

# Catalog of felt earthquakes for Puerto Rico and neighboring islands 1493-1899 with additional information for some 20<sup>th</sup> century earthquakes

William McCann\*  
Lawrence Feldman\*\*  
Maribel McCann\*

## Resumen

Numerosos temblores importantes han afectado a Puerto Rico y las Islas Vírgenes de Estados Unidos en los últimos 500 años. Archivos coloniales en Europa y artículos en periódicos locales y regionales e informes gubernamentales proveen información de testigos presenciales que confirman que se han sentido más de 200 sismos desde la documentación inicial de 1493 hasta el año 1899. Terremotos destructivos con secuencias de réplicas claramente identificadas ocurrieron en los años 1670, 1787, 1867 y 1918 en Puerto Rico. Otros eventos importantes ocurrieron en 1844, 1846, 1875, 1906 y 1943.

El uso de informes presenciales es una herramienta potente que se puede utilizar para restringir la adición de eventos certificados a catálogos de sismos sentidos. La falta de información presencial nos ayudó a desarrollar una lista de sismos sospechosos o inexistentes. Esta carencia de información también permitió identificar eventos inexistentes en 1717 y en 1824 (dos eventos) que fueron previamente incluidos en catálogos de la región. El sismo de 1717, reportado primero en 1924, se incluyó en el catálogo por un aparente error tipográfico, ya que datos adicionales incluidos en el mismo informe solamente tienen sentido si el evento ocurrió en 1787. Los otros dos eventos de 1824, que originalmente se reportaron para la isla St. Thomas de las Islas Vírgenes, aparentemente ocurrieron en el distrito de St. Thomas en Jamaica.

Algunos autores han asumido de antemano que eventos sísmicos han ocurrido o han embellecido sus informes; otros eventos tienen fechas y/o localidades erróneas. Uno de estos casos es la referencia que se hace a una réplica inexistente del gran

\* Independent consultants, Westminster, Colorado, USA.

\*\* Independent consultant, Owings Mills, Maryland, USA.

terremoto de 1787. La única fuente para el sismo y “eventos relacionados” indica que estos ocurrieron el 10 de mayo en Ponce, cuando en realidad ocurrieron en diferentes localidades y en diferentes fechas.

El catálogo de temblores sentidos para el periodo 1493-1899 y la lista de eventos sospechosos o inexistentes, aunque diseñado para formar la base de investigaciones y catálogos futuros, no presenta una visión completa de los sismos más fuertes ya que faltan catálogos completos para las islas vecinas, los cuales son necesarios para restringir el tamaño y las localizaciones de los eventos.

### **Abstract**

Numerous significant earthquakes have affected Puerto Rico and the U.S. Virgin Islands in the last 500 years. Written records from Colonial archives in Europe, as well as local and regional newspaper and government reports provide eyewitness data substantiating more than 200 felt events between the beginning of written records in 1493 and 1899. Destructive earthquakes with clearly identified aftershock sequences occurred in 1670, 1787, 1867, and 1918 in Puerto Rico. Other significant events occurred in 1844, 1846, 1875, 1906, and 1943.

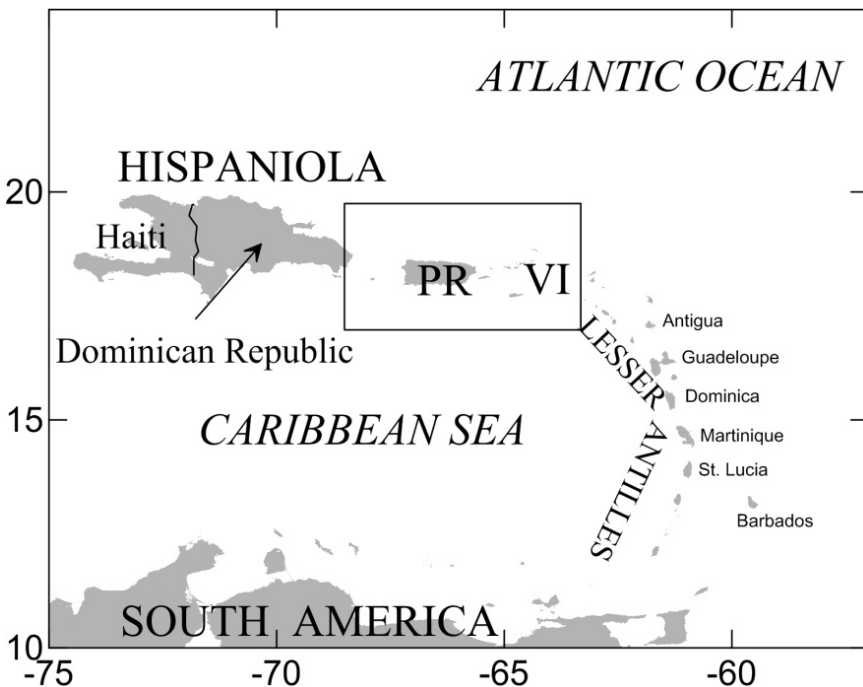
The use of eyewitness reports is a powerful tool that can be used to restrict entry of only certified events into a catalog of felt earthquakes. Lack of eyewitness reports helped develop a list of suspicious or non-existent events. It also leads to the notation in the catalog of non-existent major earthquakes in 1717 and 1824 (2 events). The 1717 event, first reported in 1924, came into existence by an apparent typographical error, as other information in the same report only makes sense if the event referred to occurs in 1787. The other events, originally reported for St. Thomas in the Virgin Islands, apparently occurred in St. Thomas Parish, Jamaica.

Some authors have assumed that earthquakes have occurred or embellished reports; other events have erroneous dates and/or places. One of these cases is the reference to a non-existent aftershock of the great earthquake of 1787. The only source for the seismic and “related events” notes them to all have occurred on May 10<sup>th</sup>, in Ponce, when in fact they occurred in different places and on different dates.

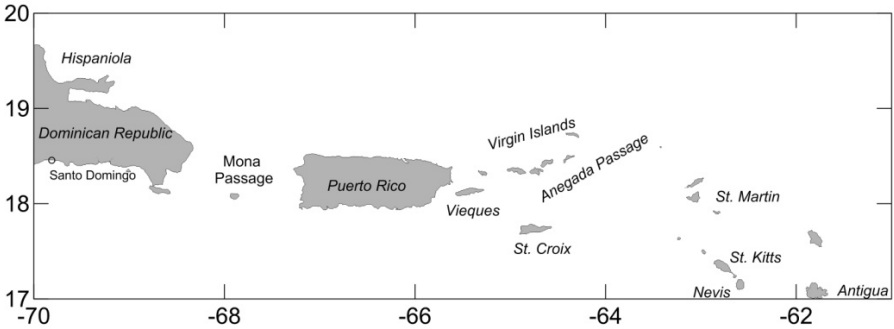
This catalog of felt events, 1493-1899, and list of suspicious or non-existent events, while designed to serve as a basis for future catalogs and investigations, does not present a complete picture for the stronger shocks as complete catalogs from neighboring islands, useful to constrain their size and location, are lacking.

### Introduction

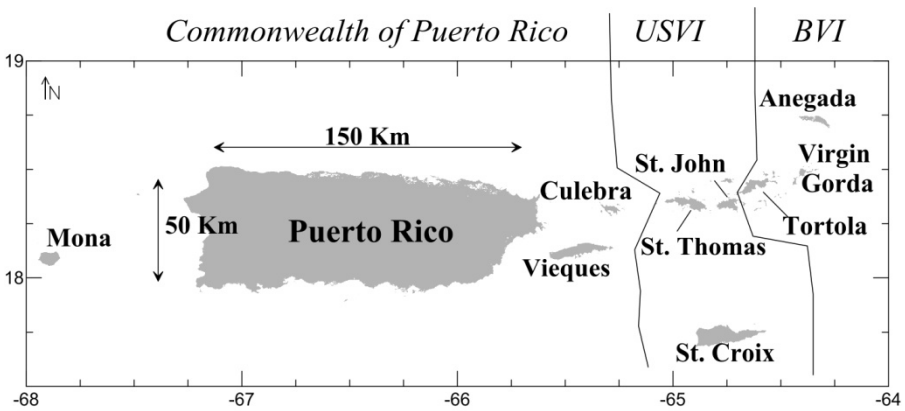
In all of the Western Hemisphere the Caribbean region has an advantage over other regions with respect to the written records for earthquakes. It was discovered first, so written records for the region began over 500 years ago. This is in stark contrast to other parts of the Hemisphere where written records may only be 100 to 200 years long. We report here on an effort to develop a more complete, accurate catalog of felt earthquakes for Puerto Rico and the Virgin Islands, the US Territories in the Caribbean (Figures 1, 2, 3, 4). We concentrated on events prior to 1900, the beginning of the instrumental period in seismology. 1900 coincides roughly with the time before the United States acquired the territories (Puerto Rico in 1898 and the U.S. Virgin Islands, 1917). Also, the first seismic station in the US Caribbean was established in Vieques, a small island off E. Puerto Rico in 1903; a history of Puerto Rican instrumental recording from 1903 to the 1960's is found in McCann (2009).



**Figure 1.** Regional Setting of Puerto Rico (PR) and the Virgin Islands (VI) (boxed region). The islands lie near the northeast corner of the islands in the Caribbean, at the eastern end of the Greater Antilles and the northern end of the Lesser Antilles.

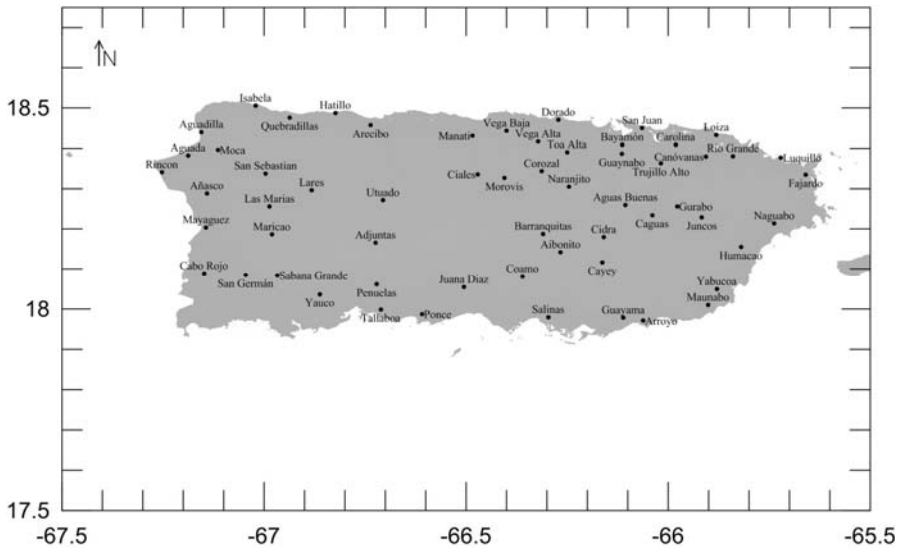


**Figure 2.** Details of the islands near Puerto Rico and the Virgin Islands.



**Figure 3.** Present-Day political makeup of the region. Puerto Rico and the U.S. Virgin Islands are part of the United States. The Commonwealth of Puerto Rico is composed of 4 islands, 3 of them inhabited. The U.S. Virgin Islands (USVI) are made of 3 large (Saint Thomas, Saint John, and Saint Croix) and other smaller islands (including Water Island). The British Virgin Islands (BVI) belong to Great Britain and are composed or 3 larger islands (Tortola, Virgin Gorda, and Anegada) and many smaller ones.

We also include new information found for important 20<sup>th</sup> century events, but the full 20<sup>th</sup> century catalog of felt event is not included here. In the 1900's there is an explosion of accessible information, much of it readily available. We focus here on publication of more difficult to obtain information (i.e. pre 1900's) and key reports for the strongest events (either damaging or magnitude 7 or greater) in the 20<sup>th</sup> century, leaving a more detailed report on the 20<sup>th</sup> century for later.



**Figure 4.** Location of towns in Puerto Rico.

For example, about 5,000 pages of data exist in the San Juan archives for the 1918 earthquake. That immense volume of information will be dealt with in a separate investigation and reported on elsewhere (McCann and LaForge, in prep.). During this investigation, data were also uncovered for events on other islands. That data is only included here if the event affected either of the US territories. The task of developing a full earthquake catalog for the historic period of the Caribbean is ongoing and nowhere near complete. Many islands still have only crude catalogs of the strongest events. The ease with which new events were uncovered suggests that Spanish, French, English, Dutch and other European archives still contain more data that are useful. This is not to mention church records, newspapers etc. We note specific events that deserve more research as we suspect that more data exist.

Archives in Spain and Puerto Rico were the primary source for new information, but data from church records, US newspapers and other catalogs were used as well. The aforementioned archives contain eyewitness reports of the effects of earthquake in areas occupied by the Spanish colonists. We also use newspaper reports in the Caribbean and the United States of America containing captain's reports of ships visiting the area, personal letters, diaries, memoirs, and books reporting events of the period. First-hand information (i.e. eye witness report) is considered the most reliable. Books written much after the event occurred, summary histories, and many catalogs, are considered secondary sources and, as the reader will see, may be merely repeating an error made by a previous investigator. We

have taken the approach that one must be suspicious of a supposed earthquake if one cannot find eyewitness reports. This is especially true of strong, damaging or supposedly widely felt events. In one particular case, we identify an author who tended to embellish events, casting doubt on all his reports of earthquakes.

If we were unable to find eyewitness reports, then the event was considered dubious or non-existent. In some cases, a specific search for information for an event turned up nothing. Therefore, the event is marked as non-existent for future listings, as the event never occurred. Tracking down how or why these errors in reporting occurred is beyond the scope of the present effort. In some cases confusion occurs between places with the same name, hurricanes and earthquakes, sometimes years, dates or hours are in error or not noted. In the earliest period both the location and year may be in doubt.

### **Caribbean History and Data Availability**

For the purposes of this article, several different epochs may be defined in Antilles history. An initial exploratory phase began in 1492 and lasts until 1524. This is before formal administrative procedures obtained the form in which they held for most of the colonial era. One finds that reports and requests from the colonies are highly scattered, a great many being in the Archivo General de las Indias (AGI) but not in locations that are readily accessible or easy to find. Also, in the absence of standardized procedures, data that afterwards would be collected never arrived in Spain. The island of Hispaniola provided the location for the earliest (fifteenth century) settlement and the political capital for all subsequent Hispanic activities in the Caribbean basin. Hence it is not surprising that the earliest event so far located, in 1493-1509, pertains to this island. Puerto Rico, while visited prior to 1508, does not get permanent Hispanic settlements until after that date. The Virgin Islands, and all islands of the Lesser Antilles, remain unoccupied in this period.

A second phase lasts from 1525 to 1715. The town of Santo Domingo (Figure 2) is established as the political capital for the islands of Cuba, Jamaica (lost to the English in 1655), Puerto Rico, Hispaniola (French settlements began about 1663 in what is now Haiti), Trinidad, and what was then called Tierra Firme (now the coast of Venezuela) and the Floridas (modern Florida, Georgia and the coast of Alabama and Mississippi). From 1630 to 1648 the Spanish maintained a garrison on the island of Saint Martin in the Lesser Antilles. St. Thomas and St. Croix were occupied by a company run by Dutch nationals (hence early documentation is often in Dutch), but using the flag of Denmark, in the last quarter of the 17<sup>th</sup> and first quarter of the 18<sup>th</sup> centuries. Except for Dominica, St. Vincent, and Grenada, which were not annexed until the eighteenth century, the British, French or Dutch claimed the other islands of the Antilles before 1700. There was also ephemeral Prussian (U.S.

Virgin Islands) and Swedish (e.g. St. Bartholome) occupation of islands in the Lesser Antilles in the seventeenth and nineteenth centuries.

In Puerto Rico the only settlements of any size and with large permanent structures were San Juan, San Germán and, after 1620, San Blas Coamo (Figure 4). In 1530 San Juan, the largest settlement contained 30 houses of wood, 20 of thatch and only 2 of stone. The fortress of El Morro, which is first mentioned toward the end of the sixteenth century, had yet to be built (Landa, 1530). Documentation, consisting of reports from the governor and other officials of the state and church, exists for Puerto Rico for every year after 1550. The years 1525-1549 are not as well covered but nevertheless for these decades there are documents for most years.

A report dated 1582, responding to a questionnaire sent out from Spain, identifies hurricanes “of August and September, together with Carib and French raids that have depopulated the island”, as the major local hazards (Ponce de Leon and de Santa Clara, 1582). “Ten or twelve years had passed without any” hurricanes. Earthquakes are not mentioned as ever being a hazard on the Island. The original structure of the cathedral, erected in 1511, was still being used in 1706 (López, 1706). No mention is made of any damage due to disasters; only that the population had outgrown this “poor” structure building (only partly of stone, it had a wooden roof).

Politically, after the middle of the eighteenth century, the headquarters of the Spanish Caribbean shifts to Havana Cuba. Hispaniola is abandoned to the French for a few years at the beginning of the 19<sup>th</sup> century. A brief reversion to Hispanic control is followed by independence and Haitian conquest after 1820. St. Croix was acquired from the French in 1733 and in 1754 the Danish government took over direct administration of all of their Virgin Islands. On Puerto Rico, by 1789, the towns of Bayamón, Guaynabo, Toa Alta, Toa Baja, Vega, Manatí, Arecibo, Utuado, Tuna, Vegas del Pepino (San Sebastián), Moca, Aguadilla, Aguada, Rincón, Añasco, Mayagüez, Cabo Rojo, Yauco, Ponce, Guayama, Cayey, Humacao, Caguas, Fajardo, Loysa, Río Piedras and Cangrejos had joined San Juan, San Germán and Coamo as capitals of local administrative districts and hence as localities likely to have permanent stone structures (Anon., 1789).

The Hispanic documentation for this epoch, for Hispaniola, Trinidad, Cuba, and Puerto Rico is quite abundant at the AGI with hundreds of boxes of manuscripts. Every box, which seemed at all likely to contain earthquake data, for this epoch for Puerto Rico has been examined. However, they only report on events (i.e. of 1751 and 1787) that caused considerable damage. The very local published *Actas de Cabildo* for San Juan, Puerto Rico for the years 1730 through 1820 have been found to contain additional data on the 1787 event. Unfortunately, it now appears unlikely that additional data for this period still exists on Puerto Rico. The only unexamined major Hispanic repository likely to have useful data from this period is that archive

with the reports from the island of Puerto Rico to the Capitan General of Cuba, and the eighteenth century records of the Audiencia of Santo Domingo, which were removed to Havana at the end of the 18<sup>th</sup> century. These are in the National Archives of Cuba.

After 1769 documentation (kept in the Royal Archives of Copenhagen), in Danish, becomes abundant. Gazettes, published in English, provide some details (the series is not complete) after 1770 for the islands of St. Croix and St. Thomas. Unfortunately the pre 1820 Puerto Rican gazettes say nothing about earthquakes. A diary, published in 1838 (Mission, 1838) lists events felt between 1793 and 1838 in St. Thomas. Additional data should exist for the event of 1785 in England and in Denmark. This information should be sought out in the records of the British West Indies and other sources.

The fourth epoch, 1817 through 1834, was a time of considerable political change. Spain lost all her mainland colonies before 1830 and, except for a brief interval in the 1860's, Hispaniola was independent of Spanish rule after 1821. The very abundant Puerto Rican records provide the details of earthquakes that caused damage. The gazettes in Puerto Rico and the newspapers of St. Thomas, St. Croix, Jamaica and other West Indian islands offer the data necessary to reconstruct the effects of minor and major earthquakes felt throughout the Islands. Finally, the dispatches from United States Consular representatives in Puerto Rico (from 1821), St. Croix (from 1791), St. Thomas (from 1804), Santo Domingo (after 1845), St. Eustatius (1793-1838), St. Christopher [St. Kitts] (after 1800), Antigua (after 1794) and Guadeloupe (after 1807) give additional eyewitness details.

A fifth epoch, extending from 1835 to 1874, is abundantly documented in the local Puerto Rico archives (and consular records). There is, however, one major gap. We lack good sources for felt, no damage events. The gazettes, while continuing, no longer report minor earthquakes and the *Boletín Mercantil*, which (judging from the very few surviving issues) did do so, but are almost completely absent from all known repositories. At this time the best hope is to scan the issues of British, Danish, Dutch West Indies newspapers and the *Times* of London for what they might have picked up from the Puerto Rico sources.

After 1874 and until about 1935, newspapers become increasingly common, and local archival data extraordinarily so, on the island of Puerto Rico. Records found for 20<sup>th</sup> century events not otherwise noted here, must easily amount to more than 5,000 pages of documentation. U.S. Weather Service reports, and those of other government agencies, specifically report on earthquakes. There was a systematic attempt to collect weather information, and earthquakes were considered "weather", in the last years of the Spanish administration. Nothing pertaining to earthquakes has been found in these [weather bureau] files in the *Archivo General de Puerto Rico*. There is however a possibility that the Jesuit archives, said to be in



Barcelona, Spain, may have useful information. There are references to Jesuits running an “observatory” on the island in those years, although the compendium of Jesuit observatories, including seismological ones, makes no mention of a Jesuit observatory on the island (Udías, 2003).

For the Lesser Antilles, the British colonial office material pertaining to the British Virgin Islands should be examined in London (British Antilles consular records are missing). If Danish West Indies newspapers were systematically read for the entire period doubtless additional material would be found. Probably at some point a systematic attempt should be made to visit all the local archives in the former British and Danish Antilles. Except for Jamaica, we don’t imagine there will be much (especially for the earlier years) but almost certainly some new information will be discovered at every locality.

After 1935 the problem is too much data, and often that data is inaccessible because it is totally unorganized. This certainly seems true for Puerto Rico. As an example there certainly were reports by the police from all over the Island for the year 1943. So, in theory, there must be very good information on the effects of events for that year in Puerto Rico. Doubtless it can be dug out but it would require a major effort devoted to just this task alone.

We should note that those writing about events many years in the past tend to commit errors in dates (either year month or both), and don’t note specifics (such as the hour) or refer to a place such as Puerto Rico, when in fact they may mean San Juan, Puerto Rico, or perhaps some other part of the island. This has been particularly true of events in the island of Hispaniola where Haiti, Hispaniola, and Santo Domingo may refer to the island; and in the case of Santo Domingo may also refer to a specific city. One is then left with a dilemma, if a historian refers to a destructive earthquake in Santo Domingo, without details, where in fact did the event occur? Part of this problem has been exacerbated by repeated translations of reports from one language to another.

In the catalog for the island of Jamaica, Robson and Tomblin (1977) cite many eyewitness reports and integrate older catalogs so that researchers have little need to examine older, sometimes difficult to obtain catalogs. We attempt to do the same here. For completeness we have integrated felts reports for Puerto Rico and the U.S. Virgin Islands as found in existing catalogs. Many of the catalogs become included by citation in another catalog. This sometimes develops a long chain of references repeating the same information. Because we will be marking “non-existent” events we hope that this catalog will serve as a basis for new research with others not having to refer back to older “contaminated” catalogs. We provide as extensively as possible quotes from the eyewitnesses, as this information is difficult to obtain and generally only available from original documents in European archives, and rare books with limited access.

## Basis for the New Catalog

The main portion of this report consists of the eyewitness texts from the various repositories noted below. Data are presented in two Appendices. Appendix I contains all events up to the end of 1899. Appendix II contains the most significant events of the 20<sup>th</sup> century. These events are summarized in Appendix III in 3 tables. Table 1, contains the full catalog of event, the strongest of which are in Table 2. Some events have been marked as suspicious or non-existent and are summarized in Table 3. Often this is due to confusion with hurricanes. In this regard the following quotation seems worth repeating: "Earthquakes are often reported as accompanying hurricanes, but we do not think that these phenomena occur together. The violent shaking of the house from sudden blasts of extraordinary force may easily be mistaken for an earthquake" (Knox, 1852). Events found in association with the months of greatest hurricane potential, August, September and October, should be looked at very carefully before accepting them as valid. After each description, based upon these and other criteria, comments may be offered on the validity of presented data.

Data pertaining to earthquakes in the Antilles (with an emphasis on data from Puerto Rico and the Virgin Islands) were found in: the United States National Archives and Library of Congress of Washington DC, the Archivo Histórico Nacional, Biblioteca Nacional, and Archivo of the Ministro de Asuntos Exteriores of Madrid, the British Public Records Office and National Newspaper Library and Commonwealth Institute in London, England, the Royal Library and University Library in Copenhagen, Denmark, the Newspaper files of the Universidad de Puerto Rico at Río Piedras, the Archivo General de Puerto Rico, the Archivo Histórico Municipal of Ponce, the Archivo Histórico Municipal of San Germán, Archivo Histórico of Caguas, Archivo Histórico Municipal of Mayagüez, Archivo Histórico Diocesano of San Juan, the Archivo General de la Nación in Santo Domingo, the archivo of Listin Diario Santo Domingo, the Biblioteca of the Sociedad Amantes de la Luz in Santiago de Los Caballeros as well as work in the Archivo General de Indias in Seville, Spain.

We have found that some catalogs are merely repeats of other works, adding little new information, but propagating errors of earlier times. For Puerto Rico and the US Virgin Islands we took Reid and Taber (1919), who cite many older sources of information, as our base catalog. A prior search of local records was undertaken by Weston Geophysical as part of the planning for the establishment of a nuclear power plant on Puerto Rico. That work, herein referred to as Campbell (1972), is part of a larger work by Weston Geophysical (1972). New events were found. The effort by Campbell contains some references to data from Spain, but mostly local and foreign newspaper reports, archives in Puerto Rico and historic books. Unfortunately, his references to a local newspaper, *El Mundo*, did not contain references

to the year or date, and because that paper was only established in 1919 we know that those references are to 20<sup>th</sup> century articles, not eyewitness reports of the era. Such references are not to be considered eyewitness reports and must be verified. All the information in Campbell (1972) was integrated into the base catalog. We also consulted the catalogs for Jamaica (Tomblin and Robson, 1977), the Lesser Antilles (Robson, 1964; Feuillard, 1983), Haiti (Anon., 1913), the Dominican Republic (Martinez, 1946; Iñiguez, 1975) and the Caribbean region (Shepherd and Lynch, 1992). If a catalog provided a more complete quote than other catalogs or reports, that quote was included. This was particularly the case for the Tomblin and Robson (1977) catalog. Many of the aforementioned catalogs are based on or refer to 19<sup>th</sup> and early 20<sup>th</sup> century compilations. As far as we can identify them they are: Fuchs (1866-1871, 1873-1887), Mallet (1850-1854), Milne (1911), Perrey (1843, 1845, 1846, 1852, 1853, 1855, 1856, 1859-1875, 1861a, 1861b, 1865, 1867), Poey (1855, 1857a, b, 1858), Rockwood (1872-1881), and Anon., (1824, 1828c).

The format used below to provide information in the catalog is as follows. Events are referred to by date, location, data and commentary. Dates are determined by local time. The local time, which today would be the Atlantic Standard Time zone, is four hours behind UCT. For many years time was local (i.e. per island) and time keeping was not accurate. Therefore, timing of earlier events is uncertain. Location refers to places reporting effects of earthquake, in some cases just a reference to an island and in others a long list of towns Refer to Figures 1-4 for town locations. Data will first include direct quotes of eyewitness documents in their original language. Full translations are left to the reader. We provide an English summary of what was reported. Remember, it is the repeated translations and distillations of older documents that have lead to confusion in other historic catalogs such as that for the Dominican Republic. We try to avoid repetition or propagation of that problem here.

As noted above we will include information from other catalogs. Those referring to data provided by Mallet (1850, 1851, 1852, 1853, 1854), and with an intensity indicated in parentheses, are taken from the Jamaican catalog of Tomblin and Robson (1977). Their intensities are on the Modified Mercalli scale. In no case should reference to another catalog (e.g. Campbell, 1972; Tomblin and Robson, 1964) be taken as a primary source. However, in some cases, the words used in the other catalogs will be the same as or have the same meaning as words used in eyewitness reports that we provide. We have in all cases attempted to identify a primary source (eyewitness); however in some cases it was not possible. In these cases the event is classified as dubious, or non-existent, caused by error in interpretation of original data or cause unknown. Commentary includes our analysis of the veracity of the information provided and interpretation of the significance of the given event.

**Table 1****All verifiable Earthquakes, Suspicious and Non-existent Events Cataloged for Puerto Rico and the U.S. Virgin Islands 1493-1899, with strongest events 1900-1943**

<i>Date</i>	<i>Location</i>	<i>Comment</i>
1493-1509, 1493-1510? Year, and Date unknown	Hispaniola; Puerto Rico	Archive documents suggest that an earthquake occurred in the new world, no details.
1524-28? Year and Date unknown	Western Puerto Rico?	Non-existent event, no eyewitness reports.
1615, September 7 <sup>th</sup> , 2300-2400	Santo Domingo, Dominican Republic, and San Juan, Puerto Rico	Major earthquake in the Dominican Republic, felt in Puerto Rico.
1663? Year and Date Unknown	San Juan, Puerto Rico	There was an event prior to 1667 that caused damage in the city of San Juan, but we do not know when it occurred (1615?).
1670, August 15 and later events	San Juan, San Germán, Puerto Rico; Santo Domingo (?), Hígüey, Dominican Republic (?)	Major Earthquake. Origin is on or near the island of Puerto Rico. Damage in San Juan and San Germán. Aftershocks felt for at least three months.
1690, April 6 <sup>th</sup> about 1600	St. Thomas; Northern Lesser Antilles	Major earthquake in northern Lesser Antilles. It was clearly felt in St. Thomas and a tsunami followed.
1717 Date and Hour unknown	Arecibo, San Germán, Puerto Rico	This event is non-existent, caused by typographical error.
1740, August 30 <sup>th</sup> ?	Ponce, Puerto Rico	We consider this another non-existent event.
1751, August 18 <sup>th</sup>	Puerto Rico, Dominican Republic	This is a non-existent event.
1768, September	St. Thomas, Virgin Islands	Two weak shocks.
1772, August 28 <sup>th</sup>	Puerto Rico	This is a non-existent earthquake.

*Continuación Tabla 1*

<i>Date</i>	<i>Location</i>	<i>Comment</i>
1776, January 30 <sup>th</sup>	Eastern Dominican Republic and Western Puerto Rico	This event must be considered as dubious until supported by better evidence.
1777, September 1 <sup>st</sup> or 2 <sup>nd</sup> 1330, evening	Saint Thomas, Saint Croix	Several shocks on Saint Thomas and Saint Croix.
1777, September 2 <sup>nd</sup> or 3 <sup>rd</sup>	Saint Thomas	More shocks on Saint Thomas.
1784, May 13 <sup>th</sup>	St. Thomas	
1785, February 26 <sup>th</sup>	St. Thomas	
1785, July 11 <sup>th</sup> 0300	Antigua, off shore from St. Kitts, St. Eustatius and Tortola	Probably felt on Saint Thomas or Saint John, no eyewitness reports yet.
1785, August 25 <sup>th</sup> ?	Puerto Rico	Probable confusion with a tropical storm or Hurricane. Possible erroneous reference to event in July, 1785, or May 1787.
1786, May 26 <sup>th</sup>	Tortola	Mild shock.
1787, April 30 <sup>th</sup>	Puerto Rico	Confusion with the event of May 2nd? Without further evidence must be considered as dubious.
1787, May 2 <sup>nd</sup> a little before noon, and May 18	San Juan, Mayagüez, Bayamón, y Toa Alta, Arecibo, Caguas, Ponce, Cayey, Añasco, San Germán, Pepino (San Sebastián), Puerto Rico	Major earthquake felt equally strongly throughout the island. Significant damage.
1787, May 10 <sup>th</sup>	San Juan, Ponce Puerto Rico	Non-existent event.
1787, October 23 <sup>rd</sup> 0400	St. Thomas	Light shocks.
1793, August	St. Thomas	Earthquakes during this month.
1813	St. Thomas	Several earthquakes during this year.
1818, May 16 <sup>th</sup> 0200-0300, 0930	St. Thomas	Two earthquakes.

*Continuación Tabla 1*

<i>Date</i>	<i>Location</i>	<i>Comment</i>
1818, December to 1819 May 21 <sup>st</sup>	Antilles	Lesser or Greater Antilles?
1821, August 20 <sup>th</sup> or 26 <sup>th</sup>	St. Thomas	Several earthquakes.
1824, April 20 <sup>th</sup> 0300	St. Thomas	Probable confusion between the island of St. Thomas and the parish of St. Thomas in Jamaica. This is a non-existent earthquake.
1824, July 20 <sup>th</sup> 0300	Saint Thomas	Non-existent event.
1825, May 16 <sup>th</sup> 0400	San Juan, Puerto Rico	
1825, May 24 <sup>th</sup> 1545, 1900	San Juan, Puerto Rico	Two earthquakes.
1825, July 26 <sup>th</sup> 1400-1500	San Juan, Puerto Rico	Small earthquake.
1826	Island of Puerto Rico	3 events this year.
1827	Island of Puerto Rico	One event this year.
1828, July 21 <sup>st</sup>	Puerto Rico	Must be considered as unlikely.
1828, August 30 <sup>th</sup> 0020	Caguas, Puerto Rico	Local earthquake.
1828, December 5 <sup>th</sup>	Rincón, Puerto Rico	Small earthquake.
1828, December 28 <sup>th</sup> 1130	Sabana Grande, Morovis, Adjuntas, Puerto Rico	Small earthquake.
1828, December 28 <sup>th</sup> 1400-1500	Yauco, Puerto Rico	This entry might refer to earlier event.
1828, December 31 <sup>st</sup> 0400	Rincón, Puerto Rico	Small earthquake at Rincón.
1829, February 22 <sup>nd</sup> 1945	Río Piedras, Caguas, Yabucea (Yabucoa), Maunabo, Puerto Rico	The month for Yabucea and Maunabo is unclear.
1829, February 25 <sup>th</sup> 1300-1400	San Germán, Puerto Rico	Strong earthquake at San Germán.
1829, May 25 <sup>th</sup> 0932	Juncos, Gurabo, Río Piedras, Loysa, Humacao, Luquillo, Naguabo, Puerto Rico	Two morning earthquakes close in time or alternatively there is confusion about the hour of one single event.

*Continuación Tabla 1*

<i>Date</i>	<i>Location</i>	<i>Comment</i>
1829 June	St. Thomas	Event in the middle of June.
1830, April 18 <sup>th</sup> 2145 or 2230	Naguabo, Humacao, Loisa, Puerto Rico	Two events on the same night, one at 9.45 PM and the other at 10.30 PM, or again confusion about time and only one event occurred.
1830, June 24 <sup>th</sup>	Aguadilla, Aguada, Pepino, Puerto Rico	Strong event near north-western Puerto Rico.
1830, July 28 <sup>th</sup> 0000	Corozal, Puerto Rico	Strong earthquake.
1830, August 26 <sup>th</sup> 0400	Puerto Rico	
1831, April 23 <sup>rd</sup> 1100 and 24 <sup>th</sup> 1000	Aguada, Rincón, Puerto Rico	Two short earthquakes.
1831, July 14 <sup>th</sup>	St. Thomas	Severe earthquake, damage.
1831, September 2 <sup>nd</sup> and 6 <sup>th</sup>	Pepino (San Sebastián), Puerto Rico	Two earthquakes.
1831, September 7 <sup>th</sup> 0500	Aguadilla, Juncos, Río Piedras, Gurabo, Naguabo, La Aguada, Moca, Rincón, Vega Alta, Naranjito, Corozal, Peñuelas, Cayey, Barranquitas, Cidra, Juana Díaz, Ponce, Puerto Rico	Widely felt, but no damage.
1832, October 19 <sup>th</sup> 0000 and 20 <sup>th</sup> 1430	Hato Grande, Mayagüez, Añasco, Cabo Rojo, Ciales, Quebradillas, Puerto Rico	Event in the western part of the island.
1832, November 24 <sup>th</sup> 2000	Añasco, Puerto Rico	
1833 May 12 <sup>th</sup>	Caguas, Corozal, Puerto Rico	
1833, May 19 <sup>th</sup>	Añasco, Puerto Rico	
1833, Julio 28 <sup>th</sup> 2100	Añasco, Puerto Rico	
1833 July	Caguas, Puerto Rico	

*Continuación Tabla 1*

<i>Date</i>	<i>Location</i>	<i>Comment</i>
1833, September 12 <sup>th</sup>	Caguas, and Moca, Puerto Rico	Strong earthquake.
1834, April	Naranjito, Moca, Añasco, Puerto Rico	
1837 August 2 <sup>nd</sup> and 3 <sup>rd</sup>	Saint Thomas, San Juan, Puerto Rico, and St. Bartholomew	Should be noted as non-existent events.
1837, September 5 <sup>th</sup> 2330	St. Thomas	Severe earthquake.
1842 May 7 <sup>th</sup> 1700	Throughout the north- central Caribbean	This is the Great earthquake (8.0Mw) of NW Hispaniola. It was clearly felt in Añasco, Mayaguez, Ponce and San Juan, Puerto Rico and St. Thomas, Virgin Islands. Damage to a church in Añasco. Aftershocks felt in Añasco.
1843, February 8 <sup>th</sup> 1050	Northern Lesser Antilles	This is a well-known great Lesser Antilles earthquake. Minimal effects in Puerto Rico and St. Thomas.
1843 March 5 <sup>th</sup>	Saint Thomas	People ran outdoors.
1844, April 16 <sup>th</sup> 0910?	San Juan, Isabela, Gurabo, Bayamón, Utua, Yabucoa, Humacao, Ponce, Caguas, Guayama Puerto Rico; St. Thomas; 200 miles at sea from Puerto Rico, Guadeloupe	Severe earthquake near eastern part of the island.
1844, May 5 <sup>th</sup>	Ponce, All Island, Puerto Rico	Erroneous reference to event of April 16, 1844. This is a non-existent event.
1844, October 19 <sup>th</sup> and 20 <sup>th</sup> 2330, 0930	Isla Puerto Rico	
1846, November 28 <sup>th</sup> 1700	San Juan, Río Piedras, Guayama, Cabo Rojo, Isabela, Arecibo, Manatí.	Strong Earthquake.



*Continuación Tabla 1*

<i>Date</i>	<i>Location</i>	<i>Comment</i>
1847, December 18 <sup>th</sup>	West Coast of Puerto Rico	
1847, December 29 <sup>th</sup>	Puerto Rico	
1848, February	Mayagüez, Puerto Rico	Need eyewitness accounts.
1849 August 1 <sup>st</sup>	Puerto Rico	Need eyewitness accounts.
1850, April 8 <sup>th</sup> 0900	Mayagüez, Puerto Rico	Earthquake rang bells.
1850, October 21 <sup>st</sup>	St. Thomas and Antigua	
1850, December 19 <sup>th</sup> 2137	Aguas Buenas	Need eyewitness accounts.
1851, February 17 <sup>th</sup> -27 <sup>th</sup>	Aguas Buenas	Need confirmation from primary sources.
1851, February 18 <sup>th</sup> 1410	St. Thomas	Smart shock.
1851, February 20 <sup>th</sup> 0330	Puerto Rico, (Saint Martin?)	Possibly Saint Martin in the Northern Lesser Antilles.
1851, June 10 <sup>th</sup> 0800	Saint Thomas	No eyewitness report.
1851, December 16 <sup>th</sup>	Saint Thomas	
1852, March 17 <sup>th</sup>	Saint Thomas	
1852, May 17 <sup>th</sup>	Saint Thomas	
1852, May 20 <sup>th</sup>	Saint Thomas	
1853, May 24 <sup>th</sup> 0200	Saint Thomas	
1853, September 19 <sup>th</sup> 0600	Saint Thomas	
1853, December 21 <sup>st</sup> 2140	Saint Thomas	Slight Shock.
1854, April 9 0800-0900	Saint Thomas	
1854, June	Saint Thomas	Light shocks.
1855, May 25 <sup>th</sup> 1500 and 1600	Saint Thomas	
1855, December 14 <sup>th</sup> 2015	Salinas, Aguas Buenas	Need eyewitness accounts.

*Continuación Tabla 1*

<i>Date</i>	<i>Location</i>	<i>Comment</i>
1856, August 28 <sup>th</sup> 1300	St. Thomas	People rushed outdoors.
1858, February 24 <sup>th</sup> 0400	Puerto Rico, St. Thomas	Felt widely throughout Caribbean.
1858, September 7 <sup>th</sup> 1515	Ponce, Manatí, Puerto Rico	Somewhat strong earthquake.
1860, October 23 <sup>rd</sup>	Mayagüez, Puerto Rico	Need eyewitness accounts. Event is suspect.
1863, October 12 <sup>th</sup> 0700 and 1020	Saint Croix	Event is suspect.
1864, May 30 <sup>th</sup>	Mayagüez, Puerto Rico	Need eyewitness accounts.
1864, September 6 <sup>th</sup>	Puerto Rico	Need eyewitness accounts.
1864, November 5 <sup>th</sup>	San Juan and Caguas, Puerto Rico	Need eyewitness accounts.
1865, May 12 <sup>th</sup> 0930	St. Thomas	Two strong shocks, damage.
1865, August 24 <sup>th</sup> 0215	Puerto Rico	Need eyewitness accounts.
1865, August 30 <sup>th</sup> 0145	San Juan, Barranquitas, Cidra, Isabela, Lares, Mayagüez, San Germán, Manatí, Ponce, Puerto Rico; Santo Domingo and Santiago de Los Caballeros, Dominican Republic.	Event felt widely between Santiago in the Dominican Republic to the west and San Juan Puerto Rico on the East.
1866, January (February?) 7 <sup>th</sup> 0800, 1300, 1830, 2015, 2300	San Juan, Mayagüez, San Germán	Need eyewitness accounts.
1866, February 14 <sup>th</sup> 1900 and 2000	Saint Thomas	Need eyewitness accounts.
1866, March 26 <sup>th</sup>	Puerto Rico	Need eyewitness accounts.
1866, April 8 <sup>th</sup> 0450	Ponce, Mayagüez, Aguadilla	Need eyewitness accounts.
1866, July 26 <sup>th</sup> 0100	Puerto Rico	Need eyewitness accounts.
1866, August 6 <sup>th</sup> and 7 <sup>th</sup> 0800-0900	Puerto Rico	Need eyewitness accounts.

