irawadi, Birma. Violent shock that caused most of the inhabitants to flee their houses.³)

- June 20, in the evening. Amboina. "At this time one felt again in the Moluccas frequent earthquakes; there was one notable during the farewell festival that we gave to the governor [A. A. ELLINGHUIJSEN], on 21 May.⁴) The indication of the date is erroneous, as, firstly the governor of the Moluccas was on not at all on the mentioned day in Amboina⁵) and besides, the departure for New Guinea that occasioned the farewell did not occur until 21 June.

- End of July. Amboina. "At this time several earthquakes were felt, a rather frequent phenomenon in these regions".⁶)

- 1830 (no date). Ternate. In the first half-year 2 shocks were observed and in the second, 5. ¹)
- 1831, October 31, around 2 p.m. Batavia and environs. Two shocks. ²)
- (no date). Ternate. In the first half-year 6 shocks and in the second 3.
 - 1832 (no date). Ternate. In the first half-year 3 shocks and in the second 5. ³)
 - (no date). Ternate. Island of Tobi [Lord North] in the Still Ocean (3 2'N, 131 5'E). Earthquake. ⁴)
- 1833, January 28, several minutes after 12 noon. Batavia. Earthquake. The shocks repeated, increasing in violence. The last was so strong that a few houses were damaged and particularly the old Protestant church received cracks. ⁵)
- -29, 12 noon. Tjiwidei. District of Tjisondari, bureau of Bandung, Preang Regencies, Java. Powerful shocks that a one minute long rumbling of the earth followed. ⁶)
 - November 24, around 8:30 p.m. Sumatra. **Violent earthquake that was also felt in Singapore and on Java.** ⁷)

In Bengkulen, west coast of Sumatra, there were powerful shocks, of which the first lasted 5 minutes ¹), which caused **damages to buildings and even their collapse. The flood wave that stormed the coast** destroyed the port dams along with the houses in the vicinity; two schooners, as well as several smaller vessels, were thrown onto land.

Pandang. Powerful, three minute long shock that repeated on the following days. Direction SSW-NNE. Aside from the damages to buildings, were created also fissures in the ground from which water and “sulfurous stream” climbed. Ever shock was attended by a subterranean rumble. **A breaking flood wave caused considerable damages.**

Indrapura and Pulu Tjingko. Powerful vibrations. **The damage caused by the flood wave was considerable,** many persons also fell victim to it. From Gunung Singalang a violent crack was heard, which was, however, just as little followed by an eruption as was Gunung Merapi, to which explosions were also ascribed.

Priaman (Pariaman?). Extremely powerful shock. In the ground fissures were created of two and more feet in width. The sea retreated and the returned in the form of a massive flood wave that tore all of the ships from their anchors. The vibrations continued for multiple days on end.
²)

Territory of Rau, bureau of Lubuk Sikaping. Precisely during an earthquake, Fort Amerongen was besieged by insurgent natives who interpreted the vibrations as a favorable sign for themselves. ³)

Palembang. The first noticed shock at 8:30 was followed by 6 more. Direction S N. **Buildings received cracks and several huts collapsed.**

On the volcano Bukit Kaba, Ajer Lang, which had its source on the same, had dried up three years earlier, because, as a result of an earthquake, a landslide had taken place and

caused the formation of a dam and at the same time of a lake.¹) Through the earthquake from 24 November, however, this dam was destroyed again and thus led to the draining of the lake. The water crashing down destroyed – entirely or partially – in its turbulent course, the village of Kapala Tjuruk on Ajer Lang and additionally the villages lying on Ajer Kling²): Udjan Panas, Lubuk Talang, Ajer Apo, Lubuk Tandjung, Tabah, Njambikei and Gurung Agung.³)

Singapore at 8:35 p.m. a weak shock was felt that was followed by a trembling of the ground, which lasted a minute or perhaps a while longer. The vibration perceived in Kampong Glam was stronger than in the city itself. In the report is also noted that it was the first earthquake since Singapore has been in English possession [1819].⁴)

Also on Java the quake was weak and in the records it was merely determined as such. On the high seas the quake was also felt. The ship “Mercurius”, located at the level of the Pageh Islands, west coast of Sumatra, was shaken by powerful shocks.

- 1833, August 26. Island of Ramri on the coast of Arakan, Birma. During the earthquake several flames a hundred feet over the summit of the mud volcano and vapors were observed from Kyauk Phyu on the north peak.⁵)
- November 25, 7 a.m. Singapore. A shock that was followed by a second at 5 a.m. Direction E-W.⁶) Pulu Pinang [Penang]. Earthquake.⁷)

- 1833 (no date). Ternate. In the first half-year 25 shocks. ¹) It was especially noticed that on 18 June, 6 a.m. the earth rumbled and directly afterwards a very strong, persisting vibration followed. ²) In the second half-year 3 shocks were observed.
- 1834, October 10, 5:30 a.m. Strong earthquake that stretched over West Java and the Lampong districts on Sumatra. In Batavia powerful, long-lasting vibration accompanied by a subterranean rumble was felt, which caused heavy damages on buildings. In Buitenzorg, isolated shocks were already noticed during the night, but the strongest occurred at 5:30 a.m. and **caused an entire, at least partial collapse of buildings**, among which the palace of the General-governor was also found. Preang regencies. The shocks caused a series of landslides. The coaching inn Tjiandjavar, no far from Tjipanas, was also destroyed by falling boulders from Mount Magamendung. Rivers were dammed up, which led to flooding. The eastern side of Gunung Gede were hit more strongly than the western ones. The **houses located there collapsed** for the most part. On military road from Buitenzorg to Tjiandjur and also in other places gaping fissures formed in the ground. In Tjiandjur itself many buildings suffered damages. In the crater of G. Gede, only a high activity of fumaroles could be observed.

The earthquake was also felt in the localities of Krawang, ³) Tegal [Tagal] (here the weakest) ⁴) and Bantam, and finally – on the far side of the Sunda Strait – in the Lampong districts. ⁵)

- 1834 (no date). Ternate. In the first half-year 4 shocks, in the last 5. ¹)
- (no date). Island of Tobi [Lord North Island]. Earthquake. ²)
- 1835, February (no date). Banda Neira, Banda Islands. During multiple days, not-strong shocks were felt frequently. ³)
- August 26. **Sumatra, Java, Singapore and Pulu Pinang. Earthquake**, around 9 p.m. Padang, west coast of Sumatra. The vibrations were nearly as powerful as on 24 November 1833. Duration of a good 4 minutes. Direction N-S. 9:30 p.m. Lebak, Locality of Bantam, Java. Rather violent quake.
 Patjitan on the south coast of Java, locality of Maduin. Earthquake.
 Singapore. "A slight shock of an earthquake was felt throughout the settlement, it lasted a few seconds but caused not injury." ⁴)
 - August (no date). Pulu Pinang [Penang]. Quake. ⁵)
 - September 10. Patjitan. Earthquake, more violent than the one observed on 26 August. ⁶)
 - October, end of the month. Patjitan. Earthquake. ⁷)
 - November 1, 3 a.m. Amboina. Especially violent quake. The shocks persisted only about 35 seconds, but caused great devastations. Through the **collapse of a barrack, 31 soldiers, 7 women and 11 children were killed** as well as 59 persons wounded. The **Chinese quarter became a rubble heap for the most part and 60 persons met their end**. In the same manner in the remaining city districts, 40 lost their lives. ⁸) **Every one of the houses still standing**

also suffered damages.

In the mountains on the east coast of Hitu, significant landslides occurred and that falling boulders blocked several rivers. Fissures also formed. The south and southwest side of Amboina had, in contrast, suffered almost nothing at all.

The shocks were attended by a subterranean rumbling that resembled a cannonade. They repeated in the next days; thereupon a period of rest occurred, but after the passage of a good two months they ceased.

On the Island of Haruku around 3 a.m., first a violent shock occurred that lasted 25 seconds. On Saparua the shock was noticed at 2:30 a.m. Duration of 8 seconds. On both islands many buildings suffered damages.

On the Banda Islands, only a weak quake was noticed. The supposition that Gunung Api had been active, was unconfirmed. ¹)

1835, November 16. Amboina. Violent quake. **Six persons perished, likely due to the collapse of a house.**

- 21, 2:30-3:30 a.m. Amboina. Shocks accompanied by subterranean rumbling.

- December 4. Amboina. Several shocks. ²)

- 8. Patjitan, locality of Madiun, Java. Shock, direction apparently S-N. ³)

- 10. Amboina. The vibrations continue on. ²)

- (no date). Ternate. Earthquake.

1836, Beginning of the year (no date). Ternate. Earthquake. ⁴)

- January 2 around 11 p.m. Wonosobo, district and bureau of Wonosobo, locality of Kedu ⁵)

- Java. Two violent shocks.

- February 22, around noon. Amboina. Powerful shocks. On

the following days shocks were also noticed from time to time.

- 1836, February 25, 3:30 a.m. Amboina. Two powerful shocks. ¹)
- March 2. Bima. Sumbawa. Violent quake.
 - - 5. Bima. Violent quake, accompanied by a **flood wave** ² that put the location under water.)
 - - 22, 3:30 a.m. Djokjakarta, Surakarta and Semarang, Java. Powerful shocks. Direction N-S. Duration of 2 minutes. ³) Patjitan, district and bureau of Patjitan, locality of Madiun, south coast of Java. Rather powerful shocks. S-N. Duration of a good 10 seconds. ⁴)
 - July 17, 2 p.m. Middle Java, et al. in Djokjakarta. Weak ⁵ quake.)
 - September 3, by night. Amboina. Powerful shock.
 - - 16, during the entire day. Amboina. Extremely powerful shocks. Houses received cracks. The vibrations must have continued to repeat until the end of the month, as under 4 October it says, that the earth had been rather still for several days. ⁶)
 - October (no date). Island of Kisser, southwest islands. In the course of the month, an earthquake was observed twice, of which one was so strong that a beam broke in the church.
 - November (no date). Island of Kisser. In the course of the months, two earthquakes were again perceived. ⁷)
 - - 28, 10:30 a.m. Bima, Sumbawa. Violent earthquake that lasted and caused strong damages to the houses. Boulders fell into adjacent gorges from the mountain ridges that stretch out south of Dongo Soro Mandi (Father Smit). The vibrations that followed until 6 o'clock in the evening were

of lesser intensity, but increased in strength after this time and were **accompanied by a flood wave**.

- 1836, November, 28, 10:30 a.m. Makassar. Wave-formed quake.¹
- - 29, in the evening. Bima and Makassar. Earthquake. ¹)
 - - 30 until December 3. Bima. Continuing vibrations.
 - December 5. Bima. Earthquake. ²)
- 1837, January 1. Island of Kisser. Not-powerful shock,³
accompanied by powerful rumbling. ⁴)
- - 10. Bima, Sumbawa. Earthquake. ⁴)
 - - 21, around 9 p.m. Amboina and the Uliassers. Earthquake.
On the last-named, namely Saparua, Haruku and Nusalaut,
a powerful vibration was felt that was followed on the 22nd
by multiple weaker shocks. The **buildings, especially on
Saparua, suffered significant damages**. On Amboina,
only the very last two shocks were observed, but on the
entire island. ⁵)
 - - 29, Bima Sumbawa. Earthquake.
 - February 17. Bima, earthquake.
 - - 20. Bima, Earthquake. ⁶)
 - March 28. Padang Pandjang, bureau of Batipu and Priaman,
locality of Sumatra's west coast. Powerful explosions
coming from Gunung Merapi, which an eruption followed.
⁷)
 - April 7. Bima. Earthquake.
 - - 11. Bima. Earthquake.

- 1837, July 10. Bima. Earthquake. ¹)
- (no date). Violent seaquake not far from the north coast of Flores. After an intense shock had been felt in the prau [small Indonesian boat], the ship began to roll continuously. ²)
 - End of September (no date). Pulu Pinang and northwest coast of Sumatra. "Penang. It appears that the earthquake which occurred here a fortnight ago was felt at the same time very severely at Atcheen ³) and all along the Pedier coast ⁴); the schooner Fattal Garib, which arrived on Wednesday [October 4], having brought accounts of several eruptions ⁵) having taken place at Telok samoy ⁶) and other parts, and particularly in the interior of Atcheen, where it is said the earthquake did considerable damage during the 7 successive days it lasted". ⁷)
 - (no date, but perhaps also at the end of September). Singapore. **Strong flood wave.** ⁸)
 - September 27, by night. Saparua, Island of Saparua. Violent quake that caused the inhabitants to flee their dwellings. ⁹)
 - November 23, 2:18 ¹⁰) Pulu Pinang [Penang]. Very strong quake. Duration of one minute and a quarter. Direction ENE-WSW. The walls of the customs office received cracks. ¹¹)
- 1838, January 11. Padang Pandjang, bureau of Batipu and Priaman, Sumatra's west coast. Again, powerful explosions coming from G. Merapi that an ash eruption followed. ¹²)

- 1838, May (no date). Ternate. Weak earthquake that was felt on the entire island. At that time an ash eruption of Pik also occurred.¹)
- August 8, 2:30 p.m. West Java. Weak earthquake. It was felt in Sumedang, Tjiandjur l.c. in the Preang regencies, but also in Cheribon, where the houses shook. 2)
 - September 28, 4 p.m. Huta Nopan [Koto Nopan] east of Sorik Merapi, Territory of Little Mandailing, bureau of Padang Sidempuan, locality of Tapanuli, Sumatra. Short but powerful shock.³)
 - (no date). Amboina. Violent earthquake. "One saw there⁴) two little villages mostly ruined by the earthquake that [stuck] that beautiful island the previous year. We observed the deep crevasses – the ground was grooved."⁵)
- 1839, January 12, 4 p.m. Captain AD. MARTIN at 40 hours NNE of Atjeh, heard an explosion that a rain of ash followed at 1:30 in the night.⁶)
- -14, 9 p.m. Sadiya [Suddeeah], Upper Assam. Shock. Direction apparently SW-NE.⁷)
 - March 19, 4:59 a.m. Muntok, Island of Bangka. Powerful shock. Duration of 10 seconds.⁸)
 - -Banda Neira, Banda Islands. Earthquake during a storm.⁹)

5) There can be little doubt that it had been the destruction of a series of earthquakes from 1 November 1835. (?)

