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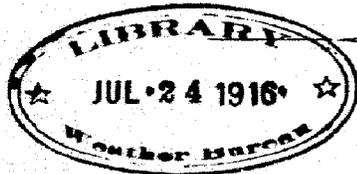


NOTES

OF

HURRICANES, EARTHQUAKES,

And other Physical Occurrences in Jamaica up to the commencement of the Weather Service, 1880, with brief Notes in continuation to the end of 1915.



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This Report is a carefully prepared revision of the Introduction to Vol. II. of the Weather Reports dated Jan. 1896. There is only one important correction to be made; in his history (Vol. III., p. 615), Long wrote about a great earthquake 1770, Sept. 3rd, and connected it with the great earthquake in Haiti that year; but Port-au-Prince and many other towns in Haiti were destroyed on June 3rd that year; and there can be no doubt that Long intended to have referred to the great earthquake in Jamaica, 1771, Sept. 3rd, as described by Lord Rodney in his despatches.

But there are several additions, for many of which I am indebted to Mr. Frank Cundall, the Secretary of the Jamaica Institute.

The notes subsequent to the commencement of the Weather Service in 1880 are brief, and refer only to the more noticeable occurrences; for fuller information reference must be made to the monthly Weather Reports themselves.

1916. May 11th.

M. H.

NOTES OF HURRICANES, EARTHQUAKES, AND OTHER PHYSICAL OCCURRENCES IN JAMAICA.

1504 Feb. 29th. Eclipse of the Moon seen by Columbus at St. Ann's Bay in Jamaica. This was during his fourth voyage to the West Indies, and he was then in great distress. (Bryan Edwards, Vol. I, p. 155; F. Cundall, *Journal of the Institute of Jamaica*, Vol. II., p. 40.)

In Keith Johnston's *Physical Atlas*, 1856, there is a list of the principal hurricanes which have occurred in the West Indies, and it is there stated that the English fleet at Jamaica was driven ashore, Oct. 7th, 1670. This may be a mistake; there was a hurricane at Barbados that year; and in Long's *History of*

1655 *Jamaica*, which was printed in 1774, we read:—"The English, from their first settlement in 1655 to

1689, a space of 34 years, never were afflicted with any of these terrible winds." (Vol. I. p. 361.) But

1689 Long may have taken his information from a small book, of which there is a copy in the Jamaica Institute, entitled *The present state of Jamaica*; it refers to the year 1675 (see p. 54); and it was printed in London in the year 1683. The following extract, when compared with the information given by Dr. Sloane, will show that the author did not exercise much care in collecting his information:—"This Island has never been troubled with these dreadful hurricanes that so often ruine and afflict the Charibe Islands, Portorico, Hispaniola, Cuba, and many parts of the Main. Here is no great ebb or flood of the sea; we have not observed above a foot difference; nor can any pilot give any certain account of the currents of these seas, they are so various and uncertain; nor can any guess why the hurricanes and earthquakes should never touch Jamaica, since they so often afflict all the Islands and Continent."

1689 The storm of 1689 does not seem to have been very severe. It was enlisted in the earlier volumes of the *Jamaica Almanac*, and was afterwards omitted.

1688 The first earthquake of which we have any account was felt by Dr. Hans Sloane at Spanish Town on Sunday, Feb. 19th, 1688, about 8 a.m. There were three light shocks, lasting about one minute altogether, and there was some sound. He writes, "Earthquakes as they are too frequent in Hispaniola where they have formerly thrown down the town of Santo Domingo, so they are too common here also; the inhabitants expect one every year, and some of them think they follow their great rains." (Sloane's *Natural History of Jamaica*, Vol. I. Introd. p. xlv.)

And again, "The Spaniards who inhabited this Island and those neighbouring, built their houses very low; and they consisted only of ground rooms, their walls being made of posts which were as much buried underground as they stood above, on purpose to avoid the danger which attended the manner of building from earthquakes. And I have seen in the mountains afar off bare spots which the inhabitants told me were the effects of earthquakes throwing down part of the hills, which continued bare and steep."