*Continuación Tabla 1*

<i>Date</i>	<i>Location</i>	<i>Comment</i>
1867, January 7 <sup>th</sup>	Puerto Rico	Strong shocks.
1867, January 20 <sup>th</sup>	Puerto Rico	Need eyewitness accounts.
1867, April 8 <sup>th</sup> 0450	Ponce, Mayagüez, Aguadilla, Puerto Rico	Strong shock.
1867, September 7 <sup>th</sup>	Río Piedras, Puerto Rico	Need eyewitness accounts.
1867, October 1 <sup>st</sup>	Puerto Rico	Need eyewitness accounts.
1867, October 29 <sup>th</sup>	Virgin Islands; Humacao, Puerto Rico	Hurricane not earthquake.
1867, November 12 <sup>th</sup>	St. Thomas	
1867, November 18 <sup>th</sup> 1443	Most Severe in the Virgin Islands, felt throughout NE Caribbean	Damaging earthquake centered between Saint Thomas and Saint Croix. Major Tsunami.
1867, November 29 <sup>th</sup>	Tortola	
1867, November 30 <sup>th</sup>	Tortola; Santiago, Cuba	
1867, December 1 <sup>st</sup> 0720, 0945, 1225, 1250	Virgin Islands, Tortola; Puerto Rico	Apparently felt in Puerto Rico.
1867, December 2 <sup>nd</sup> 1250	Tortola	Probable aftershock of Nov. 18, 1867
1867, December 4 <sup>th</sup> 0255 0530 2300	Tortola	Probable aftershock of Nov. 18, 1867
1867, December 5 <sup>th</sup> 1330	Tortola	Probable aftershock of Nov. 18, 1867
1867, December 6 <sup>th</sup>	Tortola	Probable aftershock of Nov. 18, 1867
1867, December 11 <sup>th</sup> 0630	Tortola	Probable aftershock of Nov. 18, 1867
1867, December 12 <sup>th</sup> 1016, 1442	Tortola, St. Thomas	Probable aftershock of Nov. 18, 1867
1867, December 12/13 <sup>th</sup> 2230, 0400	Tortola	Probable aftershock of Nov. 18, 1867
1867, December 14 <sup>th</sup> 2000	Tortola	Probable aftershock of Nov. 18, 1867
1867, December 15 <sup>th</sup>	Tortola	Probable aftershock of Nov. 18, 1867

*Continuación Tabla 1*

<i>Date</i>	<i>Location</i>	<i>Comment</i>
1867, December 16 <sup>th</sup>	Tortola, St. Thomas	Probable aftershock of Nov. 18, 1867
1867, December 20 <sup>th</sup>	Tortola	Probable aftershock of Nov. 18, 1867
1867, December 21 <sup>st</sup> 1000	Tortola	Probable aftershock of Nov. 18, 1867
1867, December 22 <sup>nd</sup> 0955	Tortola	Probable aftershock of Nov. 18, 1867
1867, December 23 <sup>rd</sup>	Tortola	Probable aftershock of Nov. 18, 1867
1867, December 29 <sup>th</sup> 1330 - 2355	Tortola	Probable aftershock of Nov. 18, 1867
1867, December 30 <sup>th</sup> 0153- 2200	Tortola	Probable aftershock of Nov. 18, 1867
1867, December 31 <sup>st</sup>	Tortola	Probable aftershock of Nov. 18, 1867
1868, January 1 <sup>st</sup> 1108	Tortola	Probable aftershock of Nov. 18, 1867
1868, January 2 <sup>nd</sup> 0130, 0500	Tortola	Probable aftershock of Nov. 18, 1867
1868, January 3 <sup>rd</sup> 0500, 0700	Tortola	Probable aftershock of Nov. 18, 1867
1868, January 4 <sup>th</sup> 0100, 1100	Tortola	Probable aftershock of Nov. 18, 1867
1868, January 5 <sup>th</sup> 0200, 0828	Tortola	Probable aftershock of Nov. 18, 1867
1868, January 16 <sup>th</sup> 0530	Tortola	Probable aftershock of Nov. 18, 1867
1868, January 17 <sup>th</sup> 2205	Tortola	Probable aftershock of Nov. 18, 1867
1868, January 19 <sup>th</sup> 0850	Tortola	Probable aftershock of Nov. 18, 1867
1868, January 20 <sup>th</sup> 0600	Tortola	Probable aftershock of Nov. 18, 1867
1868, January 24 <sup>th</sup> 1000	Tortola	Probable aftershock of Nov. 18, 1867
1868, January 26 <sup>th</sup> 1015	Tortola	Probable aftershock of Nov. 18, 1867
1868, January 31 <sup>st</sup> 1300	Tortola	Probable aftershock of Nov. 18, 1867
1868, February 1 <sup>st</sup> 0530	Tortola	Probable aftershock of Nov. 18, 1867

*Continuación Tabla 1*

<i>Date</i>	<i>Location</i>	<i>Comment</i>
1868, February 5 <sup>th</sup>	Tortola	Probable aftershock of Nov. 18, 1867
1868, February 8 <sup>th</sup> 0720	Tortola	Probable aftershock of Nov. 18, 1867
1868, February 9 <sup>th</sup> 0530	Tortola	Probable aftershock of Nov. 18, 1867
1868, February 10 <sup>th</sup> 0500	Tortola	Suspect event.
1868, March 10 <sup>th</sup>	St. Thomas, Antigua and Puerto Rico	This is a non-existent event and should be noted as such in further catalogs.
1868, March 17 <sup>th</sup> 1915	St. Thomas, St. Croix; Tortola; San Juan, Puerto Rico	Strong Aftershock of November 18, 1867 event.
1868, April 20 <sup>th</sup>	Tortola	
1868, April 21 <sup>st</sup>	Tortola	
1868, April 26 <sup>th</sup>	Tortola	
1868 May 15 <sup>th</sup> 1305	Tortola	
1868, May 21 <sup>st</sup> 1300	Tortola	
1868, May 28 <sup>th</sup> 2230	Tortola	
1868, June 6 <sup>th</sup> 2045	Tortola	
1868, June 7 <sup>th</sup> 0450	Tortola	
1868, June 9 <sup>th</sup> 1400	Tortola	
1868, June 10 <sup>th</sup> 1725	Tortola	
1868, June 16 <sup>th</sup>	Tortola	
1868, June 30 <sup>th</sup> 0340	Tortola	
1868, September 10 <sup>th</sup> 0300 0700	Tortola	
1868, September 22 <sup>nd</sup> 0230	Tortola	
1868, December 1 <sup>st</sup> 2015	Tortola	
1868, December 2 <sup>nd</sup> 0340	Tortola	

*Continuación Tabla 1*

<i>Date</i>	<i>Location</i>	<i>Comment</i>
1868, December 6 <sup>th</sup> 1940	Tortola	
1868, December 17 <sup>th</sup> 2150	Tortola	
1869, January 23 <sup>rd</sup> 1700	Tortola	
1869, September 17 <sup>th</sup> 1500	Puerto Rico	Needs confirmation from eyewitness accounts.
1874, August 26 <sup>th</sup> 0615	Puerto Rico	
1875, December 9 <sup>th</sup> 0120	Mayagüez, Vega Baja, Arcibo, Manatí, Ponce, San Juan, Puerto Rico	NW part of Island?
1876, January 7 <sup>th</sup> 0400 0430 0433	St. Thomas	
1878, July 12 <sup>th</sup>	St. Thomas	Non-existent event, should be noted as such in further catalogs.
1879, May 25 <sup>th</sup>	Puerto Rico, St. Croix and Tortola	Event is suspect.
1880, August 21 <sup>st</sup>	Isabela, Arcibo, Puerto Rico	
1882, March	Ponce	Tsunami observed in Ponce. Caused by a distant earthquake?
1883, February 19 <sup>th</sup> 1900	NW of Puerto Rico	
1883, September 2 <sup>nd</sup>	San Juan, Puerto Rico	
1886, September 19 <sup>th</sup> 0314	St. Thomas	Event in Virgin Islands or Jamaica?
1886, October 20 <sup>th</sup>	North of Anegada	
1888 January 4 <sup>th</sup> 0555	St. Thomas	Event in Virgin Islands or Jamaica?
1888 May 21 <sup>st</sup>	St. Thomas	Event in Virgin Islands or Jamaica?
1889 November 27 <sup>th</sup>	St. Thomas	Event in Virgin Islands or Jamaica?

*Continuación Tabla 1*

<i>Date</i>	<i>Location</i>	<i>Comment</i>
1890, August 15 <sup>th</sup> about 0150	Juana Díaz, Ponce, Adjuntas, Arecibo, Aguadilla, Barros, Dorada, Isabela, Las Marías, Toa-Alta, Yabucoa, Yauco, Caguas, Puerto Rico	Strong event, widely felt, but no significant damage
1892, February 22 <sup>nd</sup>	St. Thomas	
1895, March 19 <sup>th</sup>	Arecibo, Puerto Rico	
1896, August 2nd just after 0400	St. Thomas	May refer to St. Thomas parish in Jamaica.
1898, March 20 <sup>th</sup> 0805	Las Marías, San Juan, Puerto Rico	
1899, January 1 <sup>st</sup> 1530	Vieques, Puerto Rico	
1899, March 22 <sup>nd</sup>	San Juan, Puerto Rico	
1899, July 6 <sup>th</sup>	Isabela, Puerto Rico	
1899, July 10 <sup>th</sup>	Lajas, Yauco, La Isolina, Utuado, Ponce, Puerto Rico	
1899, August 8 <sup>th</sup> and 9 <sup>th</sup> 1115-1200, 0130	Cidra, Manatí, Puerto Rico	
1899, August 13 <sup>th</sup>	Isabela, Puerto Rico	
1899, September 4 <sup>th</sup> 2245	La Isolina, Puerto Rico	
1899, September 26 <sup>th</sup>	Canóvanas, Puerto Rico	
1899, December 7 <sup>th</sup> and 27 <sup>th</sup> ?, 1621	Isabela, Coloso, Puerto Rico	
1906 September 27th 1047	Puerto Rico	Felt strongly across the Puerto Rico and in neighboring islands.
1918 October 11th 1014	NW Puerto Rico	Major earthquake and tsunami in NW Puerto Rico.
1943 July 28th and July 29th	Puerto Rico	Strongly felt across the island.

**Table 2**  
**Significant or Damaging Earthquakes, Puerto Rico and U.S. Virgin Islands**

<i>Date and Time</i>	<i>Estimate of Location</i>	<i>Aftershocks</i>	<i>Diameter of Felt Area</i>	<i>Comment</i>
1670, August 15	?	Felt for 3 months	Much more than 110 km	Two felt reports, both note damage.
1787, May 2	N of Puerto Rico	Felt for at least three weeks, one damaging	Much more than 115 km	Great Puerto Rico Earthquake, origin probably to the north of the island, ~8.0 Mw.
1831, September 7	?		About 160 km	Widely felt, no damage.
1844, April 16	NE of Virgin Islands?		At least 600 km	Minor damage, most damage reports for E. part of Island. Felt as far as Guadeloupe.
1846, November 28	N of Central or NW Puerto Rico		At least 120 km	Damage limited to N central and NW part of island.
1865, August 30	W Puerto Rico		At least 500 km	Origin in Mona Passage?
1867, November 18	Virgin Islands, Eastern Puerto Rico	Felt for months	1000-1200 km	Origin between St. Thomas and St. Croix, ~7.3Mw.
1875, December 9	NW Puerto Rico		At least 120 km	Damage in Arecibo, Similar to 1846 event.
1890, August 15	N of Puerto Rico		At least 145 km	Widely felt, no damage, like 1906 but weaker.
1906, September 27	N of Puerto Rico		About 600 km	Widely Felt, Minor damage mostly in E. Puerto Rico.
1918, October 11	Off NW Puerto Rico	Felt for months	1000-1200 km	Extensive damage, Origin in Mona Canyon, 7.3Mw.
1943, July 28	N of NW Puerto Rico	One reported felt	?	7.5Mw, No Damage.



**Table 3**  
**Suspect Earthquakes and non-existent Events to be flagged as such in Future Catalogs**

<i>Date and Time</i>	<i>Location</i>	<i>Comment</i>
1524-1528	Western Puerto Rico	No supporting data, no eyewitness reports.
1717	Arecibo and San Germán	Typographical error, data refer to great earthquake on May 2, 1787.
1740, August 30?	Ponce	No eyewitness reports, probable Tropical storm.
1751, August 18	W. Puerto Rico, Dominican Republic	No eyewitness reports, may refer to Dominican earthquake of October 18, 1751; supposed earthquake with Hurricane.
1772, August 28	Puerto Rico	No eyewitness reports, supposed earthquake with Hurricane.
1776, January 30	W. Puerto Rico and Dominican Republic	Suspect- No eyewitness reports.
1787, April 30	Puerto Rico	Suspect- No eyewitness reports.
1787, May 10	Ponce	Authors' embellishment or error of data for May 2, 1787 event.
1824, April 20 0300	St. Thomas	No eyewitness reports, Local newspapers make no reference to this "damaging" earthquake.
1824, July 20 0300	St. Thomas	Confusion between St. Thomas Parish, Jamaica and St. Thomas Virgin Islands.
1828, July 21 1828	Puerto Rico	No eyewitness reports.
1837, August 2 and 3	St. Thomas, San Juan Puerto Rico	One suspect eyewitness report, Local newspapers make no reference to earthquakes, but Hurricane reported.
1844, May 5	Puerto Rico	No eyewitness reports, Local government records make no reference to this "strong" earthquake.

In a few cases, we identify major blunders and try to correct the error. As an aside, but on the same issue of blunders, we note that the recent electronic catalog to accompany the work of Shepherd and Lynch (1992) contains such an error. An event occurred on June 21<sup>st</sup>, 1900 was listed by Gutenberg (1956) as having occurred at 20:52 location 20°N, 80°W, magnitude, 7.5. He assigned the location a quality of F that is  $\pm 20$  degrees from the Cayman Islands, essentially including all of the Caribbean and Central America as possible locations. Pacheco and Sykes (1992) give a location of 10°N 85.5°W with a corrected  $M_s$  of 7.1. Their corrected location comes from Montero (1989) who related this poor instrumental location to a damaging earthquake in Costa Rica that occurred on the same date and time. So, a catalog as recent as a few years ago is propagating an imprecise/incorrect location corrected a decade ago. We will see later that a typographical error in a 20<sup>th</sup> century report created a new major earthquake and a major blunder in the catalog for Puerto Rico as well.

## Conclusions

While the large volume of material presented herein might seem overwhelming, there are several salient points we will note here. Tables 1-3 summarize the catalog. Major events stand out in the catalog. (Tables 1, 2) Prior catalogs listing felt earthquakes for Puerto Rico and the US Virgin Islands have for the most part gradually augmented the total number of earthquakes felt on the islands. In most cases the compiler used previous catalogs with little scrutiny to the veracity of their contents. As time as gone on errors have crept into the catalog and have been propagated by later compilers. We have taken a different tact. While using prior catalogs as a base of reference, we have noted discrepancies and have failed to find primary, which is eyewitness, reports for some events. In most cases the reason for the appearance of an erroneous event in other catalogs is clear and the event has been marked as non-existent and to be noted as such in further catalogs (Table 3). We have also noted that Neumann (1913) tended to embellish events or misreport hurricanes as earthquakes. Several of his earthquake reports were found to be unsupported by eyewitness reports. Others have supposed earthquakes to have caused damage or destruction. Those suppositions were shown to be unfounded.

While the bulk of the felt earthquakes for Puerto Rico for the period 1493-1899 have been found, many such events for the US Virgin Island probably remain undiscovered. The eyewitness reports for that region need to be searched for in the European archives. Similarly, the spatial extent of strong events on Puerto Rico and the US Virgin Islands is not at all well determined. This is because of the lack of reliable catalogs for felt events in the Dominican Republic and the North Lesser Antilles. That is not to say that catalogs for those areas don't exist, only that their

level of completeness is at such a high intensity, VII-VIII on the Modified Mercalli Scale, that lower intensity shaking from regional events such as those in Puerto Rico and the US Virgin Islands might not have yet been uncovered. A detailed search for eyewitness reports for those regions needs to be undertaken in European archives.

Major earthquakes affected Puerto Rico in 1670, 1787, 1867 and 1918. Each of these events caused widespread damage and was associated with at least weeks of felt aftershocks, suggesting shallow sources. Clearly the great earthquake of 1787 was the strongest of them all in terms of widespread nature of damage and region of highest damage. Other significant earthquakes occurred in 1831, 1844, 1846, 1865, 1875, 1890, 1906, and 1943. Some of these were widely felt and caused some damage, while others even though less widely felt, caused damage. This variation in felt area and presence of damage suggests that future investigations should be able to estimate source locations as well as earthquake magnitude, by calibrating shaking effects of these older events with those of 20<sup>th</sup> century events, which have better determined source parameters.

The absence of damaging earthquakes in Puerto Rico since at least 1943, if not 1918, is in stark contrast to the numerous widely felt, damaging events from 1787 through 1918.

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## Appendix I

# Catalog of Felt Earthquakes for Puerto Rico and the U.S. Virgin Islands 1493-1899

### *1493-1509, 1493-1510? Year, and Date unknown*

**Location:** Hispaniola; Puerto Rico

**Data:** A document in 1509 by the governor of the Canary islands states that “ya habréis sabido del terremoto acaecido en la Isla Española a causa de lo cual en ella hay aún hoy necesidad de bastimentos...” (Anon., 1509), so an earthquake must have occurred in Hispaniola in 1509 or earlier causing the lack of food or supplies.

According to the Puerto Rican Historian Aurelio Tió (1956) on July 25<sup>th</sup>, 1511, the King of Spain wrote: “desde que en esa isla (Puerto Rico) hay la debida administración de los sacramentos han cesado tormentas y terremotos”-“hágase luego una capilla y un monasterio”. So, in 1511 the Spanish King orders, that now that the storms and earthquakes have stopped, construct a chapel and a monastery in San Juan, Puerto Rico.

**Commentary:** Historic earthquake Catalogs for the Dominican Republic (Martinez, 1946; Iñiguez, 1975) refer to a possible earthquake in 1502. They cite Herrera (1730) who states that Santo Domingo was destroyed in 1502 by an earthquake. Another author (Charlevoix, 1781) attributes the destruction of Santo Domingo to a hurricane that passed at the end of June 1502 sinking various ships in the Spanish flotilla. However, this same author does mention that earthquakes frequently occur in Santo Domingo. Fray Bartolomé de las Casas was a passenger on one of the ships of the flotilla in 1502. He wrote that the flotilla “salió {from Santo Domingo} por principio de julio nuestra flota de 30 a 31 navíos... y desde treinta o cuarenta horas vino tan extraña tempestad y tan brava... Perecieron con ella las 20 velas o navíos... y toda esta ciudad {Santo Domingo} que estaba de la otra banda del río, como toda las casas eran de madera y paja, toda cayó en el suelo, ó de ella muy gran parte...” (de la Casas, 1927). He experienced the hurricane, saw the fleet lose it ships, and when they returned to Santo Domingo, he saw that the wood and leaf houses had been destroyed. He does not mention an earthquake occurring at that time.

Fray Bartolomé de las Casas, who accompanied Christopher Columbus on some of his journeys of discovery to the new World, wrote extensively about the orders of

the Pope to construct churches, and create bishoprics (de la Casas, 1927). He informs us that in 1503 “la reina doña Isabel {I de Castilla}... suplicaron al Papa proveyese de erigir iglesias y crear Obispos en esta isla Española, porque había ya mucha población de españoles en 17 villas.” The Pope’s order of 1504 started three bishoprics, each one with a church, in present day Santo Domingo, La Vega, and another in the north possibly Santiago (Utrera, 1927).

Note that this request for a church and bishopric for Hispaniola could not have included Puerto Rico as the first successful efforts to populate that island did not get underway until 1505 (Coll y Toste, 1918).

However, the next King of Spain Fernando II of Aragón, whose reign began in 1504, had to

informar y suplicar al Papa, que porque aquellos sitios para las dichas iglesias señalados, ya no eran dispuestos ni aptos para en ellos edificar... que por haber muerto las gentes de aquellos sitios y lugares, y estar despoblados de sus naturales habitantes,...que convenia mudar la orden de los obispados ya dada, suplicóle que tuviese por bien, para en esta isla {Santo Domingo}, erigir dos iglesias catedrales y cesar la metropolitana, y otra en la isla de San Juan {Puerto Rico}, tambien catedral, las cuales fuesen sujetas a la metropolitana de Sevilla” (de las Casas, 1927). Fray Bartolomé de las Casas says that in 1512 “El Papa lo concedió así”.

So the revised recommendations made by the King, and approved by the Pope in 1512, indicates that the towns previously indicated for the construction of churches are not good for construction, and their inhabitants have died, leaving them unpopulated. No reason is given for the deaths of the inhabitants.

The first indication of an earthquake or earthquakes in the new world is found written in colonial communications. However, more information may still be available in the archives containing communications by or to the Monarchy of Spain, the Catholic Pope, historians of the era, and general historic records. Until now we have not yet uncovered an eyewitness report of the earthquakes to which the King of Spain, the Governor of the Canary Islands, and Herrera (1730) refer. Bartolomé de las Casas (1927) knew what happened to Santo Domingo in 1502, it was not an earthquake that destroyed the fledgling town, so the event to which the governor of the Canary Islands refers, must have occurred at another time.

The orders to build a church in Puerto Rico refer to earthquakes on that island, so there probably was/were event(s) felt on Hispaniola and Puerto Rico during this early period of discovery. Documents in the Vatican archives may shed more light on the first earthquakes recorded in the new world by European discoverers in Hispaniola.

**1524-28? Year and Date unknown****Location:** Western Puerto Rico?

**Data:** Information about this proposed earthquake is first found in the 20<sup>th</sup> century work by Tió (1956) about the foundation of San Germán in Western Puerto Rico. He notes that “Notificó el Lic. de la Gama en 18 de octubre de 1529 sobre otro ataque, éste de indios contra Caparra, y expresaba la alarma de los vecinos de San Germán por no tener casa-fuerte de piedra para su defensa.” This indicates that the original house of Ponce de Leon, established in Western Puerto Rico (between Mayagüez and Añasco), must have been destroyed by the Corsicans, a storm, or earthquake. Three storms the following year left no wooden houses standing in Caparra (near San Juan).

**Commentary:** Tió (1956), writing in the 20<sup>th</sup> century, relatively soon after the 1918 earthquake in NW Puerto Rico, *supposed* that it was an earthquake that destroyed the house of Ponce de Leon. Salivia (1972) lists several tropical storms in 1530. He also lists a hurricane in October of 1526, which could have caused the destruction of the House of Ponce de Leon. Fernandez (1995) notes that Vadillo wrote in 1527 of a hurricane on the night of 4 October “...tormenta de viento de agua, que llaman acá huracán que durando 24 horas derribó la mayor parte de esta ciudad de San Juan...”. The same storm might have affected San Germán. Also, Fernandez (1995) reports that in 1528 the French attacked San Germán, burning it, and that it was latter abandoned, but gives no source of this information. We have not been able to find a primary source (i.e. eyewitness report) that there was an earthquake in Puerto Rico during that period. This supposed earthquake is considered unfounded and should be noted as a non-existent event in further catalogs.

**1615, September 7<sup>th</sup>, 2300-2400****Location:** Santo Domingo, Dominican Republic, and San Juan, Puerto Rico

**Data:** Utrera (1927) discussing the history of the city of Santo Domingo, cites Téllez,

Destrozó el año 1617 (error del escritor que esto escribió muchos años después de haber vuelto a España), a los principios de él (cuando los vientos nortes son por aquel clima intolerable), la mayor parte de aquella gran y fértil isla y lo mejor de su metrópoli, un terremoto horrible, que dió en tierra con lo más vistoso de sus fábricas; durando esta desdicha más de cuarenta días con mortales temblores de tierra a tres a cuatro veces cada uno...

Utrera (1927) also notes that Téllez says

Derribó el inclemente terremoto todo nuestro coro alto, quedando hundido y maltratado el arco toral que sustenta por aquella parte nuestro templo (puesto que era de piedra, marmol firme y hermosamente fabricado); pero en la mayor capilla y en el cuerpo de la iglesia más cercano a ella (con ser sus muros no de resistencia tanta) no les faltó ni la más mínima piedra).

Utrera (1927) is reporting on a horrible earthquake in 1615 that destroyed a great part of the island with aftershocks of 3 to 4 a day for 40 days.

Utrera (1927) also cites comments by Gerónimo, about the status of the church

La imagen de Nra. Señora de las Mercedes en el convento de esta ciudad a obrado Dios por ella muchos milagros, particularmente en el año 1614 en un gran temblor de tierra que hubo en esta ciudad de Santo Domingo. Víspera de su fiesta de la Natividad experimentaron el divino favor..." and "La yglesia del —(convento de la Merced de Santo Domingo) aunque muy suntuosa y elegante, no era tñ fuerte como un menester los edificios de esta ciudad. Desde muy antiguo, que debía ser a sus principios, estaba hendida y abierta y apuntalada, amenazando ruina, como en efecto se cayó, en la ocasión que diré,... (en) el año de 1635, queriendo... derribar los techos que estaban dañados y apuntalados,... un día se determinó,... como a las dos de la tarde, vino un temblor de tierra, y cayó sin hacer daño a ninguna persona todo el techo y todo lo que era menester derribar y que había de costar mucho tiempo y costó mucho trabajo y riesgo, quedandose los puntales en pie—, y lo que tambien causó admiración fué que el temblor no fué muy grande, ní fuerte, y como habían sucedido en esta ciudad otros mayores y más fuertes, se tuvo por milagro que en esta ocasión se cayese.

Gerónimo tells us that the great earthquake in the city of Santo Domingo in 1614 damaged the church of the convent of Mercy, and that the roof later fell during a minor earthquake at 2 pm (no date specified) in 1635.

Further we see that there were requests for funds to repair government buildings as well as the church and that many houses fell, and the people ran out of their houses: "Reparar el cuarto de cabildo {Santo Domingo} que con un gran temblor que hubo el año 1615 se abrió y maltrató de manera que corre un gran riesgo de caerse y llevarse casi la mayor parte de la iglesia" (Anon., 1623).

Y sabe por ser muy público y notorio y haberlo visto que en siete días del mes de septiembre de presente año entre las once y doce de la noche sucedió un temblor de tierra que duró un cuarto de hora, de la manera que se movió a toda la gente de la ciudad {San Juan, Puerto Rico} y salieron muchas personas de sus casas por lo que podra suceder." (Navarra, 1615a) El más de lo cual sabe por haberlo visto que han sucedido temblores de tierra y el último temblor que hubo fué en seis [*sic*] días del mes de septiembre del presente año con tñ fuerza que se entiende cayeron muchas casas y que

luego subcesivamente en doce días del mes de septiembre hubo una tormenta.” (Navarra, 1615b) ...Y que despues de dicha perdida en diversos tiempos habido temblores de tierra muy gran del ariesgo de caer muchas casas y que en siete de septiembre de dicho año han asi mismo hubo temblor de tierra como al doce horas de la noche, y por ser graves causó a todos temeridad y se salieron de sus casas dando bocel y pidiendo a Dios misericordia para que el socorriese (Navarra, 1615c). En la dicha ciudad que podrán ver diez y seis años poco más o menos a visto que habido temblores de tierra por cuatro ó cinco veces y que en doce días del mes de septiembre pasado del presente año (Navarra, 1615d).

There is a single reference to “loss” in Puerto Rico “..A estar la Ysla {Puerto Rico} y vecinos de ella perdidos por los temblores y esterelidad de la tierra...” (Dorantes, 1620).

Campbell (1972) includes this event with a date of September 8<sup>th</sup> along with the following information: “An earthquake and hurricane which did much damage and caused great suffering in Puerto Rico (Real, 1968) A horrible earthquake during a strong north storm. Many aftershocks during the next 40 days in Santo Domingo” (Iñiguez, 1975). A Dominican catalog also refers to this event with a date of September 8<sup>th</sup> and mentions 140 aftershocks in 40 days (Martínez, 1946). These last two references derived their information from Utrera (1927).

**Commentary:** The List of Dominican Republic Earthquakes refers to an Intensity XI event of November 8<sup>th</sup> 1615 that during forty days [with] sometimes three and four shocks per day was felt and caused damage in Santo Domingo and most of its island. From the comments above it seems obvious that it was also felt in Puerto Rico. It should be noted that it is only mentioned in the Puerto Rican testimony because a few days afterward came a really damaging hurricane that required assistance from Spain. The earthquake was simply the prelude the greater natural disaster. Governor Felipe Beaumont repeats this statement in a separate letter that houses fell down “al suelo” but that letter implies that another earthquake happened on the 12<sup>th</sup> and makes no mention of the hurricane of that date (Navarra, 1615b).

This is the first earthquake to have been felt on Puerto Rico and reported by an eyewitness for whom we have a written record. However, the fact that the aftershocks are reported from the city of Santo Domingo, in the future Dominican Republic, and that there are clear references to damage there, the event must have occurred closer to the Dominican Republic. Confusion over the year (errors such as 1614, 1617) is cleared up by the reference to a tropical storm that occurs on September 12<sup>th</sup> (Navarra, 1615b). On September 12<sup>th</sup>, 1615 a storm caused damage in Puerto Rico and later affected Santo Domingo (Salivia, 1972).

This event is possibly the first great ( $M \geq 7.75$ ) earthquake since the arrival of the Europeans, as it caused damage in Santo Domingo where aftershocks were felt, and



was felt strongly with damage in Puerto Rico. Later events causing damage in the Dominican Republic, and being felt in Puerto Rico, are estimated to have magnitudes about 8.0 (Shepherd and Lynch, 1992).

### ***1663? Year and Date Unknown***

**Location:** San Juan, Puerto Rico

**Data:** From the West Indies Archives in Spain we have: “Por parte de la iglesia Cathedral de la isla de San Juan de Puerto Rico, se ha presentado memorial en la camara, en que refiere, que con los terremotos que ha habido de algunos años a esta parte en aquella isla, se halla arruinada la iglesia de ella para cuya reedificación y otras cosas de que necesita...” (Anon., 1663).

There also is a brief reference to “las ruinas y terremotos” with respect to the city of San Juan (Anon., 1667).

**Commentary:** There was an event prior to 1667 that caused damage in the city of San Juan including the Cathedral, but we do not know when it occurred (1615?).

### ***1670, August 15 and later events***

**Location:** San Juan, San Germán, Puerto Rico; Santo Domingo (?), Higüey, Dominican Republic (?)

**Data:** Data from the Spanish archives provides the following: “parese señora que todas nuestras desdichas las pronosticó la misma Ysla pues el día propio que vió la embarcación (August 15<sup>th</sup>, 1670) en que venía el gobernador (Gaspar de Arteaga) tembló generalmente, y se continuaron después de su entrada más de tres meses los temblores tán fuerte y rigurosos que se temió, y con razón, su entera ruina; haciendolos más dos rigurosas tormentas: estos que pudieron ser acosos de la naturaleza se puedan hoy con ossen (?) como proverbios de nuestros sucesos” (Gordo, 1673). Gordo (1673) reports that on the day of the arrival of the new governor, “tembló generalmente” – it shook widely” and that for more than three months shocks continued so strongly that they feared total ruin.

200 ducados en Mexico para el reparo de la Yglesia, conventos y hospitales en atención al terremoto que sucedió en aquella ciudad (San Juan)... (Anon., 1673). ...La Yglecia parroquial de aquella villa (San Germán) y convento de Santo Domingo muy arruinados por su antigüedad y ser lo más de madera, haber recibido con los grandes terremotos que a habido mucho daño... Es de parecer podría vuestra majestad enviar al Convento de Santo Domingo, de San Germán de la Ysla de Puerto Rico de 300 pesos de limosna... para ayudar a su reedificación” (Larrera, 1692). “...Una limosna para reparar las ruinas que padecen la yglesia parroquial de aquella villa {San Germán}, y el convento de Santo Domingo por lo deterioradas que se hallan estas fabricas con los temporales, y continuos terremotos” (Ortiz, 1688). “La iglesia parroquial de aquella

villa (San Germán}, y el convento de Santo Domingo se hallan muy arruinados, respecto la antigüedad de su fabrico que lo más es madera, y con los grandes terremotos y temporales han recibido mucho... (Anon., 1680).

These other reports are requesting fund to repair churches in San Juan and San Germán and a convent in San Germán.

**Commentary:** The implication of one of these citations (Ortiz, 1688), is that earthquakes continued into the 1680's. Coll y Toste (1925) cite Friar Padilla to make clear what happened to the church in San Germán “como por haber demolido la iglesia de la Villa, a causa de la ruina que amenazaba por su mucha antigüedad, se fabricó en su lugar otra con más aseo y pulidez, quedando mayor y más hermosa que la antigua” The damaged parish church in San Germán was demolished and a new church built on the same site. The reconstruction on the parish church of San Germán was finished by October 23<sup>rd</sup> 1688 (Anon., 1688).

Higüey and Santo Domingo in the Dominican Republic may have been struck by one of the events of the 1680's: “Santo Domingo Iglesias y casas, daños no especificados probablemente a consecuencia de uno de los terremotos de 1684 o 1686, la Iglesia [of Higüey] es transformada parcialmente” (Palm, 1955).

This the first clear evidence of an earthquake whose origin is on or near the island of Puerto Rico. Damage is noted both in San Juan and in San Germán, sites separated by about 100 kilometers, indicating a major earthquake. Aftershocks felt for at least three months.

### **1690, April 6<sup>th</sup> about 1600**

**Location:** St. Thomas; Northern Lesser Antilles

**Data:** “Four governors had all ready ruled St. Thomas, when a violent earthquake took place on a Sunday, the 9<sup>th</sup> of April, in the year 1690. It cracked the walls of many buildings and the Sea receded so that the fish could be picked up from the bottom, nine or ten fathoms out” (Taylor, 1895).

In answer to your questions about tidal waves affecting the former Danish West Indies, I can inform you that concerning the 1690 earthquake the ‘Journal over aet paa St. Thomas passerede’ (Journal over daily events on St. Thomas) in the ‘records of the Danish West Indian Guinea Company’, 498, states for April 6<sup>th</sup>, 1690: ‘Sunday. Sermon held for the Lutheran community in the afternoon about 4 o’clock we had a terrible earthquake which lasted half of one quarter of an hour (*sic*). All people have run out of their houses not to be killed and the Company big warehouse has got a large crack in the wall. The sea has sunk so much that one has been able to catch fishes on dry land. (translated from Germán). In Breve og dokumente fra vestindien 1674-98 (West Indian letters and documents). # 98. a letter, dated April 8<sup>th</sup> 1690. From the governor to the Company Board in Copenhagen states that last Sunday which was April 6<sup>th</sup> this Island has been hit by a terrible earthquake lasting one half

of a quarter hour, so that people feared their houses would come down. Some hours after that the sea receded so much, that one could walk about 9-10 fathoms into the sea and pick out fishes on dry land, (translated from Danish)' (Olsen, written comm., 1988).

**Commentary:** Robson (1964) reports a major event on April 5<sup>th</sup> in Antigua, St. Kitts, Nevis and Guadeloupe. It was clearly felt in St. Thomas and a tsunami followed. Shepherd and Lynch (1992) cite other sources for this major earthquake that affected the northern Lesser Antilles.

### *1717 Date and Hour unknown*

**Location:** Arecibo, San Germán, Puerto Rico

**Data:** Coll y Toste (1925), in a letter about the church in San Germán says “Ese edificio de tapería (piedra, barro colorado y cal) tenía más de un siglo. Y la que se levantó en su lugar fué inutilizada en el siglo XVIII, año 17 {1717}, por el gran temblor de tierra que arruinó la de San Felipe Apóstol de Arecibo.” The direct translation of these important words is as follows: “That building of stone, red clay and cal was more than a century old. And that which was raised in its place was made useless in the Eighteenth century, year 17 (1717), by the great earthquake that ruined the (church) of San Felipe Apóstol of Arecibo.”

Another secondary source (Cadilla, 1961) refers to the church of San Felipe de Arecibo says “Arruinada (averiada) por terremoto, 1717...” without giving a source of information.

**Commentary:** Until now there are no known first hand reports of this supposed earthquake. Given that no primary sources have been found in Europe to document this event, despite this being a period well represented by reports from Puerto Rico, one can only assume that the damage caused by the event was not considered significant and/or no damage was caused by it in the capital of the island (San Juan), that there is an error in date, or that the event never occurred. It is difficult to accept that an event strong enough to have ruined the church in Arecibo and make useless the church in San Germán would go unnoticed in contemporary records.

There is no first hand report that the church in Arecibo was ruined by an event in 1717. Cadilla (1961) does not give a source and the only other known source is Coll y Toste, (1925). Therein they say the church in Arecibo was ruined (arruinada) by the great earthquake in 1717. However, the only data we have for damage to the Arecibo church in the 18<sup>th</sup> century is in 1787 not 1717. In fact the word “ruined” are used by several eyewitness reports for the damage caused to the church in 1787, coincidentally it is used by the only (20 century) reports for the 1717 earthquake as well. This opens the possibility that Coll y Toste (1925) have

a typographical error referring to the great earthquake of 1717, when they meant 1787.

The church in San Germán was supposedly made useless by this earthquake as well. Records for San Germán indicate that the parrochial church that was damaged by the 1670 earthquake, was torn down, and a new one built on the same site by 1688. Coll y Toste (1925) state that the church in San Germán was more than 100 years old when it was damaged by the “1717” earthquake. As we know that the church as damaged in 1670, torn down, and repaired by 1688, the contradiction in dates is apparent. The rebuilt church was only 30 years old in 1717 not more than 100 years. Upon being damaged again by the next earthquake (1717 or 1787) the church was closed for repairs (Coll y Toste, 1925). They state “Cerrada la ‘iglesia parroquial’ se hizo el servicio del culto en la capillas y ermitas. Asi paso en la villa de Arecibo, que la parroquia tuvo que funcionar en la ermita de Nuestra Señora de la Monserrate hasta que en 1848 pudo terminarse la reconstrucción de San Felipe apostal de Arecibo.” This is, the parochial church being closed meant that services had to be held in chapels, that is what happened in Arecibo, the parish had to function in Nuestra Señora de la Monserrate until 1848 when reconstruccion was finished.’ But we know (see event on 11/28/1846) that the repairs to the church in Arecibo took about 50 years starting after the damage was caused by the event in 1787, not 1717.

This event is non-existent, being caused by an apparent typographical error in the report by Coll y Toste (1925). It should be noted as a non-existent event in further catalogs. Their references to this great earthquake should be transferred to the earthquake of May 2<sup>nd</sup>, 1787.

### **1740, August 30<sup>th</sup>?**

**Location:** Ponce, Puerto Rico

**Data:** Neumann, in his work History of Ponce (Neumann, 1913), says “En 1740 un temblor de tierra destruyó la iglesia de la Guadalupe y la ermita sirvió por primera vez para el servicio religioso de la comarca; aún en tiempos de Fray Iñigo, en 1778, estaba dedicada a este objeto.” Later the same author continues “Ya hemos afirmado en páginas anteriores que en 1740 una terrible sacudida casi destruyó la iglesia parroquial de Ponce, y hubo que trasladar el culto a la ermita de San Antonio Abad, dato que nos suministró el vicario de Ponce don José Balbino David, que murió fuera del ejercicio de su ministerio, tildado de masón, liberal y enemigo de España. El hecho ocurrió el día de Santa Rosa, según constaba en uno de los libros que leímos el cual desapareció, cuando el incendio del archivo.” We do not know which fact the author refers to, the death of the vicar or the earthquake for having occurred on the day of Santa Rosa.

Another source tells us “y que Ponce... en 1740 la piedad del vecino don José Rodríguez levantó la ermita ó santuario de San Antonio a causa de haberse caído la iglesia, como consta en los archivos de este municipio, y cuyos datos han sido publicados en los números 17 y 18 del 1º de este mismo semanario {La Cronica}” (Marin, 1877), so the church fell down, but he does not say why.

Campbell (1972) tells us that the newspaper “El Mundo” says that “(el temblor) totalmente destruyó la iglesia Guadalupe en Ponce”, but does not cite the date of the information. *El Mundo* began publication in 1919, so this report is unlikely to be that of an eyewitness.

**Commentary:** There are no primary sources that describe this supposed earthquake. The “event” did not cause any damage in San Juan, Puerto Rico and was not reported to European authorities. Given the date of the event (i.e. in August), one would want to be sure that the damage was not in fact caused by a hurricane. Neumann (1913) as we will see later cannot always be considered a reliable source, as he has been found to change facts and exaggerate events. Unfortunately since the eighteenth century municipal archives of Ponce were destroyed early in the 20<sup>th</sup> century, the “archivos de este municipio” are of no use in establishing the existence of this event, it will be difficult to confirm this supposed earthquake. The “event” occurred in the same month as a hurricane (August 3<sup>rd</sup>). Salivia (1972) cites various authors about this tropical storm and one of them says: “En 1740 uno asoló el territorio de Ponce en la costa meridional de la isla, y destruyó un considerable número de palmas” (Ledru, 1957). Neumann (1913) says “Moreau de Jonnés habla de un ciclón que davastó en 1740 toda la campiña de Ponce”. We consider this another non-existent event.