- 1839, March 20, 4 p.m. Buitenzorg, Tjisarua, Tjibogo, u.a.O. on the north slope of Gunung Gede, Java. Weak quake. Houses swayed to and fro. ¹)
- - 21, around 4:30 p.m. Batavia. Weak shock. ²)
 - - 23, between 3 and 4 a.m. Birma. Violent earthquake. In Ava, Tsagain, Moulmain, Rangoon, as well as on the coast Arakau. In various places fissures of 10-20 feet in width formed, from which large volumes of water and gray mud, spreading sulfurous stench, flowed. The mud volcano on the Island of Ramri erupted violently. Quake also on the Andamans. ³)
 - - 29, 4 p.m. Eruption of Pik of Ternate. "The was preceded by a rumble, similar to a heavy cannonade." ⁴)
 - April 9. Bodjongketon on the north slope of Gunung Gede at Buitenzorg, Java. Muffled, subterranean rumbling that was able to be perceived every half to one minute. ⁵)
 - - 17, between 9 and 10 p.m. Tapos on the WNW Abhang of G. Gede. Three shocks that occurred in pauses of 15 minutes each, lasted about a quarter minute every time and triggered a wave-formed motion. ⁷)
- 1840, January 4, around 1:15 p.m. Violent quake in Middle Java ⁸)
1. Locality of Semarang: In the city of Semarang a wave-formed quake took place. The citadel and the walls of the Catholic church received cracks. A small

section of the rural road at Kendal collapsed. In the localities of Demak, Salatiga, Ambarawa and of Fort Willem I¹) the quake lasted 2 minutes. The first shock was a horizontal one. Direction WNW-ESE; the second was vertical. – 2. Localities of Japara [Djapara]: At the location of Japara a vertical shock attended by a subterranean rumbling was perceived, in contrast, in Pati there were two successive shocks. – 3. Locality of Banjumas: Two horizontal shocks of which the first lasted 30 seconds, direction W-E. The localities located in the eastern parts were shaken most strongly. In Tjilatjap the weather at the time of the quake was stormy. – 4. Locality of Djokjakarta: At the location of Djokjakarta three shocks, accompanied by a subterranean rumbling, resembling the rolling of a heavily laden wagon, were felt. Duration of the quake one minute. Direction NW- SE. Gunung Merapi apparently smoked more heavily after this event than previously. – 5. Locality of Bagelen²): Two shocks that lasted almost a minute. Direction E-W. In Purworedjo **several houses collapsed**, others suffered lesser damages. The stone bridge over the Bogowonto received cracks. The Indigo Factory in Sutji at Purworedjo was heavily damaged. Also the buildings of Wonosobo and Sapuran suffered badly. – 6. Locality of Maduin: In Patjitan the first shocks were felt between 1 and 2 p.m.; they lasted a good minute and were accompanied by a subterranean rumble. The walls of the houses received cracks. A **flood wave followed the quake**. – 7. Locality of Pekalongan²): Two powerful shocks. – 8. Locality of Kediri: two powerful shocks direction SE-NW. – 9. Kedu³): Quake. – 10. Locality of Besuki: There were no vibrations perceived, but it is reported that during the evenings and nights of 4, 5 and 6 January, stormy weather and high seas prevailed.

1840, January 5 and 6. Patjitan, locality of Madiun. The shocks

repeated in the night of 5/6 and one, noticed on the 6th at 6 a.m., was rather powerful. From these days to the end of the month, only insignificant vibrations were perceived.

- 1840, January 30 around 6 a.m. Patjitan. Earthquake. The strongest shock, accompanied by a subterranean rumble, lasted nearly 2 minutes and exceeded in intensity even those of 4 January. 1)
- February 2. Ternate. Violent eruption of Pik. **The quakes, which nearly transformed the city into a rubble heap,** did not follow until the passage of several days. 2)
 - 5, around 10 a.m. Weak shock.
 - 14, 12:30 a.m. Weak shock that was directly followed by another, increasing in intensity, which was accompanied by a subterranean rumble. At 1:30 a.m. A very strong shock was felt. Under constant increase of vibrations, the strongest shock occurred around 10 a.m., which **caused the greatest devastation, in that 500 houses collapsed** and also the walls of Fort Oranje suffered numerous damages. 3) In the night following, aside from wave-formed motions of the ground, 4 rather strong shocks were heard.
 - 15. During the day, as well as during the following night, shocks arose from time to time.
 - 16, 8 a.m. Rather powerful shock.
 - 17. During the past night, multiple shocks were observed.

- 1840, February 18. Ternate. By day, as well as during the following night, shocks were felt now and then.
- - 19. During the day shocks were felt now and again. At 4 p.m. Pik spewed out considerable amounts of smoke and between 6:30 and 7 a fiery glow was seen on the summit.
 - - 20. During the past night and during the day shocks were observed now and then. At 6 p.m. smoke, at first in small amounts, began to escape from the crater, which shortly, however, thickened to a colossal pillar of smoke.
 - - 21. During the past night multiple shocks were noticed, which occurred again at 1 p.m. Pik had again smoked heavily during the night.
 - - 22. During the past night, as well as during the day, several weak shocks were observed. The volcano showed heavy smoke.
 - - 23. During the day only, several shocks were noticed.
 - - 24, 11:30 a.m. Rather powerful shock. In the course of the day there were weak shocks from time to time.
 - - 25, 4 a.m. Strong shock; by day several more shocks.
 - - 26. A powerful shock before noon and also several insignificant shocks.
 - - 27. During the entire day, weak shocks only now and then.
 - - 28, 3 a.m. A powerful shock that was followed by several more weak ones during the course of the day and the evening.
 - - 29, between 3 and 5 a.m. Weak rumbling of the ground that continued during the day.
 - March 1. During the past night a weak movement of the ground had been noticed, which in the morning hours was followed by a couple weak shocks.
 - - 2. During the past night, several weak shocks. By evening between 8 and 9 o'clock, four more shocks were counted within three quarters of an hour.
 - - 3, in the morning, afternoon and evening, weak shocks.
 - - 4. In the course of the day, as well as the evening, weak shocks.
 - - 5. During the past night a grumbling of the ground would be noticed. 7 p.m. a shock.
 - - 6, around 1 a.m. From Pik, a thunderous

rumble that a weak shock and then a rumbling of the earth followed. In the evening another shock.

1840, March 7. During the entire day, several weak shocks.

- - 8. During the past night, as well as by day, several weak shocks. In the course of the following days several shocks arose now and then, and with that the earthquake period on Ternate came to its end.
- - 4, 1 p.m. Sadiya, Upper Assam. Shock that a second followed at 1 p.m. Direction S-N. The earthquake took place an hour after the passage of the solar eclipse.¹)
- July, in the time between the 5th and 16th. Kambotoros [Gower Port] near the southwest of New Mecklenburg [New Ireland]. "During our stay there, for two days, in the Starling, we experienced the shock of an earthquake which led up to believe that we were dragging over the rocks. The same was experienced on board the ship at the same instant and those on shore state that they felt the undulation strongly."²)
- November 1. Dodingga, West Halmahera. Earthquake. The stone work on building suffered damages. A repetition of the vibrations, however in a lesser degree, occurred in the course of the month.³)
- - 14, between 3 and 6 a.m. Repetition of the eruption, during which, on the foot of the mountain a strong shaking was observed.
- - 22, around 1 p.m. Again, an eruption of G. Gede in accompaniment of a rumble resembling cannonade. The ground was shaken by powerful, vertical and wave-formed motions.
- December 1, around 5 a.m. During a fourth eruption of G. Gede, in Tjiandjur, Preang regencies,

- a powerful bang was heard, as well as a weak quake felt.¹)
- 1840, December 3-15. Dodingga, West Halmahera. The vibrations noticed in the course of the month of November repeated, but increased in intensity.²)
- - 18. Buitenzorg, Tjitrap and Kedung Alang, bureau of Buitenzorg, locality of Batavia. Powerful subterranean rumbling.³)
- 1841, February 9 or 11. Gowhatty. Assam. An earthquake attended by a rolling rumble.⁴)
- - 26, 5 a.m. Buitenzorg. Powerful subterranean rumbling that was perceived simultaneously with an eruption of G. Gede.
 - March 1, 9:30 a.m. Buitenzorg. Weak earthquake.⁵)
 - (no date) Waronggunung, district of Rangkasbitang, bureau of Lebak, locality of Bantam. Shock that repeated itself in the afternoon.⁶)
 - May (no date). Amboina. In a letter from W. LUYKE under 23 June 1841 it reads: "In the previous month we again had violent earthquakes, 6 shocks in one night, such that we had to abandon the houses."⁷)
 - May and June (no date). Banda Islands. Three earthquakes.⁸)
 - November 23, around 11 a.m. Banda Neira, Banda Islands. Weak shock that lasted perhaps 50-60 seconds.
 - - 26, 6 a.m.⁹) Banda Neira. Weak, horizontal shock. Duration of a good minute.¹⁰) Fifteen minutes later¹¹) a **flood wave crashed against the south coast** with great force and reached a height of 8-9 feet,¹¹)

so that the water pressed up to the door of Fort Nassau. The flowing in and out lasted longer than three-fourths of an hour. It was low tide as the event took place.¹)

- 1841, December 16. Earthquake and seaquake on Amboina, Buru and Amblau. On Amboina a not particularly strong shock was felt around 2 a.m., which a **flood wave followed** about a quarter-hour later and reached a height of 4-5 feet above the highest water level. And crashed again against the beach of the Bay of Amboina. At Galala, west of the city of Amboina, **several huts of the natives were washed away**. On Buru, as well as on Amblau, a far more violent earthquake occurred between 1 and 2 a.m., and was followed on the latter islands by a **flood wave that tore away multiple huts and mosques of beach villages**. From 17-21 December additional vibrations were noticed.²)
- (no date). Captain E. T. PRATER noted a sea quake on board of a ship, about 50 knots WSW of Java.³)
- 1842, January 4, 7:30 p.m. Sibsagar, Assam. Powerful shock.⁴)
- April 3, around 11 a.m. Purwakarta, district of Sindangkasih, bureau of Krawang⁵), locality of Batavia. Weak wave-formed quake, attended by a subterranean rolling rumbling.
- 1842, - 6, 11:30 p.m. Purwakarta. Weak wave-formed quake.⁶)

- 1842, April 19. District of Kadugede, bureau of Kuningan, locality of Cheribon. Mount Hurip showed fractures in 130 places, Mount Tjikawang in 200 places. At Desa [village] Tjantilang, the ground had sunken down in 11 places and at Desa Tundagan fissures formed in the ground. In the sunken areas morasses were created.¹)
- May 3, around 10 a.m. Purwakarta. Bureau of Krawang, locality of Batavia. Weak earthquake accompanied by rolling rumble.
 - - 6, around 12:30 p.m. Purwakarta. Weak quake.
 - - 25, 7 a.m. Purwakarta. Weak earthquake accompanied by a rolling rumble.²) Batavia and Buitenzorg (no indication of time) a shock.³)
 - June 18, around 6 a.m. Batavia. Several horizontal shocks. Direction S-N. The vibrations were also perceived in Buitenzorg.⁴)
 - August 31. Kawangkoan. Minahassa, North Celebes. Quake.⁵)
 - October 29, circa 8 a.m. Sibsagur, Assam. Powerful shock. Direction SW-NE.⁶)
 - (no date). Singkel, bureau of Sibolga, locality of Tapanuli, Sumatra. Violent quake. The ground was heated in one place that all of the vegetation upon it charred. Traces of it were still clearly visible in 1853.⁷)
- 1843, January 5, 11:30 p.m. Barus [Baros], bureau of Sibolga, locality of Tapanuli. Violent earthquake, during which numerous cracks formed in the ground. Around midnight on the Island of Nias, not far from

the west coast of Sumatra, shocks were felt that seemed to come from the west, but then continued in a northern direction. They were initially only weak, but increased in intensity gradually and then no specific shock direction could be recognized. Their duration amounted to 9 minutes. A part of Mount Horifa fell into the chasm, and a part of the ramparts of Fort at Gunungsitoli sunk. With the exception of the barracks and the apartment of the commandant, **all the houses collapsed. After the passage of 9 minutes a “sky high” flood wave coming from the SE crashed against the NE beach and flooded away Kampong Mego**, an hour south of Gunungsitoli. At the same time from two to two minutes, shocks occurred. The flood phenomena lasted until

1843, January 6, 4:30 a.m., after which a yet more violent earthquake occurred. Of the shocks lasting about 6 minutes, many came “from the W and roamed towards N, but the direction changed immediately to S-N.” Many days later, the vibrations were still perceptible, though to a weaker degree.¹) In the above-mentioned Barus, a **flood wave stormed against the coast at 12:30 and, among other things, threw 3 praus 1922 feet (603 m) on land**. Shocks were still perceived at 4:30, 6, 9 a.m. and 2 and 11:45 p.m.

²
)

- - 5, midnight. Pulu Pinang [Penang]. Rather strong shock.
- - 6, 12:30 a.m. Singapore. Shock. Duration of 8-10 seconds. E-W.³)

1843, January 7, at 3, 6, 11:30 a.m. Barus, bureau of Sibolga and Batang Toru districts, locality of Tapanuli, Sumatra. Shocks.

- - 8, at 5:30, 10:30, a.m., 2:30, 6:30, 7:45, 9:30, 11 p.m. Barus. Shocks. ¹) 2 p.m. Pulu Pinang. Weak shock. ²)
- - 9, at 1, 1:45, 9 a.m., 2:30 p.m. Barus. Shocks.
- - 10, at 3 a.m., 2:30 p.m. Barus. Shocks.
- - 11, at 11:30, 11:45 p.m. Barus. Shocks. Shocks were also felt continually on the Island of Nias.
- - 12, at 12:30 a.m., 3:30 p.m. Barus. Shocks.
- - 13, 2:30 p.m. Barus. Shocks. ³)
- - 14, 12:30 p.m. Barus. A shock.
- - 15, 6:30 and 8 p.m. Barus. Each time one shock.
- - 17, at 12:15, 1 and 7 a.m. Barus. Shocks.
- - 18, 10:15 a.m. Barus. One shock. ⁴) 11:45 a.m. Amboina. Powerful shock that was preceded at 8 a.m. by a subterranean rumbling. ⁵)
- - 19, 3:30 p.m. Barus. A shock.
- - 22, 2 a.m. and 5:15 p.m. Barus. Each time one shock.
- - 28, 4:15 a.m. Barus. A shock.
- February 7, 7:30 a.m. Barus. A shock. ⁶) At night. On the south coast of the island of Gili Genting near the Island of Madura, an exceptionally strong swell was noticed, which was presumably triggered by a seaquake. Two boulders were noticed afterwards that had risen 1 foot above the high water level. ⁷)
- 9, 4 p.m. Bartus. A shock. The vibrations continues almost daily until the end of the month and even until the beginning of April, but more detailed records are lacking. ⁸)
- - 18, 2 p.m. Amboina. Powerful shock from NE toward SW.
- - March 15, 9:45 a.m. Amboina. Two shocks in quick succession. ⁹)

Around 9 p.m. Kediri, locality of Kediri, Java. Earthquake.

Direction SE-NW. The buildings were noticeably shaken, but without taking any damages. Previously, a subterranean rumbling was again heard.¹)

1843, April 1, 5 a.m. Bellary, Assam. Quake.

- - 6, 8 p.m. Sibsagar, Assam. Quake. – Dibrugarh [Dibrooghur]. Powerful shock. Direction W-E or SW-NE.
- - 7, 1 a.m. Sibsagar. Quake. – Around midnight, Dibrugarh. Weak shock. On these two days the shocks were also felt in Jaipur [Jeypur] and all of Upper Assam.²)
- April 11 until May 17. Ternate. In the entire period, 23 eruptions of Pik took place and also several vibrations were observed that, however, were of no significance.
- - 14, 5 a.m. Amboina. A shock.⁴)
- May 12, around 1 p.m. Pulu Pinang [Penang]. Wave-formed quake that 2 or 3 weak vibrations followed. Direction W-E or NW-SE. Hanging lamps also moved in these directions.⁵)
- - 15, 8:30 p.m. Amboina. Rather powerful shock that lasted several seconds.⁶)
- - 25, 7:10 a.m. Buitenzorg. Rather powerful shocks that lasted about two minutes. In Batavia strong shocks were felt as well. Direction apparently SW-NE.⁷)
- June 3. (no time indicated). Titalyah, Assam. Quake.
- - 15, 8 p.m.⁸) Sibsagar, Assam. Powerful vertical shock.
- - 17, 8 p.m. Sibsagar. Very powerful shock that was preceded by a weaker one. Direction SW-NE or W-E.