We now approach the Great Earthquake of 1692. Dr. Sloane, referring to Port Royal, writes as follows:—"This point, which was called Point Cagway, where Port Royal stood, was never built upon by the Spaniards while they remained possessors of the Island, for two reasons, as I was informed. The first was the frequency of earthquakes, which, when considerable, would certainly overturn it. . . . The second cause of the aversion of the Spaniards to this place was its being liable to be washed off by the violent sea breezes or souths."* (Introd. p. LIX.) The English, however, built there; and, according to Long, Port Royal "contained at that period upwards of 3,500 inhabitants and 2,000 houses, the greater number of which were of brick, several stories in height, founded close to the very brink of the water on a loose bank of sand. The fort, which then mounted 60 pieces of ordnance, and the rest of the houses, were founded on the rocky part of the peninsula" (Vol. II., p. 141). Long gives the following account of the Great Earthquake:—

1692 "June 7th. The year began with very hot dry weather which continued till May, when there was much blowing weather and a great deal of rain till the end of the month; from which time till the earthquake happened, it was excessively calm, hot and dry. The 7th of June was a very hot, clear sunshine day, scarce a cloud appearing, and not a breath of air felt. The Earthquake began at 40 minutes past eleven a.m., with a very small trembling. The second shake was somewhat stronger, accompanied all the while with a hollow, rumbling noise; and immediately after this second shake came on the third and most violent, which continued near a minute."†

* Port Royal is greatly exposed to the South; this last expression means "hurricane winds from the South."

† The three shocks lasted altogether two minutes.

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"All the principal streets, which were next to the water sunk at once, with the people in them; and a high rolling sea followed, closing immediately over them. Not less than 1,600 (houses) were thus swallowed up, or shook into a heap of rubbish. Some of the streets were laid several fathoms under water; and it stood as high as the upper rooms of some houses which remained. It was computed that about 2,000 whites and negroes perished in this town alone. The harbour had all the appearance of agitation as in a storm; and the huge waves rolled with such violence as to snap the cables of the ships, drive some from their anchors, and overset others. Among the rest, the Swan frigate, that lay by the wharf to careen, was forced over the tops of the sunken houses, and providentially enabled some hundreds of the inhabitants to save their lives. The fort only, and about two hundred houses escaped without damage. But a part of the neck of land communicating from the point to the Palisadoes, about a quarter of a mile in length, was entirely submerged, with all the houses, which stood very thick upon it.

The water forced its passage through the Salt Pond Hill,* and gushed in torrents from its side at an elevation of 20, and in some places, 30 feet above its base, and continued running for several hours afterwards.

The mountains on each side the river-road† leading from Spanish Town to Sixteen-mile-walk were thrown down in such heaps as to obstruct the passage of the river, and for some time to prevent all communication between these two places.

A great part of a rocky mountain in St. David's fell down, and buried a whole plantation lying at the foot of it. The part from which this huge fragment was detached is now a precipice of solid rock, conspicuous from its height at a great distance, and remains a dreadful monument of that day's catastrophe.

The shock was not less violent in the mountains. Some were even of opinion that they had sunk a fittle; others that the whole island had somewhat subsided; for they observed that several wells in Liguanea did not require so long a rope, by two or three feet, as they did before the earthquake. . . . At the northside above one thousand acres of land are said to have sunk with thirteen inhabitants.

It left not a house standing at Passage Fort; only one at Liguanea; destroyed most of the planters' habitations in the country; and all in St. Jago de la Vega, except what were built by the Spaniards.

During these convulsions which continued with little intermission, though in a slighter degree, for some weeks afterwards, the most offensive stenches were emitted from every fissure and opening made in the land near the harbour; the sky became dull and reddish, which indicated a plentiful discharge of vapours from the earth; the weather grew hotter than had been observed before the shock; and such prodigious swarms of musketoes infested the coasts as to astonish the inhabitants; the beauty of the mountains was quite effaced, and instead of their lively youthful verdure, they appeared distorted with fragments, bald, and furrowed."

In conclusion we shall quote the preamble of the Act passed by the Assembly of Jamaica in 1693 (5 W. and M):—

"An Act for establishing a Perpetual Anniversary Fast on the Seventh of June.