### *1751, August 18<sup>th</sup>*

**Location:** Puerto Rico, Dominican Republic

**Data:** Campbell (1972) reports: A large earthquake accompanied by a strong hurricane. The earthquake was felt throughout the Island (Arana, 1968). A very large earthquake centered in the Dominican Republic where much damage was done. Felt strongly in western Puerto Rico but no serious damage was reported (*El Mundo*, no year given). Felt during the San Agapito hurricane of August 18<sup>th</sup>, 1751 (Ramírez, 1933). This might have been October 18<sup>th</sup>, 1751 when a large Dominican Republic earthquake occurred.

**Commentary:** Neither the reports of the governors of Puerto Rico for this date, nor the Actas de Cabildo for San Juan, Puerto Rico, speak of a hurricane nor an earthquake (e.g. Audiencia de Santo Domingo, 2298). No primary (eye witness) data is known for this earthquake. This is a non-existent event and should be noted as such in any further catalog.

**1768, September****Location:** St. Thomas, Virgin Islands

**Data:** “Earthquakes are so common on all the West Indian islands that at least some occur every year, though St. Croix has the fewest. They are seldom strong enough to cause any real damage to houses or plantations. They consist rather for the most part of underground rattling and clapping, whereby the ground shakes and the furnishings in homes are moved about somewhat. In the course of a half year, I have witnessed in St. Thomas 4 earth tremors, all of which were light and of short duration. During one of these, I heard a rattling so nearby that it sounded like a coach being driven past the house at a high speed. And the last one, which occurred in the month of September 1768, produced 2 weak shocks, which caused the floor of the house to tremble and the tea-table to move. It can be concluded from the underground noise which accompanies them that their direction is for the most part from east to west, from Eustatius to Saba, Tortola, St. Thomas, St. John and Puerto Rico” (Oldendorp, 1777).

**Commentary:** Two weak shocks.**1772, August 28<sup>th</sup>****Location:** Puerto Rico

**Data:** A slow tremor that came during the hurricane of August 28<sup>th</sup>, 1772 (Coll y Toste, 1918). A very slow tremor accompanied by strong winds (Fontan, 1868). In the book “Viaje a la Isla de Puerto Rico” by Andre Pierre Ledru (1957), the earthquake accompanied a hurricane on August 22<sup>nd</sup>, 1772. Reid and Taber (1919) cite the catalog by Poey (1857a, 1857b).

**Commentary:** Despite excellent documentation for this period, no real evidence for an earthquake. Citations appear to confuse the actual effects of a Hurricane and those thought to be produced by an event. This is a non existent earthquake and should be noted as such in any further catalogs.

**1776, January 30<sup>th</sup>****Location:** Eastern Dominican Republic and Western Puerto Rico

**Data:** Felt in the eastern part of Dominican Republic (Iñiguez, 1975). In 1776 a very large earthquake occurred in the Dominican Republic that destroyed a great number of structures on the island. There was so much damage, a great epidemic followed. Considerable damage was done in western Puerto Rico but details were not given (Campbell, 1972 cites *El Mundo* but no year given).

**Commentary:** Given that there is no evidence that this event was mentioned in the reports of the government of colony of Santo Domingo to its European masters, one wonders if this event as important as suggested above. There seems a distinct possibility that it could be confused with the well-reported event of 1751. This event must be considered as dubious until supported by better evidence.

*1777, September 1<sup>st</sup> or 2<sup>nd</sup> 1330, evening*

**Location:** Saint Thomas, Saint Croix

**Data:** “We hear from St. Thomas, that there was a severe shock of an Earthquake felt there on Monday last (September 1<sup>st</sup>, 1777), about one o’clock in the afternoon, which lasted about ten or twelve seconds. There was also one about the same time at the west end of this island (Saint Croix), not so severe” (Anon., 1777). St. Thomas. Two strong shocks, each lasting one minute and accompanied by a fearful noise. Three more shocks were felt the following evening (Perrey, 1855). St. Thomas (V) 13.30 h. Two violent shocks, each lasting a minute Mallet (1852).

**Commentary:** Several shocks on Saint Thomas and Saint Croix.

*1777, September 2<sup>nd</sup> or 3<sup>rd</sup>*

**Location:** Saint Thomas

**Data:** St. Thomas (IV) Towards evening, three shocks. Mallet (1852)

**Commentary:** The two preceding events are given dates of September 2<sup>nd</sup> and 3<sup>rd</sup>. Anonymous source clearly states first event occurred on a Monday, which would be September 1<sup>st</sup>. If that source were correct, then the events the next date in the evening would be on September 2<sup>nd</sup> not 3<sup>rd</sup>.

*1784, May 13<sup>th</sup>*

**Location:** St. Thomas

**Data:** An earthquake (Mallet, 1852)

*1785, February 26<sup>th</sup>*

**Location:** St. Thomas

**Data:** Saint Thomas (V) An earthquake. Mallet (1852). Reid and Taber (1919) cite Perrey (1845).

**1785, July 11<sup>th</sup> 0300**

**Location:** Antigua, off shore from St. Kitts, St. Eustatius and Tortola

**Data:** “Antigua, St. Christopher and Tortola. Most violent shock known in Antigua to that date. Clefs formed in rocks in Tortola. Must have been felt in St. Thomas” (Reid and Taber, 1919, citing Mallet (1854)). Antigua. Tortola. Great clefs in rocks. New island formed. Antigua V; most violent shock in Antigua to that time. Felt by ships (Robson, 1964). Tortola (VIII) About 0300h. An earthquake made great clefs in the rocks, and separated completely a part of the island, forming a new island. Also felt in Antigua and St. Kitts, and by ships in the neighborhood of all three islands. Mallet (1852).

On Monday last the 11<sup>th</sup> instant about three O'clock in the morning we were much alarmed by a dreadful shock of an earthquake, which lasted for near a minute. It was the most severe shock that has been felt here in the memory of man (Anon, 1785a).

Extract of a letter from the island of Antigua, dated St. Johns, July 12<sup>th</sup>. About three o'clock yesterday morning, we had the most violent shock of an earthquake that has been known in the memory of the oldest inhabitant here... I was awoke suddenly by an unusual noise... Three or four minutes; after... poor hound in the yard began to howl, and the poultry to make a noise... in an instant the whole house was in a gentle trembling, which continued about half a minute. Before I could get out of bed for a candle... another dreadful shock succeeded. The house was rocked like a cradle for nearly three minutes. The windows, and some glasses were in a perfect clatter, and a dismal noise accompanied the earthquake. It has done no material damage on this island, except injuring some old houses... The shock, it seems was felt severely at sea, many leagues from the land... (Anon., 1785b).

By Capt. Black of the Mary, from Tortola, we are informed that between two and three o'clock in the morning of Monday, the 11<sup>th</sup> of July, there was a violent and tremendous shock of an earthquake at Tortola, which continued near half a minute. It was felt with more or less violence in all adjacent islands but with little damage... The subterraneous noise was like rolling a great number of empty casks in a large loft. The report ashore was it lasted above a minute, several fractures of rocks were precipitated from the mountains, and several houses damaged, but at Spanish-Town the report was, that a large part of the island severed, and several large fractures of rocks whirled to a considerable distance. There was an uncommon agitation of the sea caused by it, but a strong smell of sulphur in some places immediately followed (Black, 1785).

Extract of a letter from St. Eustatia, dated July 22<sup>nd</sup>, 1785... On Monday morning, the 11<sup>th</sup> instant, about half after two o'clock, we were much alarmed



here by a violent shock of an earthquake which lasted upwards of a minute. As I in general sleep very sound, I believe I should not have felt it, had I not been waked by the shrieks of the ladies of the house... The bed shook almost like the rocking of a cradle and the house rattled... It however went off without doing any damage. They say here they have not felt so severe a shock these 40 years. It was experienced by all the neighboring islands much about the same time, and several vessels a number of leagues out at sea felt it, especially a small one at St. Kitt's, which by the commotion it made in the water, lost her rudder, split her pump and fore-top, and was so shook that the captain was afraid she would have gone in pieces (Anon., 1785c).

**Commentary:** More work needs to be done to get details of this strongly felt earthquake. Given the effects in Tortola, estimated by Robson (1964) to be MMI (VIII), this event is likely to be have been felt and possibly caused damage on Saint John and Saint Thomas. Description in Reid and Taber citing Mallet is similar to some of the eyewitness reports noted here. They are probably the same sources.

### *1785, August 25<sup>th</sup> ?*

**Location:** Puerto Rico

**Data:** El terremoto que... se experimentó en Puerto Rico y toda la Ysla... El temporal en Puerto Rico el 25 de Agosto de 1785” (García, 1801)

**Commentary:** Probable confusion with a tropical storm or Hurricane, although no major storms are listed for that date. Possible reference to event in July, 1785, or 1787.

### *1786, May 26<sup>th</sup>*

**Location:** Tortola

**Data:** On the 26<sup>th</sup> of May a slight shock of an earthquake was felt at Tortola (Anon., 1786)

**Commentary:** Mild shock.

### *1787, April 30<sup>th</sup>*

**Location:** Puerto Rico

**Data:** Intense and prolonged earthquake felt throughout Puerto Rico (Neumann, 1913)

**Commentary:** Perhaps the result of confusion with the event of May 2<sup>nd</sup>? Without further evidence must be considered as dubious.

### **1787, May 2<sup>nd</sup> a little before noon, and May 18**

**Location:** San Juan, Mayagüez, Bayamón, y Toa Alta, Arecibo, Caguas, Ponce, Cayey, Añasco, San Germán, Pepino (San Sebastián), Puerto Rico

**Data:** “El Señor procurador general presentó escrito representando el quebranto que han padecido los edificios de esta ciudad con el temblor de tierra sucedido el día 2 de Mayo último y pidiendo que se pase oficio al señor gobernador y capitán general para su remedio, y así se acordó por sus señorías para que tome su señoría la providencia que tenga a bien” (Anon., 1787a). Report to the local government on the damage to buildings in San Juan Puerto Rico caused by the earthquake of May 2<sup>nd</sup>, 1787. Below are relevant parts of the report on that event.

Dando a vuestra excelentísima correspondiente cuenta de haberse experimentado en esta isla de mí actual mando un recio temblor de tierra en dos del corriente mes, poco antes del medio día, seguido de otros menores que todavía no han cesado enteramente, acompaño Relación de los perjuicios causados por dichos vaivenes en las obras de Fortificación de esta Capital, edificios militares y civiles de la misma costeados y entretenidos por la Real Hacienda...

Esta, que dispuse hiciera el Comandante de Ingenieros don Juan Francisco Mestre después del examen ocular de todos los estragos padecidos, hace especial mención de los edificios que por muy maltratados no admiten recomposición y es preciso derribar enteramente, expresando igualmente los que pueden rehabilitarse por medio de reparos con especificación de los ejecutivos y los que no la son y trayendo finalmente el cálculo prudencial ó de los gastos que irrogarán dichas reparaciones.

Pero observada por mí mismo la urgente necesidad de demoler el pequeño fuerte levantado en el centro del Puente de San Antonio, mediante el cual amenazaba próxima ruina y su caída atraería seguramente la del ultimo que dichosamente no ha experimentado quebranto alguno, y de rehabilitar sin pérdida de tiempo el Fuerte de San Gerónimo, contiguo al nominado Puente, casas capitulares, cuartel de Presidarios, Hospital Real, Almacenes, y Cuerpos de Guardia necesitados de pronto remedio, no puede menos de providenciarlo así y prevenir a dicho Comandante suspendiese en el entre tanto las obras de Fortificación que se estaban continuando.

Como el Almacén colorado en el Baluarte de la Concepción... se ha cuarteado y desplomado enteramente, su demolición es también absolutamente necesaria después de evacuado: Las casas situadas en esta Ciudad han sido en su mayor parte más ó menos maltratadas a impulsos del mencionado primer temblor de tierra, incluso los conventos de Santo Domingo y San Francisco, pero sin causar considerable ruina ni desgracia. En el resto de la Ysla, habiéndose experimentado en toda ella igualmente fuertes, ha sido menor el daño recibido por la circunstancia de ser sus fábricas de madera, excepto algunas Iglesias que son de mampostería; contándose entre estas derivada la del partido de Arecibo, y con distintas hendeduras las de los de Mayagüez, Bayamón, y Toa-Alta. Más se trata de reedificar la primera y habilitar las últimas en

el modo posible. Nuestro Señor prospere a vuestro excelentísimo.. como apetezco y le pido. Puerto-Rico 23 de Mayo de 1787 (Dabian, 1787).

Dabian reports on May 23<sup>rd</sup>, 1787 that on May 2<sup>nd</sup>, 1787 a little before noon, there was an earthquake that has been followed by lesser ones, which have not ceased entirely as of the date of the report. His report is with respect to damage caused to forts, military and civil buildings in San Juan, Puerto Rico. Special mention is given to buildings that, because of the extent of damage must be torn down, others that can be repaired, with an estimate of costs. He goes on to mention damaged forts, a military warehouse and other buildings and the hospital that should be repaired immediately.

Next he reports, that the majority of the houses in this city have been more or less mistreated by the first earthquake..., but without considerable ruin or loss of life... In the rest of the island, all of it having experienced the event equally strongly, damage has been less because buildings were made of wood except for a few churches of mampostería among these... Arecibo, and Mayagüez, Bayamón and Toa Alta... The first needs to be rebuilt and the others repaired as possible.

A report on military buildings says:

Manifestando en cada edificio militar el costo prudencial de la reparación resultas del temblor. Por lo correspondiente a Fortificaciones: En la cortina, y semi baluarte de la Puerta de Santiago, tienen la mayor parte de sus parapetos abiertos, con algunas de sus explanadas hundidas; se necesitará para su recomposición 1,500 pesos. El Caño que pasa por el frente de dicha Puerta, y calzada que corre por cima, se han descompuesto; su reparo ascenderá a 100 pesos. El Puerto de San Cristóbal su caballero tiene cuarteados la mayor parte de sus parapetos, y hundidas la mitad de sus explanadas de sillería, descompuestos los conductos por donde suve el agua a los Algives, con la reparación de todo ascenderá a 1,400 pesos. En el Baluarte del Norte, y Bateria baja de dicho fuerte, se necesita componer varios parapetos, y troneras, y todo ascenderá a 700 pesos. Los parapetos, y hormigones del revellín de Príncipe del ante de la Puerta de Santiago, tienen algunas hendiduras, y su reparo importará 1,000 pesos. Las Baterías de la Trinidad que siguen al Norte del expresado revellín, hay algunas aberturas y una de ellas en su sola, para su composición se necesitaron 180 pesos. El revellín de San Carlos tiene barcas aberturas en sus parapetos, y hormigones, tendrá de costo su composición 100 pesos. En el Festero del Norte de toda la fortificación del frente de tierra en el recalze que se siguió desde el nivel del mar para sostener todo aquel terreno al pie de la obra, y media entre el antiguo espigon, y fuerte de la princesa, se ha caído una porción de él en longitud de veinte varas, con ocho de alto, cuyo urgente reparo importará 2,200 pesos. Ygualmente necesitan de composición otras cortas porciones en este parare para evitar mayores daños en lo sucesivo, que importaran 200 pesos. El fuerte de la Perla en la medianía del frente del Norte se corrió el terraplén de uno de su ángulos, y para abrigarlo, y recalzarlo se necesitaran 1,500 pesos. En el recinto que cierra la expresada costa del Norte, en el Baluarte de Santo Domingo se ha abierto el parapeto de una de sus casas y en el ángulo de la espalda, una abertura des-

de el cordón hasta la retreta, que aunque no es de consideración, menere su reparo, y el del parapeto; lo que ascenderá a 120 pesos. En la Tercera Tronera de la casa al Norte del Baluarte de Santa Rosa, se ha encontrado una abertura en su muralla, y se necesita repararla, que importara 700 pesos. En el Castillo de San Felipe del Morro, y Baluarte de Ochoa, en la Muralla antigua de su flanco en el frente de tierra, se abrió una rotura perpendicular desde el cordón a la retreta, siguiendo por encima de todos los meriones y troneras de su caja, en la que, y la de algunas banquetas, y hormigones sentidos, se gastaran 600 pesos. En el antiguo fuerte de Santa Elena dentro del Puerto, se ha abierto, y separado de la muralla principal el cuerpo de Guardia, con peligro de la Tropa, su reparo importarán 150 pesos. En el Fuerte de San Agustín que sigue al anterior, tiene igual daño su cuerpo de Guardia, y el propio costo para su reparo 150 pesos. En la Real Fortaleza a habido algunas cortas aberturas en sus paredes, y dos vigas de su techo fuera un poco de su lugar; su reparo 4 pesos.

Por lo correspondiente á Edificios Militares, y Civiles: En el tinglado construido para resguardo de las curendas, y en su piso alto colocadas las animas, como principal sala de ellas, tiene porción de tejas rotas, de lo que resultan muchas goteras que para repararlas se necesita 15 pesos. La Maestranza del Real Cuerpo de Artillería, a padecido algo su azotea, y los remates de ella, cuyo reparo importará 10 pesos. En el tinglado inmediato a la expresada Maestranza que contiene sus maderas de construcción de repuerto arrimado a la cerca de una casa particular que lo cierra por un lado, se ha cuarteado toda ella, y caído mucha parte, precisa para resguardo de las citadas maderas cerrarlo con fabriques de Ladrillo los entre el arcos de Estantes conforme a su otro lado ó puerto exterior; para lo cual será su importe 200 pesos. La Herrería de Reales Obras tiene desunido el empalme de una solera de su armazón, con perjuicio del vuelo del tejado. Su reparo 8 pesos. El Cuerpo de Guardia del Almacén de Pólvora de San Gerónimo extramuros, manifiesta en su azotea algunas aberturas; su reparo 8 pesos. En el Cuerpo de Guardia del Almacén de Pólvora de Miraflores se han ocasionado varias aberturas en todas sus paredes, azoteas; y arcos del pórtico, y aun que no manifiestan próxima ruina, piden su pronto reparo, y ascenderá a 400 pesos. El Fuerte de San Gerónimo, obra antigua, colocada sobre la punta de la entrada del boquerón y comunicación de la mar del Norte con el Puerto, a padecido algunas aberturas en sus murallas y en la escalera que sube a la batería cuya reparación la pide subenterosa situación, y ascenderá a 200 pesos. El Cuerpo de Guardia de la Marina inmediato a la Aduana, tiene su tejado, y paredes quebrantadas su composición 40 pesos. La casilla que sirve para utensilios, y resguardo de la Piraguas del Rey, a padecido su tejado alguna ruina, y su reparo 10 pesos. La casita que sirve para utensilios, y custodia de la Talua del Rey, tiene algunos reparos que ascenderán a 100 pesos. El cuartel de Presidarios a experimentado algún daño en su azotea, y la cocina que sirve al Presidio, y compañía de Artilleros de la Plaza, se ha inutilizado enteramente, cuya reedificación, y reparos importaran 200 pesos. El Almacén de la Concepción, colodo mui antiguo en el Baluarte de este nombre, ha quedado enteramente inútil, y habiéndose hecho presente en otro tiempo su demolición, así por el mal estado en que se hallaba su fabricas como por el grave defecto de impedir las defensas del expresado Baluarte, no se a formado calculo de su reparación. El Hospital de Caridad que al presente, sirve a los enfermos de la Guarnición de la Plaza, ha padecido tres aberturas de algunas consideración en la pared contigua a la Yglesia, por la parte donde están formadas las escaleras, se han sentido los arcos que forman parte del piso superior, y los pórticos,

habiendo padecida generalmente las azoteas varias aberturas cuyos reparos hacen 200 pesos. La Real Cárcel tiene abierta por sus dos ángulos colaterales la pared que hace frente a la Plaza apartada de sus tirantes en los ángulos, se han abierto las paredes de división en las habitaciones superiores, y en el tejado se han corrido por ambos los dos considerables números de tejas cuyos deterioros, aunque al presente no amenazan pronta ruina, se hace preciso no retardan su reparo, que podrá importar 500 pesos.

En consideración a la antigüedad del techo de esta Iglesia Catedral, y a las varias composiciones que en el se han hecho para irlo manteniendo sin peligro de ruina; y con atención a el ensamblaje con que se forma, haber experimentado de resultas de los temblores acaecidos últimamente los tres arcos que forman la nave izquierda una ligera abertura cerca de su clave, se ha hecho un próximo reconocimiento de toda ella, ¡y aunque de el no resulta por la presente ningún peligro, merera no olvidar el precaverlo.

El puente nuevo de Martín Peña, ha padecido el segundo arco que mira a la parte del norte, y su correspondiente ala del Sur, una ligera abertura cada uno, resultante la del primero del desplomo del taxaman del Piedrol? intermedio al arco segundo y tercero, con mas bario? desconchados de los Enlucidos? que aviso [?] había hecho el cuerpo suficiente en la obra por ser nueva; su reparo importará 800 pesos.

En el Puente de San Antonio, solo ha padecido el cuerpo de Guardia alto, y bajo, con la batería circular que apoyaba a él, y servía de defensa a su cabeza, esta, ha quedado enteramente inútil, y con mucho riesgo de caer las porciones a la muralla cuarteada, y desplomadas sobre los pasajeros, precisa su pronta demolición por esta causa, reparar su cuerpo de Guardia, y formar un nuevo proyecto para sustituir la batería arruinada, y para las prontas urgencias se necesitan 70 pesos (Mestre, 1787).

Mestre (1787) presents the details of the damage of military and civil buildings as wells as fortifications. His estimate of damage to the mentioned structures is about 12,550 pesos. If taken as Spanish pesos, then the damage in the year 2000 dollars is about \$125,500. This damage estimate does not include the many houses in San Juan and other structures throughout the island damaged by the earthquake.

que con los temblores de tierra ocurridos en el dos antecedente, se ha puesto en mayor riesgo de su ruina el Almacén antiguo sobre el Baluarte de la Concepción, que por medio de continuados reparos la suplía en parte, costeano el Rey con alquileres (Mestre and Dabian, 1787).

Comprende el expediente obrado el año de 1787 sobre el reconocimiento del hecho de la santa iglesia catedral que se temió amenazan próxima ruina con motivo de los temblores de aquel año. Auto. En la ciudad de Puerto Rico a seis de junio de mil setecientos ochenta y siete años el señor don Juan Lorenzo Matos... dijo: Domingo Alvares... Mateo Jordan, Juan Antonio, Chirino, y otros a presencia del presbitero don Joaquin Urquisu, y don Juan Roldan Forsunado sacristanes primero y segundo de la expresada Iglesia... Todos los que denunciaron a este tribunal haberse descubierto de nuevo en aquel acto, varias grietas, y pelos en la bobeda de la capilla mayor, y paredes principales a más de las averturas causadas en todos sus arcos por los temblores del día dos de mayo último, que se reconocieron de orden del señor vice patrono real en

virtud de participación hecha por su señoría, reconociéndose así mismo en los techos de madera algún aumento del mal estado en que se hallaban, antes de otros temblores, y el que repitió el diez y ocho del mismo, especialmente los tramos de sobre el coro, y trascoro, que ya anteriormente, como lo demás del referido techo, había sido necesario repararlos, mediante reconocimientos hechos de orden de dicho señor vicepatrono, a fin de evitar la ruina que amenazaban entonces, con evidente peligro del clero, y pueblo, pero principalmente de los señores prevendados, cuyo destino los mantiene la mayor parte del día oficiando en su coro y altar y debiendo recelarse más inminente en el día por la fuerte y violenta conmoción de dichos terremotos especialmente del primero... (Matos, 1787).

Matos (1787) reports on June 6<sup>th</sup>, 1787 that persons, including sacristans, came before him (archdeacon) to declare that they have once again observed further damage to the cathedral in San Juan. They report observing damage to the walls, as well as the roof. He states that the cathedral was first damaged by the earthquake of May 2<sup>nd</sup>, 1787, that there were other earthquakes after the first, and mentions in particular another shock on May 18<sup>th</sup>, 1787. He begins an investigation to determine the extent of damage to the church, and any danger that it might represent for the safety of those attending or working at the church. Various persons are brought to declare before the tribunal.

Their details of the damage to the church include:

Declaración. En la bóveda de la capilla mar tres pelos, uno en el luneto del centro, y sube perpendicular desde dos varas arriba de la corniza hasta la clave de su arco apuntado, y sigue de allí culebreando hasta el florón: otro en el luneto del costado del norte, el cual sube también perpendicular desde cuatro varas debajo de la cornisa hasta su serramto y del mismo modo sigue culebreando hasta el florón, y traspasa a la parte exterior, y el tercero de norte a sur arrimado al arco toral en cuyos arranques tiene dos pelos perpendiculares en su ángulo, que bajan hasta las tribunas. En la parte del norte colateral de la capilla del Sagrario, se ven tres pelos que corren horizontales por sobre el arco de la puerta de dicha capilla en los que comprende su longitud hasta llegar a la esquina del mantillo, estando igualmente rajado dicho arco por su clave, y pasa a la pechina rematando en la corniza. Y en la otra parte del sur, que la acompaña, se encuentran los mismos pelos horizontales sobre el arco de la capilla de San Antonio.

En la primera danza de arcos, luego que se baja del presbiterio, donde está el pulpito, hay dos rajaduras perpendiculares en el mantillo de la parte norte, y en el del sur tiene otra raja desde el techo hasta el mismo arranque del arco. En la clave de el del medio, hay otra abertura perpendicular que llega hasta la madera partiendo el obalo. En el arco de la capilla de Dolores hay otra rajadura en su clave, y en la de San Pedro otra horizontal por encima de la rosca.

En la segunda danza de arcos se hallan todos tres rajados; el colateral del sur por sus tercios hasta la madera; el del norte, y el del medio por sus claves perpendiculares hasta su maciso.

En la tercera danza están igualmente rajados todos; por el del lado sur por su tercio hasta arriba, y por su arranque, hasta el maciso; el del medio rajado perpendicular como dos varas por la clave, y el de la parte del norte rajado también, por la clave y por encima del arco demuestra otra abertura horizontal.

En la cuarta danza se hallan rajados el del medio por su clave hasta la madera, y el colateral del sur por su tercio, y en el arranque dos aberturas hasta el techo. En la pared del frontis se hallan tres aberturas una en cada ángulo, y otra en el medio que parte el arco de la puerta mayor, y suben todas hasta el techo. Por lo tocante a dicho techo dijeron: Que reconocido el primer tramo del almisatege cae sobre la referida puerta principal se halla su cumbrera partida por tres partes, sostenida únicamente sobre dos tornapuntas con una cuarta de simbra, y una castañuela, a distancia de media vara. Por la parte del sur cinco alfaldas podridas, 3<sup>a</sup> 9<sup>a</sup> 10<sup>a</sup> 11<sup>a</sup> y 17<sup>a</sup>, y corridas las 10<sup>a</sup> 12<sup>a</sup> y 13<sup>a</sup>, y está desunida de su copete, y sostenida con una cuna. Por la parte del norte hay otras cuatro podridas, la 3<sup>a</sup> 9<sup>a</sup> 11<sup>a</sup> y 17<sup>a</sup>, la primera también desprendida de su copete pulgada y media, y la segunda una pulgada, y las piernas de las alfaldas de este tramo tienen una cuanta de simbra por los nudillos de los que hay algunos desnudos. La tijena que sostiene la cumbrera de dicho tramo, está podrida enteramente y es la que cae sobre la silla del señor Obispo, y demás de los señores prevendados. La madre que sostiene los nudillos del mismo tramo se halla con cuatro clavos sueltos por razón de la simbra que ha hecho de más de una cuarta por lo que está expuesta a rendirse de uno a otro momento, como lo están otras que se dirán, y las tablas de su piso desprendidas ocho pulgadas. En el segundo almisate que cae sobre el coro por la parte del sur, tiene dos alfaldas podridas, la 8<sup>a</sup> y 13<sup>a</sup>, por la parte del norte cuatro 4<sup>a</sup> 7<sup>a</sup> 12<sup>a</sup> y 14<sup>a</sup>. con una cuarta de simbra todas ellas. La cumbrera se halla podrida en su medio, y de simbra una cuarta, y cuatro nudillos reparados con castañuelas. La madre que sostiene los nudillos, además de podrida, está partida con doce pulgadas de simbra, y ocho clavos sueltos.

En el tercer almisate por la parte del sur hay cinco alfaldas podridas 6<sup>a</sup> 7<sup>a</sup> 10<sup>a</sup> 16<sup>a</sup> y 17<sup>a</sup>, dos corridas por su copete una pulgada, y acañadas, con una cuarta de simbra todas ellas, la cumbrera de este tramo podrida y rendida por el empalme, también con una cuarta de simbra y la madre que sostiene los nudillos, tiene sueltos cuatro clavos y reventada por su tercio con doce pulgadas de simbra. Por la parte del norte hay ocho alfaldas podridas, la 1<sup>a</sup> 2<sup>a</sup> 4<sup>a</sup> 6<sup>a</sup> 7<sup>a</sup> 9<sup>a</sup> 13<sup>a</sup> y 17<sup>a</sup> también simbradas una cuanta.

En el cuarto, por la parte del sur hay cinco alfaldas podridas, la 6<sup>a</sup> 7<sup>a</sup> 10<sup>a</sup> 16<sup>a</sup> y 17<sup>a</sup>, dos corridas, y acañada la una, y por el norte hay podridas ocho la 1<sup>a</sup> 2<sup>a</sup> 4<sup>a</sup> 6<sup>a</sup> 7<sup>a</sup> 9<sup>a</sup> 13<sup>a</sup> y 17<sup>a</sup> y todas con cuatro pulgadas de simbra; la cumbrera podrida, y rendida por su mitad. La madre que sostiene los nudillos de su piso tiene otras cuatro pulgadas de simbra.

El quinto que es el primero bajando del presbitero, se halla de media vida según lo demuestra su maderaje. En el losano de la pared del sur se descubrió el ancho de

cuatro alfaldas, a buscar sus barvillas, y soleras que unas y otras se encontraron hechas polvo sobre que nadan los clavos sueltos, y pasados; descansando solamente las cabezas de dichas alfaldas sobre la viga corredera con que se repararon ahora tres o cuatro años, y todas llenas de muchísima polilla viva, o especie de gusanos blancos, que las van devorando continuamente. Y en consideración al estado en que resulta hallarse dicho edificio, según el por menor referido, dijeron: Que por lo que respecta a la bóveda de la capilla mayor no juzgan amenase ruina aunque repitan temblores, no siendo descomunales. Que las paredes y arcos no volviendo temblor, tampoco la amenazan, pero si repiten algo violentos es indispensable según el quebranto presente. Que de la armadura del techo las cuatro luces que suben del palpito a la puerta principal, la están amenazando, aunque no repitan temblores, por la corrupción general de maderas, el vencimiento de estas, expuestas de uno, a otro instante a partir por el medio, a más de su dislocación, y falta de hombros que las sostengan, pues las vigas correderas, que están de la parte interior de la Iglesia, aunque nuevas, como que trabaja todo el peso sobre los canecillos que las reciben no son de confianza., Matos, Diego González, Domingo Alvarez: “de repetir los temblores de tierra que se han sentido desde el día dos de mayo último,...” Juan Lorenzo Matos.

El día dos del mayo próximo pasado, determinó vuestro señor en el pavimento de la Iglesia y así se verificó; después por no verse bien se mudó al presbiterio, todos le acompañamos; de este a San Pedro, sin que alguno repugnase, de aquí otra vez al coro, de este a la capilla de Dolores, y como quiera que don Bartolomé, Famy, don Juan Puerta, y don Juan Santaella maestros mayores de arquitectura y carpintería hallan testificado no amenazar ruina el techo ni paredes de la Iglesia, entendido en los deseos vivos de vuestro señor en que el pueblo concurriera en la presente estación a rendir cultos al señor sacramentado según la amonestación hecha por el presbítero don Antonio Sánchez estando cierto faltaban a esto por el peligro que nosotros mismos indicábamos con nuestro recogimiento a la capilla, tuve por bien como presidente hacer lo que vuestro señor ha hecho como tal. ...trece de junio de mil setecientos ochenta y siete años. José Rivera y Quiñones, señor arcediano provisor y vicario general y comisario de cruzada don Juan Lorenzo de Matos (Matos, 1787).

Los maestros mayores de reales obras; con el de carpintería irán hoy por la mañana a reconocer la Iglesia catedral particularmente en sus techos, y con especialidad la crujida que cae sobre el coro, que según noticia les ha causado mucho daño, el segundo temblor de tierra acaecido la noche del diez y ocho del pasado, de cuyo reconocimiento me informarán a continuación. Puerto Rico nueve de junio de mil setecientos ochenta y siete, Masdeu.

En cumplimiento de la anterior orden; decimos nosotros los arquitectos y maestros mayores don Bartolomé Tamy, y don Juan de Santaella acompañado del maestro mayor de carpintería José González, que hemos pasado al reconocimiento de la Iglesia catedral, y habiéndola examinado con toda proligidad decimos: Que conforme tene-



mos informado verbalmente en el que practicamos el día tres de mayo pasado al señor teniente coronel y comandante de ingenieros don Juan Francisco Mestre, no encontramos en el presente reconocimiento novedad alguna que amenase una pronta ruina (como algunos quieren decir) y que esta no es tan próxima como la suponen, según uso de arte; y para evitar en lo sucesivo algún daño, y asegurar en un todo el primer techo de madera, se deberán colocar de un arco a otro dos vigas para sostener los balcones a causa de que las maderas de sus techos se hayan bastante destruidas, con cuyo auxilio podrán aguantar algún tiempo más. Y por lo que toca a mampostería, arcos, y bóvedas se han encontrado algunas aberturas de poca consideración. Bartolomé Tamy, Juan de Santaella, José González, don Juan Francisco Mestre.

Auto... que en el día no hay inconveniente para que sea en el coro principal por la seguridad que declaran los maestros mayores de reales obras de fortificación, que al mismo tiempo exponen ser necesario hacer varios reparos por hallarse bastante destruido el techo de dicha santa Iglesia y en lo que dan a entender la poca firmeza que se tiene, especialmente después de los terremotos,... Consulta. Señor provisor y vicario general, el asesor de este tribunal en vista del estado del expediente formado sobre que se resasen los divinos oficios en la capilla de Nuestra Señora de Dolores, cita en la Iglesia catedral a donde por disposición de vuestro señor con venepiacito del muy vice cavildo se había trasladado el coro por amenasar ruina el techo que cae sobre el principal, dice: Que requería se procediese al cumplimiento de las providencias tomadas en el asunto.

The Bishop was traveling throughout the island after the earthquake struck. Some of his letters to San Juan bear evidence of what he observed and were included in Matos (1787). Below are the important parts of those letters. The first is a letter written from San Germán. There he notes that he arrived on May 10, said Mass and that that evening there was a tremendous storm and that lightning struck the altar of the church. He also notes the church in Ponce was damaged by the earthquake May 2, there was no damage to the church in Coamo, the churches in Cayey and Añasco were damaged and Arecibo is also damaged.

Cartas confidenciales 1ª ... Llegué aquí el día diez y en el de la fecha abrí la visita con misa pontifical y sermón, y el once en la noche hubo un diluvio de agua y truenos arrojando uno un rayo en la capilla de Monserrate sobre el altar que ha hecho daño aunque no sé todavía cual, de Coamo ya se sabía que no había sentido daño la Iglesia, el mismo maestro ajustó la de Ponce, toda de bóveda y aunque hubo muchas dificultades en los vecinos, por fin se vencieron, que en Cayey se sintiese algo es regular por que estaba muy reciente su media naranja muy buena con sus dos sacristías y se completará el resto de la obra, la de Añasco se ha cobijado con Yaguas, la de Arecibo esta inútil, ella lo estaba, se acopia piedra y materiales, y he dado la orden de lo que se debe hacer hasta mi llegada, y siempre era necesario se fabricase. Iglesia decente, y suficiente aún cuando no hubiese sucedido este atraso; de los demás lugares no tengo noticia en esta fecha, ya la tendrá vuestro señor y yo la tocaré con el mayor sentimiento por no poder remediarlo concediéndome Dios nuestro señor la vida que desea a

vuestro señor por muchos años su altísimo y seguro señor y capellán, Felipe José obispo de Puerto Rico, Villa de San Germán. y mayo trece de mil setecientos ochenta y siete.

This letter relates that from all parts of the island he has received nothing but bad news about what happened May 2.

Cartas confidenciales. 2<sup>a</sup> Señor don Juan Lorenzo de Matos arcedianos y provisor, Muy señor mío. De todas partes de la isla no recibo otra cosa más que las muchas lastimas sucedidas el dos de mayo que se me hacen más sensibles por no poder suvenir a su remedio, nuestro señor que por su infinita piedad nos conservó la vida, proveerá. La de vuestro señor de dos del corriente no me ha sido menos lastimosa y haberme hallado más inmediato, aunque mi presencia poco podía servir, hubiera pasado a acompañar a mi cavildo y pueblo y a implorar la divina clemencia alegrandome de la acción de gracias que ese ilustre ayuntamiento hizo el día veinte y siete; vuestro señor se las dará a los señores alcaldes en mi nombre para que lo hagan al ayuntamiento en sus acuerdos y que solo resta que en memoria de tan singularísimo beneficio se vote una fiesta solemne estando manifiesto el singularísimo para todos los años el día dos de mayo por ambos cavildos en la catedral. Esta suplica se servirá vuestro señor hacer de mi parte a los señores alcaldes para que lo propongan en el ayuntamiento, y espero de su celo y cristiandad que concurrirán gustosos con su cabeza a tan santo fin que no escribo, así por mis ocupaciones como por no molestarles con la contestación, y la voz viva de vuestro señor en la mía que debe apreciarse más que el papel. sin embargo del reconocimiento hecho por los ingenieros tan superficial, avocandose vuestro señor con el señor gobernador no podrán permanecer en su primer dictamen, ni fáltaran a lo que es tan justo y debido de hacer ver el evidente riesgo que amenaza por lo que sí en la capilla de los Dolores se halla el coro sin probabilidad de seguridad le podrá mudar fuera, por fin vuestro señor está a la vista y con consulta determinará lo que sea más conforme porque tampoco se puede exponer al pueblo a que desplomado el techo de la Iglesia quede sepultado o la mayor parte entre sus ruinas; mucho y mucho siento esta calamidad, y de no poder hallarme presente por si acaso oyendo los dictámenes de todos, nos combiniésemos en algún medio para que a lo menos provicionalmente se reparase el daño y pudiese sin temor entrar el pueblo a los oficios divinos, y solo me queda el consuelo de que vuestro señor no omitirá diligencia alguna para que tenga efecto, Dios nuestro señor me conceda este favor que tanto anhelo y me aflige (ya sabe vuestro señor como están las monjas) y de que los muchos años que desea su afecto seguro servidor y capellán, Felipe José obispo de Puerto Rico, Villa de San Germán y junio diez de mil setecientos ochenta y siete.

En este cabildo se comisionó al señor regidor don Miguel Xiorro para que contestase el oficio que con fecha de 24 de Mayo próximo pasado recibió del muy venerable señor déan y cabildo sobre que se sirviese coadyudar a la función de iglesia que se intenta re establecer el día de Mayo en memoria y agradecimiento del singu-

lar favor que Dios Nuestro Señor fue servido de no sumergirnos en la nada como lo tenemos merecido por nuestras culpas, con los temblores de tierra acaecidos... (Anon., 1787b).

That is that the local government and the Catholic Church shall work together to establish May 2 as a day of thanks for the fact that God did not destroy everything that day with the earthquake.

La yglesia parroquial [of Arecibo] principiada a levantar con motivo de haverce arruinado la que havia el año pasado de 1787, por el terremoto que sufrió la isla el dos de Mayo. Las paredes colaterales al peso de bobeda, los arcos del centro cerrados, y detenida la obra o paralizada sin saberse la causa (Correa, 1817).

Church in Arecibo was ruined in the earthquake that affected the island on May 2, 1787.

Dean Doctor Juan Lorenzo de Matos habiendo dispuesto que se trasladase el coro a la capilla de Dolores (de Catedral in San Juan) por el sobresalto de que cayese el techo de la Iglesia a motivo de los frecuentes terremotos del año de ochenta y siete u ocho (Anon., 1801).

Cordova (1968) reports “El 2 de mayo [1787] se sintió un fuerte temblor de tierra en toda la isla; padecieron mucho las fortificaciones, Catedral y casas de la Capital. La iglesia de Arecibo quedo arruinada, y las de Mayagüez, Caguas y Toa Alta hendidas las paredes”.

The data provided above confirms all of the indications of damage noted by Campbell. He reported:

Made unusable the churches at Arecibo, Caguas, Toa Alta and Mayagüez (Neumann, 1913). Destroyed the church of San Felipe at Arecibo and the chapels at Rosario and Concepcion. Also did great damage to temples at Mayagüez, Caguas and Toa Alta where large cracks occurred. In San Juan, great damage was done to the forts of Morro and San Cristobal as well as to the docks and the cathedral (Coll y Toste). An earthquake damaged the church at Arecibo and the chapels at Rosario and Concepcion (Limon, 1938). Strong earthquake throughout the Island which ruined various buildings (Gonzalez, 1903). A high intensity earthquake occurred in Puerto Rico that caused considerable damage at the El Morro and San Cristobal military fortifications. It also destroyed the San Felipe church at Arecibo and the grottos and chapels at Rosario and Concepcion. Churches at Mayagüez, (El Mundo) Caguas and Toa Alta were made unusable. Strong earthquake felt throughout entire island. Damaged and ruined many buildings (Asenjo, 1883).