- Duration 1 minute. In Dibrugarh, Jaipur and Sakimah, Assam, vibrations were felt as well. ¹)
- 1843, August 3, 9:30 p.m. Amboina. Weak shock of several seconds duration that a second followed at 11:30 p.m.
- - 4, 2 a.m. Amboina. Weak shock.
 - - 8, 7:30 p.m. Amboina. Weak shock. ²)
 - September 3, 2:30 and 7:30 p.m. Sibsagar. Each time a powerful shock. ³)
 - - 16, 1: 30 p.m. Amboina. Rather strong, long-lasting, wave-formed quake. Direction NE-SW. ⁴)
 - October 14, 11:30 p.m. Pagang, west coast of Sumatra. Weak quake.
 - - 27, 1 p.m. Padang. Weak quake.
 - November 29, 3:30 a.m. Padang. Two powerful shocks.
 - December 8, 10 p.m. Padang. Weak shock.
 - - 21, 9 a.m. Padang. Weak shock.
 - - 27, 8 a.m. Padang. Rather powerful shock accompanied by a subterranean rumbling. ⁵)
 - (no date indicated). Island of Bali. Eruption of Gunung Agung [Karang Asem], that was preceded by earthquakes. ⁶)
- 1844, February 5, noon. Island of Siau [Sijau], Sani Islands. Quake. ⁷)
- - 15, around 12:15 p.m. Tjiandjur. Preang regencies. Rather powerful shock. ⁸) – Around 1:30 p.m. Buitenzorg . Two shocks in direct succession. ⁹)

- 1844, February 15, 9 p.m. Padang, west coast of Sumatra. Weak shock was followed by a powerful one around midnight.
- March 5, 12 noon. Padang. Weak shock. ¹)
 - April 8/9, by night. Banda Islands. Rather powerful vibration that was preceded by a subterranean, cannonade-like rumbling. ²)
 - May 27, 11:30 a.m. Padang. Rather powerful shock.
 - June 18, 5 p.m. Padang. Rather powerful shock.
 - October 22, (no time indicated). Batavia. A shock. ³)
 - December 10, 2:45 a.m. Padang. Weak, wave-formed quake. ⁴)
 - - 15, around 11 a.m. On board the ship "Briton" two powerful shocks were felt not far from the coast of the Andaman Islands. ⁵)
 - (no date indicated). Menado. North Celebes. In the course of the last 2 or 3 years (i.e. from 1842-44) more than 10 vibrations of little significance were observed. ⁶)
 - (no date). Tanah Laut, SE section of Borneo. Earthquake, according the to information from older natives. ⁷)
- 1845, January 11, around midnight. Sello, located on the saddle between Gunung Merapi and Gunung Merbabu, Middle Java. Earthquake that make the houses tremble for several seconds.
- February 5, around 7:15 p.m. Madjokerto, district and bureau of Modjokerto, locality of Surabaya. Three horizontal shocks. Direction S-N. They were also felt in Wanasalem, district of Bareng, where again at 10 p.m. weaker shocks were perceptible. In the district of Djombang, locality of Surabaya, as well as in Kediri, locality of Kediri, the shocks were felt at the same time as in Modjokerto. ⁹)

1845, February 8, 3:30 p.m. **Violent earthquake that spread over all of Minahassa in the locality of Menado, North Celebes.** In the city Menado, the vibration persisted 50-60 seconds and was so strong the it was barely possible to stand upright. In the houses, all objects were thrown about. The walls of Fort Amsterdam received gaping cracks. In the European district of the city, a house collapsed, and in the Chinese, a greater number, likewise in the villages Tikala, Lota, Kakaskasen, Tonsawang, Tondano, Tnawangko, Kawangkoan, Romoon, Tombarian and Sonder. In the district of Tomohon the **more that the half of the territories were destroyed.** In Amurang, the walls of the old fort collapsed in multiple places; the church also suffered damages, just as the residences. In the village of Wuwuk (district of Amurang) the **church and 125 houses were destroyed, those left standing were uninhabitable.** In the ground many fissures formed, and landslides occurred as well, such that in certain places the rice gardens has slid down and the soil was deposited in lower places. Powerful shocks were felt also in Kema and Likupang, by comparison, the territories of Tompasso, Pasan, Ratahan, Belang and Tonsawang suffered only little. All in all, **56 persons had met their death**, while 62 escaped with injuries.

On the Kema roadstead the **sea came twice to the furthest end of the "Mole", and the fish could be gathered from the dry seafloor**, before the sea achieved again its previous level.

The mountains Lokon and Kakaskasen [Rumengan] were torn open on their summits and, as well as on Mount Tolongkow, boulders crashed down.

Mount Paseki, 1.5 km ENE away from the village of Koka, spewed "white clay and sulphur", through which the river water flowing down became heavily polluted. ¹)

- 1845, February 9 to 17. Minahassa. After the violent quake on the 8th, vibrations were still felt daily. The last rather powerful shock occurred on the 17th around midnight. As with the previous ones, it was preceded by a subterranean rumbling. 1)
- March 5, around 10:30 p.m. Batavia. The initially in quick succession shocks changed to a wave-formed quake. Duration of 57 seconds. In Tjiandjur and other territories in the Preang regencies, only a weak shock was observed, and in Biutenzorg a somewhat stronger one. On the day named, an ash eruption took place on Gunung Gede. 2)
 - May 15, afternoon. Gorontalo on the Gold of Tomini, North Celebes. Powerful shock. Duration of 20 seconds. 3)
 - June 5, 4:45 a.m. Pasirtalang, district of Muarolabuh, Padang highland, West Sumatra. Intense shock.
 - - 29, 1:30 a.m. Pasirtalang. Weak shock. 4)
 - July 20, between 1:30 and 2 p.m. Amboina. Several rather powerful shocks that repeater in the evening and also in the course of the night. They were mostly vertical, and come from the east attended by a subterranean rumbling.
 - - 21, between 6:30 and 7 p.m. Amboina. Two strong shocks.
 - - 22, Amboina. The last day on which continual, albeit weak, shocks were perceived. The government building at Batu Gadjah had suffered so greatly through the vibrations of the preceding days that it had to be cleared out. Others buildings were also damaged. 5)
 - - 30, around 5 a.m. Kediri, locality of Kediri, Java.

The very palpable quake caused no damages whatsoever.
Direction S-N. 1)

1845, August 19, 1 a.m. Padang, west coast of Sumatra. Violent quake that persisted several minutes.

- - 20, 1:30 a.m. Padang. Multiple powerful shocks that were followed by a weak one at 4:45 a.m.
- - 24, 1:30 p.m. Padang. Very weak shock.
- September 12, 12:30 p.m. Padang. Rather powerful shock. Direction SE-NW.
- October 11, 8:30 a.m. Padang. Powerful, vertical shock.
- November 2, 3:30 a.m. Padang. A strong shock that was followed by multiple weak ones. Direction SE-NW.
- - 10, 7:30 a.m. Padang. Weak shock.
- - 12 7:30 a.m. Padang. Powerful, horizontal shock. Direction E-W
- - 16. In Padang a rumbling was heard coming from Gunung Merapi. Following that, a pillar of smoke was seen rising from the crater.
- - 18. Repetition of the rumbling, but to a weaker degree.
- December 13, 8 a.m. Padang. Powerful shock. 2)

1846, January 20, 2:30 a.m. Padang, west coast of Sumatra. Powerful shock. Direction NW-SE.

- - 25, 9 a.m. Ternate. A not-violent, albeit long-lasting quake. Directly following the first shock that lasted almost one and a half minutes, was a **flood wave** that reached a height of 4 feet. The swelling motion repeated – about ten times within an hour – until 4 o'clock in the afternoon. During this time, the wells also showed an unusually high water level. In the southern parts of the island, a subterranean rumbling was also heard. The **flood wave was not only observed on the coasts of the neighboring islands**, but also on those near at Menado, North Celebes. On board of the English ship "Rochester", that was 50 knots NE from the Island of Morotai, a shock was felt. 4)

- 1846, January 26, around 2 p.m. Blitar, district and bureau of Blitar, locality of Kediri, Java. A rather powerful shock that was also felt in Kediri, although to a lesser degree. 1)
- March 13, 1 p.m. Padang (allegedly). Weak shock. 2)
 - - 18, 1 p.m. Pasirtalang, district of Muarolabuh, Padang highland, West Sumatra. Very weak shock. Direction SE-NW.
 - April 11, 10:30 p.m. Pasirtalang. Weak shock. SE-NW. 3)
 - - 27, 8:30 a.m. Kupang, Island of Timor. Weak quake. 4)
 - May 27. Ash and mud eruption of Kawah Ratu, of the eastern crater of Tangkuban Prah, West Java. In Sagalagerang, Batusirap, et al, in the villages located on the north face of the mountain, vibrations were felt. 5)
 - September 29, 4 p.m. Pandjalu, 6) bureau of Tasikmalaja, locality of the Preang regencies, Java. A trembling of the houses lasting only a short time was observed. 7)
 - - 30, around 12:45 a.m. Batavia, Buitenzorg, as well as at the foot of Gunung Gede. A weak shock.
 - October 1, around 2 a.m. In the same locations a weak shock. In Buitenzorg and environs such shocks were felt again in the course of the month. 8)
 - November 24, 6:05 a.m. Pengalengan, district of Badjaran, bureau of Bandung, Preang regencies. Several vertical shocks that at the same time caused the houses to tremble.

- 1846, December 8, 6:30 p.m. Pengalengan, district of Bandjaran, bureau of Bandung, Preang regencies, Java. Weak vibration. 1)
- - 23. Ternate. Three shocks, of which the two first ones were rather powerful and attended by a thundering rumbling. 2)
 - - 24, 3:55 p.m. Pengalengan. Powerful shock.
 - - 29, 12:40 p.m. Pengalengan. Powerful shock that ended with a trembling. Duration of 2 seconds.
 - - 29-30, at night. Pengalengan. Weak shock.
 - - 30, 5:50 p.m. Pengalengan. Rather strong shock.
- 1847, January 27, 3:30 a.m. Pengalengan. Shock that continued having effect for a time by the trembling of the house. 3)
- February 7. Ternate. Eruption of Pik, attended by a thunder-like rumbling lasting half an hour. 4)
 - - 8. Ternate. Two shocks. 5)
 - March 20, around 6:30 a.m. Banjumas, district and locality of Banjumas. Short but rather powerful quake. On the day named, unusually high pillars of smoke rose from Gunung Slamet. 6)
 - - District of Djombang (at that time Modjoredjo), locality of Surabaja. Violent hurricane accompanied by weak shocks. 7)
 - March (no date indicated). **Mount Nimbenok, 3 days journey from Kupang on Timor, collapsed. Many houses were destroyed** by the boulders rolling down from the faces of the mountain, but no one lost his life. 8)

- 1847, April 3. District of Djombang (at that time Modjoredjo), bureau of Surabaya locality of Surabaya. Violent hurricane that was again accompanied by shocks. 1)
- - 7, 1:30 a.m. Pengalengan, district of Bandjaran, bureau of Bandung, Preang regencies. Weak vibration. 2)
 - - 8, around 3:30 a.m. Ternate. Powerful shock that persisted several seconds. Direction N'S. 3)
 - May 3, 9:15 p.m. Pengalengan. A vibration lasting a quarter minute. 8 p.m. Tjilatjap, district and bureau of Tjilatjap, locality of Banjumas. Weak shock. 4)
 - September 18, 5 p.m. Sape [Sapi] on the Sape Straight, Sumbawa. Short shock.
 - - 22, 5 a.m. Gempo, Sumbawa. Powerful shock. In Bima it was said to have been felt at 3:30 a.m. 5)
 - - around 5:30 a.m. Batavia. Weak shock.
 - October 17, noon. Buitenzorg. Weak shock. 6)
- 1:15 p.m. Tjiandjur, Preang regencies. A rather powerful shock that was followed by a second at 1:30 and a third at 8 p.m. Between 9 and 9 p.m. Tjikalong and Pasawahan, bureau of Sukanbumi, Preang regencies. Shock. 7)
- 11 p.m. Tjiandjur. Three short shocks in quick succession, of which the first was rather powerful and lasted about 10 seconds. 8)
- From 16 to 18 October an eruption of Gunung Guntur had taken place.
- - 18 and 19. Tjiandjur. Again, weak shocks, according to information from JUNGHUHN who claimed to have taken them from the Javanese Courant, 10 November 1847, No. 99, where they, however, are not mentioned. It is merely noted that the vibrations on 29 October had not yet ceased.

- 1847, October 29, between 12 and 1 a.m., 9 a.m. and 12:30 p.m. Pasawahan, district of Djampang Kulon, bureau of Sukabumi, Preang regencies. Each time one shock, of which the third lasted three seconds and was accompanied by a rattling noise. 1) (no time indicated). Tjiandjur. Shocks. 2)
- 31, 3:30 a.m. 3) Pulu Milo at Nikobar Minor. Under blue skies, a quickly repeating, hollow rumbling was heard that was followed each time by a wind resembling a whirlwind. Afterwards shocks occurred and the **sea rose to flood level**, although it was low tide at the time. The **first shock caused the collapse of several houses**. 4) A quarter hour later, new shocks manifest themselves, again through a similar sound and these phenomena repeated by time hundreds on one and the same day. The earthquakes lasted, with shorter or longer interruptions, for 19 days and during this time the sea had a higher level than usual. Many of these shocks were preceded by a noise like an explosion. On the small islands located in the St. George Channel, the shocks were most powerful. Great boulders were torn from the mountains, 5) the **houses collapsed and the coastal areas were flooded by the sea**. Fissures formed in the ground, out of which cold and salty water rushed. 6)
 - November 1. Island of Kondul. Weak shocks.
 - - 2. Powerful shocks with pauses 2 hours each.
 - - 3. During the past night continuing until the noon hour, shocks.

- 1847, November 5. Island of Kondul, Nikobars. A weak shock.
- - 6. Rumbling that was attended by a shock. Direction S-N.
 - - 9. A weak shock.
 - - 10. Two weak shocks.
 - - 11. A weak shock.
 - - 12. A weak shock. 1)
 - - 16. Powerful shock that persisted 10 minutes. On the Island of Montjal, the ground tore open, forming a fissure of 2 feet in width and 12 feet in depth. 2)
 - - - Violent earthquake that spread over Middle and West Java and over Southeast Sumatra. 1) Locality of Batavia:
 10:18 Batavia a.m.. Shock of 8 second duration.
 10:25 a.m. Shock. Duration 12 seconds. Direction E-W. The walls of a series of buildings received cracks. The tower of the town hall was made crooked and the cross on it was twisted.
 10:16 Island of Onrust by Batavia and 10:25 a.m. Each time a shock, of which the last was the more powerful. Direction ESE-WNW.
 10:30 Buitenzorg a.m. g. A shock, that was followed by two more, each time with a pause of 5-10 minutes. – At Legok Njenang to the south of Gunung Gede, the powerful shocks were heard in the morning. By day other weaker shocks were felt, especially at 6 p.m.
 - - -2) Preang regencies: The earthquake was observed in numerous locations. In Sumedang the quarters of the assistant resident received so many cracks that it became uninhabitable. At Bandjaran between 8 and 9 a.m. the building in which JUNGHUHN resided was seen to sway to and fro three times. On the summit of Gunung Guntur a pillar of smoke was seen.
 3) Locality of Cheribon: In the city Cheribon the quake was manifest in the most violent manner. Around 10:45 a.m. the first shock, duration of half a minute, was felt, which was immediately followed by a second, weaker one. At 11:05 a.m., such an intense shock of 61 seconds occurred that

most building became uninhabitable. From the point on until midnight, another 13 shocks occurred, of which 3 were rather powerful. The motion was wave-formed and so strong that it was barely possible to stand upright. Direction SE-NW. The devastations were limited to the northern and western part of the regency of Cheribon. – In Palimanan, district of Palimanan, bureau of Cheribon, all of the buildings of stone in the fort suffered heavy damages. The sugar factories, Ardjowinangun and Glagamidan, in the same district, the quarters of the controller in Radjagaluh, the indigo factory there, as well as the one in Pamankiran, either **collapsed or were damaged to an uninhabitable degree**. Most coaching inns suffered heavily as well and even the millstones were thrown over.