Forasmuch as it hath pleased Almighty God, the great Creator and Judge of Heaven and Earth, on the seventh day of June, one thousand six hundred and ninety two, justly to punish the inhabitants of this island for the manifold sins and wickednesses committed against His Divine Majesty, by a most terrible and dreadful earthquake, which not only laid waste our estates and places of habitation in general, but also destroyed many hundreds of people; which tremendous judgment was succeeded by a raging sickness and mortality, that few or no families escaped: Now, that so signal a visitation may be had in perpetual remembrance"

1700 Magnetic variation 6° 30' E. at Port Royal according to Dr. Edmund Halley.—(*Phil Trans. R. S.* 1806 part ii. p. 348).

1703 Jan. 9th. Port Royal, which had been partly rebuilt, was burnt down.

May 23rd. Col. T. Handasyde, Acting Governor, wrote home officially, "we have frequent earthquakes which are a great terror to us."

1712 Aug. 28th. The first great hurricane experienced by the English in Jamaica. No account of it seems to have been preserved.

1714 Aug. 29th. Some men of war were driven ashore during a storm.—(Keith Johnston.)

1722 Aug. 28th. This great hurricane damaged the whole island; the centre passed over Port Royal where the water rose 16 ft. above its usual level. "It began at Port Royal," writes Long, (*Vol. II. p. 145*) "at 8 in the morning and lasted 14 hrs. during which the rain was incessant, and the storm veered all round the compass. In Kingston most of the buildings were thrown down or much shattered. The day preceding it was perfectly calm; but so great a swell at sea that the waves broke over the breastwork at Port Royal and laid all the streets under water. The fort suffered very much; several guns were dismounted and some washed into the sea. The Church and row of houses in the east part of the town were so battered that there remained very little appearance of buildings. In short, above half the town was laid in ruins; and the houses and plantations in all parts of the island suffered considerable damage, except in St. Jago where the Spanish buildings stood the shock unburnt. Very few of the inhabitants lost their lives; but in the harbour it proved more fatal." Part of the squadron was at sea, but out of 50 vessels in port only 4 men-of-war and two traders were saved with the loss of their masts. About 400 lives were lost. After the hurricane there was a calm, and the air was poisoned by the smell of the decaying bodies, and an epidemic broke out.‡

The effect of these storms on the community may be gathered from the fact that Aug. 28th was appointed to be kept as a perpetual fast by the Act 9 Geo. I. ch. 1, passed in 1722. The preamble is as follows:—"Whereas it hath pleased Almighty God, on the twenty-eight (sic) day of August, in the year of Our Lord one thousand seven hundred and twelve, and on the same day in this present year, justly to punish the inhabitants of this island by two most dreadful and amazing storms, which not only laid

* South-west of Port Royal on the opposite side of the channel.

† Bog Walk.

‡ A good account is given by John Atkins in "A voyage to Guinea, Brasil, and West Indies," 1737.

waste the estates and habitations of the inhabitants in general, but also destroyed some numbers of people near the sea-coasts: Now, therefore, that so signal a visitation may be had in perpetual remembrance."

In this year Capt. B. Candler of H.M.S. "Lancaster" observed an eclipse of the moon at Port Royal; and Dr. Halley determined the longitude accordingly to be 5 hr. 6 m. 30 sec. W., (Bellin's *Description Geographique* &c.)

1726 Oct. 22nd. A hurricane swept the east-end of the island, lasting three hours and a half. It blew down many houses in Kingston, Spanish Town and Port Royal, and sunk or wrecked 50 vessels.

1728 Great fire at Port Royal.

1744 Oct. 20th. "Another furious hurricane," writes Long (Vol. II. p. 146), "arose at 6 in the evening (at Port Royal) and continued until 6 in the following morning. A new fort begun at Mosquito Point* was entirely razed; many houses were blown down in the towns and other parts of the island and all the wharves at Port Royal, Kingston, Passage Fort, and Old Harbour were destroyed, and most of the goods swept away.

The inhabitants of Port Royal expected every moment to be swallowed up by an inundation, the streets being all laid several feet under water; but happily their wall withstood the shock and saved them from utter ruin. Their dangerous situation may be imagined; for the wind setting the whole time from the south drove the surge full against this part of the town and with such fury that immense loads of stone and sand were poured over the wall.