Neumann (1913) adds

Por documentación procedente del Gobierno General de la isla hemos enterado que en la última quincena de Abril y en la primera de Mayo de 1787, se experimentaron intensos y prolongados temblores de tierra, sensibles en toda la isla, tanto que el dos de Mayo, uno de ellos, inutilizó la iglesia parroquial de Arecibo y en Caguas, Toa Alta y Mayaguez hendió las paredes de sus respectivos templos. He adds that En esta capital sufrieron muchos desperfectos la Catedral, las fortificaciones y otros edificios públicos y particulares. Mucha fué la gente que abandonó este cerco de piedra y corrió des-pavorida a los campos en busca de refugio y tranquilidad.

**Commentary:** Mestre (1787), Dabian (1787), Mestre and Dabian (1787) and Matos (1787) make is clear that the earthquake was felt equally strongly throughout the island. They note significant damage to fortifications in San Juan as well as the majority of its houses. They also note that the church in Arecibo needs to be rebuilt and those of Mayagüez, Bayamón and Toa-Alta, Cayey and Añasco, and Ponce need repairs. Damage was also done to fortifications, and bridges in San Juan. Catholic Church and local government declare May 2<sup>nd</sup> as day of memory and thanks to God for his favor of not submerging them into nothing with the earthquakes that have occurred. Dabian (1787) notes that on May 25<sup>th</sup> earthquakes are still occurring. A major aftershock caused more damage on May 18 (Matos, 1787).

Documents associated with Correa (1817) refer to repairs on the churches of Vega Baja, Utuado, Yabucoa, Ponce, Mayagüez, Guayama, S. Lorenzo, Hato Grande, Juana Díaz, Loysa, the Cathedral, Aguada, Guaynabo, Humacao Yabucoa, Cayes, and Sabana Grande without indicating the cause of the damage.

We should also note that the local government, located in San Juan usually met Monday of each week. Their records on May 7<sup>th</sup>, 1787 don't mention the earthquake that occurred the Wednesday before, but discuss few issues and rapidly adjourn. Interestingly enough they do not have regular meetings for three weeks straight, and when they try to meet on June 4<sup>th</sup> there is no quorum, so no meeting is held. At the next meeting June 11<sup>th</sup>, 1787 they receive the report of the procurator general about the damage caused by the earthquake.

When data from other recording blunders (the 1717 event and that of May 10, 1787) are added to the data presented here, it is clear that this event caused widespread strong shaking, damage, and numerous felt aftershocks, at least one of them damaging. Given the extent of the region reporting damage (the island is 150 km long) it is clear that event has a shallow and long source area to the north, probably parallel to the island. Data are consistent with a great earthquake rupturing the plate interface north of the island. Of all the events reported in this catalog, this event is the strongest, most widely damaging. Tio (1956) refers to this event at the great earthquake, we agree.

**1787, May 10<sup>th</sup>**

**Location:** San Juan, Ponce Puerto Rico

**Data:** “Mayo 10<sup>th</sup> 1787 Otra terrible sacudida agrietó el día diez de Mayo de igual año, la Iglesia de la Guadalupe de Ponce cayendo un rayo dentro de su recinto en los momentos del temblor, que mató al sacristán” (Neumann, 1913). The claim here is that another terrible shock on the 10<sup>th</sup> of May of the same year cracked the Guadalupe church of Ponce and lightning bolt struck its interior in the moment of the earthquake, killing the sacristan.

**Commentary:** Neumann (1913) is the only source of information for this earthquake. It is not noted in any of the records for the principal earthquake on May 2<sup>nd</sup>, 1787 and is not noted in any of the correspondence of the Catholic Bishop who was in San Germán on that day. In fact, a communication by the bishop relates a strikingly similar event in San Germán, one so similar that one must doubt the veracity of the report by Neumann (1913). The bishop wrote “...Llegué aquí el día diez y en el de la fecha abrí la visita con misa pontifical y sermón, y el once en la noche hubo un diluvio de agua y truenos arrojando uno un rayo en la capilla de Monserrate sobre el altar que ha hecho daño aunque no sé todavía cual...” (Matos, 1787). He states that he arrived (in San Germán) on May 10<sup>th</sup>, 1787, opened his visit with a pontifical mass and sermon, and that at 11pm there was a deluge of water and thunder and a lightning bolt struck Monserrate chapel hitting the altar, damaging it. In that same letter he relates the damage caused to the church in Ponce by the May 2 earthquake. We leave it to the reader to judge the probability that on a single day the altars in two churches in Puerto Rico would be hit by lightning. We consider this event to be non-existent, and it should be noted as such in any further catalogs. Effects should be referred to event of May 2, 1787.

**1787, October 23<sup>rd</sup> 0400**

**Location:** St. Thomas

**Data:** St. Thomas (III) 04.00 h. Three feeble shocks. Mallet (1854). Reid and Taber (1919) cite Perrey (1845) with the same information

**Commentary:** Light shocks.

**1793, August**

**Location:** St. Thomas

**Data:** We have [*sic*] much rain, thunder and lightning and several shocks of an earthquake (Mission, 1838)

**Commentary:** Earthquake during this month.

**1813****Location:** St. Thomas**Data:** This year... we had much thunder and lightning, besides eight earthquakes (Mission 1838)**Commentary:** Several earthquakes this year.**1818, May 16<sup>th</sup> 0200-0300, 0930****Location:** Saint Thomas**Data:** A severe shock of an earthquake was felt in this island on Saturday morning between 2 and 3 o'clock and another at half past 9 of the same morning (Anon, 1818). A severe shock followed by another at 0930 (Reid and Taber, 1919), citing Mallet (1854)). Listed as an Antilles shock by Perrey (1845)- St. Thomas. (Poey, 1857), St. Thomas (V). A severe shock (Robson, 1964). St. Thomas (V) 09.30 h. Another severe shock. Mallet (1852).**Commentary:** Two earthquakes.**1818, December to 1819 May 21<sup>st</sup>****Location:** Antilles**Data:** Eight earthquakes were felt in the Antilles. Mallet (1852)**Commentary:** Lesser or Greater Antilles?**1821, August 20<sup>th</sup> or 26<sup>th</sup>****Location:** St. Thomas**Data:** St. Thomas (IV) Saint Croix (IV) several shocks. Others were felt for some days before, Mallet (1852)**Commentary:** Several earthquakes.**1824, April 20<sup>th</sup> 0300****Location:** St. Thomas**Data:** St. Thomas VII-VIII. Very severe shock. Many persons thrown out of bed. A building was swallowed up. In Reid and Taber (1919) citing Anonymous (1824). St. Thomas At 03.00 h. A strong shock felt here. Von Hoff (1840). St. Thomas VIII. A terrible earthquake. People were thrown from beds and a building was swallowed up (Robson, 1964). Robson (1964) gives a date of April 20<sup>th</sup> 1821 for the same event and cites Perrey (1845) as the source. St. Thomas (VII) About 0300 A terrible earthquake. Many people were thrown out of their beds and a building was swallowed up. Mallet (1854). St. Thomas (Poey, 1857). Terrible earthquake in St. Thomas (Neumann, 1913).

**Commentary:** All catalogs seem to derive their information from Anon. (1824). No earthquakes were reported for the year by the 19<sup>th</sup> century statistics reports of Cordova (1968). The published diary of Mission, who lived in St. Thomas during this period (and who was interested in earthquakes), makes no mention of this event. The issues of the newspaper the Saint Thomas Tidende were read from April 21<sup>st</sup> to May 8<sup>th</sup> (1824) without finding any reference whatsoever to this event. Probable confusion between the island of St. Thomas and the parish of St. Thomas in Jamaica. See event on July 20<sup>th</sup> 1824. This is a non-existent earthquake and should be omitted from future listings.

### *1824, July 20<sup>th</sup> 0300*

**Location:** St. Thomas

**Data:** “Terrible tremblement de terre, bruit semblable celui du tonnere: beaucoup de personnes ont ete renversees de leur lit; un batiment s’est englouti par suite de la commotion” (Perrey, 1843).

Campbell reports: St. Thomas (V) At 03.00 h. A violent shock. Perrey (1855). Shepherd and Lynch (1992) cite primary references as Perrey (1843) and Poey (1855), secondary references of Mallet (1850), Milne (1911), Robson (1964), Grases (1971), Tomblin and Robson (1977). They state that the report for this event is probably actually to an earthquake on April 10, 1824 in Jamaica affecting Kingston and St. Thomas Parish; that Mallet gives a translation of Perrey, and Robson follows Mallet; Similarity of language suggests that Perrey may have confused St. Thomas, Jamaica, with St. Thomas, Virgin Islands.

**Commentary:** As there are no first hand reports for this event, it should be noted as a non-existent event in future catalogs.

### *1825*

**Location:** Island of Puerto Rico

**Data:** 15 earthquakes noted ofr the eyar by Cordova (1968)

**Commentary:** Some of these earthquake mauy be noted below.

### *1825, May 16<sup>th</sup> 0400*

**Location:** San Juan, Puerto Rico

**Data:** El día 16 a las cuatro de la madrugada, se sintió un temblor de tierra (Anon., 1825a)

**Commentary:** Earthquake at 4:00a.m.

**1825, May 24<sup>th</sup> 1545, 1900**

**Location:** San Juan, Puerto Rico

**Data:** ...El 24 se repitió a las tres y tres cuartos de la tarde y a las siete de la noche [temblor de tierra]... (Anon., 1825a)

**Commentary:** Earthquakes at 3:45p.m. and 7:00p.m.

**1825, July 26<sup>th</sup> 1400-1500**

**Location:** San Juan, Puerto Rico

**Data:** El 26 del corriente, entre dos y tres de la tarde, se sintió un pequeño temblor de tierra... (Anon., 1825b)

**Commentary:** Small earthquake at 2:00-3:00p.m.

**1826**

**Location:** Island of Puerto Rico

**Data:** Cordova (1968) notes 3 earthquakes in the year

**Commentary:** We have no other information on these events.

**1827**

**Location:** Island of Puerto Rico

**Data:** Cordova (1968) notes one earthquake in the year

**Commentary:** We have no other information on these events.

**1828**

**Location:** Island of Puerto Rico

**Data:** Cordova (1968) notes 8 earthquakes in the year

**Commentary:** Some of these events may be reported below.

**1828, July 21<sup>st</sup>**

**Location:** Puerto Rico

**Data:** An earthquake was felt throughout the island (Asenjo, 1883)

**Commentary:** Not found in the issues of the *Gazeta de Puerto Rico* examined for this report. Must be considered as unlikely.



**1828, August 30<sup>th</sup> 0020**

**Location:** Caguas, Puerto Rico

**Data:** ...El día 30 a las doce y veinte minutos de la noche se sintió en este pueblo un temblor de tierra que pasó con rapidez. Se notó mucho en las casas y lo sintieron la mayor parte de los vecinos (Anon., 1828a).

**Commentary:** Caguas earthquake, 12:20a.m.

**1828, December 5<sup>th</sup>**

**Location:** Rincon, Puerto Rico

**Data:** Rincón... el 5 se sintió un temblor pequeño... (Anon., 1828b).

**Commentary:** Small earthquake.

**1828, December 28<sup>th</sup> 1130**

**Location:** Sabana Grande, Morovis, Adjuntas, Puerto Rico

**Data:** Sabana Grande... el día 28 (Diciembre 1828) a las 11 y media de la mañana, se experimentó un fuerte temblor de tierra... (Anon., 1829a). Morovis... El 28 se sintió un pequeño temblor de tierra (Anon., 1829c). Adjuntas... El día 28, entre 11 y 12 del día, se sintió un pequeño temblor (Anon., 1829d).

**Commentary:** Small earthquake, Central Puerto Rico, 11:30a.m.

**1828, December 28<sup>th</sup> 1400-1500**

**Location:** Yauco, Puerto Rico

**Data:** Yauco... El 28 entre dos y tres de la tarde, se sintió un fuerte temblor que duró poco (Anon., 1829d)

**Commentary:** If the hour for this event is in error, and being at 1130 not 1400-1500, then this entry probably refers to the previous event. Then the earthquake was probably located in Central Puerto Rico.

**1828, December 31<sup>st</sup> 0400**

**Location:** Rincón, Puerto Rico

**Data:** Rincón... El 31 (Diciembre 1828) a las cuatro de la mañana se sintió un pequeño temblor de tierra (Anon., 1829b)

**Commentary:** Small earthquake at Rincón.

**1829****Location:** Island of Puerto Rico**Data:** Cordova (1968) notes 3 earthquakes in the year**Commentary:** Some of these events may be noted below.**1829, February 22<sup>nd</sup> 1945****Location:** Río Piedras, Caguas, Yabucea (Yabucoa), Maunabo, Puerto Rico**Data:** Río Piedras... El día (de Febrero) se experimentó por la noche un fuerte temblor... Caguas... El 22 a las siete y tres cuartos de la noche se sintió un temblor de corta duración... Gurabo... la noche de 22 hubo un fuerte temblor y cayeron algunos chubascos (Anon., 1829e). Yabucea (Yabucoa)... El 22 se sintió un fuerte temblor seguido de un trueno... Maunabo... El 22 por la noche se sintió un temblor y cayeron algunas lluvias (Anon., 1829g).**Commentary:** The month for Yabucea and Maunabo, is unclear from the context. It could be March instead of February.**1829, February 25<sup>th</sup> 1300-1400****Location:** San Germán, Puerto Rico**Data:** San Germán... El 25 entre una y dos en la tarde se experimentó un fuerte temblor... (Anon., 1829f)**1829, May 25<sup>th</sup> 0932****Location:** Juncos, Gurabo, Río Piedras, Loysa, Humacao, Luquillo, Naguabo, Puerto Rico**Data:** Juncos... El 25 entre 8 y 9 de la mañana se sintió con fuerte temblor de tierra... Gurabo... El 25 a las 9 de la mañana, se sintió un fuerte temblor de poca duración... Río Piedras... El 25 entre 8 y 9 de la mañana se sintió un fuerte temblor (Anon., 1829h). Loysa... El 25 a las 9 y media de la mañana se sintieron dos temblores... (Anon., 1829i). Humacao... Se notó un pequeño temblor y hubo un herido levemente... Luquillo... Se experimentó un fuerte temblor el día 25 entre 8 y 9 de la mañana... Naguabo... El 25 se sintió un temblor fuerte a las 9 y 32 minutos de la mañana... (Anon., 1829j).**Commentary:** Two morning earthquakes close in time to each other take place on this day, or alternatively there is confusion about the hour of one single event occurring about 0932. If so, a single small event occurred in northeastern Puerto Rico.

**1829 June****Location:** St. Thomas**Data:** St. Thomas (IV). In the middle of the month. An earthquake. Mallet (1854)**Commentary:** Event in the middle of June.**1830****Location:** Aguada, Bayamón, Humacao**Data:** Cordova (1968), reporting statistics of the island, noted 4 earthquakes being felt on the island in the year. The following towns having reported earthquakes without out giving details, only number of shocks felt in the year: Aguada, 1; Bayamón, 3; and Humacao, 2.**Commentary:** There is a conflict between the number reported in his summary table (4) and the number reported by town. Possibly one event was felt in two towns. Some of these events may be reported below.**1830, April 18<sup>th</sup> 2145 or 2230****Location:** Naguabo, Humacao, Loisa, Puerto Rico**Data:** Naguabo... El ocho se sintió un temblor a las 9 y 45 minutos de la noche (Anon., 1830a). Humacao... El 8, se sintió un temblor á las diez y media de la noche (Anon., 1830b). Loisa... el 8 a las diez y media de la noche se sintió un fuerte temblor de tierra (Anon., 1830c).**Commentary:** Two events on the same night, one at 9:45p.m. and the other at 10:30p.m., or again confusion about time and only one event occurred.**1830, June 24<sup>th</sup>****Location:** Aguadilla, Aguada, Pepino, Puerto Rico**Data:** Aguadilla. En el mes de Junio... el 24 se sintió un fuerte temblor que duró de 4 á 6 segundos (Anon., 1830d). Aguada.... El 24 se sintió un temblor que duró como 27 segundos (Anon., 1830e). Pepino.... El 24 se sintió un regular temblor (Anon., 1830f).**Commentary:** Strong event near northwestern Puerto Rico.**1830, July 28<sup>th</sup> 0000****Location:** Corozal, Puerto Rico**Data:** Corozal... A las 12 de la noche del 28 (julio) se sintió un fuerte temblor (Anon., 1830g).**Commentary:** Strong earthquake at midnight

**1830, August 26<sup>th</sup> 0400****Location:** Puerto Rico**Data:** Un temblor de tierra se sintió en esta isla el jueves último por la mañana a las cuatro (Anon., 1830h)**Commentary:** 4:00a.m. shock.**1831****Location:** Island of Puerto Rico**Data:** Cordova (1968) notes 8 earthquakes in the year**Commentary:** Some of these events may be noted below.**1831, April 23<sup>rd</sup> 1100 and 24<sup>th</sup> 1000****Location:** Aguada, Rincón, Puerto Rico**Data:** En Aguada se sintió un temblor de corta duración... En Rincón... el 23 sintió un temblor a las once de la mañana, y otro el 24 a las diez, ambos de corta duración (Anon., 1831a).**Commentary:** Two short earthquakes.**1831, July 14<sup>th</sup>****Location:** St. Thomas**Data:** "...We had a very severe earthquake- the severest one I had ever experienced. A couple of old chimneys fell in again, some walls cracked, and all glasses and bottles shook a great deal, but none were broken. An earthquake always makes a very deep impression upon me, much more than a severe thunderstorm" (Mission, 1838).**Commentary:** Severe earthquake, damage.**1831, September 2<sup>nd</sup> and 6<sup>th</sup>****Location:** Pepino (San Sebastián), Puerto Rico**Data:** En el Pepino se sintió el 2, y el 6 con repetición en este día... (Anon., 1831d).**Commentary:** Two earthquakes.

***1831, September 7<sup>th</sup> 0500***

**Location:** Aguadilla, Juncos, Río Piedras, Gurabo, Naguabo, La Aguada, Moca, Rincón, Vega Alta, Naranjito, Corozal, Peñuelas, Cayey, Barranquitas, Cidra, Juana Díaz, Ponce, Puerto Rico

**Data:** ...El día 7 [of September] a las cinco de la mañana se sintió un temblor en Juncos, Río Piedras y Gurabo... (Anon., 1831b)... En Naguabo el 7 a las 4 de la mañana se sintió un temblor... (Anon., 1831c). El 7 se sintió un temblor a las cinco de la mañana en la Aguada, Aguadilla, Moca, Rincón, Vega Alta, Naranjito, y Corozal (Anon., 1831d). El 6 y 7 en Peñuelas, el 7 en Cayey, en Barranquitas, en la Cidra, en Juana Díaz, y el 5 y 6 en Ponce, se sintieran temblores de tierra bastante notables (Anon., 1831e). Aguadilla. Strong shock (V?) lasting 3 seconds (Reid and Taber, 1919 citing Records at the Governors Palace).

**Commentary:** Data from Anon. (1831e) may actually refer to the month of September, not clear in document. If all these places did indeed feel the same event, it must have been strong, but rather far away from the island or deep beneath the island as there are no reports of damage.

***1832***

**Location:** Island of Puerto Rico

**Data:** Cordova (1968) notes 4 earthquakes in the year

**Commentary:** Some of these events may be noted below.

***1832, October 19<sup>th</sup> 0000 and 20<sup>th</sup> 1430***

**Location:** Hato Grande, Mayagüez, Añasco, Cabo Rojo, Ciales, Quebradillas, Puerto Rico

**Data:** “...En Hato Grande... se sintió en [Octubre] un temblor a las doce de la mañana. En Mayagüez se sintió un temblor el 20 a las dos y media de la tarde. En Añasco sucedió... el 20 a las dos de la tarde sintió un temblor. En Cabo Rojo se sintió un temblor el 20 a las tres de la tarde...” (Anon., 1832a). “En Ciales se sintió un temblor el 20 a las dos de la tarde [Octubre]. En Quebradillas se notó igualmente el mismo día” (Anon., 1830c).

**Commentary:** Event in the western part of the island.

**1832, November 24<sup>th</sup> 2000**

**Location:** Añasco, Puerto Rico

**Data:** “En Añasco se sintió un temblor el 24 [de Noviembre] a las 8 de la noche” (Anon., 1832b)

**1833 May 12<sup>th</sup>**

**Location:** Caguas, Corozal, Puerto Rico

**Data:** ...En Caguas se sintió un temblor el día 12... (Anon., 1833a). En el Corozal arreció un temblor (Anon., 1833b)

**1833, May 19<sup>th</sup>**

**Location:** Añasco, Puerto Rico

**Data:** ...En Añasco se sintió un temblor el 19 al amanecer... (Anon., 1833c)

**1833, Julio 28<sup>th</sup> 2100**

**Location:** Añasco, Puerto Rico

**Data:** ...“En Añasco... el 28 se sintió un temblor a las nueve de la noche” (Anon., 1833e)

**1833 July**

**Location:** Caguas, Puerto Rico

**Data:** “En Caguas se sintió un temblor” (Anon., 1833d)

**1833, September 12<sup>th</sup>**

**Location:** Caguas, and Moca, Puerto Rico

**Data:** “...En Moca se sintió el día 12 un fuerte temblor” (Anon., 1833e). “En Caguas se sintió un temblor” (Anon., 1833f and g)

**Commentary:** Strong earthquake.

**1834, April**

**Location:** Naranjito, Moca, Añasco, Puerto Rico

**Data:** “En Naranjito y Moca se sintió un temblor de tierra” (Anon., 1834a). “En Añasco... se sintió un temblor de tierra” (Anon., 1834b).

### *1837 August 2<sup>nd</sup> and 3<sup>rd</sup>*

**Location:** Saint Thomas, San Juan, Puerto Rico, and St. Bartholomew

**Data:** Boscowitz (1890) reports:

In 1837, it (the island of Saint Thomas) was visited upon the same day by the double scourge of an earthquake and a hurricane. It was upon the 2nd of August, and although half a century has elapsed, I can remember the incidents of the drama as well as if it had only happened yesterday. The wind, which had been blowing a gale since noon, suddenly dropped about three o'clock, and there was a complete calm over the water, the air, and the earth. During this period of warning and terror-inspiring calm, my father and eldest brother galloped home in hot haste, and had the doors and windows of the house propped up with planks and rope. The house was a large one, and was built of wood upon groundwork of masonry, which was itself founded upon the rock. It would be difficult to imagine anything at once more supple and yet solid. Situated at a height of about 380 feet up on the slope of a hill, the house commanded a very wide view, at our feet being the town, while further on were the quays with their warehouses, and the port which, at the time I speak of, was crowded with shipping.

The doors and windows were scarcely closed, when a most terrible noise was heard. It was the hurricane which was coming upon us. It arrived in fury, howling and rolling black clouds before it, raising up the flood, and covering island and sea with black darkness. When the first shock struck the house, the latter shook and bent, but was not carried away. For six hours the hurricane raged with ever-increasing violence. Debris of all kinds were turned about in the air, tiles and slates were rained upon our roof, and driven into the beams and rafters; trees, torn up by the hurricane and carried along branches and all, scudded by the walls or fell violently upon the terrace; lightning lit up the sky, and the rolling of thunder mingled with the roar of the tempest. At about ten in the evening the gusts of wind became less frequent, the thunder ceased, and the end of the storm seemed at hand, when a sudden underground noise was heard. All round the house, and along the bed of rock which it stood, there was a crackling, splitting sound, immediately followed by severe shocks. A confused noise of voices and lugubrious groans were heard from outside. My father threw open a window. The whole island seemed to be in a tremble. At this moment a fresh agitated it still deeply, and then a bright flame shot up to the sky. It emerged from the ruins of a house which had just fallen in, and in a moment the whole town was on fire. I still to have in my ears the cry of anguish wrung from my father; I seem still to see the despair and terror of my mother, as she rushed to the door, dragging me with her. The inflammable matter, driven by the wind, which was again blowing a hurricane, lodged upon the roof, part of which had been carried away. It behoved us to fly, and to traverse storm of fire. We had scarcely the house when the high wall which encircled the property fell in. The burning cinders and the bitter foam of the ocean, which the hurricane of wind drove before it, flew in our faces, and constant shocks'caused the ground

undulate and give way beneath our feet. But we kept on our way without halting, the fire lighted at our feet serving to guide our footsteps. We scaled a mountain, the summit' of which was crowned with very solid building where found a secure refuge, and 'my father had seen us into a safe place, he went down 'into the town, whither his duties called him.

When day broke, the glorious and radiant sunshine of the West Indies lighted up, with its brilliant rays, the darksome work of the previous night. The whole country round was strewn with large trees, uprooted or snapped off, and all plantations w'ere destroyed. In the town the fire was dying out, and it was only here and there the ruins were still smoking. The hurricane had swept away nearly all the wooden houses, those which had been lightly placed upon beams just above the soil being carried off as they stood, while the larger ones which had resisted the hurricane were overturned in an instant by the earthquake. The whole town, in fact, was filled with which told of the violence of the catastrophe. The port, so gay and animated the day before, was dreary and deserted, a few masts here and there emerging from the water; while all along the shore, and even upon the slope of the hills were scattered wreckage and corpses of sailors. When in the morning my father took 'us our ruined home, he overcome with fatigue. The double catastrophe had annihilated his fortune, but he was self-possessed, while his countenance betokened an inward serenity, due, no doubt, to the knowledge that he had been prodigal of consolation to some and of succour to others, who, but for him, would have been crushed beneath the ruins.

Campbell reports: St. Thomas. (Poey, 1857).

There were three earthquakes on these dates in Puerto Rico. They followed or were accompanied by a strong hurricane (Arana, 1968). Tomblin and Robson (1977) report: August 2<sup>nd</sup> Puerto Rico, San Juan (VIII). Reports are current of great damage to the city and loss of life at St. John's, Puerto Rico. Barbadian 1837.8.30 quoting the St. Croix Gazette 1837.8.14. St. Bartholomew (IV). Shock of earthquake. Barbadian 1837.8.31 quoting the St. Croix Gazette 1837.8.14. St Thomas badly shaken 1837.8.2 (Milne, 1911) .

**Commentary:** The August 2<sup>nd</sup> and 3<sup>rd</sup> dates of Poey (1857) and Arana (1968) appear to be an error. There was a great Hurricane on this date but no obvious earthquake (see Mission, 1838). Boscowitz is the only eyewitness report found. It is doubtful that his observation report an earthquake. Events should be noted as non-existent events in further catalogs.

### ***1837, September 5<sup>th</sup> 2330***

**Location:** St. Thomas

**Data:** "We had a severe earthquake at half past eleven o'clock on the night of the 5<sup>th</sup> of September [1837]" (Mission, 1838)

**Commentary:** Severe earthquake.



**1842 May 7<sup>th</sup> 1700**

**Location:** Jamaica; Turk's Island; Samaná and Puerto Plata, on the East, Port Paix, Gonaives, Nichola Mole, Port Au Prince, Cape Hayti, Santo Domingo, Vega, Santiago, St. Louis, Miragoave, St. Michel, Acquin, Les Layes, Jeremie, Port Magot, Borgne, Ouanaminthe, Fort Liberte, St. Mark Plaisance, Anse a Veau, El Mole, Santiago de los Caballeros, Puerto Plata, Saint Marc, San Carlos, Monte Plata, Boyi, Bani, Azua, Bayaguana, Seyba, Higüey, San Cristobal, Moca, Cotui, Macoris, Monte Cristi, Hispanola, Añasco, ? San Juan Puerto Rico.

**Data:** "...One information has been derived from several passengers on board the Tweed, who state that about 5 P.M. on Saturday the 6<sup>th</sup> inst., when off Cape Nichola[s] Mole, about 16 miles, the vessel received a shock as it had run aground,... Their apprehension however, proving to be incorrect, the vessel afterwards pursued its course... There were there [Cape Francos] met by the British Consul, Mr. Thomson, in an open boat who informed them that on the Saturday preceding, the town of Cape Haytien had been visited by an Earthquake, and was now a mass of ruins" (Anon., 1842a).

In the early part of last month, shocks of earthquake were felt simultaneously on different parts of the island; and on Sabbath the 8<sup>th</sup> ult, Cape Town, with two thirds of its population, sunk into the earth. The lives lost in that and the other towns of St. Domingo, are not fewer than twenty thousands (Anon., 1842b).

The Falmouth Post reports that the earthquake which was felt in this town on Saturday evening last [by Jamaican count this would be May 7<sup>th</sup>], was also felt at Falmouth. There were three distinct shocks, it adds, which appeared to vibrate from N.W. to S. (Anon., 1842c).

We have been kindly favoured with the following information connected with the trip of the Steamer Tweed... and the earthquake at Cape Hayti, Turk's Island, St. Jago, etc...

The Tweed sailed from this place on the 6<sup>th</sup> inst. At 5.15 p.m. of the 7<sup>th</sup>, the shite cliff to the southward of Cape Nichol (Mole), then learning east about fifteen miles, she received a series of shocks as if passing over a coral reef...Two boasts lowered with officers to take soundings, but there was no bottom in 85 fathoms, or any appearance of a shoal to be found. On the arrival of the Tweed at Turk's Island on the following evening, it was ascertained that a smart shock of an earthquake had been felt on the previous evening at five o'clock but no damage had been sustained.

On the arrival of the Tweed at Cape Hayti on Saturday morning, the 14<sup>th</sup> instant, that place was found to have been totally destroyed by an earthquake and the towns of Samana and Puerto Plata, on the East, Port Paix, Gonaives, Nichola Mole, Port Au Prince and many others, have been equally sufferers.

At Saint Jago, where the Tweed arrived on Sunday morning, the shock was felt more severely than any previous one for the last eighteen years [since 1824?]. Almost all the walls of the houses are cracked... (Anon., 1842d).

#### Letter dated Santo Domingo 14<sup>th</sup> ...

great calamity which we have experienced in this city, at 5 thirty o'clock, on Saturday afternoon, 17<sup>th</sup> instant... earthmoving from North to West with tremendous concussions... lasted nearly three minutes, we had four shocks at intervals of so many seconds... Since the 7<sup>th</sup>, to date, we have felt upwards of fifteen shocks. The oldest inhabitants do not recollect such a calamity. The Cathedral... has suffered very much, and also the church of La Merced... The river Ozama raised about eight feet above the level of the ordinary flux and reflux... Near the borders of the river, apertures are perceptible from two, three and four inches wide, occasioned by the shocks.

The news arrived from the Vega and Santiago this morning. The mortality in those places are estimated to two thousand buried under the ruins. We are further informed that Puerto Plata has likewise suffered, however nothing certain is known of it (Anon., 1842e).

From Jamaica Morning Journal, Monday 6<sup>th</sup> June 1842: Cape Hayti- repeated upheavals of the earth had reduced the whole to a mass of rubbish. Saint Yague... laid in ruins. All its edifices... had fallen. Porte-Plate [Puerto Plata]... Some houses of wood near the town alone remained standing. At Porte-Plate two houses had been thrown down, and many damaged. It appears that all the south- Miragoave, St. Michel, Acquin, Les Layes, and Jeremie, have very slightly felt the shock... St. Louis... in the north, there has been much damage done, as also at Montecristi... Port de Paix... sea leaving empty 'Le Canal de la Torture'. The same sea returning in a short time... to cast itself with force... upon the town..

Gonaives... all the public edifices are overthrown - thirty-eight houses particularly have been, some crushed, others more or less damaged... In the space of 48 hours 42 shocks were counted... The villages of Port-Magot, Borgne, Ouanaminthe and the town of Fort Liberte- experienced somewhat approaching a coup-de-grace... St. Mark., as at Plaisance, many small houses have fallen...

Anse a Veau. 7<sup>th</sup> May, at half past 5... terrible commotion is felt, which lasts four minutes and some seconds. The oscillation from north to south... many buses have been greatly damaged... suddenly the sea... burst with fury against the steep rocks which bind the coast... many gigantic waves... On the following night we continued to feel many shocks... This morning at 5 o'clock another shock sufficiently violent but of short duration (Anon., 1842f).

San Antonio Abad de Añasco, 25 Septiembre de 1843... hecho la recomposición de esta Santa Iglesia parroquial por el destrozo que sufrió con el espantoso terremoto de 7 de Mayo del año (Rosales, 1843).

Nosotros los maestros albañiles... que necesita esta santa Iglesia Parroquial [Añasco] para reparar los deterioros que ha sufrido por efecto del espantoso terremoto que se experimentó el 7 de Mayo último con frecuentes repeticiones... el tejado ha sido removido y destrozado por los efectos de dichos terremotos (Rodríguez, 1842).

El gran terremoto del 7 de Mayo de 1842. De las ciudades del Cabo, Port-de Paix, el Mole, Fort-Liberté y Santiago de los Caballeros no quedó piedra sobre piedra. los pocos edificios de mampostería de la Vega, y los de Gonaives vinieron al suelo. En Puerto Príncipe, Puerto Plata y Saint Marc hubo algunos derrumbamientos de casas. En Santo Domingo muchos edificios se agrietaron de tal manera que amenazaban desplomarse.

De las iglesias de San Carlos, Monte Plata, Boyá, Baní, Azua, Bayaguana, Seybo, Higüey, San Cristóbal, Moca, Cotuí, y Macoris, unas se derribaron y las más quedaron en estado minoso. En el Santuario del Santo Cerro la iglesia y el convento quedaron destruidos.

En Port-de Pais el mar se retiró a gran distancia de la orilla y volviendo luego con terrible oleaje entró a la población, sus aguas subieron a más de 15 piés de altura y envolvieron en sombras de muerte a los que huyendo de la calda de los edificios se habían refugiado a la playa.

En Monte Cristi y Fort-Liberté las aguas del mar se unieron a los ríos Yaque y Masacre, devastando las comarcas circunvecinas, y con tal violencia inundaron la tierra, que el Cabo Manzanillo ó Punta Jicaro quedó sumergido en las profundidades del océano.

Desde el lugar llamado "Paso de los Borbones" a orillas del Río Yagüe en Santiago, hasta el Río Gurabito, distante media legua más ó menos, la tierra se abrió en toda su longitud dejando una ancha y profunda zanja que atraviesa parte de la Ciudad (Noel, 1979).

1842- In the first half of the year. Puerto Rico, Ponce (IV) A shock was felt in the first half of the year that lasted 4 minutes. Mallet (1854).

Earthquake at Ponce, PR- We are indebted to Capt. York, of the schr. Independence from Ponce, for the following account of the shock felt at that place on the 7<sup>th</sup> inst. Capt. York states that he was sitting with a friend, when they suddenly felt a dizziness and excessive faintness, and upon attempting to walk found themselves acting like persons intoxicated. His companion then observed that the house rocked. They went out of doors and saw that the house rocked at least two feet. So great was the motion for the earth, that the casks of sugar and molasses on the beach rolled round making great havoc. The inhabitants were filled with the greatest terror, and all rushed into the middle of the street, and falling on their knees repeated all the prayers in the Catholic service, and crying each on his patron saint to save them from their peril upon any terms the saint required. The shock was felt at 3 pm of 7<sup>th</sup> inst, and lasted about three minutes (Anon., 1842g).

The earthquake was felt at Spanish-town, at three minutes before 5 o'clock on the evening of the 7<sup>th</sup>. The shock lasted about a minute, but did no damage (Anon., 1842h).

Earthquake- Capt. Ward of the barque Condor which arrived yesterday morning from Mayagüez, (PR) informs us that the Earthquake on the 7<sup>th</sup> of May was very severely felt there; and that up to the 30 of May when he sailed, there were from two to three shocks a day. The inhabitants were very fearful of a similar shock to that which was felt on the 7<sup>th</sup> in other places (Anon., 1842i).

Campbell (1972) reports:

Great Earthquake occurred in northwestern Hispaniola. Destructive shock in Santo Domingo [Hispaniola]. Apparently felt in Jamaica and Puerto Rico (Reid and Taber, 1919). Violent earthquake in Santo Domingo. Felt in Puerto Rico, Jamaica and other islands (Perrey). Listed as Santo Domingo, Puerto Rico and Jamaica (Poey). A terrible earthquake doing much damage and killing many people, especially in Haiti. Felt in San Juan (Iñiguez, 1975). Tomblin and Robson (1977) report: Puerto Rico, San Juan (V) Earthquake reported. No loss. Jamaica Morning Journal, 1842.5.18. St. Thomas (V) Earthquake reported. No loss. Jamaica Morning Journal, 1842.5.18.

**Commentary:** This is the Great earthquake of NW Hispaniola. Estimated magnitude 8.0  $M_w$  (Shepherd and Lynch, 1992). It was clearly felt in Añasco, Mayaguez, Ponce and San Juan, Puerto Rico and St. Thomas, Virgin Islands. Damage to a church in Añasco. Aftershocks felt in Añasco.

### *1843, February 8<sup>th</sup> 1050*

**Location:** St. Martin, St. Barts, Guadalupe, Martinique, Antigua, at latitude 17N03 longitude 58W45; St. Eustatius, St. Christopher [St. Kitts], Nevis, Montserrat, St. Thomas (Virgin Islands), Tortola (Virgin Islands); Mayagüez, Guayama, Naguabo (Puerto Rico); St. Lucia, Barbados, Grenada, British Guyana, Trinidad and Dominica, Charleston, South Carolina

**Data:** “Reference to ‘recent earthquake’ felt in Point Pitre, Guadalupe (Mason, 1843)... I was at Point Pitre at the moment of the recent earthquake... fire had burnt up what the shock spared. It was impossible to tell one house from another...” (Anon., 1843a).

It becomes my melancholy duty to inform you of the most disastrous event, which has happened, within the memory of man, and which has cast a gloom over us, that time can never dispel. A most severe shock of an earthquake was experienced on the 8<sup>th</sup> inst, which fortunately caused no loss of life here, but has completely destroyed the town of Pointe Pitre Guadalupe, one of the most commercial of all the Windward Islands and burying in ruins about one third of the inhabitants-not one stone remaining on another.

Among the victims, I regret to be obliged to announce Felix H. Juan Esqr. United States Consul, for the Island of Guadalupe, who being severely wounded, was obliged to have one of his legs amputated, but did not survive the operation (Cueny, 1843).

It becomes my painful duty to acquaint you of the most awful calamity with which this Island has ever been visited. On the 8th Inst. at 10.40 a.m. an earthquake, which lasted between two and three minutes spread ruin and devastation throughout the whole island. The churches and other public edifices, the dwellings and stores of the inhabitants and the sugar works on the plantations have been all, either wholly or partially destroyed. Sufficient time has not yet elapsed to form a correct statement of the injury the Island has sustained but, the amount conjectured is, enormous. The loss of life in this terrific visitation has fortunately been small, up to this date about ten have been reported.

A French ship of War arrived here this morning from Guadalupe and reports that the once beautiful town of Pointe a Pilie is now a heap of ruins and about three to four thousand persons supposed to have perished. The islands of St. Christopher [St. Kitts], Nevis, Montserat and Dominica have all suffered, but Guadalupe and Antigua more severely (Hesinbothom, 1843).

The Inhabitants of Roseau [Dominica] were, at seven minutes to eleven o'clock this afternoon, suddenly and justly alarmed by... earthquake which for violence the oldest of them say, has not ever been exceeded here whilst it duration was longer than they ever experienced. As far as... everyone in town can... calculate the vibration rocked from N.E. to the S.W. producing a rushing noise like a Hurricane, and afterwards the ground seemed to Ave perpendicularly, shaking the houses with a cracking noise... At the same moment the larger building clearly appears to be rolling to and fro., and columns of smoke were seen issuing from several of the mountains in sight of the town... We think the shock lasted 2.5 minutes but one gentleman assures us that by a watch he had in his hand it occupied three minutes and I half... Several stone building [s] have been cracked and some old walls and chimneys thrown down... At the military arsenal the arms racks were so shaken as to bring the muskets to the floor.

Since writing the above, we have learned with regret that the Windward Quarter of the Island has sustained material injury by the awful calamity, and that amongst other losses the sugar works and other stone buildings of the Melville Hall and Londonderry Estates have been destroyed! (Anon., 1843b).

[Details given on damages to estates of York Valley, Picard, Sugar Loaf, Londonderry, Melville Hall, Castle Bruce, Hatton Garden, Eden]... The intelligence relative to Antigua has also been confirmed. Montserrat, Nevis, St. Kitts, in fact all the islands from hence to St. Thomas have suffered more or less severely... [from the earthquake] (Anon., 1843c).

The earthquake which took place this morning was from the N.E. and the vibrations were felt without intermission for the space of nearly two minutes (Anon., 1843i).

By the homeward bound steamer which passed here in Wednesday last we received our usual files of papers from the southern colonies from which we learn that the earthquake of the 8th was felt in every one of them up to Trinidad, without injuries however to life or property...

At the moment of going to press yesterday morning, a terrible and appalling calamity fell upon this Island [Antigua]... This terrible earthquake began about a quarter of an hour before eleven o'clock, lasted a considerable time and... made St. John's... ruin and devastation, there being no house of premises of which wall work formed a part, which as not felt its effects... The Cathedral church... is a heap of ruins... the Court House is... rent and cracked in several places, as to be unsafe... The new villages built and settled by the laborers, as well as the houses on the plantations, are almost all level with the ground... The town of Falmouth is a heap of ruins; English Harbour the same; the dockyard the same- There the ground sunk in many places to a great extent... The Engineer Quarter, Commissariat and Barrack Master's the only buildings escaped damage, being of wood... During the convulsion the sea encroached considerably on the I and... deep creeks and fissures in the earth are to be seen in several places from some of which water was thrown up, and the smell of sul-

phur strong in others, as described by one Moravian Missionary who was on his way from Gracehill to his house in LebAnon., and as intolerable.