In Indramaju, district and bureau of Indramaju, the first shock, that was powerful, occurred at 11:45 a.m. The second (no time indicated) was much stronger.

At 12:55 p.m. a weak shock occurred, at 1:15 p.m. a weak one, at 5:40 and 6:05 p.m. each time a weak shock. 1) The consequences manifest themselves through **heavy damages to the government building along with the fort, and about 40 houses collapsed**. In the ground in various places, fissures from 1-2 feet in width formed, from which sand and muddy water rushed in great amounts. In the villages Danaradja, Ganting and Persana, the earthquake caused similar devastation. In Butamuti on the Tji Manuk, 24 km to the south of Indramaju, **all residences collapsed**: the direction of the shocks was SW-NE. Fissures formed there in the ground as well, from which water mixed with fine bluish sand flowed.

The district of Kuningan had suffered little, likewise the district of Madjalengka, at least in its western parts. The great devastations in the locality remained limited to the west, in the areas

between Tji Manuk and the city, especially in those, which were covered by alluvial deposits.

- 1847, November 16. In the localities of Bantam, Tegal 1), Banjumas, Kedu, Semarang and Rembang, the vibrations were also felt, but to a far weaker degree.

10:38 a.m. Natar, Lampong districts, Sumatra. Weaker shock that was followed 10 minutes later by a violent, wave-formed quake, after which, another 2 very weak shocks interrupted by 4 to 5 minutes were felt. Direction SE-NW. In the villages that lay at the foot of Gunung Radjabasa [Radjobasa], the vibrations were also perceived. 1)

- 17. Continuation of the vibrations in the locality of Cheribon, Java.

1:20Indramaju a.m. . Powerful shock. From 9 a.m. until 5 p.m., multiple shocks, of which the one that occurred at 1:30 was the most powerful. 5:30 p.m. a weak shock and 6:05 p.m. a somewhat stronger one. 6:30 p.m., two shocks in quick succession. 7 p.m. a weak shock, likewise at 7:30, but lasting rather long. 7:40 again a weak shock and 7:45 a rather powerful one. 2) In Cheribon between midnight and 6 a.m. a weak shock was felt and from 6 until 10 a.m. another nine were felt, of which one lasted 31 seconds. 3)

- 18, 1:30 a.m. Indramaju. Weak shock. 4) (no time indicated). Karimon Djawa Islands in the Java Sea. Two powerful shocks. 5)
- (no time indicated). Island of Milu near Nikobar Minor. Weak shocks, the last in the series of the earthquake taking place since 31 October. 6)

- 1847, November 20, 1:30 a.m. Indramaju. Weak shock, repeating at 8:45 and 10:30 a.m. and 1 p.m.
- - 21. Indramaju. During the entire night a subterranean rumbling was continually heard, but not until at 5:30 a.m. And then again at 12 noon, as well as at 2 p.m. was a weak shock felt. A somewhat more powerful one occurred at 3 p.m. 1)
 - - 23, around 7 a.m. Patjitan, district and bureau of Patjitan, locality of Madiun. Weak vibration that was followed by a powerful shock attended by a subterranean rumbling. This shock was also felt very clearly on board the ship "D'Elmina". 2)
- 12:30 p.m. Indramaju, locality of Cheribon. A weak shock.
- - 26, 6:30 a.m. Indramaju. Weak shock that was followed by two weak ones at 11:30 a.m. and again another weak shock at 2:15 p.m. At 8 p.m. a powerful shock occurred and then again at 10 p.m. a weak one.
 - - 27, 4 a.m. Indramaju.. Rather powerful shock that was followed at 5:30 a.m. by two shocks and at 12 noon by another weak one.
 - - 29, noon. Indramaju. A weak shock. 3)
 - December 5 (no time indicated). Nikobar Minor. A weak shock. 4)
 - - 9, 11 p.m. Indramaju. A shock that, though weak, was not insignificant. Direction E-W.
 - - 10, 11:30 a.m. Indramaju. Rather intense shock. Duration of 8 seconds. Direction E-W. 5)
 - - 19, 6:30 and 6:40 p.m. Pengalengan, district of Bandjaran, bureau of Bandung, Preang regencies, Java. Each time a shock. Wave-formed quake. 6) -- 25, 9:30 a.m. Indramaju. Two rather powerful shocks accompanied by a subterranean rumbling. 7)

- 1847, November 26, 7:30 until 9 p.m. Pengalengan, bureau of Bandung, Preang regencies. Subterranean, rattling noise. 1)
- - 27, around 10:30 a.m. Bureau of Tegal, locality of Pekalongan. A weak shock. 2)
 - 8:30 a.m. Indramaju . Powerful shock accompanied by a subterranean rumbling. 3)
 - 10 a.m. Pengalengan. Shock that set the ground into a trembling motion. 4)
- 1848, January 7, around 4 a.m. Rather powerful shock that was felt in the localities of Kediri, Kedu, Djokjakarta, Bagelen 5), but especially in the bureau of Patjitan, locality of Madiun. Direction N-S. On the foot of Gunung Merapi, 29 hours after this shock, the natives heard a rumbling coming from the mountain. 6)
- - 8, in the morning. Patjitan, locality of Madiun. A not very powerful shock. 7)
 - - 12, 10 p.m. Pengalengan. Shock that caused a heavy trembling of the residences.
 - - 14, between 9:30 and 10 p.m. Pengalengan. "It is a very peculiar rumbling, unable to be described by words, it sounds very powerful, strong, and yet dull; deep and hollow it resounds from the insides of the earth, one hears an intermittent groaning that only at time causes a light trembling of the buildings, which however, makes a stronger and more fearful impression upon the observer than the loudest thunder." 8)
 - February 6-7, at night. Kediri, place of residency, Kediri, Java. Short shock of lesser strength than of the one observed January 7. Direction N - S. In Patjitan, place of residency was as in Panggul. Trenggalck Dept. Place of residence, Kediri, a vibration lasting 8-10 seconds

was observed that ended with a powerful shock – direction N-S.¹)

1848, February 17, 10 a.m. Besuki, Capital of the Locality Besuki, East Java. A weak shock. In the Banjuwangi, district and bureau of the same Locality, a somewhat stronger shock. 10 a.m. Singlaradja and Buleleng, district and Bureau of Buleleng on the north coast of the island of Bali. Rather violent shocks that did not, however, have any effect on the sea. In Kasimann on the southwest coast powerful shocks were again observed, which persisted 3 minutes.²)

- March 2, 11:30 p.m. Pengalengan. Weak vibrations.³)
- April 1, about 9 p.m. In the Locality of Banjumas, Bagelen, Kedu, Madiun, Kediri and Pasuruan, several rather heavy shocks that did not, however, cause any damage.
- May 11, about 11 a.m. Department of Ponorogo and Patjitan, Locality of Madiun and Kediri, Locality of Kediri. A shock.
- -16, in the evening. In Madiun and Patjitan, Locality of Madiun, as well as in Beduki on the east coast of Java, powerful rumbling similar to a cannonade, which, in the last named place, was so powerful that the glass on the lamps was broken and the chandeliers even fell from out the hooks attached to the ceiling. Powerful eruption of Gunung Kelut.⁴)
- May 18, 11 a.m. Kediri, capital of the Locality of Kediri. Three shocks, of which the last was rather powerful.⁵)
- June 4, 3 p.m. Tjaringin on the Sunda Strait, Bureau of Tjaringin, Locality of Bantam. Very weak shock.
- - 5 (no time indicated) until June 19. Anjer on the Sunda Strait. District and Bureau of Aufer, Locality of Bantam. Isolated shocks at various times of the day, especially, however, at evening time.

- 1848, June 6 12:45 a.m. Tjaringin, Locality of Bantam. Weak shock that was followed at 1 a.m. by another two weak ones.
- - 7, around 10 a.m. Tjaringin. Weak vibrations of the ground.
 - - 9, 4:30 p.m. Tjaringin. Weak vibrations of the ground.¹
) No time indicated. Lampon district on Sumatra as well as in the Locality Bantam and Kediri. Multiple shocks.²)
 - - 10, 6:30 p.m. Tjaringin. Rather violent shock.
 - - 11, 10 and 11 p.m. Tjaringin. Each time a rather violent shock.
 - - 12, 2 a.m., 12 :30, 8:30 p.m. and 12 at night. Tjaringin. Each time a shock.
 - - 14, 8 a.m. Anjer. Horizontal shocks. Direction of E – W.
 - - 17, 1 p.m. Tjaringin. Strong shock that was followed at 1:15 p.m. by one of lesser strength.
 - - 22, 1 p.m. Tjaringin. Weak vibration.
 - - 23, 6 p.m. Tjaringin. Rather powerful shock.
 - - 27, 3:30 a.m. Tjaringin. Weak shock. Since 4 June more than 80 shocks had been counted. They had also been perceived in other areas of the lowlands, while the mountain districts had been almost entirely spared from them. Also on the opposite coast of the Sunda Strait, in the Lampon districts, powerful shocks were again observed in the course of June.³)
 - July 4-5, by night. Locality of Kediri, Java. Three shocks, attended by a subterranean rumble, of which the last was rather powerful.⁴)
 - - 21 and 22 (no time indicated). Tjaringin. Repeated shocks, of which, however, many were hardly palpable.
 - - 23, 9:20 p.m. Tjaringin, very strong shock that lasted a good 15 seconds. 3 p.m. Anjer. Rather powerful shock.⁵)
 - 24 (no time indicated). Anjer. Two shocks, of which one was rather powerful.

- 1848 July 25 and 26 (no time indicated). Tjaringin. Repeated vibrations.
- - 29, 9:30 a.m. Buitenzorg. Rather powerful shock.
 - - 27 until August 7. Tjaringing and Anjer. 17 shocks, of which several were rather powerful.¹)
 - August 4 until 14. During a ten day long stay on the roadstead of Anjer, upon the ship "Norna", captain BIROCHE, daily vibrations were noticed. Two days before the departure, a volcano eruption was observed. The mountain lay in the east of the southernmost point of the Radjabasa and a nautical mile SW of the little island of Logok, lying north of the Cape of Kangalan.
 - - 7, 8, 9, 14, 16 and 18.³) Island of Buru. Seven powerful, and multiple weak shocks. The vibration on the 18th was the strongest and persisted 4 minutes.³)
 - - 18, around 11 a.m. Locality of Kediri. Two shocks. Gunung Kelut was active.
 - September 2, 4:01:45 a.m. Batavia. Rather powerful shock. Direction N-S. With regard to its duration, the information is at odds; but in any case, it persisted longer than 10 seconds.
- Buitenzorg. Vertical shocks attended by a rumbling similar to thunder. Duration one and a half minutes. Locality of
- Bantam. Wave-formed quake. Direction SW-NE.
- Locality of Banjumas and Bagelen, Java.⁴) Rather powerful shocks.
- 4:30 a.m. Pekalongan, Locality of Pekalongan.⁵)
- Powerful shocks. Direction N-S.)

- 1848, September 28 (no time indicated). Tjaringin, Locality of Bantam, Java. Rather powerful shocks that lasted half a minute. ¹) --
- October 17 (no time indicated). Menado, Minahassa, North Celebes. Rather powerful shock attended by a subterranean rumble. Direction E-W. ²)
- November 14, 8 p.m. Tjaringin. A shock that was followed in intervals by others during the course of the night.
 - - 23, 6 p.m. Tjaringin. A shock that was followed by quite a few others.
 - -December 16, 7 a.m. Kediri, Locality of Kediri. Shock,. Direction N-S. ³)
 - - 27, 10:30 a.m. Locality of Tegal. ⁴) Weak shock. ⁵)
 - (circa). Bunut, Sintang, West Bureau of Borneo. Quake. ⁶)
- 1849, January 3 – 4, by night. Island of Tajan, in the Kapuas Stream. Bureau Pomtianak. West Abteiling of Borneo. Several rather powerful shocks. ⁷)
- - 22, about 8:15 a.m. Gowhatty, Assam. Powerful shock that was also felt in Ruka – duration one minute at least – as well as in Nowgong. 8 a.m. Burpetah. Wave-formed that was accompanied by a rolling, gradually increasing rumble and soon after a powerful shock followed.
 - - 23, 9 p.m. Jagee, Assam. Powerful shock.
11:15 p.m. Burpetah. Strong shock. Direction N-S.
 - - 26, about 5 a.m. Jagee. A rumble as a cannonade followed an unpowerful shock. Burpetah. Two weak shocks. Direction N-S. ⁸)

- 1849, March 19, 2 p.m. Tjaringin, district and Bureau of Tjaringin, Locality of Bantam, Java, until
- - 20, 4 a.m. 71 shocks, of which several were rather powerful. In Pandeglang and Anjer, several shocks were noticed in the night from 19/20 March. In Serang, in contrast, only one. In the ramparts of the lighthouse on Java and under construction just at that time, 4th Punt [Tandjung Tjikong] on the Sunda Straight, three cracks formed.
 - April 26, about 3:30 p.m. Locality of Banjumas. Three shocks in quick succession, of which the last was the most powerful and lasted longest as well. At the same time there occurred rather powerful shocks in the localities of Kediri and Bagelen.¹) Also in Ambarawa in the localities of Semarang, vibrations were felt.²)
 - May 28, between 7:30 and 8 p.m. Island of Saparua, east of Amboina. Violent shock lasting 10-12 seconds, which was followed by weaker shocks with pauses of 8-10 minutes.
 - - 29. Saparua. Until 1:30 a.m. during the night, several powerful and then weaker shocks were observed. The ground was in constant vibration during this time.
 - - 30 until June 2. Saparua. More or less palpable vibrations, that declined gradually in strength after growing intervals. The walls of Fort Duurstede took cracks in about 5 places and the church of the localities Saparua and Tijau in 13 places. Near the bank of the river Taraka near Ulat, not distant from the southeast corner of the island, the ground was torn open in a north to south direction in the length of 276 feet and the fissure achieved in places a width of 2 feet and a depth of 8 feet. Of the two houses that were in the area, one collapsed.