Sir Chaloner Ogle who then had the command on this station was fortunately at sea with the major part of the fleet; but there were 9 men-of-war and 96 merchant ships in harbour, 104 of which were stranded, wrecked or foundered; so that only the "Ripon" rode it out with the loss of her mast; and a great number of marines were drowned." A shock of earthquake accompanied the storm. A pestilence followed which proved fatal to a still greater number of lives.

1751 Sept. 2nd. Storm (*Jamaica Almanac*.)

1761 There is no disaster to be recorded this year, which is memorable for the establishment of the first rain-gauge in Jamaica. Long writes "By a measurement taken of the quantity of rain which fell in the parish of Westmoreland in 1761 the whole amounted to 63 inches and about $\frac{1}{4}$ of an inch, Westmoreland being supposed one of the wettest parishes."

The recent annual rainfall at Windsor, Sav-la-Mar is 64.31 according to 45 years observations; and at Belle Isle, 82.46, according to 28 years observations; both ending with 1900. It is greatly to be regretted that the register commenced in 1761 was not continued.

1763 Sept. 14th. The magazine at Fort Augusta containing over 2,000 barrels of gunpowder was struck by lightning and blown up.

The introduction of lightning conductors followed Franklin's experiment in 1752; and we may be pretty sure that there was no lightning conductor at Fort Augusta in 1763. It is to be noticed that lightning in Jamaica does most harm in the month of September.

1766 June. A violent earthquake did great damage at Santiago de Cuba: the undulation from N. to S. was felt in Jamaica between 11 and 12 p.m. The weather was clear but unusually close. It threw down no buildings here.—(Long III., p. 617.)

1769 "From Oct. 1768 to May 1770, was the largest and severest drought ever remembered in the Island." (Long, Vol. III., p. 615).

1771 Sept. 3rd. A severe shock of earthquake at Kingston and Port Royal.

"Since my letter of the 4th instant, giving their Lordships an account of the violent earthquake which happened the day before, which has been attended with frequent shocks till within these few days, and, in the opinion of the inhabitants, done more damage than any since the great one in 1692, particularly in the towns of Port Royal and Kingston, in the former of which there is not a single house that has not been damaged, I find His Majesty's dockyard has suffered considerably.

* * * * * There have been nine shocks since the first, but as each has appeared weaker, I hope we shall experience no more of them." (Letter of Admiral Lord Rodney to the Admiralty, dated 19th September 1771, pp. 115 & 116 of *Life and Correspondence of Admiral Lord Rodney*.—*Major-General Mundy*.) Lord Rodney arrived at Port Royal, July 24th, 1771.

In Long's History, III. p. 615, an account is given of a very smart shock of earthquake which is stated to have occurred 1770, Sept. 3rd., about 8 in the morning; "it was most violent in Kingston, where it threw down several kitchen chimneys, &c. This earthquake happily so little injurious to Jamaica originated near Port-au-Prince in Hispaniola, where it was accompanied with eruptions and did infinite damage." But in Southey's Chronological History of the West Indies, Vol. II. pp. 403, 7, the great earthquake occurred in Haiti, June 3rd, 1770, about 7.15 p.m., and in the Introduction to Vol. II. of the J. Weather Reports an attempt was made to set the dates right. But there can be no doubt that while Jamaica would have felt some long rolling waves of earthquake from Haiti on the evening of June 3rd, 1770, which would have done no damage, the historian Long intended to have referred to the great shock in Kingston and Port Royal, 1771, Sept. 3rd., which he does not even mention.

1772 Aug. 31st. A great hurricane passed along Porto Rico, Hispaniola and the south of Cuba. In Jamaica there was not much wind but there were deluges of rain which flooded the rivers to an incredible height and destroyed several bridges.—(Long, III., p. 620).

1779 December. The greater part of Savanna-la-Mar was burnt down; money was voted by the House of Assembly to rebuild the town.—(*Journals of Assembly*.)

1780 Jan. 7th. 8.10 a.m. Earthquake at Kingston. About 10 minutes afterwards there was a small undulation of the earth; and at 10.10 a.m. another undulating tremor.—(Dr. Benn. Mosley, *A Treatise on Tropical Diseases*).

May 16. Great fire in Kingston.