The smell was also perceived at Popeshead in a quite opposite direction of the Island (Anon., 1843d).

Yesterday was the anniversary of the dreadful earthquake with which we [Nevis] were visited in the year 1833, just ten years before; and upon that anniversary at half-past ten in the morning we had a shock that it is impossible for me faithfully to describe... Charlestown is almost in ruins, it stand, and no life has been lost... Our court house is nearly level with the ground (Anon., 1843e).

St. Thomas, 10:30a.m.

Shook violent, lasted more than three minutes, but no injury whatever done. Tortola. The same, and lasted five minutes... St. Kitts. Town much injured, several buildings destroyed. Montserat. Town much injured... fear lives lost. Martinique, Santa Lucia, Barbados, Granada. Shaken severely but no actual damage done. Guadeloupe-Pointe a Petre. The earthquake commenced with a tremendous motion... at half-past 10 o'clock AM... The earthquake lasted 45 seconds, and in 15 seconds, one-third at least of the town was destroyed. At the end of this period the shock somewhat abated, but shortly after was renewed with greater force, whereupon the whole town was buried in ruins. The ground opened in different places, and volumes of water spouted up to an extraordinary height... Such was the agitation of the earth, that the inhabitants were all thrown prostrate, and stunned by the fall... The Soufriere Mountain was in eruption and burst, melting iron chests with specie, etc... (Anon., 1843f).

This island [Barbados] felt the shock, but slightly at half past-ten. It lasted about three minutes.

N.B. At the time when the earthquake took place, the *Dee* was off the island of Porto Rico. Not the slightest indication was felt on board...

The Barbadian says: At 20 minutes before eleven o'clock this morning, sitting at our desk, we were alarmed by the shaking of the chair and instantly felt... earthquake. The vibration of the earth from south to north- lasted at least a minute and a half. The shock was so severe as to induce very many persons to turn out of their houses... That shock... brought to the recollection of us all that awful convulsion of the earth on the 11<sup>th</sup> of January, 1839, which was severely felt here, but in Martinique produced most disastrous consequences, destruction of property, and dreadful loss of human life...

And the Liberal... at 20 minutes before 11, yesterday afternoon, the inhabitants of Bridgetown, were alarmed by a very severe shaking of earthquake, which lasted about two minutes...

British Guyana, February 8<sup>th</sup>. At ten minutes past 11 o'clock,... occurred as severe an earthquake as some of the oldest inhabitants have any recollection. Every... house was in motion, and every house shook violently; some old chimneys... fell the shock, or rather the two shocks, lasted forty seconds...

The last earthquake experienced in the place, occurred on the 11<sup>th</sup> of January, 1839. It was severe, but not alarming in comparison of the convulsion of today. Yet, on that fatal morning, fell the town of St. Pierre in Martinique, killing... a thousand of its inhabitants... Our... wooden tenements - the flatness of the land, whereby no

buildings are erected on declivities .. lessen the debilitating effects of earthquakes in Guyana..., Herald.

Brig British Queen, Capt. Kennedy, from Whitehaven, 17N03 long 58W45, ship going six knots, felt a very severe shock of earthquake, which stopped her way, about 160 miles due east of the island [Antigua], on 8<sup>th</sup> past. which lasted about four minutes.

Guadeloupe... At the time of the earthquake, there was an eruption of the mountain called Souffriere the sides of which split in several places. Basse-Terre on the same island felt the shock, but sustained no injury.

Montserrat, Feb 9<sup>th</sup>... The fall of earth in various parts of this island has been tremendous, the dust rising from it was so great as at one time to induce a belief that it was smoke from the Souffriere - This is however quiet, and not... affected... Trinidad. A slight shock of earthquake was felt yesterday in the town and suburbs; the motion was tremulous - slow and unbroken and of about a minute's duration... The shock was not repeated... Trinidad Standard, Feb 9 (Anon., 1843g).

St. Lucia. Yesterday at 28 minutes past 10 AM... an earthquake lasted nearly three minutes... like the great shock of January 1839... [buildings] cracked... slight shocks were also felt during the night of... and last night - Palladium., February 9<sup>th</sup> (Anon., 1843h).

St. Thomas. The Royal mail steam-placket Forth, Commander Fayrer, from St. Thomas, which place she left on Thursday last, bringing account of an earthquake having occurred at the island of St. Thomas.

...On the 8<sup>th</sup> of February at 30 minutes after 10 o'clock AM, I was sitting at table with Mr. Comrie, of the Colonial Bank at St. Thomas', his private house being on a declivity halfway up the highest part of the town. We were suddenly surprised by a confused sound very much resembling the action of a strong draught of one of the large steamers that with the door shut, attended by a hissing sound... Everything was on the move, the glass windows in our house, and those in the one immediately above rattling and the plaster falling off... This lasted full three minutes... from the motion did not conceive that anything serious would occur, nor has there, beyond much fright... A French brig coming to St. Thomas's off Tortola, felt the shock so severely, he thought that the vessel had struck on a rock... In a subsequent account received from the commander of the Fort, he states that Tortola had not suffered... Fayrer (1843).

[At St. Thomas) about half-past 10 o'clock; when all of a sudden the inhabitants were thrown into a state of the utmost consternation and alarm, by a violent trembling and shakes of the earth... I happened to be on shore at the time and seeing the people suddenly rush in crowds from their houses into the streets, with terror and dismay... I inquired of a gentlemen, who looked pale as a sheet, what was the matter, when he replied "Oh Sir, It's an earthquake; don't you feel It?" I had indeed felt the ground tremble and quiver underneath me; but, never having felt an earthquake before concluded it was produced by some very heavily-laden wagon or other passing through the street... I was, however, soon undeceived, for the houses began to shake, doors and window shutters to swing upon their hinges, pots, pans and tins, suspended from the ceiling of the shops and stores, to play tunes upon each other, bottles to be flung off the shelves, and glasses to dance and jingle on the sideboards. All this occurred in about two minutes and fortunately passed off in this place without doing much dam-

age to property... We understood afterwards... that St. Eustatius had suffered pretty severely... (Anon., 1843j).

Two distinct shocks of an earthquake were felt yesterday, in this city (Charleston SC/USA) a few minutes before 10 o'clock. They were slight, and we did not ourselves feel the vibration, but we have heard many persons, and in different sections of the city, say that they felt the shocks perceptibly, and observed the movement of curtains, and pictures, hanging against the walls of their houses (Anon., 1843k).

The Columbia South Carolinian of Thursday last says ' Some two or three shocks of earthquake- continuing altogether, with little more than momentary intervening cessations, perhaps two or three minutes- occurred in the city at 10 ½ o'clock yesterday morning (2/8/1843). The vibrations seemed to be about an inch each, alternately between North-west and South-east (Anon., 1843l).

Wilmington NC February 9<sup>th</sup>, 1843- A shock of an earthquake was sensibly felt in out town (Wilmington NC) yesterday morning, about 10 o'clock, it continued some seconds, during which time, some houses shook so as to cause a rattling of the windows and the doors to open. A gentleman told us, his house shook so that he became alarmed and left it. Earthquake- we learn from several of our citizens that a slight shock of an earthquake was felt yesterday morning, between ten and eleven o'clock, in this city. The vibration was the more severely felt in the direction of Curry Town-Savannah Georgia (Anon., 1843m).

#### Campbell reports:

Origin from Guadeloupe to neighborhood of Antigua. Very destructive. Was felt for long distances. No report from Puerto Rico but undoubtedly felt over eastern portion of Island, III-IV. Famous earthquake of Pointe-a-Pitre. A good coverage is given with Puerto Rico and other islands mentioned near conclusion (Perrey) St. Thomas, St. Croix and most islands of West Indies, but Puerto Rico is not included (Poey). Guadeloupe (IX). Felt throughout Caribbean. (Robson, 1964) St. Thomas IV. No damage. Damaged customs houses at Mayagüez, Guayama and Naguabo in Puerto Rico (Anon., 1843n).

Tomblin and Robson (1977) report: St. Bartholomew (VIII) All stone buildings were damaged beyond repair. A crack 10 inches wide and 1/2 mile long appeared in the town. No lives were lost. Barbadian, 15.2.1843. St. Martin (VIII) Estates all mined and stone houses all thrown down. No lives were lost. Barbadian, 15.2.1843. Tortola (V) 10.30 h. A severe shock lasting four minutes. No damage. Barbadian, 15.2.1843. St. Thomas (IV) An earthquake was felt but caused no damage. Barbadian, 15.2.1843

**Commentary:** This is a well-known and well reported great Lesser Antilles earthquake. Minimal effects in Puerto Rico and St. Thomas. Felt as far away as the Carolinas in the USA.

#### **1843 March 5<sup>th</sup>**

**Location:** Saint Thomas



**Data:** Tomblin and Robson (1977) report: St. Thomas (V) An earthquake caused people to run outdoors, but did no damage. Barbadian, 22.3.1843

**Commentary:** People ran outdoors.

### *1844, April 16<sup>th</sup> 0910?*

**Location:** San Juan, Isabela, Gurabo, Bayamón, Utuado, Yabucoa, Humacao, Ponce, Caguas, Guayama Puerto Rico; St. Thomas; 200 miles at sea from Puerto Rico, Guadeloupe

**Data:** “El día 16 del actual a las nueve menos diez minutos de su mañana se sintió en esta Isla un fuerte temblor de tierra que se dilató sintero más segundos, poniendo en consternación a todos sus habitantes, tanto por su espantoso sacudimiento como por el ruido subterráneo que lo acompañó siguiente a un bueno, afortunadamente no causó desgracia alguno; varios edificios de particulares han sufrido descalabros, pero más particularmente los templos de las monjas y convento dominico de esta Ciudad en cuyos muros y bóvedas se ha abierto algunas grietas, las iglesias de los pueblos de la Isabela, Gurabo, Bayamón, Utuado, Yabueda (Yabucoa), Ponce y Caguas experimentaron iguales daños reparando dichos edificios, así como también el de la cárcel del último de los referidos pueblos en que causó igualmente algunos deterioros...” (Mardenaligo, 1844).

El alcalde Señor dijo que correspondiendo a la comisión de Policía Urbana (San Juan) proceder al reconocimiento con el arquitecto de la casas ofendidas por el temblor de tierra de día 16 del mes actual, a proporción que lo vayan participando los vecinos por la orden fijara en las esquinas al intento.

...La dipusación de esta casa consistorial (San Juan) expuso en el 18 del corriente, los daños que ha sufrido la misma con motivo de las abundantes lluvias que hubo a principio del mes y del temblor de tierra acaecido al día 16 [damage detail given but cause uncertain] (Anon., 1844b).

Abril 19,... cabildo extraordinario [Isabela]... relativo al estrago causado por el terremoto del día diez y seis [on May 7<sup>th</sup> in the same document refers to the temblor de tierra en la mañana del día 16] en la iglesia de esta parroquia... El horroroso terremoto sentido a las nueve de esta mañana causó en la iglesia de esta parroquia el estrago siguiente; se nota una abertura... prolongada desde el... de la cruz... hasta el arco de la puerta mayor abrazandolo en todo su espesor, cuya contracción no puede... con la visita natural; en las dos columnas primeras que sostienen el... la nave y de las torres junto al... se ven tres hendiduras que causan igual cuidado, y que... se reconocen en tiempo para el... repara puedan atraen la ruina... (Roman, 1844).

Cabildo extraordinario del día 9 de Mayo [1844, Caguas]. Manifestó el Señor Presidente que el objeto de esta reunión lo era acordar las medidas que deben adoptarse para atender a la recomposición del cementerio de este pueblo que acaba de derrumbarse por partes a consecuencia del temblor que bastante afectó las paredes... (Anon., 1844c).

‘The same journal (*St. Thomas Tidende*) informs us that a very strong earthquake was felt in the town of St. Thomas (Charlotte Amalie) on the 16<sup>th</sup> of April at 20 minutes past 9 O’clock in the morning’ The weather since that time, says that journal, was rainy and expected some disaster of that kind, but we are fortunate not to have experienced any damage’ The Barbadian on May 25 (Anon., 1844d).

It continues:

...Bacao (Humacao?, Puerto Rico) of date April 23<sup>rd</sup>... ces that on the morning of the 16<sup>th</sup>... a long shock followed by a subterranean noise was felt throughout the island. The church of this town has been much damaged, as well as the customs House of Guayama. In the island many houses and public edifices have been thrown down. The alarm has been general... The Boletín Journal of Saint John (Puerto Rico) has just reached us – the following is what we have extracted. Yesterday at ten minutes after 9 in the morning we experienced an extremely strong shock of earthquake accompanied with a subterranean noise, which has ruined us all, and which lasted about 50 seconds. The oscillation was so strong that the oldest inhabitant of the place declares he does not recollect a like example. Now that we are settled we look for expressions capable of demonstratring the position in which we were at the time of the awful event. Nearly all the stone houses are cracked as well as the church that is in a complete state of ruins; we have not yet received account from the interior.

Let us return thanks to God that it was only of a short duration for we could be all at the current hour like a point a pitre under heaps of ruins. It was worth of remark that for a week we had strong and abundant rain which completely flooded the country (Anon., 1844e).

Earthquake at Guayama, P. R. - we learn by the brig. Meteor, Capt Stevens, from Guayama, that on the 16<sup>th</sup> April, at half-past 8 P.M., with light northerly airs and sultry weather, the shock of an earthquake was heard there, which lasted about minute. The customhouse was cracked in several places, but we have not heard of its doing any damage. At Ponce they say it was a great deal more severe; a great many house are more or less damaged, and some have fallen down. The oldest people at that place say it was the severest shock ever felt there. *Ibid.*

A shock of an earthquake was experience at Puerto [*sic*] Rico on the 16<sup>th</sup> ult., which cause nearly all the houses to creak more or less. The church was injured considerably, and several houses were thrown down in Ponce and Guayama. The Captain of the brig Alphonzo, who arrived two days afterwards, from New York, states that 200 miles from the Island he felt the shock severely (Anon., 1844a).

From St Johns PR –Captain Martin, of the schr. Euarkee informs us that a severe shock of earthquake was felt at St. Johns, PR the 16<sup>th</sup> April at 8 O’clock, A.M. The houses were much damaged, and the people were moving out of town. The vessels in the harbor felt the shock, but received no damage. He heard of no person being hurt (Anon., 1844a).

Temblores de tierra en los días 20 de Abril y 21 Octubre (Anon., 1846a).

Campbell (1972) reports:

Severe earthquake of 30 seconds duration. Felt in Puerto Rico, VII-VIII, and in St. Thomas. In Puerto Rico, several houses and some public buildings were overthrown

or cracked. A tower of the temple at Isabela was cracked. The origin may have been north of Puerto Rico. The felt report from Guadeloupe must have been an error (Reid and Taber, 1919). Puerto Rico. A violent shock (Perrey, 1855). St. Thomas, Puerto Rico, and Guadeloupe (Poey, 1857). Puerto Rico VIII. In San Juan, nearly all stone houses were cracked. In Bairoa, the church was badly damaged and there was damage to the customs house at Guayama (Robson, 1964).

Perrey (1845) refers to an event in Saint Thomas April 17<sup>th</sup>.

Tomblin and Robson (1977) report: San Juan (VII) 09.20 h. nearly all the stone houses were cracked and the church ruined. Re shock was felt throughout the island. Barbadian, 25.5.1844. Puerto Rico, Bacao (VI) Church damaged. Barbadian, 25.5.1844. Puerto Rico, Guayama (VI) Custom House damaged. Barbadian, 25.5.1844. St. Thomas (V) A very strong earthquake. No damage. Barbadian, 25.5.1844

“A tower of the Catholic Church at Isabela was overthrown or cracked” in Reid and Taber (1919; citing Archives of Governor and Deville, (1867). Felt in Guadeloupe (Feuillard, 1983).

**Commentary:** Not mentioned in the Saint Thomas Tidende for the period of April 11<sup>th</sup> -May 11<sup>th</sup> although the Barbadian, 5.25.1844 refers to it being felt on this island (as cited in Robson, 1964). Reid and Taber feel that the report of the event being felt in Guadeloupe must be erroneous).

First hand reports are primarily found for the eastern part of the island. Supposedly felt as far as St. Thomas and Guadeloupe.

### *1844, May 5<sup>th</sup>*

**Location:** Ponce, All Island, Puerto Rico

**Data:** González (1903) wrote “5 de mayo de 1844- Terrible terremoto en toda la isla y que se sintió también en las de Barlovento, especialmente en Martinique y Guadalupe”.

Un fuerte temblor de tierra se sintió en Ponce acompañado de profundos ruidos subterráneos en Mayo 5 de 1844, en virtud del cual vino abajo la parte superior del frontispicio del templo de Guadalupe con la cruz que lo adornaba, y sonaron las campanas, según nos refería en sus inolvidables veladas nuestra abuela materna doña Carmen Geraldino. Neumann (1913).

Coll y Toste (1918) Por tradición familiar sé que el 5 de Mayo de 1844 hubo un terrible terremoto, que sacudió en toda la Isla.

Campbell (1972) reports: A strong shock felt in Ponce accompanied by a profound subterranean noise (Neumann, 1913). A great earthquake in Puerto Rico (Limon, 1938). A terrible earthquake in all the Island (González, 1903).

**Commentary:** All these references are secondary and hence not be trusted. A check of actas de cabildo (Caguas, San Juan, Mayagüez, San Germán, Ponce) and gazeta records for this event failed to uncover any reference to it. A careful check of AGI treasury and army records for the Island of Puerto Rico in this year (AGI Audiencia de Santo Domingo 2458 and 2459) failed to uncover any references to this event. Nor is there any reference to any event on that island in the Saint Thomas Tidende for the dates April 11<sup>th</sup> to May 11<sup>th</sup>. Apparently erroneous reference to event of April 16, 1844. This is a non-existent event. It should be noted as such in further catalogs and references passed to April 16, 1844 event.

### ***1844, October 19<sup>th</sup> and 20<sup>th</sup> 2330, 0930***

**Location:** Isla Puerto Rico

**Data:** “El 19 del corriente a las 11 y media de la noche, se ha sentido un temblor de tierra y el 20 a las 9 y media de la mañana hallándose... sin apariencias notables, se ha sentido de nuevo con un movimiento de trepidación, que principió a alarmar el vecino; por que habiendo cesado en pocos instantes se recuperó la calma en que hasta la fecha se sepa ha ocasionado alguna desgracia y sido más sensible en algún otro punto de la isla” (Lescubel, 1844).

“Temblores de tierra en los días 20 de Abril y 21 Octubre” (Anon., 1846a).

### ***1846, November 28<sup>th</sup> 1700***

**Location:** San Juan, Río Piedras, Guayama, Cabo Rojo, Isabela, Arecibo, Manatí

**Data:** “A las 5.25 de la tarde de ayer,... se sintió en esta Capital un fuerte temblor de tierra oscilatorio, cuya dirección, según el movimiento que observé en los cuadros de mis despacho, fue del NO. al SO. y su duración de 4 á 5 segundos. Ningún daño ha causado en los edificios de esta Ciudad ni en los del inmediato pueblo de Río Piedras, sin embargo de que se sintió con más violencia” (Anon., 1846b).

El temblor de tierra experimentado en esta Capital el 28 de Noviembre ultimo, del que di a vuestra excelencia conocimiento en 29, siguiente se bajo el número 426, se ha sentido en toda la Ysla con más ó menos vehemencia, particularmente en Guayama, Cabo Rojo, Isabela y Arecibo. En los dos primeros puertos no causó daño alguno; en la Ysabela... la columna que sostiene una de las torres de la yglesia, que se hallaba resentida desde el temblor acaesido el 16 de Abril de 1844 y en preciso se creyó que había causado grandes deterioros en la nueva Iglesia Inaugurada en 12 de repetido mes según participó a VE (Anon., 1846c).

...Muy al contrario de lo que sucedió en [Manatí] el del año 46, pues dos casas de mampostería de las mejores que aquí existen, sufrieron en aquella fecha deterioros considerables. T.R. (Anon., 1858b).

...las cinco menos cuarto de la tarde ha habido un terremoto el más terrible y largo que he conocido en cuarenta y nueve años que tengo de edad, el cual ha cuarteado ambas naves laterales de la iglesia nueva de un extremo a otro... Las aberturas por el frente de la iglesia [Arecibo] particularmente en la nave del sur pero disminuye bastante en el tercer arco. Los circos de la nave mayor también se les conoce han tenido movimientos pero no es gran cosa (Balseiro, 1846).

Objeto de reconocer los daños causados por el terremoto del veinte y ocho del próximo pasado [en Arecibo]; los cuales consisten en haberse descubierto unas pequeñas aberturas en todo... los muros que sostienen las bóvedas de la capilla bastimal y de las animas, se hallan perfectamente a plomo... [more details on minor damage] (Zayas, 1846).

Marvel and Moreno (1984) referring to San Juan Archive documents note “On November 24<sup>th</sup>, 1846, the town celebrated with gala activities the opening of its church, which had taken a half century to construct [being ruined by the 1787 earthquake]. Within four days, on November 28<sup>th</sup>, an earthquake shook the church, cracking both sides aisles from one extreme to the other”. Cadilla (1961) says “En 29 de noviembre de 1846, Nuevo temblor la damnificó” referring to the church in Arecibo.

Campbell notes: Felt throughout Puerto Rico with highest intensity, VII, north-western part. Church at Isabela again damaged. VI at Cabo Rojo and Arecibo; V at San Juan. Epicenter probably in Mona Passage. Listed as Puerto Rico only (Poey). Another earthquake occurred in Puerto Rico (Limon, 1938). An earthquake occurred in Puerto Rico on November 28<sup>th</sup>, 1846 (La Gazeta de Puerto Rico). Probably in Mona Passage. VII (R-F scale) in northwestern part. Strongest in northwestern part (VII). Damage done to church at Arecibo, at first believed due to the earthquake, were reported later as settling cracks in a new structure. Cabo Rojo and Arecibo (VI) San Juan (V) Reportes at Guyana (IV?). This shock probably originated in the northern part of the Mona Passage; perhaps near the origin of the 1918 shocks” Reid and Taber (1919, citing Archives of the Governor).

**Commentary:** Strong Earthquake. The church in Arecibo was destroyed in the 1787 earthquake. Reconstruction was well underway in 1817 (see 1787 references). The church was just finished 4 days before this earthquake (half century to construct).

### ***1847, December 18<sup>th</sup>***

**Location:** West Coast of Puerto Rico

**Data:** “An earthquake was registered on the west coast of Puerto Rico” (Anon., 1847).

***1847, December 29<sup>th</sup>*****Location:** Puerto Rico**Data:** “An earthquake was felt in Puerto Rico” (Anon., 1847)***1848, February*****Location:** Mayagüez, Puerto Rico**Data:** Mayagüez, several shocks felt during the month (Anon., 1855; Poey, 1857)**Commentary:** Poey is not a primary source and information needs confirmation from gazetas or local actas de cabildo or other eyewitness accounts.***1849 August 1<sup>st</sup>*****Location:** Puerto Rico**Data:** Puerto Rico (Anon., 1855). Listed as Puerto Rico (Poey, 1857)**Commentary:** Poey is not a primary source and thus needs confirmation from gazetas or local actas de cabildo or other eyewitness accounts.***1850, April 8<sup>th</sup> 0900*****Location:** Mayagüez, Puerto Rico**Data:** Mayagüez, where church bells rang. The shock reported from Martinique on this date must have had a different origin (Reid and Taber, 1919 citing Perrey, 1856). Poey (1857) reports an event in Martinique on the same day but reports no hour.**Commentary:** Earthquake rang bells. Not a primary source and thus needs confirmation from gazetas or local actas de cabildo or other eyewitness accounts.***1850, October 21<sup>st</sup>*****Location:** St Thomas and Antigua**Data:** St. Thomas and Antigua. Severe in Antigua (Anon., 1855)***1850, December 19<sup>th</sup> 2137*****Location:** Aguas Buenas

**Data:** Campbell (1972) reports: Aguas Buenas, IV-V. Strong oscillatory Earthquake. Duration 20 seconds. Accompanied by subterranean noise. Origin in eastern part of Island (Reid and Taber, 1919 citing Governors Archives) Aguas Buenas (IV-V). Aguas Buenas, IV-V. Strong oscillatory Earthquake. Duration 20 seconds. Accompanied by subterranean noise. Origin in eastern part of Island (Poey, 1857).

**Commentary:** Not a primary source and thus needs confirmation from gazetas or local actas de cabildo or other eyewitness accounts.

***1851, February 17<sup>th</sup>-27<sup>th</sup>***

**Location:** Aguas Buenas

**Data:** February 17<sup>th</sup>, Aguas Buenas (V?). Origin in eastern part of Island . Several aftershocks, Feb. 20<sup>th</sup>-27<sup>th</sup>, 1851(Reid and Taber, 1919 ). Listed earthquakes for February 20<sup>th</sup> and 22<sup>nd</sup> in Puerto Rico (3). Aguas Buenas V? on 17<sup>th</sup>; Aguas Buenas IV-V on 20<sup>th</sup>, 1900 and 2058; Three shocks, San Juan City Hall walls cracked (location doubtful) on 22<sup>nd</sup>; Aguas Buenas V on 23<sup>rd</sup> about 0300; Aguas Buenas rather intense VI? on 27<sup>th</sup> 1905.

**Commentary:** The reference to earthquakes at Aguas Buenas in Puerto Rico need confirmation from primary sources.

***1851, February 18<sup>th</sup> 1410***

**Location:** St. Thomas

**Data:** A very smart shock of earthquake was experienced in this town yesterday, at about ten minutes past 2 o'clock, P.M. It was not however generally felt (Anon., 1851).

**Commentary:** Smart shock.

***1851, February 20<sup>th</sup> 0330***

**Location:** Puerto Rico, (Saint Martin?)

**Data:** Shock reported at Santa Martha, W.I. Poey (1857), (Anon., 1855)

**Commentary:** Possibly Saint Martin in the Northern Lesser Antilles.

***1851, June 10<sup>th</sup> 0800***

**Location:** St. Thomas

**Data:** St. Thomas (Perrey, 1856)

***1851, December 16<sup>th</sup>***

**Location:** St. Thomas

**Data:** St. Thomas (Anon., 1855)

***1852, March 17<sup>th</sup>***

**Location:** St. Thomas

**Data:** St. Thomas (Anon., 1855)

***1852, May 17<sup>th</sup>***

**Location:** St. Thomas

**Data:** St. Thomas (Poey 1857a, b)

***1852, May 20<sup>th</sup>***

**Location:** St. Thomas

**Data:** St. Thomas (Poey, 1857a, b)

***1853, May 24<sup>th</sup> 0200***

**Location:** St. Thomas

**Data:** St. Thomas III RF (Perrey, 1845)

***1853, September 19<sup>th</sup> 0600***

**Location:** St. Thomas

**Data:** St. Thomas VI-VII RF (Perrey, 1845)

***1853, December 21<sup>st</sup> 2140***

**Location:** St. Thomas

**Data:** Tomblin and Robson (1977) report: St. Thomas (III) 20.40 h. A slight shock.  
Barbados Globe, 26.12.1853

**Commentary:** Slight Shock.



***1854, April 9 0800-0900*****Location:** St. Thomas**Data:** St. Thomas (Anon., 1855)***1854, June*****Location:** St. Thomas**Data:** Some light shocks were felt in St. Thomas in the month of June (Perrey, 1855).**Commentary:** Light shocks.***1855, May 25<sup>th</sup> 1500 and 1600*****Location:** St. Thomas**Data:** St. Thomas (Reid and Taber, citing Anon., 1855).***1855, December 14<sup>th</sup> 2015*****Location:** Salinas, Aguas Buenas**Data:** Campbell reports: Salinas (VI) RF and Aguas Buenas (V) RF. Said to be the strongest shock ever felt at Salinas. (AG) Origin probably in the southeastern part of the Island (Reid and Taber, 1919) Aguas Buenas (V). Salinas (VI) (CGS).**Commentary:** Not a primary source and thus needs confirmation from gazetas or local actas de cabildo or other eyewitness accounts.***1856, August 28<sup>th</sup> 1300*****Location:** St. Thomas**Data:** Tomblin and Robson (1972) report: St. Thomas (VI) 13.00 h. A sudden, severe shock, causing rafters and beams of houses to creak. People rushed outdoors. The walls of a few stores were cracked. St. Thomas Times, 30.8.1856.**Commentary:** People rushed outdoors.***1858, February 24<sup>th</sup> 0400*****Location:** Puerto Rico, St. Thomas

**Data:** Widespread but apparently light. Reported from Puerto Rico, St. Thomas and other islands. There might have been more than one shock causing confusion in reporting (Reid and Taber, 1919). “St. Thomas and Puerto Rico. Shocks also reported this day from Martinique (4.09am), Guadeloupe (4am), Jamaica, St. Bartholomew and Curacao. (Poey, 1857). Severe shock in Martinique on this day (Perrey, 1861a), which may have been felt in Guadeloupe, but probably not as far as St. Bartholomew. The reports at other places are either erroneous, or they refer to independent shocks” (Reid and Taber, 1919).

**Commentary:** Not found in the Saint Thomas Tidende for February 28<sup>th</sup> through March 10<sup>th</sup> of 1858 hence dubious for St. Thomas. Needs confirmation from primary source for Puerto Rico. Possibly event in Venezuela basin or near Martinique.

### *1858, September 7<sup>th</sup> 1515*

**Location:** Ponce, Manatí, Puerto Rico

**Data:** Temblor Ponce. El martes último a las once y minutos debió empezar el eclipse solar... con el temblor que durante el chubasco que cayó como a las tres, se dejó sentir de oscilación de E a 0 y que duró como veinte segundos. No fue muy fuerte, pero sin embargo, se dejó sentir (Anon., 1858a).

...Ayer, como a las tres y cuarto de la tarde, se dejó sentir en este pueblo un terremoto algo fuerte y de poca duración, por cuya última circunstancia nada tuvimos que lamentar afortunadamente; muy al contrario de lo que sucedió en Manatí el del año 46, pues dos casas de mampostería de las mejores que aquí existen, sufrieron en aquella fecha deterioros considerables (Anon., 1858b).

**Commentary:** Somewhat strong earthquake.

### *1860, October 23<sup>rd</sup>*

**Location:** Mayagüez, Puerto Rico

**Data:** Mayagüez. Rather strong shock with some damage VI-VII RF (Reid and Taber, 1919 citing Perrey, 1865).

**Commentary:** Not a primary source and thus needs confirmation from gazetas or local actas de cabildo or other eyewitness accounts. Actas del Ayuntamiento de Mayaguez for October 28<sup>th</sup> and 29<sup>th</sup> do not mention an earthquake. Event is suspect.

### *1863, October 12<sup>th</sup> 0700 and 1020*

**Location:** Saint Croix

**Data:** Campbell reports: St. Croix. Two shocks. One about 0700, III RF; one about 1020, IV RF. (Reid and Taber, 1919 citing Perrey, 1875) No record of this shock being felt in Puerto Rico.

**Commentary:** Not found in the Saint Thomas Tidende from October 10<sup>th</sup> to October 31<sup>st</sup> of 1861 Needs to be checked in the Dansk Vestindisk Regierings Avis of St. Croix. Confirmation necessary from gazetas or local actas de cabildo or other eyewitness accounts. Event is suspect.

*1864, May 30<sup>th</sup>*

**Location:** Mayagüez, Puerto Rico

**Data:** Mayagüez. Light shock (III) (Reid and Taber, 1919)

**Commentary:** Not a primary source and thus needs confirmation from gazetas or local actas de cabildo or other eyewitness accounts. Actas del Ayuntamiento de Mayagüez for May 30<sup>th</sup> and June 6<sup>th</sup> make no mention of earthquake.

*1864, September 6<sup>th</sup>*

**Location:** Puerto Rico

**Data:** Puerto Rico Light shock (Reid and Taber, 1919)

**Commentary:** Not a primary source and thus needs confirmation from gazetas or local actas de cabildo or other eyewitness accounts. Actas del Ayuntamiento de Mayagüez for September 9<sup>th</sup> make no mention of earthquake.

*1864, November 5<sup>th</sup>*

**Location:** San Juan and Caguas, Puerto Rico

**Data:** Puerto Rico and Caguas (Puerto Rico probably means San Juan) (Reid and Taber, 1919)

**Commentary:** Not a primary source and thus needs confirmation from gazetas or local actas de cabildo or other eyewitness accounts.

*1865, May 12<sup>th</sup> 0930*

**Location:** St. Thomas

**Data:** Two strong shocks, the second the stronger; some damage. (Reid and Taber, 1919 citing, Fuchs, 1866; Perrey, 1867, 1875)

**Commentary:** People rushed outdoors.

**1865, August 24<sup>th</sup> 0215****Location:** Puerto Rico**Data:** Puerto Rico, IV. Strong, undulatory shock lasting 45 seconds (Reid and Taber, 1919)**Commentary:** Not a primary source and thus needs confirmation from gazetas or local actas de cabildo or other eyewitness accounts. Actas del Ayuntamiento de Mayagüez for August 28<sup>th</sup> makes no mention of earthquake.**1865, August 30<sup>th</sup> 0145****Location:** San Juan, Barranquitas, Cidra, Isabela, Lares, Mayagüez, San Germán, Manatí, Ponce, Puerto Rico; Santo Domingo and Santiago de Los Caballeros, Dominican Republic.**Data:** “Anteayer entre una y dos de la noche se sintió en esta ciudad [Santo Domingo] uno bastante fuerte [temblor]. Durante como 18 segundos” (Anon., 1865a).

También se sintió en Santiago de los Caballeros el sacudimiento de la noche del 29 del pasado. La población no dejó de alarmarse, porque lo mismo que aquí duraría allá sobre 68 segundos (Anon., 1865b).

El 30 del mes pasado a las dos menos cuarto de la noche se ha sentido en esta Capital un terremoto que tuvo de duración un minuto aproximadamente, y el cual hizo mover los edificios fuertemente. En toda la isla se ha sentido igualmente, y según las informaciones que he recibido no han ocurrido desgracias por consecuencia de este fenómeno, si bien han sufrido en general los edificios públicos, de lo cual daré a vuestra excelencia detalles cuando me sean bien conocidos (Uresino, 1865a).

Consiguiente con lo que tuve - del actual cobre el temblor de tierra que se ha sentido en esta... la noche del 30 de Agosto último debo manifestarle, que según las noticias suministradas por los alcaldes y corregidores resulta que el temblor se hizo sentir notablemente en toda la isla principalmente en los pueblos de Barranquitas, Cidra, Ysabela, Lares, Mayagüez y San Germán, causando algunos deterioros en los edificios públicos y privados, que se bien no fueron de mucha consideración necesitando una pronto reparación ocasionaron gastos imprevistos, habiendo sido necesario hechar abajo la torre de la iglesia parroquial del referido pueblo de la Cidra por el mal estado en que la dejo el temblor a evitar desgracias, atendiendo a lo que expuso un arquitecto que la reconoció. La tarde del 7 del corriente hubo un fuerte temporal en diferentes pueblos de la Ysla de la Costa del Sur, habiendo ocasionado estragos de bastante consideración en la cosecha de café y otros frutos, sufriendo más los distritos municipales de Yauco, Mayagüez, Peñuelas, Ponce y S. Germán sin ocurrir desgracia personal (Uresino, 1865b).

Prolongado temblor de tierra, llamado de Santa Rosa, que consterna al vecindario (Neumann, 1913).

...El edificio cuartel de esta Villa (San Germán) para ver si ha sufrido algún deterioro a consecuencia del temblor de tierra experimentado en la noche del veinte y nueve al treinta del pasado (Quiñónez, 1865).

Campbell reports: Cracks formed in churches at Manatí and Ponce, VI? (Reid and Taber citing Episcopal Archives in San Juan). No report from other places. Origin probably in center part of the Island (Reid and Taber, 1919). A prolonged earthquake in Puerto Rico (Neumann, 1913). A large earthquake was felt (Limon, 1938). A prolonged earthquake in Puerto Rico Prolonged earthquake felt throughout the Island at 2:00a.m. (Font, 1903)... Origin probably in center of the Island. Apparently widespread and probably located on the Island and quite deep, 50 to 100 kms (Campbell, 1972).

**Commentary:** Event felt widely between Santiago in the Dominican Republic to the west and San Juan Puerto Rico on the East. Origin probably near western part of the island. Note- Actas del Ayuntamiento de Mayagüez for September 5<sup>th</sup>, and 12<sup>th</sup> make no mention of earthquake.

**1866, January (February?) 7<sup>th</sup> 0800, 1300, 1830, 2015, 2300**

**Location:** San Juan, Mayagüez, San Germán

**Data:** San Juan III. Shocks also felt at Mayagüez and San Germán on this day at 0800, 1300 and 1830 (Reid and Taber, 1919). San Juan III. Also felt at Mayagüez and San Germán. February 7<sup>th</sup> Mayagüez IV (shocks at 0800, 1300, 2015 and 2300) (Reid and Taber, 1919).

**Commentary:** Not a primary source and thus needs confirmation from gazetas or local actas de cabildo or other eyewitness accounts.

**1866, February 14<sup>th</sup> 1900 and 2000**

**Location:** St. Thomas

**Data:** St. Thomas (VI RF) Reid and Taber (1919) citing Perrey (1870)

**Commentary:** Not a primary source and thus needs confirmation from gazetas or local actas de cabildo or other eyewitness accounts.

**1866, March 26<sup>th</sup>**

**Location:** Puerto Rico

**Data:** Puerto Rico, III (Reid and Taber, 1919 citing Perrey, 1870)

**Commentary:** Not a primary source and thus needs confirmation from gazetas or local actas de cabildo or other eyewitness accounts.

**1866, April 8<sup>th</sup> 0450**

**Location:** Ponce, Mayagüez, Aguadilla

**Data:** Western Puerto Rico V. Duration 20 seconds. Reported from Ponce, Mayagüez and Aguadilla. There was an aftershock on April 10<sup>th</sup> at 0300 (Reid and Taber, 1919, citing Perrey, 1870).

**Commentary:** Not a primary source and thus needs confirmation from gazetas or local actas de cabildo or other eyewitness accounts.

**1866, July 26<sup>th</sup> 0100**

**Location:** Puerto Rico

**Data:** Puerto Rico V RF (Reid and Taber, 1919 citing Perrey, 1870)

**Commentary:** Not a primary source and thus needs confirmation from gazetas or local actas de cabildo or other eyewitness accounts.

**1866, August 6<sup>th</sup> and 7<sup>th</sup> 0800-0900**

**Location:** Puerto Rico

**Data:** Puerto Rico. Aftershock on August 7<sup>th</sup> in the morning (Reid and Taber, 1919 citing Perrey 1870)

**Commentary:** Not a primary source and thus needs confirmation from gazetas or local actas de cabildo or other eyewitness accounts.

**1867, January 7<sup>th</sup>**

**Location:** Puerto Rico

**Data:** "...Las fuertes sacudidas de la isla de Puerto Rico el día 7 [de enero] y manteniendo la agitación de sus ondas, en toda su extensión, durante los meses de enero, febrero, marzo y aún el presente de Abril [1867] (Revenga, 1867).

**Commentary:** Strong shocks.

**1867, January 20<sup>th</sup>**

**Location:** Puerto Rico

**Data:** Puerto Rico (Reid and Taber, 1919, citing Perrey, 1872)

**Commentary:** Not a primary source and thus needs confirmation from gazetas or local actas de cabildo or other eyewitness accounts.

**1867, April 8<sup>th</sup> 0450**

**Location:** Ponce, Mayagüez, Aguadilla, Puerto Rico

**Data:** "...Por último, a las 4 horas y 50 minutos de la mañana del 8 de Abril, hubo una fuerte sacudida en Puerto Rico, que se extendió a Ponce, Mayagüez y Aguadilla..." (Revenga, 1867).

**Commentary:** Strong shock.

**1867, September 7<sup>th</sup>**

**Location:** Río Piedras, Puerto Rico

**Data:** Río Piedras. A shock of short duration (Reid and Taber, 1919, citing Perrey, 1872).

**Commentary:** Not a primary source and thus needs confirmation from gazetas or local actas de cabildo or other eyewitness accounts.

**1867, October 1<sup>st</sup>**

**Location:** Puerto Rico

**Data:** Puerto Rico. Commencement of shocks that were felt for several months. The earlier shocks were not reported from St. Thomas and probably had no relation to the later ones which represented the Great Virgin Island earthquake of November 18<sup>th</sup> 1867 (Reid and Taber, 1919 citing Perrey, 1872).

**Commentary:** Not a primary source and thus needs confirmation from gazetas or local actas de cabildo or other eyewitness accounts. Garcia (1867) implies that "terremotos" were felt since June of 1867 in Isabela but the document is, at this point, very faded and hence difficult to read.

**1867, October 29<sup>th</sup>**

**Location:** Virgin Islands; Humacao, Puerto Rico

**Data:** Shocks reported felt in the Virgin Islands and at Humacao during the disastrous hurricane. Probably erroneous (Reid and Taber, 1919 citing Perrey, 1870 and 1872).

**Commentary:** The violent hurricane "San Narciso" occurred October 29<sup>th</sup> 1867 (Campbell, 1972).

**1867, November 12<sup>th</sup>**

**Location:** St. Thomas

**Data:** St. Thomas Reid and Taber (1919) citing Perrey (1872)

**1867, November 18<sup>th</sup> 1443**

**Location:** Guadeloupe; St. Thomas, Tortola and St. Croix, St. Martin; San Juan, Mayagüez, Ponce, Naguabo, Aguadilla, Arecibo, Río Piedras, Arroyo, Vega Baja, Bayamón, Barros (near Bayamón), Manatí, Tabucos, Loisa, Juncos, Arecibo, Fajardo, Isabella, Cidra, Juana Díaz, Puerto Rico; not felt in Cuba and Santo Domingo (but references to light earthquakes felt about this time in the Dominican Republic).