At the same time as the earthquake that occurred on Saparua, several shocks were also observed on Amboina, but did no damage.³)

- 1849, June 4, 11 a.m. Blora, district of Karangdjati, Bureau
Blora, Locality of Rembang, Java. Weak shock. ¹)
- August 12, around 1 p.m. Locality of Kediri. Several weak
shocks. ²)
 - September 14 until 17. Molukken. Violent shocks that
spread to Timor. ³)
 - - 15, in the morning. Localities Bagelen and Banjumas.
Two weak shocks. Direction E-W. Gunung Merapi had
been active since the evening of the 14th 4).
 - - 24, around 11 p.m. Ambarawa, district of Ambarawa,
Bureau Salatiga, Locality of Semarang. Rumble that
resembles canon shots fired in rapid succession in the
distance. ⁵)
 - October, 19 (no time indicated). Besuki, district of Besuki
and also the entire Bureau Bondowoso, Locality of Besuki.
Multiple shocks. Direction SW-NE.
 - - 22-23, by night. Locality of Kediri. A shock.
 - - 23, 5 p.m. Locality of Kediri. A shock. ⁶)
 - December 30 (no time indicated). Ternate. A weak shock.
⁷)
- 1850, January 12, 7:40 p.m. Amboina. Vertical shock.
- - 13 (no time indicated). Amboina. Several weak vertical
shocks. ⁸)
 - - 28-29, by night. Locality of Banjumas. In various places,
two shocks in quick succession, of which the last was
rather powerful. Several hours later (that is, in the
morning of the 29th) a weaker shock was felt in Tjilatjap.
⁹)

- 1850, February 28, 12:45 a.m. Muntok, not far from the western point of the island of Bangka. Weak shock. Direction NE-SW. Duration of several seconds. ¹)
- March 12 (no time indicated). Padang, west coast of Sumatra. A shock. ²)
 - - 18, 5 and 7:10 p.m. Amboina. Each time a shock.
 - - 20, 2 a.m. Amboina. A shock. ³)
 - - 25, in the morning. District of Besuki, Bureau Bondowoso, as well as Panarukan, Locality of Besuki. A rather powerful shock. ⁴)
 - April 4, 9 a.m. and 8:30 p.m. Amboina. Each time a shock
 - - 5 (no time indicated). Amboina. A shock.
 - - 14, ⁵) 1:30, 8:25 a.m. and 10:03 p.m. Amboina. Horizontal shocks.
 - - 15 (no time indicated). Amboina. Multiple weak shocks. ⁶)
 - -May 31 (no time indicated). Padang, west coast of Sumatra. A shock. Direction N-S. Duration about 20 seconds. ⁷)
 - June 6 (no time indicated). Ternate. Vibration lasting 60 seconds that was later followed by a powerful shock. This was also felt at sea, 50 English miles away from the island. ⁸)
 - - 27, 10:50 p.m. Amboina. Horizontal shock. ⁹)
 - July 30, around 11 p.m. Banjumas, district and Bureau Banjumas, Locality of Banjumas. Two weak shocks. ¹⁰)
 - August 29, 9-9:30. ¹¹) Padang, west coast of Sumatra. Un-strong shocks. Duration 30 seconds. ¹²)

- 1850, September 20, early in the morning. Locality of Maduin, Java. Powerful shock. Direction E-W. Duration of several seconds. ¹)
- - 21, early in the morning. Locality of Kediri. Two powerful shocks that were preceded by a subterranean rumble. Direction SE-NW, such that they seemed to originate from Gunung Kolut. Duration of several seconds. The walls of multiple houses in the localities Kediri, Bureau Kediri, and Ngrawa, Bureau Tulungagung received cracks. ²)
 - October 8, 3:30, 5:30, 5:45 and 11:30 a.m. Amboina. Each time a shock. With the first, a storm came up simultaneously. According to the information of a weather reporter the vibrations were accompanied by a subterranean rumble.
 - - 9 and 10 (no time indicated). Amboina. Repeated weak shocks.
 - - 11, 9:30 and 10:20 p.m. Amboina. Rather strong shocks. ³)
 - November 8, 5:45 p.m. Palembang, Sumatra. Several vertical shocks. ⁴)
 - - 28, 10 p.m. Ternate. Powerful shock of long duration. Eruptions of Pik had taken place on the 15th and 19th.
 - December 30 (no time indicated). Ternate. Weak shock. ⁵)
- 1851, January 24, around 5 p.m. Kediri, Locality of Kediri. Three rather powerful shocks in quick succession that were preceded by a subterranean rumble. Direction SE-NW, apparently coming from Gunung Kelut that had been active for several days. ⁶)
- - 30, 8 p.m. Blora, district of Karangdjati, Bureau Blora, Locality of Rembang. Weak shock. ⁷)

- 1851, February 4 (no time indicated). Amboina. Shock. ¹)
- - 11. Ternate. Quake according by A. PERRY, whose information is however based on an error. ²)
 - March 14, 6:05 p.m. Padang, west coast of Sumatra. Rather violent, wave-formed quake. Direction N-S. Duration half a minute. ³)

Around 7:15 p.m. Painan, 49.5 km. SSE from Padang, Locality of the west coast of Sumatra. Violent wave-formed quake that was preceded by a subterranean rumble. Duration of 3 minutes. ³)
 - - 15, 3:30 a.m. Painan. Weak, wave-formed quake.
 - May 4, around 3:30 p.m. Batavia. Several weak, apparently horizontal shocks. Duration of several seconds. ⁴) 9 a.m. Telokbetong in the Lampong Bay, south coast of Sumatra. **Flood wave that rose 5 feet** above the high water level of the previous day.
 - - 4, 3:08 p.m. Telokbetong. Horizontal vibrations. Direction SE-NW. Duration 5 minutes. The first shocks were of lesser strength than the latter. ⁵)
 - July 4, 1:05 a.m. Padang. Several vertical shocks that were followed by wave-formed movements. Duration 20 seconds. Direction SE-W (sic)
 - - 5, 9:08 p.m. Padang. Several shocks. ⁶)
 - - 7 (no time indicated). Amboina. A shock.
 - - 24 (no time indicated). Amboina. A shock. ⁷)

- 1851, August 27 (no time indicated). Ternate. Several shocks. ¹)
- - 29, 2:53 p.m. Batavia. Weak shocks. ²)
 - 8 p.m. Palembang, Sumatra. Weak shock. ³)
 - September 29, early in the morning. Locality of Banjumas. A weak shock in multiple localities. Direction SE-NW, but “somewhat vertical”. At the same time on board the ship “Jacqueline en Elise”, 14 nautical miles away from the coast of Nusa Kambangan on the south coast of Java, a powerful shock was felt. ⁴)
 - October 3, around 8 p.m. Locality of Banjumas. In multiple localities, a rather powerful shock. ⁵)
 - - 8 (no time indicated). Ternate. Several shocks. ⁶)
 - - 18 (no time indicated). Amboina. A shock. ⁷)
 - November 20, 11:55 p.m. Amboina, Hila, Larike and in any case, also in the remaining parts of the island of Amboina. Powerful, apparently vertical shock that, as far as strength, exceeded all others observed in the course of the year. At the same time, a shock was also felt on the islands Haruku and Saparua, lying to the east of Amboina.
 - - 21, ⁸) 12:05 a.m. – that is, 10 minutes after the above mentioned – a second, weaker shocks followed. ⁹)
 - December 29, 11:15 a.m. Padang, west coast of Sumatra. A shock. Direction N-S. Duration 5 seconds.
- 1852, January 7, 3 a.m. Padang. Rather powerful, wave-formed movements, alternating with shocks. ¹⁰)
- - 9, shortly after 6 p.m. Earthquake that spread from the Locality of Batavia, West Java, until South Sumatra. Batavia. Two rather powerful and several weak shocks. At 6:09 one of these brought the astronomic clock to a stop.

Direction apparently E-W. Buitenzorg. Rather powerful vibration. Tjaringin, Locality of Bantam, Java. Three very powerful shocks, along with four weak ones, that followed each other in quick succession and were accompanied by a subterranean rumble. Duration 2 minutes. Direction E-W.

Serang, Locality of Bantam. A rather powerful shock.

6:25 p.m. Telokbetong,, Locality of the Lampon districts, Sumatra. Powerful, horizontal shocks that repeated after a twice-occurring, short pause. Direction apparently SE-NW. Duration 3 minutes.

At 8 p.m. a sudden rising and then falling of the sea occurred, which repeated several times. Its height did not, however, exceed that of the highest high water level.

¹
)

1852, January 27, 6 a.m. Kediri, capital of the Locality of Kediri. Several shocks that were preceded by a subterranean rumble. The last was powerful. Direction SW-NE.

Around 7 a.m. Locality of Madiun. Several shocks. Direction E-W. In the Bureau Patjitan, they were followed by a muffled, subterranean noise. ²
)

- (no time indicated). Amboina. A shock. ³
)

- March 22, 9:30 p.m. Tjiamis, Bureau Tasikmalaja, Preanger Regency. Three rather powerful shocks in quick succession. Direction E-W. ⁴
)

- April 6, 10:30 p.m. Padang. Two shocks that were accompanied by a constant trembling of the ground. ⁵
)

- June 20, around 7:30 p.m. Pandang highland, West Sumatra. Earthquake that spread across the areas of Tanahdatar, XX and XIII Kotas, and perhaps yet farther inland. Following a subterranean, thunder-like rumble that lasted 2 seconds, and the passage of another minute, came a rather powerful, short shock. It lasted another 5-6 seconds before the ground again came to rest. Direction seemingly SSW-NNE. ⁶
)

- 1852, July 2, in the morning. Kediri, Locality of Kediri, Java.
Weak shock. Direction SE-NW. ¹)
- - 21, 5:25 p.m. Telokbetong, Lampong districts, Sumatra.
Weak shock.
 - - 23, 10:37 p.m. Telokbetong. Several horizontal
shocks within two minutes. Direction SW-NE. ²
 - 10:30 p.m. Palembang. A shock. ³)
 - - (no date indicated). Amboina. A shock. ⁴)
 - August 18, around 1:45 a.m. Banda Neira, Banda
Islands. Weak shock. W-E. ⁵)
 - September 12, around 10:45 p.m. Banjumas,
Locality of Banjumas. Several rather powerful
shocks. Direction NNW-SSE. ⁶)
 - - 16 (or on one of the following days). Kakas,
Minahassa, Locality of Menado, Celebes. Utmost
weak vibration. ⁷)
 - October 5, from 9 a.m. to 1 p.m. Lawajong on the north
coast of the island of Solor. A subterranean, thunder-like
groaning was again heard and felt. In the night from the 5th
to the 6th, a weak shock followed and an ash eruption of
Gunung Lobetole took place on the island of Lomblen. ⁸)
 - - 11 (no time indicated). Banda Neira. A somewhat
stronger shock than the one on 18 August occurred. ⁸)
 - - 13, around 11:30 a.m. Banjumas, Bureau Banjumas,
as well as the bureaus Tjilatjap and Bandjarnegara,
Locality of Banjumas. Rather powerful shock.
Around 12 noon. Kebumen, Bureau Kebumen. Four
shocks in succession. E-W.

- After 12 noon. Tjamis, Bureau. Tasikmalaja, Preanger Regency, Java. A powerful shock. Direction S-N. ¹)
- 1852, October 15, 7:50 p.m. Tegal, Bureau Tegal, ²) Locality of Pekalongan. Weak wave-formed quake that was also perceived in other areas of the Bureau. Direction. S-N. ³)
- - 15, around 8 p.m. Magelang, district and Bureau Magelang. Locality of Kedu. Weak shock. N-S.
 Around 7:45 p.m., Bureau Bandjarnegara and Tjilatjap, Locality of Banjumas. Shocks that exceeded in strength those of 13 October. Around 8 p.m. Purworedjo and Kutuwardjo, Bureau Purworedjo, Locality of Kedu. Powerful, not wave-formed vibrations. The shocks followed one another in a period of 2 seconds. In Kebumen, Bureau Kebumen, 9 shocks came in quick succession and cracks formed in the walls of several buildings.
 8:15 p.m. Tsjiamin, Bureau Tasikmalaja. Three shocks, of which the last was very powerful. ⁴)
 - - 17, 9:07:03 a.m. Buitenzorg. Weak shock. Direction S-N. ⁵)
 - - (no date indicated). Amboina. A shock. ⁶)
 - November 10 (no time indicated). Amboina. Shocks accompanied by powerful movement of the sea. ⁷)
 - - 11, early in the morning. Singkel, west coast of Atjeh and Sibolga, Locality of Tapanuli, as well as at other points of the west coast of Sumatra, also on Nias. Earthquake. At 7 a.m.

a seaquake was perceived 3 miles away from Gunung Sitoli on Nias. ¹) 7 a.m. Padang, Sumatra's west coast. A shock.

²)

1852, November 16, 7:40 a.m. Banda Neira and other islands of the Banda group. Earthquake that a seaquake followed at 8 a.m. ³)

- 19 (no time indicated). Amboina. Weak shocks again, which can be considered as forerunners of the violent quake of the 26th. ⁴)

- 25, 10:30 a.m., 4 and 6 p.m. Labuha, island of Batjan. Each time a shock attended by a subterranean rumble. ⁵)

- 26, 6:45 a.m. Surabaya. A weak shock. Direction NW-SE. In Semarang, as well as in Pasuruan a weak shock was likewise felt. Danau Klindungan, also known as the Lake of Grati, in the district of Grati, Bureau and Locality of Pasuruan, was set in motion. Finally, a weak shock was observed also in Sumenep on the island of Madura. ⁶) 4:30, 7, 10, 10:30 a.m. and 6:30 p.m. Labuha, island of Batjan. Each time a strong shock; the most powerful among them occurred on the days from the 25th-28th. The flag pole and the trees swayed to and fro. A flood wave was not seen. ⁷)

7:50 a.m. Banda Islands. Powerful vertical shocks that, waxing in strength, soon transformed into a

motion directed NW-SE, of 5 a minute duration. Already at the first shock, the **majority of the residences on Banda Neira were transformed to a rubble heap, but even those that remained standing had become uninhabitable due to the numerous cracks.** A part of Papenberg, upon which the signal station was located, fell away. All along the beach numerous fissures formed. Similar devastations were caused on Lonthor [Banda Major] as well. Barely had the ground been calm for a quarter of an hour when a **flood wave crashed in.** The bay was quickly filled with water, and then just as quickly emptied, such that for a time it appeared to be nothing but a narrow river. At 10 o'clock the tides increased in force and Banda Neira and Lonthor were **thrice poured upon by breakers** that had originated in Zonnegat and in the Lonthor Sound. They reached the hill upon which Fort Belgica is built on Banda Neira, and on Lonthor, the foot of the mountains. The difference between the highest and the lowest water level was 26 rh. Feet [8.2 m]. On the north coast of Banda Neira, as well as on the south coast of Lonthor, no disturbances of the sea level were manifest. During the quake, a cannonade-like rumble was heard. In the course of the day, 9 further shocks occurred on Banda Neira, of which the first and the fifth were rather powerful.

1852, November 26. On the islands of Rosengain and Pulu Ai, the quake was also forcefully manifest. On the latter, the flood wave reached only a few feet above the usual water level. Gunung Api, which forms an island of the same name, did not show the slightest manifestation of volcanic activity. ¹)4

1852, November 26, 7:30 a.m. Amboina. Violent, wave-formed quake. Duration 5 minutes. Direction ENE-WSW. Shortly after there came a **rising of the water in the bay**, which was followed by a fast outflow. The process repeated some twenty times until 2 o'clock in the afternoon. During the first 5 times, the sea (the low water level) climbed to 1.8 m, a height that exceeded the highest high water level by 20 cm. The earthquake and seaquake were also observed in Hila and Larike, but without causing any damages there.

7:30 a.m. Island of Saparua. After the earthquake, a **flood wave penetrated into the bay** of Saparua four times between 8:30 and 11 a.m., and reached a height of 3 m above the highest high water level. In the environs of the localities Saparua and Tijau, it thrust itself 405 feet (127.11 m) inland.

Beginning at 11 in the morning and until the late evening hours, the high and low tide motions continued in turns, though in lesser amounts.

On the northeast side, that of the beach area of Hatuana, as also at Porto on the west coast, at Kulor on the north coast, at the two villages of Siri-Sori that lie on the Bay of Saparua, only a weak flood wave was observed. In Boi, located on the same bay, a cannonade-like rumble coming from the SE was heard.

7:30 a.m. Island of Haruku. As a result of the vibrations, the walls of the Church of Aborn and the fort Zeelandia were cracked. A flood wave bear the localities Hulaliu, Oma, and Wasu was perceived; in the last-named village was at the same time a cannonade-like rumble. On the island of Nusalaut the earthquake had also been palpable and instances of flooding were noted at Amet, Akoon and Leinitu.

From the island of Buru was reported merely the fact that an earthquake accompanied by a flood wave had occurred, but without having caused damages.

These phenomena manifest themselves in a violent manner on the island of Ceram, at least at the localities of Amabai and Wahai. 8 a.m. Ternate. Two shocks in quick succession.

1852, November 26. In the vicinity of the island of Ut (5°35'S, 132°59.5'E), Kei Islands. According to statements by the natives, **islets had arisen as a result of the quake**. It was shown through an investigation undertaken by Leut. z. See OUDRAAT on 15 May 1854, that one was almost circular and had a diameter of 250 m. It consisted of clay and on the surface were found several stones and fragments of iron ore and iron-manganese ore.¹)

The second newly formed island was too distant and not well enough known to the natives to have paid a visit. It is also noted that originally a third island had been visible, yet later disappeared.