May 19. The dark day. On Feb. 12th 1915 there died in Montego Bay an old woman at the great age of 142 years: she was a child at the time of "the dark day" but had a distinct recollection of it. (*New Century Newspaper*, Feb. 13th 1915.)

* Fort Augusta.

1780 In October this year there occurred in the West Indies three great devastating hurricanes:—

The Jamaica hurricane, Oct. 3rd.

The Barbados hurricane, Oct. 10th and 11th.

Admiral Solano's hurricane, Oct. 18th to 22nd.

Colonel Reid has considered these hurricanes very fully in his *Law of Storms*; the following extracts are taken from his great work:—"Three great storms occurred nearly at the same time; and these have been confounded together, and considered as one. The first destroyed the town of Savanna-la-Mar, on the 3rd of October, 1780. The second, and by far the greater one, passed over Barbados on the 10th and 11th of the same month and year. The third dispersed and disabled the Spanish fleet, under Solano, in the Gulf of Mexico, after it had sailed from Havannah, to attack Pensacola."* (p. 289).

"The command of the British fleet in the West Indies was divided. Sir Peter Parker commanded at Jamaica, and was at Port Royal; but Sir George Rodney was off New York in the Sandwich, having gone to the coast of America with a portion of his fleet just before the storms occurred. Of Sir Peter Parker's squadron, the Thunderer, Stirling Castle, Scarborough, Barbados, Phoenix, Deal Castle, Victor, and the Endeavour, were all lost; and nearly the whole of their crews perished. The Berwick, Hector, Trident, Ruby, Bristol, Ulysses, and Pomona, were dismasted.

Of Sir George Rodney's squadron, the Blanche, Andromeda, Laurel, Camelion, and Beaver's Prize, were lost; and the Vengeance, Montagu, Ajax, Alcmena, Egmont, Endymion, Albermarle, Venus, and Amazon were dismasted or severely damaged."

The following account of the Jamaica hurricane, Oct. 3rd, is taken from the *Annual Register*.—"About 1 p.m. the gale began (at Savanna-la-Mar), from the S.E., and continued increasing with accumulated violence until four in the afternoon, when it veered to the S. and became a perfect tempest, which lasted in force until near eight; it then abated. The sea during the last period exhibited a most awful scene; the waves swelled to an amazing height, rushed with an impetuosity not to be described on the land, and in a few minutes determined the fate of all the houses in the Bay. About ten the waters began to abate, and at that time a smart shock of earthquake was felt. All the small vessels were driven ashore and dashed to pieces. The ships Princess Royal, Henry, and Austin Hull, were forced from their anchors and carried so far into the morass that they will never be got off. The earthquake lifted the Princess Royal from her beam-ends, righted her, and fixed her on a firm bed. This circumstance has been of great use to the surviving inhabitants, for whose accommodation she now serves as a house.

At Lucea Bay only two houses remain; and H.M. sloop Badger, lying in that harbour has lost all her masts, and run on shore.

At Montego Bay the tempest increased to such an amazing degree as at dark to threaten general ruin and destruction. The prodigious flashes of lightning which regularly succeeded each other, was an alleviation. From midnight the storm began to abate."

Lieutenant Archer, of H.M.S. "Phoenix," wrote respecting Montego Bay:—"Many of the houses, where we had been so merry, were so completely destroyed, that scarcely a vestige remained to mark where they stood." The "Phoenix," under Sir Hyde Parker, was driven ashore near Cape Cruz in Cuba just as she was about to founder. Archer crossed back to Jamaica in a rickety open boat and procured assistance for the survivors.

With regard to the destruction of Savanna-la-Mar, it is stated by other authorities that a fearful pestilence broke out shortly after which was due to the putrefaction of the unburied corpses. Gardner in his *History* says that people would suddenly fall down when smitten with the pestilence and die within two hours!

For accounts of the great Barbados hurricane, and the hurricane which destroyed Admiral Solano's fleet we must refer to the *Law of Storms*.

1780 Oct. 29th., 9 p.m. Severe shock in Kingston which lasted 14 sec., *R. Gazette*, 1780 Nov. 4.

1781 Feb. 17th. 9.28 a.m. A shock of earthquake was felt in Kingston (*Jamaica Almanac*.)

Aug. 1. Another hurricane; between the east-end of Kingston and Passage Fort ninety vessels went ashore, and of the fleet which was lying at Port Royal thirty vessels were wrecked.