**Data:** “After the earthquake took place, and just before the rollers were seen, many persons on La Plata’s deck saw smoke ascend from the island of Little Saba, about 5 miles from St. Thomas and shortly afterwards they were sensibly affected by a sulphureous smell. As La Plata steamed close past Little Saba, on the morning of the 20<sup>th</sup> instant, the island was seen to have quite an altered appearance- something like recent lava was seen on the middle slope; at another place, the Island has sunk considerably, and at the South-side a mass of rocks have fallen into the sea (Ray, 1868).

...News reaches St. Thomas on the 19<sup>th</sup> that both St. Croix and Tortola had experience exactly the same earthquakes and rollers, causing great alarm and some loss. At the West-End town of St. Croix an American war steamer had been lifted up by the rollers, and deposited in the middle of the town...

The following particulars have been kindly furnished us by another passenger on board La Plata, who was at St. Thomas when the earthquake occurred: About ten minutes to three on the afternoon of 18<sup>th</sup> instant, the island of St. Thomas, was visited by the most fearful earthquake it has ever experienced. Similar at first the rumbling of heavy carts, the noise increased as the wave seemed to roll on under the earth than gradually died away in the distance, the rocking of the earth increased with the rumbling, and kept increasing for over a minute and a half and altogether, close on three minutes elapsed ere all movement ceased.

The effect on the town was most disastrous, although few buildings were totally destroyed. Scarcely any brick or stone one escaped uninjured.

Near the moment of the first shock, the waters began to gradually recede from the shore. The panic stricken and shrieking inhabitants, whose heartrending cries for mercy, rendered yet more striking the dull and heavy stillness which pervaded all nature after the first shock, had barely had time to quite their houses and reach the open air, when another shock came and then was noticed the fearful aspect the sea was gradually assuming, far away about two miles from the mouth of the harbour-- slowly but surely rising--an immense wave came--gathering strength as It rushed, till, having reached the harbour entrance, this Immense wall-- not less than forty feet high--toppled over and broke, roaring, on what the hurricane had left standing. Ships were driven ashore or dragged from their moorings--wharves swept away. Wrecks ashore high and dry floated off--here a schooner was capsized--there one, left lying by the hurricane broad-side on, was righted and floated out to deep water. The harbour boats were nearly all smashed or carried far up the wharves, or on to the main street. Warehouses were completely gutted, and their contents strewn across the roads.



A second wave less intense followed the first, and then came a third! Little by little the Harbour resumed its former aspect, its surface, if anything, strewn with yet more wrecks... Still the Earthquakes earthquaked on from the first till dark - - no less than eight distinct and violent shocks were felt during the night--the rumbling hardly ceased--and the rocking, or trembling of the earth was incessant.

Daylight brought little cessation--the shocks if less frequent seemed more severe--and during the night of the 19<sup>th</sup> five most distinct and powerful Earthquakes occurred, and up to eight o'clock on the 20<sup>th</sup>, when the "La Plata" left the Harbour, into which she had been brought to coal, no less than 27 shocks from 4 to 30 seconds, had succeeded the first fearful one.

Extracts from the Log of the "Plata," Oct. 18<sup>th</sup>. 2.40--Experienced a very heavy shock of Earthquake, shaking the ship violently--cleared away all the covers from the boats--took in all awnings, and rigged the fore gear. 2.50--Observed a tremendous breaking sea in the offing advancing towards the ship, from the South, threatening her with destruction, the ship being then nearly broadside to it. About a minute afterwards, observed the ship to be canting swiftly round, bringing her stern towards the sea, providentially enabling her to ride over it. 2.55--Breaker struck the ship on the starboard quarter, stove in the bulwarks, and smashed the gig, tearing away hulks from alongside. Let go the starboard anchor, ship head working round to all points of the Compass, surphy-dingy washed away. Lowered cutters to pick up Negroes thrown out of the hulks by the breakers. Observed the stern copper to be displaced, and wood started—examined the stern, but found no leakage--found port after life boat stove in—lowered boats and landed the passengers" (Anon., 1867a).

Repeated shocks of earthquake, as many as four and five in the twenty-four hours, has spread dismay among the inhabitants (of St. Martin)... we have suffered no material injury (Ray, 1868).

Church in Bayamón damaged (Anon., 1868a).

Capital (San Juan) - Palacio de Intendencia Este edificio ha sufrido con los temblores de tierra deterioros en sus paredes y techo, quiere sigan reparación. Casa de Aduana- Ha surgido con los temblores de tierra en terminos de haber sido necesario apuntal un arco y el lintel de una punta; y el depósito... ha padecido, aunque poco. Quedó inútil para el servicio la palúa y el bote auxilliar por consecuencia del huracan.

Mayagüez - Casa Aduana. Ha experimentado algún daño por el huracan; y los temblores de tierra ha abierto grietas en sus paredes. La casilla del aduanero del puerto aduanero ha sufrido con el huracan.

Ponce y Guayama - Casas Aduanas. Tiene muchas grietas en sus paredes causadas por los temblores de tierra.

Naguabo y Aguadilla. Casas Aduanas. Con los temblores de tierra se le han abierto algunas grietas [en Naguabo huracan damage to casillas... quedando sin techo] [en Aguadilla no huracan damage].

Arecibo. Casa de Aduana. No damage.

Fajardo, Guayanilla, Cabo-Rojo, San Germán, Salinas. Hurricane damage only to Casa de Aduana in Fajardo and Salinas, otherwise absolutely no damage at all (Salvan, 1867).

Por el vapor español Montezuma hemos recibido periódicos de Puerto Rico hasta el 30 del pasado Noviembre y que contienen los por menores de los terremotos ocu-

rridos en aquella Isla el 18 del mismo y los días subsecuentes: Leemos en el boletín Mercantil de Puerto Rico del 25: El lunes 18 a las tres ménos diez minutos de la tarde, los habitantes de la isla de Puerto Rico fueron sorprendidos por el terremoto más violento y de mayor duración de cuantos se tiene memoria.

En esta ciudad, el sacudimiento vino acompañado de un ruido subterráneo aterrador y empezó por una oscilación N. S. terminando con una trepidación horrible que, aterrando a las personas más animosas, esparció por todas partes la consternación y el espanto. La población en masa se lanzó á las calles, y como al viese llegada su última hora, invocaba la misericordia Divina con exclamaciones y lamentos capaces de conmover el más empedernido corazón. Aun nos parece que las escuchamos y tiembla nuestra mano al trazar estas mal coordinadas líneas.

Los espíritus empezaban a tranquilizarse y muchas familias habían vuelto a ocupar sus casas, cuando a eso de las tres y media sintióse otro movimiento de la tierra, seguido a los pocos minutos de un nuevo sacudimiento, que fué la señal para que esta ciudad presentase un cuadro que en vano retenderíamos describir. Plazas y calles llenándose nuevamente de la muchedumbre que abandonaba sus hogares en busca de un lugar seguro, y en aquel momento las empresas de coches hubiesen tenido quinientos, todos se hubieran ocupado por el sin número de familias que deseaban salir de la ciudad, pero no teniendo posible obtener los carruajes necesarios, cada cual se alejaba como podía, saliendo a pie la mayor parte de la población: los que no lo efectuaron el lunes pasaron la noche en las plazas y muchos se trasladaron a bordo de los buques surtos en el puerto, hasta el día siguiente en que la emigración fué general, de tal modo que no quedaron en la ciudad ni seiscientas personas, a más de la guarnición, cuando sabemos que pasan de diez y ocho mil habitantes de esta capital. Nosotros la recorrimos el día 19 a las desde la tarde y ofrecía el lúgubre aspecto de una ciudad desierta.

Después de los tres sacudimientos del día 18 se sintieron otros, aunque leves, durante toda la noche. El 19 hubo varios, ha sucedido los días 20, 21 y 22 y ayer a las 9 de la mañana mientras escribíamos este artículo, otro sacudimiento que duró 12 segundos, ha vuelto a perturbar los ánimos porque fué bastante fuerte.

Todos los edificios del Estado y muchas casas particulares demuestran los estragos que les ha causado el terremoto, por lo cual el gobierno ha dispuesto que mientras se hacen en aquellos las reparaciones necesarias, los trabajos de las oficinas respectivas se ejecuten en tiendas de campaña levantadas en los altibajos convenientes para comodidad del público y de los empleados. Las tropas de la guarnición están acampadas bajo tiendas en el campo del Morro y el batallón de artillería lo está en una levanta en el espacioso patio de su cuartel.

Hé aquí la relación de las casas y edificios públicos que han sufrido con los temblores ocurridos en Puerto-Rico el 18 y siguiente...

Río Piedras - Pasado los primeros momentos de terror todos los vecinos hicieron una rogativa pública, desalojando las casas de mampostería que estaban muy resentidas y distribuyéndose entre las de madera. La torre del campanario de la Iglesia se resintió bastante, así mismo la cocina de la Convalecencia. Según hemos sabido a última hora se ha restablecido ya allí la calma y la confianza, y todo el vecindario se ha entregado a sus ocupaciones ordinaria.

Arroyo - Las sacudidas se sintieron con una intensidad terrible, deteriorando muchos edificios, aunque sin producir la caída de ninguno ni desgracias personales. El

mar en uno de los movimientos se retiró de la playa, volviendo a los pocos momentos a refluir con impetuosidad, y avanzando más de cuarenta metros; pero poco a poco volvió a ocupar su posición habitual.

Ponce - En la playa, la retirada del mar, que dejó en seco en uno de los movimientos una fragata, produjo un pánico terrible que se aumentó al ver que a los pocos instantes se lanzaba una impetuosa ola é invadía algunas de las casas más próximas a la orilla. Algunos creyeron que la población iba a ser sumergida, y se llenaron de espanto; pero a los pocos momentos se restableció la calma el ver que el Océano volvía a tomar su primitivo cauce.

Vega Baja, Noviembre 19 de 1860 - Desde ayer a las tres menos quince minutos de la tarde, vivimos en continua zozobra y angustiada alarma.

A dicha hora dejóse sentir un movimiento de oscilación en la tierra, que duró setenta segundos en constante dirección de E. á O. Suave en su principio, hizose más sensible en su mitad, sín llegar jamás a ser violento. Más tarde, y a cosa de las cuatro, sintióse una más corta sacudida; y sucediéndose con inaudita frecuencia, otras y otras más en la noche de ayer y el día de hoy, en que hasta la hora en que escribimos van contadas once.

Por ahora, gracias a Dios, solo se nota una pequeña grieta en la fachada Sur de la torre de nuestra nueva Iglesia, único quebranto perceptible de nuestros edificios, así públicos como particulares, lo que debemos considerar como una fortuna atendido al gran número de casas de material que poseemos, y a que no se habían terminado todavía las obras del nuevo templo, por lo cual es mayor su exposición en estas repetidas convulsiones.

Ponce, Noviembre 20 de 1867. Como resultado del último de los terremotos que reseñó ayer, ha quedado nuestro hermoso templo rajado por algunas partes, temiéndose un desplome. Las chimeneas de las haciendas, con muy raras excepciones, han venido a tierra. Ayer, después de hechada al buzón mi carta, tuvimos otro terremoto a las nueve y cuarto de la mañana, pero de poca fuerza y duración, y a las doce de la noche otro. Hoy a las tres de la madrugada y a las nueve de la mañana hemos sentido dos, pero casi imperceptibles, todos de oscilación...

Bayamón, Noviembre 24 de 1867 - Al primer sacudimiento de la tarde del 18, obtuvimos la triste realidad de ver perdida nuestra preciosa Iglesia, que el vecindario todo conservaba como el blason de sus sentimientos religiosos.

Manatí, Noviembre 21 de 1867 - Reanudamos hoy nuestra correspondencia para el Boletín, la cual interrumpimos y cerramos anteayer martes a las doce y minutos de la noche, manifestando que ayer, como a las tres y pico de la madrugada y como a las ocho matinales, volvió a sentirse aquí bastante fuerte la termoción,... la siete de esta misma noche en que se sintió el último.

Ponce, Noviembre 19 de 1867... Serían las tres menos cuarto de la tarde, cuando se empezó á sentir un terremoto que cada segundo aumentaba más su fuerza; fué de oscilación Norte a Sur y su duración como de unos dos minutos. Ha sido tal su fuerza, que las campanas sonaron por espacio de un minuto, y ha dejado muy atrás al tán memorable de Santa Rosa.

Casi todos los edificios de mampostería han sufrido más ó menos en sus paredes; pero los que más han padecido con nuestro hermoso Teatro y la casa de don Carlos Cabrera, que han quedado, puede decirse, amenazando ruina.

...A las cuatro y seis de la tarde y a las diez de la noche volvió a temblar la tierra, pero fué corta la duración del temblor; esta madrugada a las cuatro ménos diez minutos volvió a temblar, siendo siempre de oscilaciones de Norte a Sur...

A última hora - Son las ocho ménos cuarto de la mañana y se ha vuelto a sentir otro temblor de tierra que, aunque no tán fuerte como el primero de los citados, no le ibas muy en zaga...

Noticias de San Thomas - El lunes 18 la isla de Saint Thómas, fué la escena de un desastroso terremoto acompañado de una horrible invasión del mar, cuyos efectos son indescriptibles. A las tres de la madrugada se oyó un ruido espantoso, al que sucedió inmediatamente una conmoción de toda la isla, de tal clase que es un prodigio el que todos los edificios no hayan sido derribados. Sin embargo, infinidad vinieron al suelo. Los habitantes estaban poseidos de un terror verdaderamente pánico, corriendo desolados por todas partes a centenares, y reuniéndose en un campo abierto gente al muelle de King, cayeron todos de rodillas esperando su última hora. A los 20 minutos, y apénas había pasado el terror del primer sacudimiento, los millares de individuos que se hallaban en aquel sitio, vieron que el mar se acercaba á la ciudad bajo la forma de una muralla de treinta piés de alto, y extendiéndose por todo el horizonte El mar invadió la ciudad hasta una altura de cincuenta piés arrazando con todo. Las pérdidas son enormes. Durante aquella noche horrible, se sintieron varios temblores de tierra más ó ménos fuertes. Por la mañana se repitieron con más intensidad, continuando todo el día y la noche siguiente.

En la pequeña isla de Saba ocurrió una erupción volcánica que cambió enteramente la faz de la isla, la que se ha cubierto de innumerables grietas.

En Santa Cruz y Tórtola, la mismas calamidades tuvieron lugar. La primera fué inundada parcialmente: un vapor americano fué arrojado por las fuerzas de las aguas hasta la plaza del mercado. La isla ha quedado en ruinas. La de Tórtola ha sufrido considerablemente (Howard, 1867).

The hurricane experienced on these latitudes on the 29<sup>th</sup> [of October]... caused considerable injury in this island in the commercial agricultural interests, we have to lament also the considerable loss of human life .. received no damage to the buildings or other property... A day or two after the hurricane had passed over heavy rains... such as one very rarely seen... prevented communication on the Island... paralyzed.

[Severe Hurricane damage] at Fajardo, Humacao and Naguabo situated in the east end of the Island and more in proximity to St. Thomas suffered dreadfully from the gales which destroyed many buildings on the Estates and towns - the principal injury however was caused by the immense overflowing of the rivers to such an extent that all the lowlands were flooded... --- This was the state of things on the 18<sup>th</sup> when a series of earthquakes commensed in this island which have thrown the inhabitants into a complete state of consternation, so much so, that this City which is entirely built of bricks has been almost entirely abandoned by the population who have fled to the country for safety. -The first and most severe shock was experienced here at quarter before 3 o'clock PM- These shocks with more or less severity have been repeated at short intervals day and night up to the present time of writing. Though none of the edifices in the City have been thrown down a very considerable number are so much cracked in injured that they will likely have to be torn down for public safety. Considerable further injury has been done by the earthquakes in the sugar plantations by throwing down their chimneys and... damaging other buildings and works.

The earth continues to tremble and frequent strong vibrations are felt day and night that keep the inhabitants in the greatest state of alarm. The shock at St. Thomas and St. Croix on the 18<sup>th</sup> was very severe since we have no Intelligence from that island or have we any information from the surrounding islands. We have late data from Cuba and Santo Domingo and learn that the phenomenon was not felt on either of those Islands..." (Howard, 1867).

...The great earthquake followed by an outflow of the sea and the disastrous consequences attendant upon It, which occurred on this Island [St. Croix] on the 18<sup>th</sup>... light shocks of earthquake still continue at intervals" (Perkins, 1867a). Light shocks of earthquake still continue [St. Croix] (Perkins, 1867b).

Desde el 18 del actual a las tres de la tarde se están sintiendo en toda la Isla temblores de tierra de más ó menos extensión y duración. Resentiose desde el 1º que duró unos 22 segundos los edificios se han hecho más considerables sus deterioros a medida que el fenómeno subterráneo se ha ido repitiendo.

La vida ordinaria ha sufrido profunda perturbaciones, los negocios estan completamente paralizados, las familias han salido de sus habitaciones ordinarias para procuran en seguridad, la mayor parte en los campos y algunas de ellas en las plazas públicas, y en los pocos lugares que están sin fabrican en esta ciudad...

Desde las nueve de la mañana del 23 hasta hoy a la misma hora no se ha sentido temblor alguno de consideración, pero puede decirse que las conmociones a la vez no cesan (Anon., 1867b).

...Para reparaciones de las fortificaciones y edificios militares destrozados por los terremotos de Noviembre y Diciembre últimos [places with damage] cuartel de San Francisco. Barracas de Puerta de Tierra, real fortaleza, Puerta de San Juan, almacén Americano, almacén de polvora de Miraflores, almacén de polvora de San Geronimo, puente de San Antonio, castillo de San Cristobal. Cuartel de San Francisco... recorrida de las azoteas cuyo mal estado han originado los temblores de tierra (Anon., 1868b).

...Thro' slight vibrations are yet felt here almost every day, the alarm has greatly disappeared and the farlies which fled in... to the country when the first shocks of earthquakes occurred, are now coming back to this city which is assuming its usual aspect. The houses, which were not injured so much as it was at first reported, have been almost all easily repaired. None was thrown down by the earthquakes nor was it found necessary to pull any one down for safety. In the country the damages done to the buildings on the sugar estates have been repaired and the mills are now in full operation... (Jourdan, 1868a).

The earthquakes which began on the 18<sup>th</sup> of November 1867 and have since been frequent, seem to have had their origin by the bursting out of a submarine volcano in the sea somewhere about or between the Danish Islands of St. Thomas and St. Croix.

The reasons of this opinion are: 1. The great wave, which soon followed the first heavy shocks, was seen for some short time rolling on towards St. Thomas and Puerto Rico from the south to the north, while at the same moment another similar wave, perhaps even larger than the first, rolled in toward St. Croix from the north to the south, thus showing the volcanic eruption, which caused them, had occurred in the sea, somewhere between those two Islands and the force sent the water in both directions. 2. It is historical that, some 175 years ago, the small island of Saba (little Saba as it is called) just west of the harbour of St. Thomas, was an active volcano and on

the 18<sup>th</sup> and 19<sup>th</sup> of November last emitted smoke, thus showing the volcanic action was not distant. 3. Previous to November 10<sup>th</sup> 1867, earthquakes had not been felt at St. Croix. On that day they were and subsequently they have been simultaneously with the shocks felt at St. Thomas, showing thereby that a communication had and has been opened between the two islands.

The shocks extended to Puerto Rico, and were felt through the whole island, but the force of, and damage by them done to buildings, sugar estates- works and chimneys, was chiefly at the eastern end, the north side as far down as Arecibo and the south side as far as Ponce, about the middle part of this island. Below or west of these places, the other north or south side, was any damage done to buildings.

The great rolling wave passed into the harbors and over the beaches at the East end and down the south side of this island, but it did not extend to the north or west side.

The earthquake felt on the 17<sup>th</sup> of March was as strong as the shock felt on the 1<sup>st</sup> December last, since we continue to feel slight vibrations at short Intervals (Jourdan, 1868c).

2.30 P.M. [Tortola]. Terrific vertical earthquake fully quarter hour long sea sinking about 4 feet and suddenly rising 4 to 5 feet above first level. Strong current... to shore. Not 5 minutes pass... until 3 o'clock on 19<sup>th</sup> with one or more shocks, sometimes 3 in 5 minutes - in fact there appears to be a constant... of the earth (Porter, 1934).

The oldest inhabitant here knows no parallel to the sad calamity that happened here [St. Croix] yesterday, at about ten minutes of three o'clock P.M. Two very severe shocks of earthquake, one immediately after the other, occurred, these lasting over 3 minutes... The troubled sea, which had receded soon after from the shores, coming furiously, mountain-high, and dashing on the shore, as far as 100 yards, in some places. The greatest damage here was in Gallows-Bay, where upward of twenty small houses, were upturned or completely demolished, from the violence of this encroaching sea.

The people of Frederiksted - suffered - in a far greater degree... The sea washed up high in town; and many stores received great injury The water washing in, immense sheets...

Everything did not end here. Through monday night the inhabitants were again alarmed from many more severe shocks taking place; and the continuence of this... continued all day to-day, up to our going to press making in all some 18 or 20 shocks" (Anon., 1867c).

Tortola, 25<sup>th</sup> November 1867 ...On the 18<sup>th</sup> instant the Virgin Islands were visited by a severe earthquake which lasted fully fifteen minutes and was followed by numerous other shocks less severe at intervals not exceeding five minutes for over twelve hours; repeated shocks still occur, all appear to come from the north or north-west, save the first which came in from the northeast.

Immediately after the first shock had ceased the sea receded or rather sunk about four feet and immediately rose between four and five feet above its original level, submerging the whole of the lowest part of the Town sweeping before it nearly all the smaller dwellings which had not been entirely destroyed by the Late Hurricane...

With regard to the outer Islands, I have received reports that they have not sustained any injury. At Virgin Gorda large blocks of granite were rent during the first

shocks. At Peters Island the sea rose to so great a height above its original level that the inhabitants took to their boats and came across to Tortola.

At Salt Island, as in Tortola; the earth was observed to open in several places near the seashore and water rush upwards from the openings. On the hills in Tortola I am told there are some openings caused by the earthquakes... (Rumbold, 1867).

Guadeloupe at 3.18 p.m. In Sainte-Rose the sea withdrew a hundred metres down the beach; then a wave sixty feet high and three miles broad inundated the beaches and entered the houses causing much damage (Deville, 1867).

From the Archives in Ponce (Anon., 1867h):

Barrio 1. Relación detallada de los Individuos que han sufrido perdidas en terremotos del 18 y 19 de noviembre de 1867 [in or near Ponce]. Establecimiento de Juan Isidoro [lists botellas, potes frutas almibar, marrasquina, cantaros de barro, alcaparras, escupideras, tazas, botellitas, sacos, tarros barro ordinario, ollas de barro ordinario, tubo de quinque, frascos de vidrio etc]. Sr. Correjidor: Participo a vos. como el día 18 del actual con el terremoto me cayó una pared de 6 varas de largo y 3.5 de alto lo que le manifestó a vos. para los fines que convengan. N. R. Corsino Torres: Jefe de la guardia se le ha destruido completamente la cocina de su casa que hecho de manpostería y frente de la cerca de su comedor causandole una perdida de más de 200 pesos. Las chimeneas del Quemado fueron derrivadas por causa del temblor. Sr. Correjidor: Participo como en el temblor de tierra en los días 18 y 19 del mes pasado se inutilizó una escalera de manpostería. Edificios de manpostería han sufrido deterioro a causa de los temblores de tierra.

Barrio 1. Calle de la Concordia: pared de empalizada de 6 varas de largo y 3.5 de alto. La misma calle, una galería de manpostería con alto y bajo y las murallas del mismo material que circulan la casa. La proxima calle, escalera de manpostería inutilizada. Casa con varias grietas.

Barrio 2. Playa: varias casas con grietas. Iglesia: varios desperfectos.

Barrio 3. Calle de Grabor: varias grietas en casas. Calle Mayor: varios deterioros en el teatro.

Barrio 4. Calle de Mamira: grietas y otros deterioros. Proxima calle: grietas en casas de manpostería.

Barrio 5. Calle Mayor: varias grietas y desperfectos en galería de manpostería. Plaza: varios desperfectos.

Playa. El edificio Triglarario: varias grietas y desperfectos. Cumpliendo con lo dispuesto por vos. respecto a las perdidas ocasionadas por el terremoto del 18, debo manifestar que solo ha quedado a mí parecer inutilizada la casa de doña Antonia y en las demás no tengo conocimiento sobre otra evidencia alguna.

Barrio 5. nada paso.

Playa. En el día de hoy hasta esta hora que a las 2 de la tarde de hoy se han sentido 2 temblores de tierra; el primero a las 9 de la mañana y el segundo a las 11 menos cuarto. Los almacenes de manpostería de la comisaria sufrieron perdidas. En la mayor consternación y aflición de mis barrios y las familias de todas clases abandonaron sus casas así como todos los trabajos paralizados. Relación detallada de las perdidas del terremoto del día 19 de 1867. [perdida de vasos, botellas, damescura, tazas, chimenea] Relación de los efectos del terremoto del 18 de noviembre de 1867 (tazas,

platos porrones de barro, frascos, botellas, vasolio, ollas de barro, casuelas, poncheras, fuentes con tapa, gaforra anisado mallorca, damiesana, garrafon).

Bucana. Hacienda Isabel: chimenea destruida y la mitad del almacén se le ha caído y la Hacienda Santa Cruz se le cayó la chimenea por causas del gran terremoto.

Barrio Capitanejo: Por causa del terremoto he tenido perdidas y chimeneas que se han caído.

Barrio Machuelo Arriba: nada.

Barrio Portugues: nada.

Barrio Limon: perdidas insignificantes.

Barrio Marrueno: no hubo perdidas.

Barrio Guaraguaos: ...lo que es tocante es no haber habido perdidas en el terremoto, pero han habido calenturas y catorros desde el primer temblor (Anon., 1867h).

1867. Noviembre 18. Gran alarma por el advance del mar. Todo el pueblo huye hasta el Vigía. 1867 Noviembre y Diciembre. Continuos temblores de tierra [Ponce] (Neumann, 1913).

...La humilde iglesia con que a fuerza de sacrificios habrán reemplazado a la que por consecuencia de los terremotos de 1867 fué a ruinas [of Barros near Bayamón] (Anon., 1875a).

Noviembre 21 de 1867... Los edificios públicos [*sic*] que... a consecuencia del terremoto ocurrido en la tarde del día 18 del corriente, y los repetidos movimientos que se han sucedido hasta las ocho de la mañana del día de hoy. [Follows with detail on damage to edificios of: Real Carcel, Casa Ayuntamiento, Aduana, Presidio de Plaza y en toda la fuerte antigua [no damage here], teatro... (Hernández, 1867).

23 Noviembre 1867... Río Piedras... La Iglesia... ha sufrido muy poco limitándose principalmente las avenas, a haberse descompuesto unos pequeños arcos que sostienen el coro y sulida de la torre y también los arcos que en... la iglesia sostienen la cubierta del campanario. Todas estas degradaciones son fáciles de reparar... La carnicera tiene unas grietas de poca consideración y en cuanto a los edificios particular... solo uno amenaza peligro inminente de ruina mucho más por el interior que por la fachada reduciéndose en los demás a grietas de mayor ó menor entidad... y de fácil reparación -23 Noviembre 67, Loisa. En el día de ayer... la iglesia de Loisa habiendo observado que la bóveda principal de la Iglesia tiene tres grietas en toda de longitud de las cuales dai [*sic*] eran correspondientes a los rincones y llegaban hasta el... [more detail on damage given] (Churrua, 1868).

...En el templo parroquial de Juncos, en la parte interior de su bóveda, solamente se observa una grieta, que los vecinos sostienen que producida en el terremoto de año 1867 (Pérez, 1918).

...La iglesia de este pueblo [Arecibo] fabricada de mampostería y cubierta de bóveda se ha hallado que ha sufrido algo por los temblores pero no ha perjudicado en nada la utilidad de la obra; se ha dispuesto una reparación interina de las goterías... (Llonpot, 1867).

...Son las cuatro de la tarde y cojo la pluma para participarle la horrible catástrofe que acaba de ocurrir [in Fajardo]. Sería las tres y cuarto cuando empezamos a sentir un ligero temblor de tierra que, aumentando gradualmente, causó en pocos instantes grandes estragos, llenando se amarga congoja todos los carazuezo.... Templo... estaba en el suelo: sus paredes todas cuarteadas, el altar mayor en tierra, la nave se ha iz-



quiera caído, y en fin solo la nave se la viguiendo y una tercera parte del techo quedaron parades, pero todo amenazando la más completa ruina... (Lavaey, 1867a).

Del de la tarde de ayer que tuvo lugar [Fajardo] el horroroso terremoto de que cuenta a vuestro señor hasta esta fecha y hora que son las nueve de la mañana no ha cesado un momento de estabais sintiendola repetidos temblores más o menos fuertes (Lavaey, 1867b).

...En el terremoto ocurrido en el día 18, hemos tenido que lamentar la caída de este hermoso templo [of Fajardo]... los temblores, se bien en esta mañana son bastante suave y que no suelo terminasen muy en breve... [details on local prayers to avert more earthquakes] (Lavaey, 1867c).

...La Iglesia [of Fajardo]... está su mitad en el suelo y el resto inutil completamente la carniceria agrietada y parte de las paredes desconchadas por los últimos temblores de tierra... No tienen establecimientos en que elaborar las teniendo sus chimeneas y demás oficinas destruidas siendoles muy difícil la reparación... (Rojas, 1867).

26 Noviembre 1867... una sesión extraordinaria [in Isabela]... respecto al estado deplorable en que se encuentra la Santa Yglesia Parroquial por consecuencia de los fuertes temblores de tierra que viene asolando este castillo... parten a la altura en que se encontraba antes de los terremotos que se han sentido, no dudan de que esta Junio... (García, 1867).

...El terremoto de que dispone para llenarnos momentaneamente de terror y hacer a la larga inutiles por mucho tiempo los esfuerzos que pudieramos desplegar para reponer las perdidas materiales que tanto nos afectan. Efectivamente, la tierra parecía desquiciada de su eje, en el terrible 18 de corriente, ya sus fuertes y prolongadas succididas parece que no debía quedar piedra sobre piedra. La población se ha salvado; pero en las haciendas, las chimeneas, los trenes y los establecimientos han sufrido, siendo preciso fabricarlos de nuevo con toda premura a fin de aprovechar los pocos días que faltan para la zafra y no perder el escaso fruto y al vado de los temporales...

Nuestras iglesias, nuestras casas, los edificios públicos todos estan arruinados ó amenazando ruina por los repetidos terremotos que desde el 18 del pasado se suceden sin tregua y con violencia cada vez mayor, dos de Diciembre en mil ochocientos sesenta y siete (Mangual, 1867).

...Una casa temera, de mampostería para cuerpo de guardia y oficinas de politica en la marina de esta Villa - a las reparaciones ulteriores de dicho edificio y sus utensilios... ---Al daño que los temblores de tierra que vecinos experimentando desde el diez y ocho han causado en el lugar excusado de la Carniceria; acordó el Ayuntamiento que aquel quede cerrado hasta tanto que sea posible componerlo... (Anon., 1867i).

...Suplica de que, atendida la inseguridad que ofrecen los edificios de mampostería para habitantes por los temblores de tierra que estamos sufriendo desde el diez y ocho del corriente, le permita fabricar de madera en el sitio que posee- .... perdidos inmensas que no admiten termino de comparación con las producidas hasta ahora por los sacudimientos de la tierra... (Anon., 1867j).

...Se leyó una exposición del caballero sindico primero don Manuel María Mangual manifestando la angustiosa y miserable situación de esta Antilla por causa de las calamidades... como remedio que mitigue un tanto su lastimoso estado, que se solícito del Gobierno SM La Reyna quede la isla exenta de contribución real durante los dos años... el Ayuntamiento, por unanimidad, halló plausible la idea... (Anon., 1867k).

Marvel and Moreno (1984) give Archivo General de Puerto Rico references to damages caused by 1867 event in Juana Díaz and Cidra.

Ramón (1888) notes in reference to the Dominican Republic that

...después de esta fecha [1842] se han sentido ligeros temblores, particularmente a fines de 1867 y a principios de 1868...

Grenada - On monday... 5.20 p.m. ... an unprecedented fall took place in the tide which had but shortly before attained the high water mark of fully four to five feet-The reef in front of the lagoon showing its full extent and the surrounding shores standing out in bold relief for several feet below the usual height... In a very few seconds after the fall of the tide, preceded by a slight rumbling subterraneous noise, the water over the "green hole" was seen to rise a few feet and to be in great ebullition... forming a regular lake of boiling water... whilst a strong sulphurous odour pervaded the air. As quick as thought the sea rose to the extent of a little over four feet, pouring in one vast volume... Six times did this submarine phenomena show itself in eruption... when it suddenly ceased. Everything looking in its direction as if nothing had occurred...

On Monday night, at 9 o'clock, we experienced a shock of earthquake; and a little before one on Tuesday morning, another shock was felt. They were slight and undualted perpendicularly. [Description of damage due to sea "began to flow and ebb with astounding rapidity... finally reaching in its rise to about 20 feet, and in incursions and recess to about 150 feet ...]... In the year 1705 when father Labat... visited the West Indies the spot where on this explosion or eruption took place on Monday was solid land, and a portion of the old town of St. George, first settled by the French. 'Tradition,' as we have written before 'tells of the site of the said town having been submerged by an earthquake...' (Anon., 1867f).

Most awful series of earthquakes were felt. Islands are in complete ruin, Tidal wave. Port of Spain Gazette, 11.12.1867

A violent earthquake. Several shops collapsed. Nearly all houses were severely damaged. Fifteen minutes after the first shock, a tidal wave invaded shops in the lower part of the town to a depth of several feet. After shocks were felt approximately every five minutes for the first twenty-four hours. Puerto Rico. Especially felt in north and east. The Govenor's Mansion was partly destroyed, and also the bell tower of the cathedral (Deville, 1867).

...Captain R. H. Bass, USN, Commander Submarine Squadron Ten in U.S. S. Fulton, writes me that you are interested in the history of the Virgin Islands and particularly seek information regarding the earthquake of 1867 and its effects on the *U.S.S. Monogahela*.

It is strange that except for the official report of the Commanding officer, Commodore S. B. Bissell, USN, and a brief mention in U.S. naval history textbooks, nothing has been written about this incident that I know of although it was one of the strangest disasters of maritime history.

The official report Commodore Bissell wrote was published in the issue of the Army and Navy Journal dated 21<sup>st</sup> December 1867. Based upon this report the facts are briefly as follows.

While anchored in the Harbor of Fredericksted, St. Croix, at 3:00p.m. on 18<sup>th</sup> November 1867 the earth trembled violently with a roar which sounded like the es-

cape of steam which lasted for about 30 seconds. The water in the Harbor began to recede to the south and the returning swell carried the *Monogahela* aground near shore. The water receded again very rapidly and this time the returning wave was a wall of water 25-30 feet high. This wave carried the vessel over the tops of the warehouses and into the first street of the town. When the water receded, the vessel was carried back and deposited on the edge of a coral reef just offshore. Commo. Bissell was of the opinion that if the ship had been carried out just a few feet farther over the edge of this reef, that it would have been a total loss. Actually, no serious damage was done to the ship, and equally miraculously only four men were lost all of these being in the ship's boats at the time. The coral reef provided a solid foundation upon which ways were built, the ship being buoyed up by India rubber camels and the vessel was launched from these ways in 10 feet of water about 100 feet from the beach. We are fortunate in having a photograph taken just before launching and I enclose a copy of it, compliments of the Naval Academy Museum.

It will interest you to know at about the same time the cruiser *De Soto* was torn from her moorings in the Harbor of St. Thomas and thrown upon the piles of a new wharf, the receding water carrying her into deep water again, with little injury. In the same Harbor the *Susquehana* barely escaped similar treatment. I know of no further details on these two incidents... (Wade De Weese, written comm. to I. Paiewonsky, 1953)

El temblor comenzó a las 2 y 42 minutos de la tarde. Desde la noche de Santa Rosa del año 1865 nadie había sentido un temblor tñ prolongado. Haciendo comentarios, discurriendo por las calles y visitando los sitios de más peligro, estaban las gentes temiendo sin duda lo que aún pudiera sobrevivir... En este momento se oye un grito... Un segundo después este grito simultáneamente repetido por millares de almas deja inhabitado el pueblo de Ponce. ¡El mar! ¡El mar! gritaba la multitud fuera de sí ¡El mar viene! Gritaban corriendo algunos hombres, llevando en brazos a sus hijos.

¡Corred! ¡Corred! ¡Al cerro! ¡Al cerro! Gritaban otros. Tal era la zozobra y la angustia que se retrataban en todos los semblantes y el afán con que hombres, mujeres y niños corrían, parecían un vasto campamento. Impresionado el pueblo con relaciones tan fabulosas como la desaparición de la Isla Tórtola con sus ocho mil habitantes, ante el inmenso peligro del mar cuyos límites sólo Dios conoce, nadie se detuvo a reflexionar.

Las gentes corrían hacia la altura más próximo: el espíritu de conservación hacía prodigios. A los gritos de ¡El mar! ¡El mar! la madre llamaba a sus hijos, la mujer a su esposo, y el aire se poblaba de gritos que desgarraban el alma. Aquí caía desmayada en tierra una joven, allí un niño buscaba a su madre, más allá, un viejo se arrastraba jadeante procurando en vano correr.

Arremolinábanse los niños en torno de sus padres, iban y venían coches y hombres a caballo conduciendo niños y mujeres que lloraban; y en medio de aquel desorden, de aquélla horrible confusión, en tan apurado trance, nadie acertaba a explicarse lo que pasaba en realidad.

¡La mar! ¡La mar! gritaban todos corriendo hacia el Vigía. Si algún hombre de ánimo bastante sereno intentara calmar aquel desconuelo, sus voces se habían perdido en el espacio. Todos creían ver las espumosas olas el mar agitándose sobre el pueblo. El camino que conduce a la playa jamás ha presentado un golpe de vista tan extraño.

Veíanse centenares de mujeres, hombres y niños, no caminando, sino corriendo hacia el cerro, cubiertos de copioso sudor, con la vista extraviada y el paso ya incierto. Algunos se caían en el medio del camino; nadie se detenía para levantarlos.

Otros hombres a caballo gritaban: ¡no correr! Ya pasó el peligro! Pero como el temor embargaba todos los sentidos, las gentes nada oían y todos se apresuraban a llegar al cerro, para contemplar desde allí el mar tranquilo, ¡tan tranquilo como antes!

Una hora después, restablecida la calma se supo que el mar, una media hora después del temblor, se retiró algún tanto, dejando en seco las playas, para bañarlas otra vez, al buscar su nivel. He aquí pues, el origen de tanto y de tan grande terror. Fontan (1868).

Below are excerpts of articles in *The Daily News Saint Thomas*, All are presented in the column "History Corner" by Isidor Paiewonsky during 1979. Therein he cites various sources of information about the event in 1867.

Text is quoted from pamphlet containing eyewitness report of passenger of *La Plata*:

... We anchored off the southern point of Water Island... our ship lying about two and a half miles from the town... Several of us passengers were leaning over the rail, watching the antics of the coal workers when without warning came such a shaking of the timbers of our ship as few mariners or passengers before had ever experienced! It was not a quivering of our ship, but a downright shaking which threatened to leave not one bolt in place, nor 2 planks together in the ship. It is difficult to describe the scene on board during this frightful earthquake!... (Paiewonsky, 1979a).

It was of no less than two and a half minutes duration. It was not one continuous shock. For some 4 or 5 seconds in the middle, there was an appreciable lull. Then it came again, if anything, with redoubled force... At 35 minutes past 2 o'clock a 2<sup>nd</sup> cloud of smoke appeared over Little Saba. This time it was white, like steam. Then it was we saw, looming behind that island, like a gigantic wall, a tremendous tidal wave rushing towards us. A small steamer happened to be passing outside. She turned her head to sea and rode over the wave; probably because she was in deep water. A moment more and the great wave reached Little Saba island, and in an instant that rock was a mass of foam, 100 feet high... One instant before the great wave struck us, the forward tackle of the life -boar broke, and it fell down nearly perpendicular. In the meantime, the terrible mountain of water rolled swiftly upon us. We had 5 minutes to prepare for the shock, and it may well be imagined, though it is impossible to describe, how those 5 minutes went. Down on our ship came the roaring sea, literally piled up on us at the rate of 50 miles an hour, with a perpendicular face of fully 40 feet. Fortunately for us, about half a mile outside of our position, Water Island ended in a low point. This point, exposed to the full force of the wave, met it like a wedge. It was observed that the moment the wave reached this Water Island point, it broke and dropped, so that when the wave struck our ship, it was perhaps not more than 10 feet higher than the taffrail. (A rail around the upper part of the stern). We had been lying all that morning head to sea; but the water receding from the shore like a mill race to meet the wave turned our ship around, so that we took the onslaught on our stern. When the first rush of water came on us, it turned our ship even more, and the main

force of the wave itself fell on out starboard quarter. Three waves in one it came, with the roar of 100 Niagaras; and contrary to all expectations the La Plata rose over it like a duck and was saved! he sea smashed the quarter deck to ribbons, twisting the davits like pinwire, breaking in pieces all the upper works on the side, and flooding all the saloons and after cabins. ...So the wave passed us, and in a short time beat in awful fury on the shore, its sound mingling with its echoes from the hills... (Paiewonsky, 1979b)

The main street of St. Thomas, running parallel to the beach, presented an extraordinary sight. Though fully 30 feet above the waters edge, and 2 or 300 hundred yards away, the whole space had been flooded several feet deep by the wave; and the agglomeration of wreckage in it was astounding... We looked around in vain for the massive American screwpile jetty that seemed to firm and strong the day before, and of which, now, not a vestige remained...