As R. D. M. VERBEEK visited the first mentioned island in 1899, its Durchmesser was then no more than circa 50 m. It was at the time high tide, and at low tide rose circa .25 m above sea level.²) As for the second newly formed island, which was said to be located between “Tianda”⁸) and Kauwer [Tajando and Kaimer], VERBEEK supposed that this was the same spot where an island had already formed in 1649.⁴) Nothing further could be discovered concerning the third island.

- According to A. PERRY, the earthquake was also felt in Krawang, Bantam, Banjumas, Tegal, Pekalougan and Magelang on Java, as well as in the Lampong districts on Sumatra.⁶) This report, though, refers to the earthquake of 21 December reads the same as its printed report.⁷)

1852, November 27 to about December 3. Locality of Amboina. In the course of the week following 26 November, shocks were again perceived.

4:30, 9, 11 a.m. and 9:45 p.m. Labuha, island of Batjan. Each time a shock.

- 30. Banda Neira, Banda Islands. A powerful shock that was also felt on Amboina. ¹)
- December 21, 12:39 a.m. Telokbetong, Lampong districts, South Sumatra. Powerful horizontal shocks. SW-NE. Duration 3 minutes. The earthquake was preceded by a subterranean rumble. ²)

12:45 a.m. Serang and Tjaringin, Locality of Bantam. Repeated shocks. Duration 1.5 minutes.

Batavia. Violent wave-formed quake that was preceded by a subterranean rumble. Direction N-S, or according to another indication SW-NE.

Buitenzorg. Powerful vibration. Direction SSW-NNE. Duration 1.5 minutes.

Tjiandjur, Bureau of Tjiandjur, Preanger Regency. Shocks accompanied by a rolling rumble. Direction S-N.

Purwakarta, district of Sindangkasih, bureaus Krawang, Locality of Batavia. Vertical and horizontal shocks. Direction of the latter, WNW.

Cheribon and Indramaju, Locality of Cheribon. Shocks. Direction E-W.

Tegal, Bureau Tegal, Locality of Pekalongan. Several powerful shocks. Direction S-N. Duration about 2 minutes.

Semarang, Locality of Semarang. Weak shock. Direction SE-NW. Duration 15 seconds.

Magelang and Temanggung, Locality of Kedu. Quake. Duration 1 minute.

Purwokerto, Bureau Purwokerto, Locality of Banjumas. Constant powerful shocks.

Purbalingga, Bureau of Purbalingga, Locality of Banjumas. Weak shock.

Tjilatjap, Bureau Tjilatjap, Locality of Banjumas. Constant shocks.

Banjumas, Bureau and Locality of Banjumas.

Shocks accompanied by rumbling. Purwodedjo, at that time the capital of the Locality Bagelen, now of the Bureau

Purwodedjo, Locality of Kedu. Powerful shocks. ¹)

1852, December. 1 a.m. On the ship "A.J. KERR", captain GARDNER, at 9 48'S, 104 15'E, such a powerful shock was felt that it trembled for 3 minutes.

- - 22, 8:30 p.m. Banda Neira, Banda Islands. Very perceptible quake.
- - 23, 7:30 p.m. Banda Neira. Two rather powerful shocks in quick succession.
- - 24, between 2 and 2:30 p.m. Banda Neira. Two strong shocks. ³)
- - (no time indicated). Amboina together with the neighboring islands, likely Haruku, Saparua and Nusalaut. Two horizontal shocks in quick succession. Direction NW-SE. ⁴)
- - 24, 5:39 p.m. Telokbetong, Lampong districts, Sumatra. Weak shocks. ⁵)
- - 27 (no time indicated). Batavia. Powerful vibration lasting 2 minutes. ⁶) -- 28, 7:21 p.m. Telokbetong. Four horizontal shocks within two minutes. Direction WSW-ENE. ⁵)
- - 29, about 12:30 a.m. Banda Neira. Powerful wave-formed shock.
- - 30, 6:30 and about 11 a.m. Banda Neira. Each time a weak shock. Again, at 5 p.m. a strong shock. ⁷)

- 1852, December (no date), 8:30 a.m. Pulu Pinang [Penang]. Weak shock.¹)
- 1853, January 1, 8 a.m. Banda Neira. Weak shock.
- - 6, 7:30 a.m. Banda Neira. Weak shock.
 - - 7, 12:30 p.m. Banda Neira. Weak shock.
 - - 8-9 (no time indicated). Banda Neira. Multiple weak shocks within 24 hours, of which the last occurring were attended by a subterranean rumbling.
 - - 16, 6:30 a.m. Banda Neira. Subterranean rumbling, but no vibrations.
 - - 19, 2 p.m. Banda Neira. Weak shock.
 - - 23, 5:30 p.m. Banda Neira. Two powerful shocks in quick succession and attended by powerful subterranean rumbling. The garrison sick bay suffered further damages because of it.²)
 - - 27, around 2 p.m. Tjilatjap, Bureau Tjilatjap, Locality of Banjumas. Three weak shocks in direct succession. Direction E-W.³)
 - - (no date). Amboina. Two shocks.⁴)
 - February 4, 11:30 a.m. Bengkulen, Locality of Bengkulen, Sumatra. A shock.⁵)
 - - 7, 5:30 p.m. Labuha, island of Batjan, Locality of Ternate. Earthquake. Duration 6 minutes.
 - - 8, by night. Batand Puti Homestead, Supajang, Section of Solok.⁶) Padang highlands, Sumatra. Subterranean rumble that resembled a mighty cannonade. At the same time a landslide took place, through which the homestead was buried. **Of the 44 inhabitants, only 15 were able to save themselves** through a quick flight.⁷)
 - - 18, 10:07 p.m. Singkel, Abteiling West coast of Atjeh, Sumatra. Weak shock.⁸)

1853, February 28, several minutes after 2 a.m. Menado, Minahassa, Celebes. A vertical shock.

- March 19, 5:30 a.m. Menado. Several horizontal shocks. ¹)
- April 1, 12 noon. Banda Neira. A weak shock.
- - 3, 1 p.m. Banda Neira. A weak shock.
- - 6, 3:30 p.m. Banda Neira. Rather long-lasting horizontal shock.
- - 7, 4 p.m. Banda Neira. Weak shock.
- - 11, 7 p.m. Banda Neira. Weak shock. ²)
- - 11-12, by night. Simpang, Surabaya. Weak shock. ³)
- - 12, 4 a.m. Amboina. Rather powerful shock. Direction E-W. Duration half a minutes. ⁴) 4:30 a.m. Hila and Larike on the northwest coast of Amboina. Powerful shock. S-N. Duration 45 seconds.
- - 12-13, by night. Simpang, Surabaya. Weak shocks. ³)
- - 13 (no time indicated). Amboina. A shock.
- - 16 (no time indicated) Amboina. A shock.
- - 21, 5:30 and 8:30 p.m. Banda Neira. Each time a weak shock. ⁵)
- May 7, 12:15 p.m. Singkel, Bureau Probolinggo, ⁷) Locality of Pasuruan. Weak shock. ⁸)
- - 16, 3:30 a.m. ⁹) Singkel. A rather powerful shock. ¹⁰)
- - 18, 3 a.m. Singkel. A shock. ¹¹)
- - 24, 5:30 p.m. Menado, Minahassa, Celebes. Three weak shocks.

- 1853, May (no date indicated). Banda Neira. Repeated weak shocks.¹)
- June 14, 2 p.m. Kroe, Bureau Kroe, Locality of Bengkulen, Sumatra. Heavy storm accompanied by strong shocks.²)
 - - 15, around 3:15 a.m. Telokbetong, Lampong districts, Sumatra. Heavy wind accompanied by 4 shocks in quick succession. Direction NW-SE. Duration about 30 seconds.³)
 - - 19, 3:49 a.m. Menado, Minahassa, Celebes. Powerful horizontal shocks. Direction E-W. Duration $\frac{3}{4}$ minute.
 - - (no date indicated). Banda Neira. Repeated weak shocks.
 - July 1, 3:30 a.m. Banda Neira. Powerful shock transforming into a weak wave-formed movement that increased in strength. At 4:30 a.m. another weak shock occurred.⁴)
 - - 3, 6:30 a.m. Bengkulen, Locality of Bengkulen, Sumatra. A shock. Direction SE-NW.
 - - 9, 6:30 a.m. Bengkulen. A shock. Direction SE-NW.⁵)
 - - 19 (no time indicated). Ternate. A rather strong shock.⁶)
 - August 16, 11:30 p.m. Bengkulen. A shock.⁷)
 - - 21, 3:50 and 4 p.m. Besuki, district of Besuki, Bureau Bondowoso, Locality of Besuki. Each time a shock, of which the first persisted several seconds. Direction S-N.⁸)
 - September 3-4, by night. Menado. Weak shock.

1853, September 4, 2 p.m. Menado. Two powerful shocks.

6 a.m. Banda Neira. A weak horizontal shock. ¹)

2:10 p.m. Singkel, Bureau West coast of Atjeh,
Sumatra. Weak shock.

- 5, 10:30 p.m. Singkel. A strong shock. ²)

- 7, 10 a.m. Singkel. A shock. ³)

- 8, 5 p.m. Singkel. A weak shock. ⁴)

- 9, 3 a.m. Singkel. A shock. ³)

- 30 (no time indicated). Banda Neira. A horizontal shock.
Direction NWSE.

- October 1 (no time indicated). Banda Neira. A weak
shock. Gunung Api smoked more heavily than usual
during October. ⁵)

- 11, around 10:45 p.m. Padang, west coast of
Sumatra. Rather violent earthquake that began with a
strong subterranean rumble. Duration 57 seconds. ⁶)
p.m. Bengkulu, Locality of Bengkulu. Quake. Duration
seconds. ⁷)

11:30 p.m. Telokbetong, Lampong districts. Two
horizontal shocks. Direction E-W. ⁸)

11 p.m. On board the clipper "Sea Serpent", as
the ship was 200 nautical miles away from Java in the
Indian Ocean, ⁹) a vibration attended by a muffled
rumbling. Half a minute later

- A second shock occurred, this time in accompaniment of a hissing noise.¹)
- 1853, October 14 (no time indicated). Banda Neira, Banda Islands. A weak shock.
- - 19 (no time indicated). Banda Neira. A weak shock.²)
 - - 28, around 6:45 a.m. Bureau Galuh, which now belongs to Bureau Tasikmalaja (Preanger Regency), at that time to the Locality of Cheribon. Two powerful shocks. The movement was a “twisting and rocking” one. Direction SW-NE. In several places the quake was accompanied by a thunder-like rumble.
 - November 1-2, by night. Bureau Galuh. Two shocks, of which the last was rather powerful and also wave-formed. Direction SW-NE.
 - - 2, around 4 a.m. Bureau Galuh. A weak shock.³)
 - - 8 (no time indication). Banda Neira. Two vertical shocks accompanied by a subterranean rumble. Duration 6 seconds. The noise repeated again during the following three days.⁴)
 - - 10, 11 o'clock. As the ship “Albrecht Beyling”, Captain K. VAN DEN ERVE, was located at 7° S, 100° 38' E, a powerful shock was felt and simultaneously a rattling noise. Duration of the vibration circa 2 minutes.⁵)
 - - 22, (no time indicated). Banda Neira. A weak shock.⁶)
 - - 28, 5:30 p.m. Bengkulen, Locality of Bengkulen, Sumatra. Shock. Direction SE-NW. Duration 20 seconds.⁷)

- 1853, November 30, around 2 a.m. Abteuilung Galuhm, at that time Locality of Cheribon. Multiple shocks, wave-formed. Direction SW-NE. Duration 10 seconds. ¹)
- December 10 (no time indicated). Banda Neira, Banda Islands. Several horizontal shocks.
 - - 30-31, by night. Amboina. A weak shock. ²) Tjiamis, Bureau Tasikinalaja, Prean Regency. In the course of the year, 6 quakes. The date of 4 of them is known, namely 28 October, 1-2 November, by night, 2 and 30 November. ³)
 - (no date). Sintang, Bureau Sintang, West Division of Borneo. According to the natives, an earthquake had taken place within the course of the year. ⁴)
- 1854, January 2, 3, 4 and 5. On the islands of Haruku and Sapparua, east of Amboina. Rather powerful shocks that were accompanied by subterranean rumbling. Direction SE-NW. Following the first shock there was a not particularly **strong flood wave**, though it was not noticed on Amboina.
- - 8 (no time indicated). Banda Neira. Horizontal shocks attended by a subterranean rumble that seemed to hail from a distance,
 - - 19 (no time indicated). Ternate. Weak shock.
 - - 26 (no time indicated). Banda Neira. Horizontal shocks accompanied by a subterranean rumble. ⁵)
 - - (no date indicated). Sibolga, Bureau Sibolga and Batang-Toru districts, Locality of Tapanuli, Sumatra. In the course of the month 5 earthquakes took place. ⁶)
 - February 2 (no time indicated). Ternate. Weak shock. ⁷)

- 1854, March 30, around 2 a.m. Menado and Kema, Minahassa, Celebes. Rather powerful shock. ¹)
- April 19 (no time indicated). Banda Neira. Powerful shocks. ²)
 - - 20 (no time indicated). Menado and Amurang, Minahassa, Celebes. Rather powerful shocks. Direction NW-SE and N-S.
 - - 28 (no time indicated). Menado and Amurang. Rather powerful shocks, resembling those on the 20th.
 - May, during the first days of the month. Banda Neira. Powerful shocks. ³)
 - - 3, 9:30 a.m. Kediri, Locality of Kediri. The quake began with a weak vibration and ended with a rather powerful shock. Direction NE-SW. In Prigi, district of Kampak, Bureau Trenggalek, located on the south coast, a coffee pitcher suffered damages as a result of the earthquake. 9 a.m. Probolinggo, district and Bureau Probolinggo, Locality of Pasuruan and Pradjekan, district of Pradjekan, Bureau Panarukan, Locality of Besuki. Several shocks. Direction SE-NW. ⁴)
 - - 4, 11:30 a.m. Ponorogo, district and Bureau Tasikmalaja and Garut, district of Sutji, Bureau Limbangan, Preanger Regency. A rather powerful shock. ⁶)
 - - (no date indicated). Sibolga, Bureau Sibolga, Locality of Tapanuli. In the course of the month two earthquakes were observed. ⁷)
 - June 14, 8 p.m. Locality of Kediri. Rather powerful shock. Direction E-W. ⁸)

- 1854, June 27, 3:30 and 9:10 a.m. Bengkulen, Locality of Bengkulen, Sumatra. Each time a shock. ¹) At the same time on board the schooner "Slyph", lying in the roadstead of Berahu on the northwest side of the island of Enggano (5 18'S, 102 7.5'E), there was felt a short shock, then 6 shocks accompanied by a subterranean rumble. In the course of the day, that is, until 3 p.m., another 5 shocks were observed. On land, trees had fallen and the forest began to move as if a whirlwind were passing through it. ²)
- 29, 3:04 p.m. Bengkulen. Powerful vibrations. Duration 3 minutes. Direction E-W. ³) Around 1 p.m. (sic). Padang. Rather powerful shock. Direction N-S. Duration of several seconds. ⁴)
 - July 12, in the evening. Ponorogo, district and Bureau of Ponorogo, Locality of Madiun. Weak shock. ⁵)
 - - (no date indicated). Amboina. A shock. ⁶)
 - August 20, 10-10:34 a.m. Fort Erfprins, Surabaya. Weak quake. Direction NE-SW. ⁷)
 - - 21. Island of Timor. Earthquake. ⁸)
 - - 29 (no time indicated). Padang, Bureau Padang and Fort de Kock, Bureau Agam, Locality of the West Coast of Sumatra. Rather powerful shock. Heavy pillars of smoke had been rising from Gunung Merapi for several days, and had brought ash rain. On the day of the earthquake, though, there was no eruption.
 - - (no date indicated). Ternate. Multiple shocks accompanied by subterranean rumbling during the course of the month. Also

on the island of Batjan, a rather powerful earthquake is supposed to have been observed. ¹)

- 1854, September 10, around midnight. Ponorogo. Weak shock. ²)
- - 24, 1 p.m. and 12 at night. Bantarkawung, district of Salem, Bureau Brebes, ³) Locality of Pekalongan. Each time a weak shock ⁴)
 - - 27, in the evening. Ternate. **Flood wave** that caused no damages.
 - October 8, 11 a.m. Amurang, Minahassa, Celebes. Two powerful shocks. ⁵)
 - - 12, around 5:30 p.m. Purworedjo, district and Bureau Purworedjo and Wonosobo, Locality of Kedu. Powerful shock. Direction NE-SW. ⁶)
 - - , in the evening. Ponorogo, district and Bureau Ponorogo, Locality of Madiun. Weak shock. ⁷)
 - - 18, 7:30 p.m. Tjikadjang, district of Batuwangi, Bureau Limbangan, Preanger Regency. Two powerful shocks. ⁸)
 - - 22 (no time indicated). Padang, west coast of Sumatra. Several weak shocks. ⁹)
 - - 28, noon. Buitenzorg, Bureau Buitenzorg, Locality of Batavia. A weak shock. ¹⁰)
 - - (no date indicated). Amboina. In the course of the month one shock. ¹¹)
 - November 3, around 10 p.m. Ratahan, Bureau Tondano, Minahassa, Celebes. Powerful shocks.
 - - 6, around 8 a.m. Padang. A weak shock.
 - - 18 (no time indicated). Amboina. Several weak shocks.