1781 July 30th. Another hurricane; all the vessels at Kingston and Port Royal but four were wrecked; and the barracks at Up-park Camp were blown down. Two shocks of earthquake were felt.

1785 Aug. 27th. Another hurricane.

1786 Great drought this year. (Beckford p. 63.)

1786 Oct. 20th. Another hurricane, followed by great scarcity of food.

In the Act 29 Geo. III ch. 13, Sec. 4 we read that in consequence of the destruction of many receipts and vouchers for money paid by "five successive hurricanes and two great fires" it became necessary to pass that "Act for the further Raising and Establishing the Credit of this Island, and for preventing vexatious suits at Law." It is dated 1788. Bryan Edwards who wrote about this time clearly points out these "successive" hurricanes (Vol. I p. 234); and prefixing the fires according to the notes above we have as the whole series:—

1779—Dec. Sav.-la-Mar burnt down.

1780—May 16.—Great fire in Kingston.

1780—Oct. 3. Hurricane.

1781—Aug. 1 " "

1784—July 30 Hurricane.

1785—Aug. 27 " "

1786—Oct. 20 " "

Florida was ceded by Spain to England in 1763. Spain reconquered it in 1781.

The poet William Cowper referred to these calamities in Jamaica in *The Task: Book II.*

"When were the winds
Let slip with such a warrant to destroy?"

As far as Jamaica is concerned we feel pretty sure that there must have been such visitations during the Spanish occupation of the Island to have induced the Spaniards to neglect Point Cagway as described above by Dr. Sloane; we have noted three great hurricanes during the English occupation before 1789; and although there has not been such a succession since 1780 to 1786, there have been enough hurricanes to satisfy the scientific *dictum* of Bryan Edwards:—What has thus frequently happened will probably happen again!