The La Plata was moored alongside the remains of the Royal Mail Company's coal-wharf, in a somewhat sheltered position, as a jutting point of land partially protected her from the run of the sea. Yet the great tidal wave had done its work here too. The destruction of the wharf and stores, unfinished by the hurricane, had been completed by the sea. Even in that sheltered corner, the storekeeper said, the water had rushed over everything, 16 feet deep and more (Paiewonsky, 1979c).

*St. Thomas Tidende* November 1867- In describing the Earthquake we must begin by stating the first great rumblings and shocks came from the Southwest, passed under our feet and proceeded in a Northeasterly direction. No sooner had the first terrific shocks ceased, than a spectacle presented itself that will never be obliterated from the memory of those who saw it. An ocean of water, of snowy whiteness, was seen at the southwest, beyond our harbour, majestically rolling onward towards us.

That part of the wave that entered the harbour, swept clear up into our principal streets. No store, from King's Wharf westward, but has from 4 to 5 feet of water in it. The losses of merchandise, therein, can easily be comprehended... We said, before, that the Wave's length must have been in the span of our islands. This we believe, for the Wave entered our harbour not only at the entrance, but into the Gregorie from the western and eastern ends of Water Island. Also, the Wave entered our harbour at the Haulover, so that the seashore and the streets at the western end of the town have suffered as badly as those that were exposed to the Wave that came in at the harbour entrance. At the Gregorie, where a village had sprung up within recent years, houses were picked up and carried a long way inland (Paiewonsky, 1979d).

*St. Thomas Tidende* November 30<sup>th</sup>, 1867- We have just learned from the Grenada Chronicle ..that on Nov. 18<sup>th</sup>., the same day of the great Earthquake here, a long hidden Volcanic Crater had come into action there, causing the waters of their Carenage to boil up and rise to a fearful height.

*St. Croix Avis*, November 19<sup>th</sup>, 1867- The oldest inhabitant here in Christiansted, knows no parallel to the calamity that happened yesterday at about 10 minutes of 3 o'clock p.m. Two very severe shocks of Earthquake occurred, one immediately after the other. These shocks lasted for over 3 minutes. Frightened people rushed from their houses to behold a troubled sea; a sea which, receding after shocks came rushing back, furious and mountain high, dashing inland as far as 100 yards in some places. Quick appraisal showed that the greatest damage done was at Gallows Bay where upwards of 20 houses were upturned or completely demolished.

The sea washed far into that town (Frederiksted). It came in immense sheets and many stores and buildings received injury. Several lives were lost and vessels driven ashore.

*St. Croix Avis*, November 29<sup>th</sup>, 1867- The distress caused to the inhabitants of West End is even greater. There, the heavy sea having no barrier to stop its impetuosity; no reef to break its force, boiled up and swept everything before it, shaking the foundations of large buildings and removing the smaller ones, carrying them no short distance from where they stood (Paiewonsky, 1979e).

Letter from T. M. Krause, Frederiksted, *St. Croix* January 7<sup>th</sup>, 1868- About 10 minutes to 3 p.m., I was lying on a sofa in my house, when suddenly a vibration of the earth commenced. This vibration continued so strongly that I and my children, with difficulty, made our way to the street... Suddenly there was a loud outcry, an awful human shriek that the sea had receded and was coming back on us... I hastened to a high point of land from which I could behold the sea; and the movement of it something to see. I beheld the second roll of an incoming tide. This tidal swell had created what seemed to be a large reef on which the water swirled, red and boiling as if in a pot.

At this time, I beheld a spectacular and frightening sight. The *U.S.S. Monongahela* a ship of war, anchored in Frederiksted's harbour, which had been left high and dry on her beam ends in the mud by the receding waters, was now caught in the oncoming awesome wave and placed on the shore. Another vessel, a large Brigantine, and a sloop, were also carried far up on land by the wave. Some lives were lost from the man-of-war and several on shore.

*St. Croix Avis*, January 17<sup>th</sup>, 1868- We paid a visit to Frederiksted yesterday, and found people busily looking after their ruined properties. Damage along Bay street was very great. Wooden buildings had been tossed about like corks and floated inland for considerable distances. Many substantial stone houses were completely destroyed.

Letter to the *St. Croix Avis* dated January 21<sup>st</sup>, 1868 from its correspondent C. (Frederiksted). Mr. Editor, your correspondent T. M. Krause, in his description of the Tidal Wave gives an idea of the latter that serves to distract the mind rather than describe the Phenomenon. When I compare Mr. Krause's statement with that of a most reliable other observer, important differences of observation stand out. This other reliable observer of the Phenomenon, to whom I refer, also took his stand on a high point of land that commanded a clear view of the sea and its movement. "He saw no 'reef thrown up.' Nor did the water appear 'red and boiling as if in a pot.'" "History tells us that this could have happened and has happened in other places. But this did not happen here, according to my informant who witnessed everything, coolly, calmly, and deliberately. "We believe that Mr. Krause's description was the result of optical illusion created by high nervous excitement brought on when 'the awful calamity that befell Lisbon' flashed through his mind. "As to another statement made by him regarding 'a reef,' it is well known that the bed of the sea, particularly on the western end of this island, is all sand. Therefore, what appeared to him as 'a reef' was evidently a large and temporary sand bank formed by one set of tidal movements and dispersed by another. "My reliable informant described the tidal action in this way. In the beginning the sea went out gradually a

short distance from the shore, then flowed back slowly towards the land. “The waters receded a second time beyond where the *U.S.S. Monongahela* was lying at anchor. Just, enough water was left at that point to prevent the *Monongahela* from keeling over into the mud. “Outside and beyond the warship, the sea rose majestically to a series of heights like a chain of hills of graduated heights, swelling to gain, velocity to overwhelm everything before it when its forward movement began. “The *Monongahela* seemed doomed, lying as it was at the base of the towering wave. Suddenly, to the joy of the beholder, the ship began to rise by degrees, as if a great force of – water was rising-under it; “Up, up went the *Monongahela*, so high as to be plainly seen from the rising ground at the back part of the town where people had run for safety. There was the *Monongahela* floating on the top of the great incoming wave, on an apparent level with the tops of the houses in Bay Street. Aboard the *Monongahela*, her desperate but trained crew finding that her heavy anchor and chain were a preventative to her rising, had from the beginning released said anchor and every inch of chain. Also, they had hoisted some sails in the hope that they might direct or influence the ship’s landing ashore... The *Monongahela* landed in an open area of Bay street, but did not stay there. The massive, powerful receding waters which carried away lumber sheds and other buildings on the waterfront, deposited the warship with architectural precision on a ledge reef on the shore’s edge.

There remained the *Monongahela*, for days, until human efforts were made to fix her more securely in position. Four crewmen were drowned during the episode, all of them being in the ship’s boats in the harbour at the time. Three of the drowned men were picked up on the first day. The body of the fourth man was found floating in the harbour on the second day... (Paiewonsky, 1979f).

...The cruiser *De Soto* was severely damaged when the violent Earthquake and Tidal Wave, Nov. 18<sup>th</sup>, 1867, drove her on some iron piles in St. Thomas harbor... (Paiewonsky, 1979g).

From the manuscript: Time of the first buying of the Islands by the United States”... Clifton Hall, one of the oldest plantations in St. Croix; eight miles distance from either of the towns... Suddenly people began screaming: ‘Look at the sea’ The waters had receded, exposing an expanse of bare rocks. Now it was coming back in one great tidal wave... An hour later, a messenger arrived from Fredericksted to see if we were still alive and to say that the sea had smashed in and had taken out houses and had washed up the American warship, *Monogahela*, as well as other vessels, high on the land (Paiewonsky, 1979h).

**Commentary:** This is the famous, large earthquake and tsunami in the Virgin Islands.

**1867, November 29<sup>th</sup>**

**Location:** Tortola

**Data:** Not a day has passed since 18<sup>th</sup> without some shocks more or less severe (Porter, 1934)

**1867, November 30<sup>th</sup>****Location:** Tortola; Santiago, Cuba**Data:** Several shocks (Porter, 1934). “El sábado 30 antes de la una del día se sintió uno regularcito, por la noche a las siete hubo otro según dicen; a la una de la noche del mismo otro bastante fuerte que puso en movimiento a la población, repitiendo una hora después aunque muy leve el estrechón siendo el trueno largo. Hemos oído decir que en el de la una de la noche no faltaron algunos personas estropeados. Por la madrugada la se veían muchas personas por las calles y casi todas las puertas abiertas...” (Anon., 1867g).**1867, December 1<sup>st</sup> 0720, 0945, 1225, 1250****Location:** Virgin Islands, Tortola; Puerto Rico**Data:** 07:20 min. A... sharp shock of earthquake followed by another in two minutes less severe. 9:45 slight shock. 12.25 p.m. sharp shock. 12.50 PM “about 2 min long” (Porter, 1934). Campbell reports: Aftershocks of earthquake of November 18<sup>th</sup>, VII-VIII. There were three shocks at 0710, 1210 and 1240 on this date. Damage in Virgin Islands and in Puerto Rico. See Reid and Taber (1919). Noticeable strong shakes were felt during early December (Neumann, 1913) A strong earthquake was felt in San Juan. Houses abandoned. There were also strong aftershocks on December 12<sup>th</sup>, 1867, and January 5<sup>th</sup>, 1868.**Commentary:** Apparently felt in Puerto Rico at 0710, 1210 and 1240 (Reid and - Taber, 1919).**1867, December 2<sup>nd</sup> 1250****Location:** Tortola**Data:** 12:50a.m. Sharp shock not long, one or two warnings before. Several warnings with slight vibration before daylight. 4:50p.m. slight shock, more rumbling - a slight shock about noon today (Porter, 1934).**1867, December 4<sup>th</sup> 0255 0530 2300****Location:** Tortola**Data:** 2:55a.m. sharp shock not long - 5:30a.m. A shock, slight. 11:00p.m. “sharp” shock (Porter, 1934).



***1867, December 5<sup>th</sup> 1330*****Location:** Tortola**Data:** 12:30p.m. Shock not very sharp (Porter, 1934).***1867, December 6<sup>th</sup>*****Location:** Tortola**Data:** PM. Sharp Shock (Porter, 1934)***1867, December 11<sup>th</sup> 0630*****Location:** Tortola**Data:** 6:30a.m. Sharp Shock (Porter, 1934)***1867, December 12<sup>th</sup> 1016, 1442*****Location:** Tortola, St. Thomas**Data:** 10:16a.m. A very sharp shock, from 6<sup>th</sup> to 11<sup>th</sup>. Several shocks not so severe. 02:42p.m. - sharp shock without any rumbling at first (Porter, 1934)

On Thursday last 12<sup>th</sup>, a few minutes after 10 o'clock a.m. another most severe shock of earthquake was felt here [St. Thomas]... At a little before three o'clock P.M. there was another shock, but in severity not to compare with the first (Anon., 1867d).

***1867, December 12/13<sup>th</sup> 2230, 0400*****Location:** Tortola**Data:** 4:00a.m. Slight Shock. A sharp shock at 10:30 last night (Porter, 1934)***1867, December 14<sup>th</sup> 2000*****Location:** Tortola**Data:** 8:00p.m. Slight Shock (Porter, 1934). We are now within two days of four weeks since we had the first earthquake, and with occasional exceptions, it may be said, that not a day or night has passed without a shock being felt or some rumbling noise heard... Most of these are very feeble, and create no alarm... (Anon., 1867d).

***1867, December 15<sup>th</sup>*****Location:** Tortola**Data:** Several slight shocks, vibrations through night and before day (Porter, 1934)***1867, December 16<sup>th</sup>*****Location:** Tortola, St. Thomas**Data:** Some slight shocks through the 24 hours (Porter, 1934)... Shocks and rumbling have continued almost ever since (18<sup>th</sup> November in St. Thomas), fortunately, however, of no great severity, excepting the one of Thursday the 12<sup>th</sup>, from which time, nothing has been felt (Anon., 1867e).***1867, December 20<sup>th</sup>*****Location:** Tortola**Data:** At least a slight vibration with rumbling noise every day... (Porter, 1934)***1867, December 21<sup>st</sup> 1000*****Location:** Tortola**Data:** 10:00a.m. Sharp shock but not long, more a jerk, rumbling noise. Several slight shocks through day (Porter, 1934)***1867, December 22<sup>nd</sup> 0955*****Location:** Tortola**Data:** At daylight slight shock - at 9:55a.m. sharp shock - at 9:55a.m. sharp shock and much rumbling and distant shocks (Porter, 1934).***1867, December 23<sup>rd</sup>*****Location:** Tortola**Data:** One or two shocks this day or... through night (Porter, 1934)***1867, December 29<sup>th</sup> 1330 - 2355*****Location:** Tortola

**Data:** One or more slight shocks every 24 hours. 1:30p.m. shocks not very severe. 8:35 very severe shock fully 2 minutes long. Followed by another. 8:40, 8:55, 9:01 (no rumbling) slight shocks. 9:15 two sharp not long shocks, 9:57 slight shock, 10:06 two sharp shocks in succession, 11:30 sharp not long shock, 11:37 very short but sharp shock, 11:55 sharp shock (Porter, 1934).

***1867, December 30<sup>th</sup> 0153-2200***

**Location:** Tortola

**Data:** 1:53a.m. Sharp shock... slight between last and this. 6:10 shocks- two slight before, 7:53a.m. sharp not long shocks, 6:35p.m. sharp and long with great rumbling, 6:48 slight shock little rumbling, 6:55 slight shock, 7:17 slight shock, 8:05 slight shock, 10:00 sharp and long shock (Porter, 1934).

***1867, December 31<sup>st</sup>***

**Location:** Tortola

**Data:** Jerk 3:10a.m., 4:45 Sharp Shock, 5:50 Jerk (Porter, 1934)

***1868, January 1<sup>st</sup> 1108***

**Location:** Tortola

**Data:** 11:08a.m. slight shock- several vibrations since last jerk (Porter, 1934)

***1868, January 2<sup>nd</sup> 0130, 0500***

**Location:** Tortola

**Data:** 1:30a.m. sharp shock, 5:00a.m. slight shock (Porter, 1934)

***1868, January 3<sup>rd</sup> 0500, 0700***

**Location:** Tortola

**Data:** 5:00a.m. very sharp shock, 7:00a.m. slight shock through slight one or two slight shocks (Porter, 1934)

***1868, January 4<sup>th</sup> 0100, 1100***

**Location:** Tortola

**Data:** 1:00a.m. shock, 11:00a.m. shock (Porter, 1934)

***1868, January 5<sup>th</sup> 0200, 0828***

**Location:** Tortola

**Data:** 2:00a.m. shock, 8:28a.m. shock (Porter, 1934)

***1868, January 16<sup>th</sup> 0530***

**Location:** Tortola

**Data:** 5:30 long rumbling but no shock from 5<sup>th</sup> to date. Occasional rumbling and slight vibrations (Porter, 1934).

***1868, January 17<sup>th</sup> 2205***

**Location:** Tortola

**Data:** Noon a long rumbling. 10:05p.m. shock mild rumbling (Porter, 1934)

***1868, January 19<sup>th</sup> 0850***

**Location:** Tortola

**Data:** 8:50a.m. slight shock low rumbling (Porter, 1934)

***1868, January 20<sup>th</sup> 0600***

**Location:** Tortola

**Data:** 6:00a.m. rumbling (Porter, 1934)

***1868, January 24<sup>th</sup> 1000***

**Location:** Tortola

**Data:** 10:00a.m. sharp shock (Porter, 1934)

***1868, January 26<sup>th</sup> 1015***

**Location:** Tortola

**Data:** 10:15a.m. shock little rumbling (Porter, 1934)

***1868, January 31<sup>st</sup> 1300***

**Location:** Tortola

**Data:** 1:00p.m. slight vibrations, some shocks through night before (Porter, 1934)

***1868, February 1<sup>st</sup> 0530*****Location:** Tortola**Data:** 5:30a.m. slight shock (Porter, 1934)***1868, February 5<sup>th</sup>*****Location:** Tortola**Data:** Since 1<sup>st</sup> have not observed many shocks but two last night, one or two slight, and one this morning (Porter, 1934)***1868, February 8<sup>th</sup> 0720*****Location:** Tortola**Data:** Have not observed any until 7:20a.m. when one not very sharp (Porter, 1934)***1868, February 9<sup>th</sup> 0530*****Location:** Tortola**Data:** 5:30a.m. slight shock (Porter, 1934)***1868, February 10<sup>th</sup> 0500*****Location:** Tortola**Data:** 5:00a.m. slight vibration (Porter, 1934)**Comment:** The reference to a February 17<sup>th</sup> “severe shock causing no damage from the Port-of-Spain Gazette, 15.2.1868 (as cited in Robson, 1964) is, since Porter makes no mention of it, wrong or a misquote.***1868, March 10<sup>th</sup>*****Location:** St. Thomas, Antigua and Puerto Rico**Data:** Violent shock (Reid and Taber, 1919)**Commentary:** An error. Not supported by any primary source. Reid and Taber (1919) cite Fuchs (1869). They note that in the work of Fuchs “there are a number of errors... does not seem to have been sufficiently careful and critical”. Probably a

misquote of the event of March 17<sup>th</sup>. This is a non-existent event and should be noted as such in further catalogs.

### **1868, March 17<sup>th</sup> 1915**

**Location:** St. Thomas, St. Croix; Tortola; San Juan, Puerto Rico

**Data:** From a report on earthquake sent to Commodore B. T. Lando, Superintendent of the United States Observatory at Washington

...Yesterday 17<sup>th</sup> instant at quarter past seven P.M., a severe shock of earthquake has been felt here; the duration was about 30 seconds, a series of slight shocks continued during the day and some houses suffered crevices, but as far as now, no great damage is reported - we have received news from St. Thomas; the same earthquake was felt there but lightly. The principal movement on the 17<sup>th</sup> was from E... and preceded by a subterranean noise which created a general panic... (Jourdan, 1868b).

The earthquake felt on the 17<sup>th</sup> of March was as strong as the shock felt on the 1<sup>st</sup> December last, since we continue to feel slight vibrations at short intervals (Jourdan, 1868c).

I have the honor to inform you that another... shock of earthquake was felt in this island as a few minutes past 7 o'clock yesterday morning. It's duration was about sixty seconds. At Frederiksted I am informed by the consular agent the sea rose four feet which is the only time this phenomenon has occurred since the first great earthquake of the 18<sup>th</sup> November last. The inhabitants of that town were greatly terrified remaining in the streets and above the doors of their houses and the stores on the street fronting the sea were closed.

I have heard of no very serious injuries being done. Some buildings upon estates in the country destroyed by the first earthquake have again shaken down. In... and duration, I consider this shock second only to the one of November 18<sup>th</sup>. Many slight shocks have been felt during the last 24 hours... (Perkins, 1868c).

Sharp shock of earthquake and long - followed by two others less severe - sea rose in lagoon and stirred up the... and a strong current... out to sea... in the harbour. Tide rose a trifle in the harbour (Porter, 1934).

Today... we [St. Thomas] have to record another shock which occurred yesterday morning at fifteen minutes after seven. The duration was about thirty seconds, but the vibrations... not so powerful as on the 18<sup>th</sup> November. It was observed that the sea receded several feet. No particular damage occurred further than the bursting of a few old condemnable wall-works (Anon., 1868b).

Damage to cathedral details from 18<sup>th</sup> of November event and March 17<sup>th</sup> “...del corriente. [Also details of damage to]: Real Audiencia, Intendencia, Iglesia de San Francisco, Iglesia de San José, Convento de Carmelitas, Palacio Episcopal, Casa de Beneficencia...” la encuentra en buen estado”, deposito mercantil, Presidio de la

plas...” Se han abierto algunas grietas insignificantes”, Real Carcel, Pentitla, Teatro, Mercado, Sociedad Economica, Consejo de Administración, Casa de Correos, Tribunal de Comercio.

17 de Marzo 1868. He reconocido la cárcel de esta ciudad y en su consecuencia debo manifestarle que los deterioros sufridos por el temblor de tierra del 17 de esta mañana no han sido de gran consideración pero como quiera que permanezca sin componer las numerosas grietas que se abrieron desde las primeros temblores... todo el edificio está en un estado bastante malo. [additional data given on minor damage to Catedral and lack of additional damage to iglesia de San José, presidio [minor damage], correccional de la pentilla] (Churrua, 1868).

**Commentary:** Strong Aftershock of November 18, 1867 event.

*1868, April 20<sup>th</sup>*

**Location:** Tortola

**Data:** Slight rumbling (Porter, 1934)

*1868, April 21<sup>st</sup>*

**Location:** Tortola

**Data:** Slight rumbling through day. Slight shock... before 9:00p.m. (Porter, 1934)

*1868, April 26<sup>th</sup>*

**Location:** Tortola

**Data:** Sharp shocks after 1:00a.m., slight shocks before 4:00a.m. (Porter, 1934)

*1868 May 15<sup>th</sup> 1305*

**Location:** Tortola

**Data:** 12:05p.m. slight shock with rumbling (Porter, 1934)

*1868, May 21<sup>st</sup> 1300*

**Location:** Tortola

**Data:** 1:00p.m. slight shock rather long rumbling (Porter, 1934)

***1868, May 28<sup>th</sup> 2230***

**Location:** Tortola

**Data:** 10:30p.m. slight shock (Porter, 1934)

***1868, June 6<sup>th</sup> 2045***

**Location:** Tortola

**Data:** 8:45p.m. long rumbling, slight shock (Porter, 1934)

***1868, June 7<sup>th</sup> 0450***

**Location:** Tortola

**Data:** 4:50a.m. slight rumbling (Porter, 1934)

***1868, June 9<sup>th</sup> 1400***

**Location:** Tortola

**Data:** 2:00p.m. rather sharp shock with long rumbling (Porter, 1934)

***1868, June 10<sup>th</sup> 1725***

**Location:** Tortola

**Data:** Slight shock with rumbling at 5:25p.m., rumbling at noon (Porter, 1934)

***1868, June 16<sup>th</sup>***

**Location:** Tortola

**Data:** After midnight a sharp shock (Porter, 1934)

***1868, June 30<sup>th</sup> 0340***

**Location:** Tortola

**Data:** 3:40a.m. sharp but short shock (Porter, 1934)

***1868, September 10<sup>th</sup> 0300 0700***

**Location:** Tortola



**Data:** 3:00a.m. slight shock, 7:00a.m. sharp shock with long rumbling before (Porter, 1934)

***1868, September 22<sup>nd</sup> 0230***

**Location:** Tortola

**Data:** 2.30a.m. sharp shock long rumbling (Porter, 1934)

***1868, December 1<sup>st</sup> 2015***

**Location:** Tortola

**Data:** 8:15p.m. long rumbling slight shock (Porter, 1934)

***1868, December 2<sup>nd</sup> 0340***

**Location:** Tortola

**Data:** 3:40a.m. long rumbling (Porter, 1934)

***1868, December 6<sup>th</sup> 1940***

**Location:** Tortola

**Data:** 7:40p.m. "strange" rumbling, slight vibration (Porter, 1934)

***1868, December 17<sup>th</sup> 2150***

**Location:** Tortola

**Data:** 9:50p.m. sharp shock, long rumbling from west (Porter, 1934)

***1869, January 23<sup>rd</sup> 1700***

**Location:** Tortola

**Data:** 5:00p.m. sudden rumbling and slight vibration (Porter, 1934)

***1869, September 17<sup>th</sup> 1500***

**Location:** Puerto Rico

**Data:** Campbell reports: One strong and many weaker shocks which followed. Some claim the first shock to have been nearly as strong as the earthquake in St.

Thomas in 1867, but this statement is believed to be exaggerated (Reid and Taber, 1919).

**Commentary:** Not a primary source and thus needs confirmation from gazetas or local actas de cabildo or other eyewitness accounts.

### ***1874, August 26<sup>th</sup> 0615***

**Location:** Puerto Rico

**Data:** A severe shock in the morning at Puerto Rico. Vibrations lasted two minutes; houses rocked, V-VI (Reid and Taber, 1919). Yesterday I (Gov. Sanz of Puerto Rico) received the following telegram: “News from other sources inform me of an earthquake having occurred on that island which caused considerable damage. Your silence makes me think the event was not of importance; answer by cable.” The Governor’s answer to Spain was: “neither the earthquake nor other news has in any way affected the tranquility of this island” (Anon., 1874a).

Shepherd and Lynch (1992) report Intensity VI, San Juan “Earthquake at 6:15 this morning. Vibration lasted two minutes. Houses swayed to an incredible extent. Inhabitants much alarmed. No casualties reported” (Anon., 1874b)

### ***1875, December 9<sup>th</sup> 0120***

**Location:** Mayagüez, Vega Baja, Arecibo, Manatí, Ponce, San Juan, Puerto Rico

**Data:** “Temblor de Tierra. A las 1 y veinte minutos de la madrugada de hoy 9 se sintió un fuerte y prolongado terremoto que despertó a la mitad de la Capital. No hubo desgracias ni desperfectos que sepamos” (Anon., 1875b).

Copiamos de la prensa de Mayagüez - Temblor de tierra. -A la una y media de la madrugada de hoy se ha dejado sentir un fuerte temblor de larga duración, de trepidación al principio y variando en oscilación de Norte a Sur en seguida. No tenemos que lamentar desgracia alguna: los edificios han soportado este sacudimiento sin graves averías. -Sintieramos que en algún otro punto de la Isla o fuera de ella, haya causado algunos estragos porque la fuerza de este temblor hace sospechar que tenga su origen en otro punto (Anon., 1875c).

Terremoto. A las una y media de la madrugada del día 9 del corriente se experimentó un fuerte y bastante prolongado temblor de tierra que hizo lanzarse de sus casas a las calles a gran parte de los habitantes de esta Ciudad [San Juan], afortunadamente no causó daño alguno de importancia en los edificios ni hay que lamentar ninguna desgracia personal (Anon., 1875d).

La iglesia de Vega Baja ha padecido muy poco a consecuencia del movimiento de tierra y reparada consecuentemente y prontamente podrá estar en perfecto estado de seguridad.

No sucede lo mismo con las iglesias de Manatí y Arecibo. En la primera ha quedado muy resentida la torre que de muy antigua tiene en su fachada posterior y han sufrido más o menos algunos de sus muros principales. Sin embargo de esto, en estado... siempre su acontecimiento extraordinario no ofrece un peligro inmediato si se acude prontamente a remediarlo, debiendo proceder a efectuar inmediatamente en reparación completa, antes que la permanencia de sus desperfectos o las degradaciones que puedan producir las lluvias, empeoren en estado y se haga más difícil en remediarlo.

La iglesia de Arecibo es la que a juzgar por sus efectos ha experimentado con más violencia el sacudimiento de la tierra que ha desplomado, pondeado y agrietado parte de sus muros y abierto la mayor parte en las bóvedas por las juntas de las claves ó por las de los rincones. Su estado actual ofrece por lo tanto extraordinario gravedad y aunque no sea imposible de remedar exagera una urgente reparación, difícil y costosa. No es este el lugar de entrar en detalles sobre los desperfectos ocurridos su cada cuya de sus partes... (López, 1875).

Cordova (1968) reports that in 1875, without specifying the date that:

tuvo lugar uno de bastante duración y violencia para agrietar las bóvedas y los muros de las iglesias en varios pueblos de la isla, dejándolas en estado ruinoso; para abrir grietas en muros de edificios públicos y casas particulares y derribar sólidas chimeneas de ladrillos en algunas haciendas de canas. No hubo perdidas de vida.

Neumann (1913) reports “Aún recordamos el fuerte temblor de tierra que se sintió en Ponce la noche del 8 de diciembre de 1875, que fue de trepidación y algo prolongado, que hechó abajo algunas chinemeas de los ingenios de la jurisdicción”.

Rockwood (1876), Reid (1911). Intensities Arecibo VII “On the night of the 8th and 9th an earthquake occurred in Porto Rico by which the town of Arecibo was almost entirely destroyed. Two churches and only six houses remaining” (Rockwood, 1876).

Campbell reports: Severe at Arecibo, VII-VIII. A report reads “Only two churches and six houses remaining “. Since Arecibo never had but two churches, this account is an exaggeration. A more correct report is that one church was so badly damaged the dome had to be taken down. Some high structures badly damaged. Elsewhere, there was little or no damage but the shock was reported strong (Reid and Taber, 1919) A strong earthquake was felt in Ponce. Tremors were prolonged which threw down some chimneys at sugar mills (Neumann, 1913). The Island experienced another strong earthquake (Coll y Toste). Another strong earthquake shook Arecibo. Did

much damage to the church and the priests' quarters (Limon, 1938). Arecibo VII-VIII. Church badly damaged. Little damage elsewhere. Must have been on the Island and quite deep, 50-100 kms (Campbell, 1972).

**Commentary:** Neumann's report of event being felt and causing damage in Ponce has not yet been verified by first hand reports. Other reports suggest source north of western part of the island.

**1876, January 7<sup>th</sup> 0400 0430 0433**

**Location:** St. Thomas

**Data:** Three shocks of earthquake were experienced here yesterday morning. The first at about 4 o'clock; the second at about half past 4, which was very severe; and the last about 3 minutes later (Anon., 1876). St. Thomas. Second shock at 0430, very severe, VI (Reid and Taber, 1919)

**1878, July 12<sup>th</sup>**

**Location:** St. Thomas

**Data:** Severe V-VI (Reid and Taber, 1919)

**Commentary:** No reference in the *St. Thomas Tidende* for the period July 11<sup>th</sup> to July 28<sup>th</sup> of 1878 and hence probably an error. St. Thomas, Severe V-VI (Reid and Taber, 1919). Non-existent event, should be noted as such in further catalogs.

**1879, May 25<sup>th</sup>**

**Location:** Puerto Rico, St. Croix and Tortola

**Data:** A severe shock was felt in Bermuda at same time (Reid and Taber, 1919, citing Rockwood, 1880)

**Commentary:** Not mentioned in either the *St. Thomas Tidende* (May 25<sup>th</sup>/June 4<sup>th</sup>1879) nor the *St. Croix Dansk Vestindisk Regieringle Avis* (May 25<sup>th</sup>/June 7<sup>th</sup>) hence for the Virgin Islands probably an error. Needs confirmation from a primary source and thus needs confirmation from eyewitness accounts for Puerto Rico. Event is suspect.

**1880, August 21<sup>st</sup>**

**Location:** Isabela, Arecibo, Puerto Rico

**Data:** "...La iglesia [of Isabela] había sufrido notablemente a consecuencia de dicho temblor... [damage due to] los temblores que hace años los pusieron en ese estado... la continuación de los temblores que se han sentido en esta con especialidad en de hoy hecho que referido pilar se encuentre un estado por la rajaduras que se le han ocasionado compose sostener la carga de la torre la cual coro... las diferentes grietas que se advierten..." (Anon., 1880a). Church in Arecibo damaged by earthquake on August 21<sup>st</sup>, 1880 earthquake, repairs to be complete in the years 1884 (Marvel and Moreno, 1984, citing Anon., 1880b, 1884).

**1882, March**

**Location:** Ponce

**Data:** "Quizás debido a corrientes sísmicas cuyo origen no se determinó, allá en días de Marzo de 1882 el mar se retiró por dos ó tres veces en la rada de Ponce, más de diez metros de su nivel común en las orillas" Neumann (1913).

**Commentary:** Tsunami? observed in Ponce caused, apparently, by a distant earthquake.

**1883, February 19<sup>th</sup> 1900**

**Location:** NW of Puerto Rico

**Data:** Ship Siddartha reported a sharp earthquake in the Mona Passage. Ship trembled as if dragging over a hard bottom but found no soundings at 30 fathoms. The ship's position was 20°04' N and 67° 45' W (Reid and Taber, 1919).

**1883, September 2<sup>nd</sup>**

**Location:** San Juan, Puerto Rico

**Data:** "...Temblor de Tierra. Parece que se sintió uno muy ligero ante noche en este ciudad..." (Anon., 1883)

**1886, September 19<sup>th</sup> 0314**

**Location:** St. Thomas

**Data:** St. Thomas, Sharp Shocks (Tomblin and Robson, 1977; citing Barbados Globe 1886.9.20)

**Commentary:** Event in Virgin Islands or Jamaica?

**1886, October 20<sup>th</sup>****Location:** North of Anegada**Data:** Ship *Wilhelmina* at 19°21'N and 64°22'W felt an earthquake accompanied by noise like distant thunder. It seemed like the ship was running over rocks, though water depth was more than 2,000 fathoms (Reid and Taber, 1919).**1888 January 4<sup>th</sup> 0555****Location:** St. Thomas**Data:** Tomblin and Robson, (1977): St. Thomas (V). A sharp shock of earthquake. *Barbados Globe*, 1.5.1388**Commentary:** Event in Virgin Islands or Jamaica?**1888 May 21<sup>st</sup>****Location:** St. Thomas**Data:** Tomblin and Robson, (1977): St. Thomas (IV). About midnight a rather strong shock *Barbados Globe*, 28.11.1889**Commentary:** Event in Virgin Islands or Jamaica?**1889 November 27<sup>th</sup>****Location:** St. Thomas**Data:** Tomblin and Robson, (1977): St. Thomas (V). A sharp shock of earthquake. *Barbados Herald*, 28.11.1889**Commentary:** Event in Virgin Islands or Jamaica?**1890, August 15<sup>th</sup> about 0150****Location:** Juana Díaz, Ponce, Adjuntas, Arecibo, Aguadilla, Barros, Dorada, Isabela, Las Marías, Toa-Alta, Yabucoa, Yauco, Caguas, Puerto Rico**Description:** Telegraphed reports from town mayors to governor in San Juan. All from Anon. (1890). "Juana Díaz: Anoche a la una y media de la madrugada se sintió un fuerte movimiento oscilatorio de la tierra de duración de treinta y cinco segundos. Único desperfecto conocido un ligero agrietamiento en la clave puerta por un apal [*sic*] yglesia que reconocido no ofrece peligro de ninguna manera. Despacho telegráfico, 15 Agosto 1890, 10:35.

Ponce: dos de esta madrugada se sintió un temblor de duración 8 a 10 segundos. Alcalde cárcel... participa que grietas de la misma se han agrandado. Los demás edificios públicos y particulares no han sufrido desperfecto alguno. Despacho telegráfico, 15 Agosto 1890, 19:30.

Adjuntas: ...dos madrugada se ha sentido fuerte temblor de tierra calculada su duración 25 segundos. Ninguna desgracia que lamentar.

Arecibo: a las dos menos cinco minutos sentido en esta villa un fuerte y prolongado temblor de tierra, el sacudimiento hizo hacer sonar los campanas y iglesias y salvamento naufragos.

Aguadilla. Habiéndose sentido a las dos menos ocho minutos de la madrugada de hoy, un fuerte temblor de tierra de oscilación, tengo la... no ha originado desperfecto alguno en los edificios públicos ni particulares.

Municipal de Barros. Tengo el honor de manifestar a Ud. que a las dos de la madrugada de hoy, se sintió un temblor de tierra algo intenso que empezó de oscilación y concluyó de trepidación.

Dorado. A la una y media de la mañana del día de hoy se ha sentido en este pueblo un prolongado y fuerte temblor de tierra con movimientos de trepidación y oscilación de Norte a Sur acompañado de un ruido subterráneo bastante sensible. En los edificios de mampostería de este pueblo no ha ocurrido no vedar alguna digna de mencionar lo mismo de en los de los campos.

Isabela....Dos menos diez, y ocho minutos de la madrugada de hoy se ha sentido en esta localidad durante 65 segundos un pronunciado temblor de tierra que dió principio con un movimiento de trepidación que a los pocos segundos y con ruidos subterráneos se convirtió en a oscilatorio de Oeste a Este sin que afortunadamente haya habido que lamentar perdida en las personas ni en las casas...

Las Marías. A las dos menos cuarto de la Madrugada del día de hoy se dejó sentir en esta población un fuerte temblor de tierra de bastante duración y cual se repitió dos veces más en el intervalo de 15 minutos... Ni los edificios públicos ni los particulares han sufrido desperfecto alguno...

Toa Alta... A las dos de la madrugada de hoy, se sintió en este pueblo, un fuerte y prolongado temblor de tierra, sin que ocasionara pérdidas ni desgracias personales...

Yabucoa. Como a las dos de la mañana de hoy, se sintió en esta localidad un terremoto de alguna duración pero no de gran fuerza. Hasta ahora no se tiene noticia de que haya causado desperfecto en ningún edificio.

Yauco. En la madrugada de este día y hora de las dos, se ha sentido en esta población un fuerte temblor de tierra de oscilación y trepidación que duró unos quince segundos. Felizmente no ocasionó más novedad que el terror de las personas que la sintieron.

Caguas 1:30 AM 35 sec. Slight damage.

**Commentary:** Strong event, widely felt, but no significant damage.

**1892, February 22<sup>nd</sup>****Location:** St. Thomas (V)**Data:** In the morning. A sharp shock. Barbados Herald, 25.2.1892**1895, Marzo 19<sup>th</sup>****Location:** Arecibo, Puerto Rico**Data:** An earthquake occurred in Arecibo (Limon, 1938)**1896, August 2<sup>nd</sup> just after 0400****Location:** St. Thomas**Data:** Tomblin and Robson (1977): St. Thomas (V) A few minutes after 0400, a sharp shock of earthquake. Barbados Advocate 4.8.1896, Jamaica Post 4.8.1896.**Commentary:** May refer to St. Thomas parish in Jamaica.**1898, Marzo 20<sup>th</sup> 0805****Location:** Las Marías, San Juan, Puerto Rico**Data:** “Relativo a los desperfectos causados en la iglesia y casa escuela del pueblo de Las Marías por un temblor de tierra” (Anon., 1898a).

A las ocho y cinco minutos de la mañana de hoy se ha sentido en esta capital [San Juan] un ligero temblor de tierra que duró pocos segundos, creyendose que haya sido general en toda la Isla juzgar por las noticias telegráficas recibidos (Anon., 1898b).

**Commentary:** No manuscript just title page, without date of event (just month of manuscript) for Anon. (1898a).**1899, January 1<sup>st</sup> 1530****Location:** Vieques, Puerto Rico**Data:** Duration 4 seconds (Reid and Taber, 1919)



***1899, March 22<sup>nd</sup>*****Location:** San Juan, Puerto Rico**Data:** San Juan felt (Reid and Taber, 1919).***1899, July 6<sup>th</sup>*****Location:** Isabela, Puerto Rico**Data:** Felt at Isabela (Campbell, 1972 citing local weather bulletin)***1899, July 10<sup>th</sup>*****Location:** Lajas, Yauco, La Isolina, Utuado, Ponce, Puerto Rico**Data:** Lajas. Strong V. Yauco also felt two shocks. Another shock at 0200 on July 11<sup>th</sup> (Reid and Taber, 1919). Felt at Yauco, La Isolina, Lajas, Utuado, and Ponce (Campbell, 1972 citing local weather bulletin).***1899, August 8<sup>th</sup> and 9<sup>th</sup> 1115-1200, 0130*****Location:** Cidra, Manatí, Puerto Rico**Data:** Cidra, two shocks (Reid and Taber, 1919). Felt at Cidra on August 8<sup>th</sup>. First August 9<sup>th</sup> shock felt at Manatí (Campbell, 1972 citing local weather bulletin). At 0130 August 9<sup>th</sup> shock felt at Manatí, Cidra (Campbell, 1972 citing local weather bulletin).***1899, August 13<sup>th</sup>*****Location:** Isabela, Puerto Rico**Data:** Isabela evening, (Reid and Taber, 1919)***1899, September 4<sup>th</sup> 2245*****Location:** La Isolina, Puerto Rico**Data:** La Isolina. (Reid and Taber, 1919). Movement from west to east, lasting a few seconds (Campbell, 1972 citing local weather bulletin). 1899 September 4<sup>th</sup> 2245. La Isolina.***1899, September 26<sup>th</sup>*****Location:** Canóvanas, Puerto Rico

**Data:** Felt at Canóvanas (Campbell, 1972 citing local weather bulletin)

***1899, December 7<sup>th</sup> and 27<sup>th</sup> ?, 1621***

**Location:** Isabela, Coloso, Puerto Rico

**Data:** December 7<sup>th</sup> at Isabela. December 27<sup>th</sup> at Coloso at 1621 (Reid and Taber, 1919)

## Appendix II

# Catalog of Significant Earthquakes for Puerto Rico and the U.S. Virgin Islands 1900-1943

*1906, September 27<sup>th</sup> 1047*

**Location:** San Juan, Caguas, Santurce, Yabucoa, Arecibo, Mayagüez, Arecibo, Ponce, Río Piedras, Isabela, Manatí, Juana Díaz, Moca, Hatillo, Fajardo, Coamo, Humacao, Guayama, Añasco, Río Grande, Carolina, Toa Alta, Vega Baja, Trujillo Alto, Bayamón, Ciales, Cayey Puerto Rico; Saint Thomas, Santa Cruz; Santo Domingo, Santiago de los Caballeros, Dominican Republic; Isla de Cuba (Santiago); Isla Margarita; Florida

**Data:** “A sharp earthquake shock occurred at 10:47:30 A.M. the 27<sup>th</sup>; increased in force until 10:47:35; continued for an interval with irregular, diminished force; increased rapidly to a maximum at 10:47:55. A slight movement was distinguished for 25 seconds after the maximum reached at 10:47:55. The vibrations were short and sharp, with an apparent general wave movement from east to west. The accompanying sound, as heard in the Weather Bureau Office, was as if a heavy piece of furniture were being dragged across the floor.