- 1854, November 24, 1:30 p.m. Ternate. Violent quake. The direction of the shocks was initially vertical, then transitioning to a horizontal. Shocks were also felt on board the ships in the roadstead. Around 12:30 p.m. All of Minahassa was shaken continually for some two minutes. No time indicated. Amboina. Several weak shocks. ¹)
- Around 1:30 p.m. Labuha, island of Batjan. Three powerful shocks. Direction NE-SW. The first two shocks lasted 40-50 seconds, the third a while longer.
- - 25, around 4 and 7 p.m. Labuha, island of Batjan. Each time a shock. Direction NE-SW. The first lasted a good 40 seconds, the second was of a shorter duration.
 - - 26, around 2:30, 5 and around 10 a.m. Labuha. Each time a weak shock. ²)
 - - (no date indicated). Sibolga, Bureau Sibolga, Locality of Tapanuli, Sumatra. In the course of the month Erschueterungen were again perceived. ³)
 - December (no date indicated). Banda Neira, Banda Islands. Multiple powerful shocks that occasioned damages to multiple buildings. ⁴)
 - - (no date indicated). Amboina. A shock. ⁵)
 - (circa). Sambas, West Bureau of Borneo. According to information from the natives, an earthquake was to have taken place in 1854. ⁶)
- 1855, January 20, 4:15 a.m. Buitenzorg. A shock in the direction N-S was quickly followed by a powerful vibration in WSW-ENE. After a few seconds its force gradually diminished. Total duration 25 seconds. ⁸)

- 1855, February 16, 3:30 p.m. Srengat, district of Srengat, Bureau Blitar, Locality of Kediri, Java. Shock.
- - 17, 3:30 p.m. Sisir (also called Batu), district of Penanggungan, Bureau Malang, Locality of Pasuruan. Shock. Direction SSW-NNE. ¹)
 - - 26, 7:30 p.m. Island of Nias, not far from the west coast of Sumatra. Rather strong, wave-formed quake. Direction SE-NW. Duration 30 seconds. A half minute later a repetition took place, but this time the direction was NE-SW and had a duration of only 10 seconds. 10 p.m. a wave-formed vibration occurred again. Direction S-N. Duration 25 seconds.
 - March 6, 5:30 p.m. Island of Nias. Weak shock. S-N. Duration 30 seconds. ²) -- 11, 7:30 p.m. ³) Island of Nias. Weak shock, weaker as the one of the 6th. Direction S-N. Duration 17 seconds.
 - - 12 (no time indicated). Banda Neira. Weak shock. ⁴)
 - - 13, 1 in the evening. ⁵) Island of Nias. Rather powerful shocks. E-W. Duration 20 seconds. ⁶)
 - - 15 (no time indicated). Gorontalo on the Golf of Tomini, Bureau Gorontalo, Locality of Menado and Kema, Minahassa, Celebes. Rather powerful shock.
 - - 21, around 10:30 a.m. Menado and Kema, Minahassa, Celebes. Rather powerful shocks.
 - - 23 (no time indicated). Gorontalo. Rather powerful shock. ⁷)
 - - 31, around 1:45 a.m. Batavia. Two rather powerful shocks. S-N. ⁸) The vibrations were likewise felt

in the Locality of Bantam and in the Lampong districts on Sumatra.¹)

- 1855, April 3 (no time indicated). Gorontalo. Rather powerful and long-lasting vibrations. The movement was initially horizontal and transitioned gradually to vertical.
- - 21 (no time indicated). Banda Neira. Powerful shock. Direction E-W.
 - - 25 in the morning. Ternate. The shocks repeated with intervals until 2 p.m. Their direction was, as far as could be determined, E-W. Multiple buildings suffered damages. On board the ships in the roadstead the shocks were also felt. The quake was perceived on Halmahera at the same time and the fort at Dodingga was damaged so badly that it had to be abandoned.²)
 - May 4, 4:30 p.m. Island of Nias. Rather powerful shocks. SE-NW. Duration 28 seconds.³)
 - - 12, in the morning. Amboina. Powerful shock.⁴)
 - June 6, 2:30 p.m. Island of Nias. Weak shocks. SE-NW. Duration 12 seconds.⁵)
 - - 12 (circa),⁶) in the afternoon. Srengat, district of Srengat, Bureau Blitar, Locality of Kediri. Several shocks of lesser strength than those of 26 June.
 - - 12) 7:15 a.m. Buitenzorg. A shock.⁶)
 - - 14, 11 a.m. and 5 p.m. Ternate. Each time a shock, also perceived at Dodingga on Halmahera. Additional shocks followed with intervals during the night. Direction, as far as perceptible, N-S; many were

vertical. The quake was of a force that hadn't been seen since 1840.¹)

9 p.m. Nanga Rama, Territory Manggarai, on the south coast of Flores. Occurrence of a **flood wave** during calm weather. It was so strong as the first wave hit that the water penetrated into the schooner lying in the bay. As the second wave hit the anchor chain broke and the ship was set upon the beach where it was made to rubble by the following wave.²)

1855, June 21, 10a.m. and 3 p.m. Kema, Minahassa, Celebes. Three shocks.

- - 24, 8 a.m. Menado, Minahassa. A shock.³)
- June 26, 1 a.m. Tjilatjap, Bureau Tjilatjap, Locality of Banjumas. Two shocks, between which was a pause of 20 seconds. Direction SE-NW. Around 1 a.m. Srengat, district of Srengat, Bureau Blitar, Locality of Kediri. Twice occurring,⁴ very powerful vibrations. N-S. Duration 4-5 minutes.)

By night. Buitenzorg. A shock.⁵)

- - 27, 10 a.m. Amurang, Bureau Amurang, Minahassa, Celebes. Weak shock.⁶)
- July 4, 11 a.m. and 9:30 p.m.⁷ Banda Neira, Banda Islands. Each time a shock. E-W.)

1855, July 7, in the morning. Padang, west coast of Sumatra.

Rather powerful shocks. ¹)

- - 13, 5 p.m. Island of Nias. Weak shock. SE-NW. Duration 25 seconds. ²)

- - 14, 12:30 and 1 a.m. Banda Neira. Powerful shock that was followed by a second at 1 a.m., which, however, caused only a wave-formed movement. Direction E-W. ³)

4 p.m. Ternate. Very violent quake that began with vertical shocks and ended with horizontal ones. The vibration lasted two minutes and **caused great devastation, damaging all buildings badly. The earthquake manifest itself more strongly on the neighboring island of Tidore where 25 houses collapsed and 24 persons departed this life.** Moreover, 8 persons found their death in the rocks falling from Mount Dojado. The quake in Dodingga on Halmahera was allegedly of the same force. Ternate's Pik showed no signs of life during the occurrence. ⁴)

- - 20, 9 p.m. Island of Nias. Weak, wave-formed vibration. Direction S-N. Duration 20 seconds. ⁵)

- - 29, 10 a.m. Bureau Sukapura and Sumedang, Preanger Regency. Vertical shocks.

- - 30, 5 p.m. Bureau Sukapura and Sumedang. Quake that was allegedly quite violent in Tjikadjang, district of Batuwangi, Bureau Limbangan, where it was manifest through vertical shocks. ⁶)

In the morning. Padang, west coast of Sumatra. Several shocks. ⁷)

No time indicated. Pajakombo [Pajokumbuh], Bureau: L Koto, Padang highlands, West Sumatra. A powerful shock. ⁸)

- - 31, 9 a.m. Bureau Sumedang and Sukapura, Preanger Regency. Vertical shocks.

- 1855, August 3, noon. bureaus Sumedang and Sukapura. Powerful vertical shocks whose duration varied between 10 and 20 seconds. As to strength, they exceeded those of 29-31 July.
- - 9, in the evening. In the entire Locality of Cheribon, two shocks in quick succession were felt. Direction S-N. ¹)
 - - 11 (no time indicated). Surakarta, Locality of Surakarta, Java. Weak shocks.
 - - 16 (no time indicated). Surakarta. Weak shocks. ²)
 - September 6 (no time indicated). Pajakombo, Bureau L Koto, Padang highlands, West Sumatra. Powerful shock. ³)
 - - 7, in the evening. Banda Neira, Banda Islands. Weak shock. E-W. ⁴)
 - - 12, 1 p.m. ⁵) Menado, Minahassa, Celebes. Weak shock. ⁶)
 - - 16 (no time indicated). Ternate. A shock. In June, July and August and in the first half of September vibrations were noticed, about which there exists no greater detail. ⁷)
 - - 18, in the evening. Banda Neira. Weak shock. W-E. ⁸)
 - - 20, 4 p.m. Island of Nias. Weak shocks. Direction SE-NW. Duration 12 seconds. ⁹)
 - October, beginning of the month. Fort de Kock, Bureau Agam, Padang highlands. Powerful shocks again.

From the towering Gunung Merapi in the SE there a lively activity also developed.¹)

- 1855, October 4, noon. Amboina. A weak shock.²)
- - 15 (no time indicated). Banda Neira, Banda Islands. A weak shock.³)
 - (no date indicated). Ternate. Weak shocks now and again in the course of the month.⁴)
 - November 6, 9:30 a.m. Banda Neira. Vertical shocks that a wave-formed quake of 3 second duration followed.⁵)
 - - 8, around 1:15 p.m. Magelang, district and Bureau of Magelang, Locality of Kedu. Rather powerful, horizontal shock. Direction NE-SW. The vibration was a stronger one in the Bureau Probolinggo, at that time still belonging to the district of Muntilah, near the smoking Gunung Merapi.
 - - 9,⁶) 1:30 p.m. Surakarta, Locality of Surakarta, Java. Weak shock E-W. Duration of several seconds.
 - - 16, early in the morning. Ternate. Two weak shocks.
 - - 17, 19 and 21 (no time indicated). Menado, Minahassa, Celebes. Weak shock.
 - - 4, 1 a.m. Menado. A weak shock.⁸)
 - - 5, 7 a.m. Gorontalo on the Gulf of Tomini, Locality of Menado, Celebes. Two rather powerful shocks in quick succession. Cracks formed in the walls of the fort.⁹)

- 1855, December 7, 6:30 and 8 a.m. Menado. Each time a weak shock.
- - 10, 4 p.m. Menado. A weak shock.
 - - 20, around 4 a.m. Menado. A weak shock. ¹)
 - 11:30 a.m. Buitenzorg. A weak shock. ²)
 - - 27, 9 p.m. Menado. Weak shocks. ³)
 - - 29 and 30. Banda Neira. A subterranean rumble was heard coming from Gunung Api. ⁴)
 - (no date indicated) Singkel, Bureau West coast of Atjeh, Sumatra. In the course of the year 10 weak shocks were felt. ⁵) Labuha, island of Batjan. Eleven weak shocks in the course of the year. ⁶)
 - End of the year, resp., 1856, beginning of January. Bureau Ajer Bangis [Air Bangis] and Rau [Rao], Bureau Lubuksikaping, Padanger lowlands, West Sumatra. Continual storms, tempests and earthquakes. ⁷)
- 1856, January 3, around 11 a.m. Menado, Minahassa, Celebes. Weak shock.
- - 5, around 7 p.m. Menado. Weak shock.
 - - 10, around 4 p.m. Menado. Weak shock. ⁸)
 - 2 p.m. Pandang, west coast of Sumatra. A rather powerful shock. ⁹)
 - - 11, around 2 a.m. Menado. An unusually powerful shock. ¹⁰)
 - By night. Ternate. A weak shock. ¹¹)
 - - 13, 5:15 p.m. Ternate. Powerful shock. ¹¹)
 - - 18, around 8, at 10:30 a.m., 1 and around 12 at night. Menado. Each time a weak shock.

Around 11 a.m. Banda Neira. A very weak shock.
Direction N-S.¹

- (No time indicated). Padang. A weak shock.²) The quake reported from Padang Pandjang, Bureau Batipuh and Priaman, Padang highlands in January with no date indicated may also have taken place on this day.³)

1856, January 19, in the evening. Ternate. Weak shock.⁴)

Around 6:30 a.m. Batavia. Weak shock.

6:15 a.m. Semarang, Locality of Semarang, Java. Rather powerful shock. Direction NE-SW. A large crack formed in the walls of the fort.

Around 6 a.m. Magelang and other localities of the Residenschaft Madiun. A shock. Direction S-N. Duration circa 8 seconds.

6 a.m. Kediri, Locality of Kediri. Powerful shock, apparently originating from the direction of Gunung Kelut. Direction SE-NW.

- - 20, from 11 p.m. to January 21, 2 a.m. Manado. Continual, not powerful shocks.⁵)
- - 25, around 5 a.m. Manado. Weak shock.
- - 28, 10 a.m. Manado. Weak shock.⁶)

6:30 p.m. Bengkulu. Locality of Bengkulu Sumatra. Rather violent, wave-formed quake. Direction E-W. Duration 30 seconds.⁷)

- - 29/30, by night. Banda Neira. Subterranean rumble hailing from Gunung Api.
- - 30, around 5 p.m. Banda Neira. Rumbling again.⁸)

From Gunung Api climbed heavy clouds of smoke.⁸)

- 1856, January (no date indicated). Gorontalo on the Tomini Gulf, Locality of Manado, Celebes. In the course of the month a shock was twice observed. ¹)
- Island of Sangi, Sangi Islands, north of Celebes. Several months before the eruption of Mount Awu (2 March) an insignificant vibration was felt, which, however, was not noted because of the frequency with which such occurs on the island. 2)
- February 5, by night. Buleleng on the north coast of Bali. ³ Two weak shocks.)
 - - 7 (no time indicated). Manado. Weak shock.
 - - 11, around 11:30 p.m. Manado. Powerful and long lasting vibration.
 - - 12, 11 p.m. Ternate. Weak ground movement. Duration 1 minute.
 - - 14 (no time indicated). Manado. Weak shock.
 - - 20, around 1:30 a.m. Banda Neira. Several shocks that were followed by a gentle ground movement, which lasted 4 seconds. Direction E-W.
 - - 29, 10:45 p.m. Ternate. Weak shock. ⁴)
 - March 2, in the evening between 7 and 8. Island of Sangi. Uncannily powerful blow that was directly followed by an eruption of Mount Awu. **The sea also rose up and a flood wave penetrated far inland.** ⁵)
 - - 7, around 11:30 p.m. Ternate. Weak shock. ⁶)
 - - 17, afternoon. Padang, west coast of Sumatra. Weak shock. ⁷)
 - - (no date indicated). Dore on the Geelvink-Busen, north coast of New Guinea. "As the Sangi Islands were beleaguered by serious eruptions in 1855 (must mean 1856),

strong earthquakes also took place here, forcing the population to flee into the forests.”¹)

1856, May 10 (no time indicated). Amboina. Two rather powerful shocks.