There were no premonitory signs. The water of the bay was slightly agitated; no accompanying wave. The walls and ceilings of some buildings were cracked but no material damage was done.” (Thompson, 1906).

El Temblor de Tierra. A las 11 menos 17 mts. de la mañana [San Juan] de hoy se han sentido dos fuertes temblores de tierra, que han durado cerca de medio minuto., mediando entre ellos una ligera intermitencia... Afortunadamente no ha habido que lamentar desgracias personales, ni deterioros de consideración en los edificios: pequeños desconchados en algunos y una grieta en un muro del Ayuntamiento, en este edificio se apuntalaron las puertas... En el edificio de la Audiencia, cayeron frente a la Sala de lo criminal pequeños desconchados.

Tenemos entendido, según se dice, que se ha agrietado una pared de la Iglesia de Santana, y en la Colectiva han habido su desperfectos, la misma que en la arquería del edificio del Banco Español; Hotel Inglaterra, Intendencia, etc., etc... De Obras Públicas no hemos podido obtener datos, porque el descuido y abandono del sismógrafo le han hecho inservible para la presente ocasión (Anon., 1906a).

Los Temblores en Caguas, Septiembre 27 1906. Hoy, diez y media de la mañana, se produjo un terrible temblor de tierra que duró veinte segundos (Martínez, 1906).

La escalera de la Escuela de Caridad de niños de Santurce se ha agrietado con motivo del temblor de tierra que se sintió esta mañana. En la oficina telegráfica de la Policía Insular se han recibido informes de varios pueblos de la Isla, referentes a haberse sentido con gran intensidad en casi todos dichos pueblos el temblor de tierra de esta mañana, habiéndose agrietado las paredes de la casa escuela de Yabucoa. En Arecibo se sintió fuerte y prolongado el temblor” (Anon., 1906b).

El Temblor de Ayer. En Mayagüez. El periódico “Unión Obrera” recibido hoy trae los siguientes informes: “A las 10.45 minutos se produjo una oscilación sísmica en la ciudad de Mayagüez que duró más de 20 segundos... El temblor es uno de los más poderosos que han sentido las personas más ancianas de Mayagüez. Daños causados en Arecibo por el temblor de Ayer. La Iglesia Católica, la casa que ocupaba la Corte de Distrito, las escuelas Jefferson, Baldorioty, y Lincoln, la casa de don Agustín Collazo, la de la sucesión Balseiro Juliá, la del señor Coll y Cuchí y otras más han sido agrietadas. En el establecimiento de Botellerías de don Francisco Sanchez cayeron muchas botellas de los escaparates, igual sucedió en la tienda de don Corpus Gomez, que perdió tres docenas de botellas de diferentes licores. Muchos edificios más han sido averiados. Casi todos los edificios escolares han sido agrietados, las escuelas Baldorioty, Lincoln, Jefferson han sufrido pequeños desperfectos...

Efectos del temblor en Ponce (del Águila). Con motivo del temblor de tierra que hoy a las 10.40 A. M. se ha sentido en esta ciudad, agrietáronse las paredes de los edificios escolares de la calle Mendez Vigo y las Grammar School de la calle del Comercio, la casa... vive... Sergio Bernier y también se han notado grietas en las paredes de la Plaza del Mercado.

Uno de los arcos correspondientes al Departamento Sur del Asilo de niños de Santurce, ha sufrido importantes averías con motivo del temblor de tierra de ayer.

También el edificio que ocupan en Río Piedras “los niños desamparados” ha sufrido considerables desperfectos, al extremo que han tenido los asilados que abandonar la parte alta de dicho edificio.

El cabo López, del puesto de policía de Isabela, telegráfico ayer tarde a 4 y 34 minutos, que con motivo del temblor de tierra, el bracero Pedro Gandía, que trabajaba en la trinchera de la Compañía del Ferrocarril al huir desplomóse una piedra que hirióle gravemente en la cabeza, además de ocasionarle una fuerte contusión en la espalda y otras, leves (Anon., 1906c).

El temblor de ayer (del Águila de Ponce)... Al sentirse el primer temblor... pero al sentir la segunda conmoción que fue mucho más fuerte que la primera, casi todo el pueblo se lanzó a la calle... Los alambres del teléfono, los cables del alumbrado eléctrico y de los “trolleys” se movían rápidamente.

Edificios agrietados [further details on damage, in part repeats details given previous day].

La Conmoción Terrestre de Ayer (del “Pueblo” de Arecibo): “Ayer poco después de las 10 A.M. sintióse un fuerte temblor de tierra en toda la ciudad. La afirmación general de los entrados en regular edad es que muy pocos se han sentido en Arecibo como el que relatamos [very different in Ponce and San Juan] [follow with details of damage caused by earthquake].

Editorial. A few moments after the seismic phenomenon was felt in San Juan, the general feeling of dismay and stupor was intensified by the incredible report that the magnificent seismograph which had existed in San Juan during the former sovereignty had been stored away as useless lumber, thanks to the wisdom of our tutors...

El terremoto en Manatí. Septiembre 28 de 1906. Pánico horrible... algunos edificios de mampostería fueron ligeramente agrietados (Anon., 1906d).

Sobre el temblor del día 27, dice "El Águila", de ayer: "Los puentes tendidos en la carretera que une a Ponce y Juana Díaz, han sufrido desperfectos por consecuencia del temblor del viernes pasado... (Anon., 1906e).

Notas de Moca. Acaba de sentirse en este pueblo un temblor de tierra que ha producido un pánico extraordinario... en verdad, que nunca habíamos sentido un fenómeno sísmico tan fuerte y prolongado... (Anon., 1906f).

Desde Arecibo. Ayer sintióse entre 10.20 y 10.30 una fuerte conmoción sísmica... calculándose su duración 5 segundos.

Entre los daños que ha causado dicha conmoción... la iglesia católica, coté "La Mallorquina", casa del abogado Coll, las escuelas Lincoln, Baldorioty y Jefferson, etc.

Unos marinos que recorrían la bahía pescando, notaron un movimiento extraño en las aguas del mar (Anon., 1906g).

Desde Hatillo. El fenómeno sísmico... con motivo de mencionado movimiento de oscilación, la iglesia romanista quedó con algunas grietas y la infeliz Rita López se impresionó de tal modo, que tuvo un parto prematuro (Anon., 1906h).

More details of damage to buildings in San Juan. Refers to Weather Bureau for further detail [Bureau de Tiempo]. Also notes Impresiones y Noticias. "...se nos asegura que ayer, durante el terremoto, el mar estuvo muy violento, estrellándose con furia sobre el viaducto de la Puerta de San Juan. Durante el fenómeno, un gran ruido subterráneo se sintió en la ciudad, que produjo la mayor alarma... Copy of seismogram for earthquake on front page. Varios telegramas del terremoto en la Isla.

Fajardo, Septiembre 27. En este momento, días de la mañana, conmoción sísmica. Iglesia de mampostería agrietada. Algunos aleros de casas viejas desplomadas con estruendo...

Coamo, Septiembre 27. Terremoto bastante fuerte 10 y 43 minutos. Gente alarmada. Muchos desperfectos.

Río Piedras, Setiembre 27. Terremoto a las once menos cuarto. Muchas casas agrietadas. Incluso la del municipio, que sufrió algunas averías.

Caguas, Setiembre 27. En estos momentos se ha sentido en esta ciudad un fuertísimo temblor de tierra, ocasionando alarma en la población. Varias casas de mampostería han tenido averías y muebles han sufrido desperfectos al caer al suelo.

Humacao, Septiembre 27. Se ha sentido fuerte conmoción, produciéndose la constante alarma. La iglesia católica sufrió ligeros desperfectos.

Guayama, Septiembre 27. A las diez y cincuenta se sintió fuerte temblor de tierra. ...La iglesia protestante resultó con las paredes agrietadas.

Añasco, Septiembre 27. Temblor de tierra ocurrido en la mañana de hoy, hizo daño en edificios..., ayuntamiento, central telefónica y correos.

Isabela, Septiembre 27. Temblor de tierra hoy, causado grandes grietas en la Iglesia Católica, ayuntamiento...

Los telegramas que recibimos... de Coamo, Arecibo, Aguadilla, Mayagüez, Río Grande y Carolina informan... solamente en varios edificios hubo pequeños desperfectos (Anon., 1906i).

Desde Carolina. Septiembre 27. Como a las once menos cuarto de la mañana de hoy, sintióse aquí un fuerte sacudimiento de la tierra, durando 20 segundos.

...Con motivo del temblor de tierra acaesido, se derrumbó una parte de un edificio que existió en estado de ruinas, en la antigua hacienda...

Iglesia de Río Piedras. Nos informan de Río Piedras que el terremoto de anteayer causó grandes desperfectos en la torre y columnas del templo de la iglesia católica de aquella población, dejándola en estado ruinoso.

Más de Ponce. [eyewitness accounts of earthquake] (Anon., 1906j).

Desde Toa-Alta....Con motivo del terremoto, en la campana del reloj de la casa alcaldía se oían aquí toques como si una mano la hiciera sonar tanto, ese edificio como si que sirve para el culto católico, han sufrido grietas de alguna consideración, por diferentes partes, ofreciendo peligros en el caso de que el fenómeno se repita. Corresponsal.

Desde Aguadilla....con motivo del fenómeno sísmico algunas casas y edificios de la población se han agrietado. Mario Morales (Anon., 1906k).

El temblor en Vega Baja. Septiembre 27... a las 10.40 de la mañana se sintió un fuerte temblor acompañado de un ruido subterráneo, repitiendo como a los 5 minutos con más fuerza y propagación de ruido... Sufrieron desperfectos varias casas...

El temblor en Trujillo Alto. Septiembre 28. A las once menos veinte minutos hizo un temblor de tierra, que no podemos precisar su duración; pero sí que ha sido el más fuerte de los que hemos sentido....Los niños de las escuelas abandonaron los salones á causa de una grieta en la pared del centro de edificio...

Noticias circuladas anoche informaban que el fenómeno se había sentido con gran intensidad en Saint Thomas, Santa Cruz, Isla de Cuba (en Santiago de Cuba con más fuerza) y otras islas... desde Margarita hasta la Florida.

Informase que hace tres noches hubo un pequeño movimiento sísmico, notado por algunas personas de esta ciudad.

Créese, que la duración del primer periodo del temblor, el de oscilación, fue de cinco segundos y medio; la del segundo, trepidación, de cuatro y medio.

...La fábrica de tabacos de Bayamón, se informa que presenta grietas. Los tabaqueros se arrojaron fuera del edificio seguidamente de sentir el fenómeno.

El temblor en Bayamón. Septiembre 26. -A las 11 menos cuarto A. M. se sintió en esta ciudad un terrible temblor de tierra... En la fábrica de tabacos... los edificios moverse como una hamaca...

La iglesia católica ha sufrido bastante, así como se ha agrietado el edificio de la escuelas públicas (Anon., 1906l).

En Ciales una chimenea fue derivada por el temblor. El miércoles á las once menos cuarto de la mañana, sintióse en esta población un fuerte temblor de tierra, cuyas trepidaciones duraron próximamente diez ó quince segundos.

Entre los desperfectos causados... el derrumbe de una chimenea... y el agrietado de las paredes... (Anon., 1906m).

Una desgracia ocurrió en Cayey el día del temblor....Varias casas de mampostería se agrietaron entre ellas el colegio. No hubo otra desgracia personal que la de una mujer que se arrojó desde una de las ventanas de la "colectiva" estando próxima a dar a luz. Su estado es grave" (Anon., 1906n).

Esta mañana [in Santiago de los Caballeros Dominican Republic] a eso de las 10 y cuarto se sintió un fuerte temblor de tierra" (Anon., 1906o).

Cordova (1968) reports that: "tuvo lugar uno violento que afortunadamente solo abrió en algún lugar alguna vieja herida no bien restañada todavía".

Campbell (1972) says:

The shock was felt from Santo Domingo to St. Thomas, a distance of 500 kms; and probably still further east. It was strong all over Puerto Rico, not less than V in any part of the Island. At San Juan, objects were overturned and people were frightened. Duration 50 sec., rising gradually to a maximum then diminishing. Reports were received from many towns but without details. The seismograph at Vieques made a good record. It indicated a distance of about 140 kms to origin, in a NW-SE line. Origin believed to be about 50 kms north of Puerto Rico about opposite the middle or a bit further west; about 19° N and 66 1/2° W. No sea wave. The reported damages were widespread; about 19 Puerto Rico communities reported intensities varying from V to VII. A more complete detailed account is in the Reid and Taber (1919). Puerto Rico V. At about 10:15 a severe and prolonged shock (Robson, 1964). A heavy double shock earthquake was felt throughout the Island. The earthquake became noticeable at 10:47:30 AM, increased rapidly in intensity with short sharp vibrations. There was an apparent east to west direction, reaching a maximum at 10:47:35 AM, after which the energy seemed to decrease somewhat for about 10 sec., and then again increased reaching the greatest energy at 10:47:55 AM. The vibrations then rapidly decreased in intensity but continued perceptible until about 10:48:20 AM. The walls of some buildings were cracked; some clocks stopped and great confusion among people resulted but no material damage was done. At least V in all parts of the Island. Caguas, VI-VII. Río Riedras, VI-VII. Cayey, V. San Juan, VII. Bayamón VI-VII. Origin 50 miles north of Puerto Rico.

**Commentary:** Strong earthquake felt throughout the island. Minor cracking in buildings in several towns. No report of major damage.

### ***1918, October 11<sup>th</sup> 1014***

**Location:** NW Puerto Rico

**Data:** The following reports were sent by telegrams to the government in San Juan by the local mayors. Data all come from (Anon., 1918a)

Juana Díaz- Edificio donde esta la oficina (de la Alcaldía) con grandes desperfectos.

Carretera Las Marías- Km 18 obstruyese derrumbes ayer tarde, movimiento sísmico no ha terminado.

Manatí Obras metálicas, mataplatanos, Cialitos, Morovis y Vega sin novedad.

Mayagüez- 10/25/1918, La alcantarilla de km 3.5 ramal de Cabo Rojo sufrió caída de parte del arco y un pretíl y se le hizo una nueva grieta. El puente sobre el Caño Corazón carretera a la correccional... fué deslocada. Las Vegas km 17.9 se hizo una grieta vertical a un muro de alcantarilla. Añasco-Mayagüez km 35.3 se abrieron nuevamente grietas antiguas que habían sido reparados en una obra de ladrillo y piedra. Mayagüez-Las Marías km 2.9 el muro de alcantarilla...grieta vertical, km 21.3 tubo roto. Derrumbes se repitieron en todas las carreteras aumentando el su total en unos 600 (ms?). Derrumbes difíciles a entrar en carreteras #13 y 14... en Las Vegas quedan pocas, Sacudida del 23 por la noche hizo nuevos escombros.

Sección Cataño-Bayamón Casilla residencia del capatár Higinio Soler km 4+8 tiene grietas de consideración en los marcos de las puertas y ventanas. Puente deno-

minado Valdés km 6+8 tiene en el estribo de la parte hacia Cataño grietas bastante consideración.

Sección Santurce-Bayamón Puente de Báscula Km 1+637 sufrió en el estribo de la parte hacia Santurce una grieta de consideración que ha hecho retroceder la mitad del estribo hacia el mar como 1/2". Puente km 9+6 sufrió grietas. Puente de mampos-tería km 11+950 grieta sería en centro de bóveda.

Sección Bayamón- La Carmen Casilla residencia sobresante km 13+030 sufrió grietas de consideración residencia de camionero Emiliano Garcia km19+240 también sufrió grietas de consideración

Sección Bayamón-Comerío Puente km2+800 estribo hacia Bayamón grietas muy serias. Puente La Plata Km 14+3 tiene grietas en alteas

Yabucoa- 10/25/1918 Movimiento Sísmico de anoche no ha causado ningún daño puentes en construcción

10/25/1918- Pueblos costa norte hasta Isabela al parecer no han sufrido gran cosa. Aquella en Aguadilla nuevos daños de importancia edificios particulares... Familias abandonan la población hacia los campos. Las noticias Mayagüez son muy contradictorias. Se opina ha sufrido mucho más.

10/29/1918- Inspeccionados- hoy nuevamente puentes Guayabo, Santi, Ponce demuestran grietas verticales hacia aguas raíz Loza. Puente Guayabo a más grieta sobre pita del medio. Solicito inspección de Aguadilla a Depto. de Interior.

11/4/1918 Mayagüez- Fuerte avenida Río Yagüez arrastró tramo atravesado en su cause. Suponemos lo haya doblado por el centro estar cortados casi todos los remaches. Caudal aguas impide precisar exactamente daños si los hay.

11/5/1918 Suben Río Manatí, Ríos Inabon, Jacaguas, descabrado, y Santa Isabel.. Fuerte Avenida.. Utuado-Adjuntas lluvia torrencial Mayagüez, agua en Carr. #2 Km 2+300 Quebrada Grande, Sabalos.

11/5/1918 Cayey Km 61-68 Derrumbes.

11/6/1918 Tallaboa, Peñuelas, Ponce derrumbes.

11/13/1918 Terremoto ayer causó nuevos daños Mayagüez Chalet sobrestante se desplomó más obrase Mayagüez, San Germán, y Monte Grande bien Ramal Cabo Rojo km 3X950 alcantarilla roto.

The houses destroyed in this town (Aguadilla) were mostly located on the sea-shore in barrios "Higüey" and "Pueblo Nuevo" at the southern end of Progreso St. between this, and the sea", "A considerable number of dwellings were destroyed at a place named "Bajura de Vadé" in Barrio "Maleza Alta".

Mayagüez- "...Mayagüez se encuentra 25% destruido 25% seriamente averiado y el resto esta en buenas condiciones. Muchas casas pequeñas en la playa destruidas y averiadas por el agua." "Después de telegrama último Alcalde aparecieron dos muertos más siendo el total de estos 38 (Anon., 1918b).

The following are entries in the daily diary of the Redentorist Fathers; (?) indicates unintelligible text:

Mayaguez, October 26<sup>th</sup>, 1918- Today I will try to set down the awful occurrences that happened in Mayagüez this awful fortnight. As far as possible I will try to narrate them in the order of their occurrence. The earthquake. Friday October 11<sup>th</sup>. St. Fermín's day at 10:15 in the morning Mayagüez suffered a terrible earthquake. It is sim-



ply impossible to give an adequate idea of this terrible (earthquake) visitation. The noise was terrifying. It began with an oscillating movement and ended with a trepidation. Everyone ran to the street. A cloud of dust covered the city. People running wild-eyed with blanched?... Many hysterical. The fathers at once went to the schools, to the hospitals, the asylum, the playa school. Ruins covered the streets everywhere. By a miracle God's goodness, all our children, over 1500, were saved. All the sisters lives spared. All the fathers and brothers spared. Only Sister Ferboyn had a bad fall down the stone steps of the patio. She herself says she was hurt by the terrible strain trying to save the children as they went down those stairs which jumped and shook like crazy. No bones were broken, but she suffered a severe strain.

Tidal wave- The next scare and perhaps the most terrifying event of the morning was the cry "ya se viene el mar" A tidal wave is coming. Automobiles, wagons, cars, crowded going toward the city at full speed. "El mar, el mar, ya se viene el mar" [the sea is coming to cover us]. Hundreds of terrified men and women, the whole population of the playa, going as fast as they could to reach the Plaza de Colon. From there they went to the cuesta de Salud [how well named] and the mesa [the highland overlooking the city]. This exodus of tired terror stricken Mayagüez was horrifying. ...?.. there was reason for fearing. Mr. De Pass, the postmaster, told me the other day that after the earthquake everyone at once had to leave the town post office and no one could enter anymore because the place was ruined. Mr. De Pass at once went to the playa post office to close the safe and stow away or save the valuables. Suddenly he noticed the people were running out in the street. He rushed out, heard the cry "El mar, el mar" [the sea, the sea] and went as fast as possible to get his auto near the Aduana [Custom House]. By the time he got there the water was a foot deep. He cranked his auto, but just as he started to jump in a 5 foot wave covered him. A small yacht shot past him. A ford car encased in a packing case was carried along in the waters. One of the ?Bianchi? big trucks was carried across the street. The water went as far as the playa church. So there was good reason for fear.

Now the disaster that overtook the Habanera [the big cigar factory] in the first earthquake became known. That big building filled with hundreds of men and women making cigars crumbled like a cardboard box dealing death and destruction crushing the lives out of many. Another scene of disaster was the Playa Public School whose thick cement columns crumpled like pieces of chalk. They say that 8 children a teacher and a janitor were killed. There are no safe rules to be followed in earthquakes. The reverend Father who went through this building an hour after the earthquake found some rooms intact. Others with the ceiling fallen. Had the teachers remained in the building she would have been saved. She was killed by the falling cornices. On the other hand, many of the children were killed by the ceiling falling on them. One teacher José Velez saved many by an act of heroism when he saw the ceiling falling he bent over caught the weight of the metallic ceiling on his shoulders and this allowed the children to escape under him. [Explosion and Fire in college of agriculture station] All the while big black smoke arose from the burning building of the agriculture college [the college of mechanical arts] the earthquake has caused an explosion and fire resulting in a total loss \$40,000 with many valuable instruments (experiments?) which cannot be replaced when lost.

Short summary of losses in the church. The church towers are cracked, ruined. St. Vincent school a ruin. Candelaria sisters convent total loss. Playa school ruined en-

tirely. (Siervas?) al Mariás convent total loss. Hospital in ruins. Spanish colegio unsafe. Whole plaza de colon ruined. Balboa, a district near the bridge a mass of ruins. Many houses on Mendez Vigo ruined. Ruins in the Playa. 735 houses in ruins in Mayagüez [according to Correspondencia of October 24<sup>th</sup>]. Every house that was built of masonry is ruined. Every brick house is ruined. Only first class buildings of reinforced cement stood the test. Combination iron and cement structures, like the market place, also in tact. Our house new and compact, is the wonder of the town. Not a crack in the construction.

Relief work began at once. At noon when the sisters had come back from the mesa and the tidal wave scare was over. Reverend offered their house as a shelter to the sisters. They did not want to accept (So some of ?) brought coffee and crackers to the plaza. The sisters gave most of this at once to the poor. Then it began to rain, so the sisters were forced to accept our offer, but all stayed on the kitchen floor everyone was terrified. We sat down to a little soup and coffee but no one could do much. In the course of the afternoon when it became known how great was the ruin the fathers offered the house for whatever use it could be put to. Toward evening it was published that the home guard and (Firemen?) would help to guard the city. We invited all in the service of the city to come at any time they might for soup and coffee an offer which was gratefully accepted and made use of. The city was in complete darkness. We had a lantern at our Mendez Virgo Street (?) and all night long they came to refresh themselves at the Redentorist house. It was really a blessing for ourselves and for the sisters. It kept us busy and occupied because all night the shocks continued. We used up all the coffee we had on hand and our? and? Then one of? the sisters gave all the candles? with it. Spanish sisters toasted us some ? We took in all the Spanish sisters who wanted to come. We had also invited the (Siervas?) de Maria, who visit the sick in their houses, whose house was entirely unsafe and afterwards destroyed but they did not dare to leave the little shed in which they? in a little out house of the kitchen as they did not dare pass through their house in the dark when at any moment another earthquake might bury them in the ruins...

All night long there were constant tremors and we were kept in constant fear. But at half past four came a big shock which frightened everyone and drove us all in fear and trembling waiting for the morning. It was a dreadful two hours...

Meanwhile the work of helping the injured and the government of the city suffered a kind of paralysis. The provisional mayor lost his own house and besides did not measure up to the situation. Mr. De Pass as post master and major of the home guards took charge of things. It seems the authorities in San Juan and military only found out as it were by chance and then did not visualize the extent of the catastrophe...

The Presbyterian church, having a central location had been taken over as headquarters by Colonel Stanton who arrived from San Juan... All communications with San Juan had been cut off so it was impossible to tell Rector there how serious the situation was. Nobody in San Juan realized the extent of the catastrophe. On Saturday morning we managed to send off a cable... We all settled down to a kind of routine in the house - the wounded some 40 or so number occupied the chapel floor... only one of the patients died.

The routine was punctuated at times by an extra violent earthquake. I say extra violent because I believe the earth has not been wholly quiet since the first shock.

Thus we had one on Saturday October 12<sup>th</sup> at 4:30 am, another ?? several on Sunday night. Others on Monday night made us all nervous. A big one the following Friday or Saturday and a tremendous one almost as bad as the first on Thursday or Friday. It did lots of damage knocked down some walls, cracked more houses and made more walls unsafe and took away all confidence from most of the people. We see that the disaster was partly known in the states as early as October 14<sup>th</sup> a fairly accurate account appearing in the Boston Herald.

November 2<sup>nd</sup>, 1918- People are still very nervous on account of the continuance of the earthquakes... Work is progressing ? down the old buildings, repairing etc...

November 12<sup>th</sup>, 1918- A pretty heavy earthquake at about 8 am frightening the people... But at 5:40pm came a first class shake in many respects as hard as the first one of October 11<sup>th</sup>. Our own house suffered somewhat (over the ? at the ends of the corridors). In the church the whole cornice over the high altar fell down. We did not know that it had been constructed of brick. The ends of the walls of the church are badly cracked. Our house must have been 5 feet out of plumb judging from the mark a crucifix made on the wall. A distinct wave motion was both seen and felt in the country among others by Mr. Garwood the Dean of the Agricultural College. Our house on the finca where the sisters are staying was shaken violently... The earth kept shaking all night pretty heavy shake at 11:45p.m. ...Slight tremors have been felt since then every day.

November 25<sup>th</sup>, 1918-... in the neighboring village or rather the ruins of the neighboring village of Añasco the sisters went to Añasco and kept on going there for a few weeks, but it was not so much the influenza as sheer misery and starvation (Anon., 1918c).

San Juan (Puerta de Tierra) October 11<sup>th</sup>, 1918- Today is a day never to be forgotten in Porto Rico. About 10:20 am without the least forewarning the earth shook and rocked something frightfully. Earthquake! cried everybody. The house shook like a sail in a storm; so violently that it rang the community bell and the hanging electric lights swayed and banged against the ceiling. All made a fast exit to the street. The first shock was followed by a second just as severe throwing furniture around the house and causing fear in the hearts of all. It seemed the earth was going to open and swallow us all. The streets were filled with people yelling and crying; all down on their knees calling on God and our Lady for help and protection. There was pandemonium in school. In some of the classrooms part of the plaster fell from the ceiling and other movable articles were thrown around the room in disorder. The sisters kept their wits about them however. The children all knelt down and prayed and made all kinds of promises not to miss mass again etc. etc. then the sisters led them out of the building. Many of the parents had rushed to the school for their children- Great damage was done in all parts of the island, except San Juan according to reports- The church tonight was simply? crowded with people for the rosary and October devotions.

October 13<sup>th</sup>, 1918- Report has it that Mayagüez has suffered greatly from the earthquake.

October 14<sup>th</sup>, 1918- Father Lynch returned to Mayagüez in an automobile. The trains are not running owing to damages caused to the roads by the earthquake on Friday.

October 15<sup>th</sup>, 1918- The first reports of disaster in Mayagüez and surrounding towns were mild in Comparison to what the ?...e reports reveal. The city is a mass of

ruins. Our house is practically the only one standing. The church has been badly damaged; the school and sister's house practically destroyed. But, the marvel is that not a single child in our schools was hurt; several in an adjoining school building were killed. The priests and sisters are safe.

October 17, 1918- Very Rev. Father Visitor returns from Mayagüez giving us vivid accounts of the disaster- they have turned our house into a base hospital to care for the sick and wounded. The Spanish sisters and also our own have quarters in our house. So called soup kitchens have been organized in different parts of the town dispensing food to the poor and homeless.

October 25<sup>th</sup>, 1918- Last night, 24th, just before midnight another violent earthquake almost as violent as the first.

October 26<sup>th</sup>, 1918- The midnight earthquake caused considerable damage throughout the island. The church in Mayagüez is in a deplorable condition.

November 1<sup>st</sup>, 1918- The fervor [religious] caused by the earthquake still continues.

November 13<sup>th</sup>, 1918- This evening about 6:00 another violent earthquake (Anon., 1918d).

Letter to the Earthquake board states that 262 petitions have been received for Aguadilla houses being lost totally or partially, many of them lost by the inrush of the sea. Will rebuild in the same place as where houses used to be- Approved by Governor on May 24<sup>th</sup>, 1920 (Anon., 1918e, 1920).

Esta mañana a las 9.35 sintióse en esta ciudad [Santo Domingo] un fuerte temblor de tierra, ondulatorio, que sembró la consiguiente alarma en esta población. El fenómeno duro mas o menos 35 segundos y no causó daños materiales, excepto en el establecimiento comercial del Sr. Rafael Montás donde por derribado un tramo de bebidas. Los habitantes de Santo Domingo de Guzman, alarmados ante la seísmica sacudida, echarónse a las calles y parque, especialmente al Colón que se vió colmado por particulares y oficinistas.

Esta mañana, una hora despues del temblor del tierra, notose con estupor por los marinos de este puerto que las aguas del Ozama descendieron bruscamente mas o menos un pié de su nivel ordinario y luego ascendieron como dos pies de dicho nivel. Pequeños embarcaciones que habian junto a la ceyba quedaron en seco con el primer movimiento del rio y, en el segundo, flotaban en máxima cantidad de agua. Estos movimientos de ascenso y descenso del rio continúan marcándo se cada 40 minutos hasta la hora en que escribimos, 1 P.M., en que el Sr. Francisco Catrain, Quien ha constatado dichos movimientos, nos suministra esta interesante información (Anon., 1918f).

Santiago, Octubre 11. Esta mañana fuerte sacudimiento tierra causó alarma general. Nos se sabe hayan ocurrido desgracias.

Puerto Plata, Octubre 11. Sintióse esta mañana movimiento seísmico de larga duración... No hubo daños ni se registro ninguna desgracia. Movimiento tuvo lugar como a las nueve y treinta minutos.

Samaná, Octubre 11. Como a las nueve y cuarenta minutos de la mañana de hoy se sintió el más fuerte temblor de tierra de que se tenga conocimiento en esta localidad. ...No se tienen noticias de que haya ocurrido desgracia alguna ni tampoco de daños materiales.

Sánchez, Octubre 11. Hoy, como a las nueve y cuarenta minutos de la mañana forusimo temblor con movió esta población originando la alarma consiguiente. Se estima la duración del movimiento en cuarenta segundos. No se ha registrado desgracia alguna... Este uno de los más fuertes temblores Que aquí se han sentido (Anon., 1918g).

Edificio Agrietado. Durante el fuerte temblor de tierra que se sintió aquí el jueves a las 9 y 20, se agrietó por muchas partes el edificio que ocupa el tribunal de Primera Instancia de este Distrito Judicial (Anon., 1918h).

San Tomas, 11.- una sacudida prolongada de temblor ha sido sentida aquí a las 10.15 esta mañana, no se señalan daños (por cable frances al List in Diario) (Anon., 1918i).

De Azua, Octubre 12. Ayer, a las 9.30 AM. se sintió una fuerte commoción seismica, de bastante duración, la cual afortunadamente no ocasionó ninguna desgracia. No obstante, se pararon muchos relojes de pared... (Anon., 1918j).

De Palaenque. Octubre 12. El dia 10 del presente, como a las diez AM., se sintió un fuerte temblor de tierra que duró treinta segundos y como a los diez minutos de pasar ésto, se retiró el mar del radio en que estaba, como 30 pies y por algunos partes dejó seco como 20 metros y en su regreso subió 5 pies más del nivel que tenia antes de retirarse cuya acción se repitió 6 veces quedando luego en su esta natural...

De Higuey. Octubre 12. Ayer, viernes, a las 9.30 de la mañana sintióse un fuerte temblor de tierra de muy larga duración, repitíendose con la misma intensidad 5 minutos después. Otro temblor se sintió a las 10.5. Otro más, a las 11.15, otro a las 12.20; otro a las 1.40 p.m. y otro a las 7.48 de la noche. Desde las 9.30 de la mañana hasta las 1.40 p.m. estuve temblando la tierra de un modo casi imperceptible.

Hoy, por la madrugada, sintiéronse 2 temblores; de poca intensidad. La iglesia está seriamente agrietada. El Corresponsal (Anon., 1918k).

Personas llegadas hoy de Higuey nos dicen que la commoción de viernes produjo daños de consideración en el templo de aquella ciudad. Serios desperfectos han afeado su parte interior...

El mar se abalanzó, como una avalanche arrolladora, sobre Punta de Canas y puso en grave peligro la existencia de los moradores. Una infeliz mujer pareció entre las aguas (De La Tarde de La Romana) (Anon., 1918l).

**Commentary:** See Reid and Taber (1919), for more details of this well-known destructive earthquake.

### **1918, Octubre 13**

**Location:** Santiago, Hispanola; Ponce, San Juan Puerto Rico; St. Thomas

**Data:** Santiago, Octubre 14. Anoche sintiose en esta ligero movimiento terraqueo... (Anon., 1918p)

Puerto Rico (V) At 1.00 a.m. A shock was felt in Ponce and San Juan (Port-of-Spain Gazette, 15.10.1918). St. Thomas (111). At 1.00 a.m. A slight but prolonged earthquake (Port-of-Spain Gazette, 15.10.1918).

**1943, July 28<sup>th</sup> 2302 and 1943, July 29<sup>th</sup> 2102****Location:** Puerto Rico

**Data:** From *El Mundo* July 29 (Anon., 1943a) a local newspaper in Puerto Rico we have the following reports: “Anoche, a las 11:06 se sintió en San Juan y Santurce el primero de dos temblores que según cálculos del Negociado del tiempo duró cerca de un minuto. A las 11:09 se sintió el segundo que fue de menos duración y se sintió más en Santurce. Los movimientos sísmicos se sintieron también en Guaynabo y en Ponce, según información que pudimos recibir anoche cuando una alegada congestión de servicio en la Compañía de teléfono nos impidió comunicarnos a tiempo con otras poblaciones de la Isla”.

*El Mundo* July 30 (Anon., 1943b): Fueron 19 los temblores registrados antenoche. Empezaron a las 11:02 p.m. y terminaron a las 7:45 a.m. El epicentro fue cerca del Canal de la Mona, registrados en E.U. La Isla fue sacudida antenoche 19 veces por temblores que se registraron desde las 11:00 de la noche del miércoles hasta las 8:00 de la mañana del jueves según informes del Observatorio Magnético Insular. El Sr. Carl A. Ludy, director del Observatorio, informó ayer que uno de los más fuertes estremecimientos ocurridos en la madrugada del jueves averió los sismógrafos del Observatorio.

Agregó el director Ludy que el epicentro del terremoto evidentemente fue cerca de Canal de la Mona y que lo más probable es que los temblores hayan sido registrados por estaciones sismológicas del continente. En este sentido la agencia noticiera Prensa Unida, informó en la mañana de ayer “que uno de los temblores de tierra más severos registrados por el sismógrafo de la Universidad de Fordham en los últimos años, ocurrió como a 1,500 millas al sur de Nueva York, en las cercanías de Cuba ó la Republica Dominicana con la posibilidad de que hayan ocurrido daños sustanciales en las Indias Occidentales. El primer temblor se registró a las 11:07 p.m. y fue seguido por varios otros de menor intensidad que evidentemente ocurrieron cerca del mismo sitio.

El despacho cablegráfico de Prensa Unida informa además que los temblores fueron registrados por el sismógrafo del Colegio Weston, Massachusetts en donde se opinó que el mismo pudo haber afectado a P.R. “En la estación sismológica del Colegio Weston se informó que el temblor fue registrado en la misma hora que en la Universidad Fordham agregando que fue uno de los temblores más fuertes registrado este año y que ninguno de los ocurrido en la Indias Occidentales durante los últimos diez años puede compararse con el que se sintiera anoche. Se indicó que el epicentro fue en un punto a 1,655 millas al sureste de Boston”.

En P.R. el primer estremecimiento ocurrió exactamente a las 11:02 de la noche del miércoles cuando la mayor parte de la población se había retirado a sus hogares. Miles de personas salieron precipitadamente de sus casas al sentir el primer temblor especialmente en las ciudades más grandes de la Isla en donde la mayoría de los edificios son de concreto. Sin embargo, en la mañana de ayer jueves no se habían informado desgracias personales ó daños a la propiedad según la versión obtenida en los cuarteles generales de la Policía. Se esperan informes finales.

El director del Observatorio Insular informó que espera recibir informes finales de E.U. antes de poder determinar con exactitud el curso seguido por los temblores. Dijo el señor Ludy que los instrumentos de su Observatorio registraron 19 temblores en total, el más fuerte de los cuales ocurrió 2 ½ minutos después de las 11:00 de la noche; otro se sintió a las 1:39 de la madrugada del jueves; otro a las 2:17; otro fue registrado 4 ½ minutos antes de las 3:00 de la madrugada y otros dos, uno poco más fuerte, a las 3:10 y a las 3:25 de la mañana. Entonces, ocurrieron otro diez temblores de menos intensidad, el último de los cuales se registró a las 7:45 de la mañana.

El director Ludy declaró que los dos instrumentos que resultaron averiados dependen de fibras para su funcionamiento y que siendo las fibras muy finas, se rompieron debido a la fuerza del primer temblor que según dijo fue muy intenso. Comentó el señor Ludy que frecuentemente ocurren temblores que tienen su epicentro en el Canal de la Mona.

Anteanoche, al registrarse los primeros temblores en Ponce, parte de la Defensa Civil fue movilizada, según nos informó el Dr. Carlos Muñoz McCormick, director de la Defensa Civil quien empezó a recibir informes de la isla poco después de registrarse el primer temblor. Desde Humacao nuestra corresponsal nos informó lo siguiente “de bastante intensidad resultó el temblor de anoche. Se produjo alarma general especialmente entre el público que salía del teatro”.

En la República Dominicana- Ciudad Trujillo informa a Prensa Unida que a las 11:04 de la noche del miércoles se sintió allí un fuerte temblor sin que se registraran daños ni desgracias personales. El temblor se sintió en toda la isla.

Explicación de la Telefónica- “Como resultado de los temblores de tierra ocurridos en la noche del 28 en las centrales telefónicas, especialmente los de San Juan, Santurce y Hato Rey recibieron un número considerable de llamadas que sobrecargaron las líneas”.

Las líneas de larga distancia sufrieron interrupciones y pasaron algunas horas antes de que la telefónica pudiera restaurar el servicio.

En Mayagüez- A las 11:00 p.m. se sintieron dos fuertes temblores de tierra que ocurrieron casi seguidos uno del otro y que duraron cerca de un minuto. Los estremecimientos se repitieron a eso de la 1:00 de la madrugada y luego a las 3:00 y a las 4:00 pero con menor intensidad. Según informó la Policía no hubo daños ni accidentes personales, sin embargo, el teléfono sufrió interrupciones. Los habitantes de Mayaguez comentan el hecho curioso de que el reloj de la Iglesia presbiteriana en la Marina se paró a las 11:00 de la noche en punto cuando se sintió el primer estremecimiento.

En Ponce- No hubo desgracias personales ó daños que lamentar con excepción de los cables de luz eléctrica que se partieron en algunos sitios, especialmente en la calle Molina, frente al cuartel policiaco. Al romperse los cables se produjo un pequeño incendio.

En Caguas- No se registraron daños a la propiedad ni daños personales.

En Puerto Príncipe- Informó Prensa Unida que en esta ciudad se sintió un temblor que duró 2 segundos a las 10:03 de la noche del miércoles. El movimiento iba dirigido de este a oeste. Pueblos a 10 km de distancia nada sintieron y la mayor parte de la población se enteró de los temblores cuando leyó los diarios de la mañana.

Temblor se sintió en Europa- Prensa Unida informa que según la radio Alemana en Gena, el sismógrafo de Belgrado registró fuertes temblores de tierra a las 4:13 de la

madrugada, que continuaron hasta las 6:00 de la mañana. “Aparentemente —dice el despacho— el epicentro fue en el Mar Caribe.

Exactamente, a las 9:04 se sintió anoche otro temblor de tierra en San Juan y Santurce que duró 14 segundos y el cual según nos informó el Negociado del Tiempo fue de menor intensidad que los registrados durante la noche del miércoles. Un telegrama de Ponce nos informa que el temblor fue sentido allí también pero que no hubo daños. Con este suman veinte los temblores de tierra registrados en P.R. durante los últimos dos días.

El Mundo July 31 (Anon., 1943c): Weston también registra otros temblores. Daniel Lineham, director de la estación Sismológica de Weston College, informó que 15 estremecimientos con su centro localizado posiblemente en las Antillas, habían sido registrados durante un periodo de 24 horas que terminó anoche a las 12:00. Dijo el sr. Lineham que la más fuerte de todas las conmociones se sintió a las 7:00 de la noche y que tuvo una duración de tres horas (?), siendo mucho más fuerte el otro registrado poco antes de la medianoche del miércoles. El centro de estos temblores ha sido localizado a 1,655 millas al sureste de Boston por el noreste de P.R.

Puerto Rico suffered a moderate seismic shock... We have not received any reports of damage to dwellings on the Island due to the above mentioned earthquake (Lundy, written comm., 1944).

**Commentary:** Although this earthquake was of significant magnitude ( $7.5M_w$ ), there was no damage anywhere on the island of Puerto Rico.

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