- - 26, around 8 p.m. Manado, North Celebes. A rather long lasting, powerful vibration.
8:30 p.m. Ternate. Weak shocks.
- - 28, 4 a.m. Ternate. Weak shocks.²) -- 30, afternoon. Gorotalo on the Golf of Tomini, Locality of Manado, Celebes. Rather powerful shock.³)
- June 1, around 9:30 a.m. Tuban, district of Rembes, Bureau Tuban, and Bodjonegara, district and Bureau Bodjonegara, Locality of Rembang (East Java). Three rather powerful shocks with intervals of 10 seconds each. Direction SW-NE.⁴)
- - 16, around 1:30 a.m. Lampong districts, Sumatra. Several weak shocks.⁵)
- - 26, around 5 p.m. Manado, Minahassa, Celebes. Shock.⁶)
- - 28, around 5:30 p.m. Bengkulu, Locality of Benkulen, Sumatra. Rather violent, wave-formed quake. Direction E-W. Duration 20 seconds.⁷)
- 29/30, by night. Banda Neira. Rather powerful shock that was of a short duration. Direction S-N.⁸)
- July 4, 10 p.m. Manado. A shock.⁹)

- 1856, July, 2 and 3 a.m. Solor Islands. Weak shocks that lasted 6-7 seconds each time. Direction N-S. ¹)
- - 23, 10:30 p.m. Menado, North Celebes. A shock. 11 p.m. Ternate. A weak shock.
 - - 24, around 8:30 a.m. Menado. A shock. ²)
 - - 25 (no time indicated). Lubuhan Tereng [Labuan Tring], West Lombok. Quake. At the same time, a heavy surge was noticed on the beach about 20 km away in Ampenan. ³)
 - - 26, around 8:30 a.m. Menado. An especially powerful shock. ⁴) No time indicated. Besuki, Locality of Besuki (E. Java). A powerful shock. ⁵)
 - 29, 2:30 p.m. Ternate. A weak shock.
 - 30, 2 p.m. Ternate. A weak shock. ⁶)
 - August 4, 5 and 6 Menado, weak shock 7)
 - - 6 and 7 (no time indicated). Gorontalo, Locality of Menado. Powerful shocks. The walls of the fort suffered heavy damages. ⁸)
 - September 9, by night. Tosari, district of Tengger, Bureau and Locality of Pasuruan. Weak shock. On the 10th a violent eruption on the part of Gunung Bromo in the Tengger Mountains occurred. ⁹)
 - - 18 (no time indicated). Menado. Multiple, rather powerful shocks. ¹⁰)
 - - 21 (no time indicated). Buleleng, north coast of Bali. A rather powerful shock. Direction NW-SE. ¹¹)

- 1856, September 23 (no time indicated) Menado, north Celebes. Multiple rather powerful shocks. ¹) -- 24 (no time indicated). Pandang, west coast of Sumatra. Rather powerful shocks.
- - 29 (no time indicated). Pandang. Rather powerful shocks. In the walls of several buildings, cracks were formed. ²)
 2:30 a.m. Pajakombo [Pajokumbuh], Bureau L Koto, Padang highlands. West Sumatra. A rather powerful shock. ³)
 - October 7/8, by night. In a part of the Locality of Kediri and in the Bureau Malang of the Locality of Pasuruan. Thrice there occurred vibrations, of which those concurrent with the second occurring shock were rather powerful and lasted long as well. ⁴)
 - - 10, around 11:30 p.m. Banda Neira, Banda Islands. Three weak, vertical shocks.
 - - 24, 9:30 p.m. Menado. Weak shock. ⁵)
 - - 26, 11:10 p.m. Tjikadjang, district of Batuwangi, Bureau Limbangu, ⁶) Padang highlands, West Sumatra. A short horizontal shock. ⁸)
 - November 9, 6:30 p.m. Ternate. A weak shock.

- 1856, November 12, in the morning. Banda Neira and Lonthor [Great Banda], Banda Islands. Three horizontal shocks through which doors and windows were made to shake. Direction W-E. A muffled rumble was heard from Gunung Api.¹)
- December 16, around 1 a.m. Tegalwaru, district of Tegalwaru, Bureau Krawang, Locality of Batavia.²) Three shocks in quick succession, while in Telokdjambe, district of Sumedangan, 23.5 km NNW away, the vibrations were barely extra.³)
 - (uncertain, but between 1856 and 1858 at any rate). Maclay Coast on Astrolabe Bay, Kaiser Wilhelms Land, New Guinea. According to the information of natives, the **village located between the delta of the rivers Kabenau and Kole⁴) was destroyed by an earthquake and the following flood wave.** As the event took place during the night, only few men along with two women were able to save themselves. They then founded a new village called Gumbu.⁵)
- 1857, January 11, around 11:30 p.m. Banda Neira. Short but powerful and vertical shock accompanied by a loud rumbling, apparently coming from Gunung. Api.
- - 16, around 4 a.m. Banda Neira. A weak shock. Direction N-S. Gunung Api showed especially heavy smoke.
 - - 22, 8 a.m. Menado. Several shocks.
 - - 23, around 4:30 p.m. Purworedjo, district and Bureau Purworedjo, Locality of Kedu.⁶) Short but powerful shock accompanied by a thunder-like rumble.⁷) Direction

E-W. ¹) Kebumen, district and Bureau Kebumen, Locality of Kedu, Java. A shock. ²)

3:30 p.m. ³) Madiun, Locality of Madiun. A weak shock. ⁴)

4:15 p.m. Locality of Kediri. Two rather powerful shocks following each other.

Direction S-N, resp. SE-NW. ⁵) 5:30 p.m.

On board the ship "Eva Johanna", captain S. van Boekhoven, a shock was felt at 8 S, 100

40'E in the Indian Ocean. ⁶)

1857, January 26, around 4:30 p.m. Ternate. Weak shock.

- - 27, around 9 p.m. Menado. Several shocks.
- February 6, around 9 p.m. Menado. Several shocks.
- - 8, around 1 p.m. Amboina. A weak shock.
- - 10, around 10 p.m. Ternate. A weak shock. ⁷)
- - 25, around 6:30 p.m. Gorontalo on the Golf of Tomini, Locality of Menado. A rather powerful shock. The walls of several buildings suffered damages. ⁸)
- (no date indicated). Labuha. Island of Batjan. In the course of the month a weak shock was observed. ⁹)
- March 2, shortly before 11:30 p.m. Banda Neira. Weak shock. Direction SW-NE.
- - 11, around 5:30 p.m. Banda Neira. A weak, hardly noticeable shock. Direction apparently W-E.

- 1857, March 21, around 1 a.m. Menado. Two very powerful shocks. Around 1:30 a.m. Ternate. A rather powerful shock. Direction SWNE. Duration about .5 minutes.
- April 6, 10:24 p.m. Banda Neira, Lonthor [Greater Banda], Pulu Ali, Rosengain, Pulu Run and Pulu Pisang, Banda Islands. Very powerful shock. Direction SW-NE. Doors slammed, clocks stood still and the hanging lamps swung. At the battery "Voorzigtigheid" a fissure formed of some 7 m in width, while the walls of multiple buildings were cracked. Several persons who were in the bay between Banda Neira and Lonthor, believed to have noticed a beam of light and at the same time a noise, such as makes an object falling into the water.
(around 10 a.m. (!) Gorontalo. A weak shock.²)
 - 17, few minutes after sundown. Rook Island [Umboi], not far from the coast of Kaiser Wilhelm Land, New Guinea. Three powerful horizontal shocks. Direction N-S. The first shock made the sea tremble. In the ground a fissure 3 feet in width formed, which began in the village on Lutherhafen [Porto San Isidore] and continued until the sea. Late in the night, another, insignificant vibration manifest itself.³)
 - 21, around 7 p.m. Menado. A strong shock, accompanied by a subterranean rumble. – Ternate. A weak shock. As a result of the quick movement, the direction could not be ascertained.
 - 26, 5:30 p.m. Dili, capitol of Portuguese Timor. A weak, horizontal shock Direction S-N. On the same evening in Oikusi, a Portuguese Enclave on the north coast, a powerful and long lasting vibration was perceived.
 - 29, before noon. Banda Neira. Weak shock Direction W-E.⁴)

1857, April (no date indicated). Labuha, Island of Batjan. Weak shock.¹)

- May 3, 11 a.m. Menado. Weak shock. Before noon. Weak shock.

- - 8, around 5:15 p.m. Banda Neira. Weak shock.²)

- - 13, around 10:30 a.m. Violent quake on the island of Timor. In Dilli, where the people were thrown to the ground, the vibration lasted as least 15 seconds. Direction S-N. **A collapse of a part of the walls of the fort. A flood wave penetrated into the Bay of Dilli four times** and achieved a height of 10 rh. feet [3.1 m]. On the sea beach fissures had formed in the ground. In Hera, 12 miles [12.3 km] to the east of Dilli, the quake occurred even more powerfully. The ground had sunk in many places and puddles of mud had been created.³) The vibrations in the inner parts of the Portuguese share of the island were also very strong, particularly in the environs of the villages Laklo, Lautem, Lale and Batu Grade. At the same time, there was an eruption of the mud volcano Bibiluto, through which the “Rainha de Viqueque” (Queen Viqueque) was also partially destroyed. At Likiso [Liquica] **a flood wave penetrated inland and flooded almost the entire village.**⁴)

Around 11:30 a.m. Amboina. A seaquake took place in the bay.⁵)

Before noon. Atapupu and Kupang, Dutch Timor. A weak shock.⁶)

Before noon. Pulu Kambing in the Ombai Strait, north of Dilli. Unusually violent quake. **The hill upon which Kampung Makdadi, sank; 23 men, 13 women and an undeterminable amount of children departed this life.** Further, there were many wounded. In various places, smoke and fire allegedly rose from the ground. ¹)

1857, May 14 (no time indicated). Atapupu. A weak shock. ²)
Dilli. Shocks.

- - 15, 16 and 17. Dilli. Shocks were also felt on these days. ³)

- - 24, 8:42 p.m. Padang, West coast of Sumatra. Two very powerful shocks, of which the first was a vertical one and the second, which followed directly, was horizontal. Direction W-E. The walls of several buildings cracked. ⁴)

- (no time indicated). Padang highland, West Sumatra. Powerful shocks. ⁵)

- - 27, around 7 p.m. Menado. Weak shock. ⁶)

Around 7 p.m. Gorontalo on the breast of Tomini, Celebes. Violent quake that commenced with short shocks and then transitioned to a wave-formed movement. Direction S-N. Isolated buildings suffered damages. ⁷)

In the evening. Ternate. Weak shock
Duration about 20 seconds.

- - 29, around 7 p.m. Menado. Weak shock. ⁸)
Around 7 p.m. Gorontalo. Powerful vibrations, as on 27 May. ⁹)

- - (no date indicated) Labuha, island of Batjan. In the course of the month weak shocks. ¹⁰)

- 1857, May until June. Dilli, Timor and Pulu Kambing near Dilli.
The shocks that commenced on 13 May repeated daily until the completion of this report (16 June).¹)
- July 15, 5 a.m. Besuki, Locality of Besuki. Powerful shock that was followed a quarter-hour later by a weaker one. Duration about a second. Direction N-S.²)
 - - 20, around 12:30 p.m. Gorontalo. Weak shock.³)
 - - 26, 8:30 p.m. Ternate. Weak wave-formed quake. Duration several seconds.
 - August 2 (no time indicated). Ternate. Weak shock.
 - - 8, 11:30 a.m. Kema, Minahassa, Celebes. Weak shock.⁴)
 - - 19 (no time indicated). Padang, west coast of Sumatra. Two rather powerful shocks.⁵)
 - - 30, 8:30 p.m. Menado. Minahassa, Celebes. Shocks – Kema. Weak shocks. – Gorontalo on the breast of Tomini, Locality of Menado. Strong shocks.
 - September 1, 3:30 p.m. Menado. Shocks.⁶)
 - - 15, 7:30 a.m. Ledok, district of Panolan, Bureau Blora, Locality of Rembang, Java. Three powerful shocks between which were intervals of 3 minutes each time.⁷)
 - October 6, around 8 a.m. Southern part of Minahassa, North Celebes, Weak shock.
 - - 22, around 3:30 a.m. Banda Neira. A weak, horizontal shock.⁸)
 - - 27, around midnight. Batavia. A weak shock. Direction N-S.⁹)
 - - 30, around 8:35 p.m. Samarinda, Subbureau Kutei, Locality of the south and east bureaus of Borneo. Two horizontal shocks in quick succession.¹⁰)

- 1857, October (no date indicated). Tanah Laut, Bureau Bandjermasin, Locality of the south and east bureaus of Borneo. Earthquake. ¹)
- November 11, around 10 a.m. Gorontalo. A shock. ²)
 - - 14 (no time indicated). Locality of Sumatra's west coast. Weak quake. In the gorge of Anei, on the way to Padangpandjang, Bureau Batipuh and Priamau, landslides took place.
 - - 17, 4:30 a.m. Menado and Kema, Minahassa. A shock. On the beach near Kema was **a flood wave that tore away multiple huts and trees.**
 - - 18, 6 and 9 a.m. Menado and Kema. Each time a shock. On the Kema beach, **a flood wave occurred again.**
 Around 4:30 a.m. Ternate. Weak shock. The groundswell on the beach reached a height that was unknown even to the oldest residents and also caused devastations.
 - - 19, around 10 a.m. and 7 p.m. Menado. Each time a shock.
 - - 23, 3 a.m. Menado. A shock. ³)
 - - 25, 5 a.m. Gorontalo. A shock.
 - - 26, 9:47 p.m. Banda Neira. Weak but long lasting shock. Direction E-W.
 - December 11, 2 a.m. Menado. A weak shock.
 - - 11/12, by night. ⁴) Ternate. A weak shock.
 - - 19, 12 at night. Menado. A weak shock. 12 noon. ⁵)
 Ternate. A weak shock.
 - - 25, 8 p.m. Menado. Weak shock.

- 1857 December 28, 3 a.m. Banda Neira. Weak shock. ¹)
 (No date indicated). Ajerbangis [Airbangis], Bureau
 Lubuksikaping, Padang lowlands, Locality of Sumatra's
 west coast. In the course of the year, 7 earthquake took
 place with 1 to 2 shocks each. Direction NW. ²)
 Padang Sidimpuan, Bureau Pandang Sidimpuan
 (previously bureaus Mandailing and Angkola), Locality of
 Tapanuli, Sumatra. In the course of the year, an
 earthquake took place. ³)
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CORRECTIONS

Page 1, line 7 from begining. and page 68, line 6 from end
 read "Louis Cotte" instead of "Pierre Cotte".

Page 31, line 5 from end read "C. J. Bosch" instead of
 "G.J. Bosch".

" Page 98, line 16 from beginning read "lasted" instead of
 "laeted"