- 1795 June 6th. There was a great fire in the town of Montego Bay; it was checked by the blowing up of the Court-house and other buildings; but 110 of the best houses in the town were levelled with the ground. The town was afterwards rebuilt, and the streets were widened and straightened. (Bryan Edwards, V. p. 89.)
1796. Aug. 11th, 3.30 a.m. Smart shock in Kingston, which lasted 3 sec.—*Columbian Magazine*, 1796.
- 1798 Oct. 4th. Two smart shocks of earthquake were felt all over the Island between 6 and 7 a.m. (*New Jamaica Magazine*.)
- 1799 Jan. 6th. A smart shock was felt all over the Island at 1.45 p.m. It lasted about half a minute.
- 1801 Aug. 17th, 5 a.m. Shock of earthquake at Spanish Town.
- 1802 Sept. 25th, 10 p.m. do. do.
Sept. 26th, 1.30 a.m. do. do.
Sept. 30th, 1.30 a.m. (?) do. do.
Dec. 25th 10.30 a.m. do. do.
- These five shocks were taken from *Lady Nugent's Journal*.
- 1804 In James Robertson's *Map of Jamaica* bearing this date the Magnetic variation was $6^{\circ} 30'$ E. This map was legalized as to its boundaries of Parishes and Counties by 50 Geo. III. ch. 15. It therefore appeared that the variation had not changed since 1700; and Robertson wrote an article on the subject (*Phil. Trans.* R. S. 1806, part ii. p. 348). Since that time the variation has changed rapidly and was $1^{\circ} 30'$ E in 1908.
- 1806 Mar. 4th, 1 a.m. A smart shock of earthquake was felt in Kingston, with rumbling noise and undulating motion from E. to W.—*St. Jago de la Vega Gazette*.
- 1808 June. Fire in Montego Bay. (Bryan Edwards, V. p. 89.)
- 1812 June 23rd. Shock of earthquake felt in the Parish of St. George.
July 6th. Two smart shocks at 5.10 a.m. were felt in Kingston and the adjacent parishes; they lasted several seconds.
Oct. 12th. A hurricane swept the whole Island; it was a very large *cyclone*; by a cyclone is meant a storm more or less severe in which the wind rotates round the centre of low barometric pressure while the centre advances on its course. All the storms and hurricanes in the West Indies are cyclones; and in general, when we write of a "storm" or "hurricane" we wish to call attention to the loss of life or the damage done to property, and when we write of a "cyclone" we wish to call attention to the natural laws regulating the sweeping of the winds round the centre of low barometric pressure. In the present instance we have no barometric readings, but the direction and changes of the wind at Kingston, Morant Bay and Montego Bay, and the notes as to what occurred at Lucca and Savanna-la-Mar, assure us that the storm was caused by a large cyclone which passed over the Island from Old Harbour to the Dolphin Head.
On the 12th the sea was heard roaring all day, and as night came on the rain fell in torrents, and the wind blew hard from the S.E. In Kingston many outhouses and fences were blown down, and great damage was done to the wharves and shipping. At Port Royal some houses were demolished, and 27 schooners, sloops and smaller boats were destroyed. At Spanish Town but little damage was done. At Salt Hill in the Parish of Port Royal, a piece of land of about 16 acres with a small house on it sank down and moved 300 or 400 yards from its original situation without injuring the house.
At Morant Bay the wind blew hard from the South at 1 a.m. on the 13th, and veered to the West; there was but one vessel in the Bay which was thrown to a considerable distance on the land. The lake at Rio Hoe in St. Ann's rose considerably with the heavy rains. At Lucca it blew a perfect hurricane about midnight, and a few vessels in port were driven ashore; at 9 a.m. on the 13th the wind suddenly ceased.* At Montego Bay the storm commenced from the North, the wind veered to the South-East, and reached its greatest strength at 7 a.m. on the 13th. At Savanna-la-Mar the sea was driven up the main street as far as the Court House, and several houses were blown down.—(*Jamaica Mag.*)
The hurricane was accompanied by a severe earthquake. Several ships in the ports of the north-side went ashore; one vessel in the harbour of Port Maria, which rode out the gale, suddenly lost her hold of the anchorage ground and drifted on the beach. After sounding for the bottom, it was found considerably deeper, and the harbour much discoloured, owing unquestionably to the earthquake. (Dr. Arnold, *Jamaica Physical Journal*, Nov. and Dec. 1835, p. 459.)
- 1812 Nov. 11. About 10 minutes before 6 in the morning there was a great earthquake, which was felt all over the Island but chiefly at the eastern end. Three shocks succeeded each other rapidly: there were tremblings, concussions, undulations and sound. Great damage was done to the houses in Kingston. At Annotto Bay the anchorage ground sank; the "Experiment" lost her anchor and 90 fathoms of cable which were swallowed up. There had been a slight shock previously at 2.30 a.m. that morning.—(*Jam. Mag.* 1812, p. 364.)
- 1813 Aug. 1st. It rained all Sat. July 31st and about midnight the wind blew hard. At 7 minutes past one o'clock on the Sunday morning there was a smart shock of earthquake; shortly after the wind became violent "and veered about in different directions during the whole morning," that is to say the centre of the cyclone passed over Kingston and the direction of the wind worked round the compass in

* Most likely when the wind changed from northerly to southerly, the town being sheltered from the south.

- accordance with the cyclonic theory. The storm did considerable damage to shipping and buildings.—*J. Courant*, 1813, Aug. 2.
- 1813 Aug. 28th. Storm at Savanna-la-Mar. It commenced at 10 a.m. and was at its height at noon; ships were driven ashore and wrecked. The wind was from the E. and S.
Oct. 15th. A shock of earthquake at 1.45 p.m. was felt from Spanish Town to Montego Bay.—*J. Magazine*, 1813.
- 1815 July 13th. Fire at Port Royal.—*Bryan Edwards*, V. p. 90.
Oct. 18th and 19th. A hurricane swept over the eastern half of the island. In the parishes of St. George, St. David and the upper part of Port Royal great damage was done by the wind and the flooding of the rivers, and many lives were lost.
A good account is given in the *J. Physical Journal*, Nov. and Dec., 1835. See also *J. Weather Report*, Vol. IV., No. 352.
- 1818 Nov. 18th, 19th and 20th. A hurricane swept over the western half of the island; great damage was done.
Dec. 6th, 6 a.m. A severe shock was felt in Kingston and throughout the Island.—*Kingston Chronicle*, 1818, Dec. 8.
- 1832 Aug. 7th. Violent storm which lasted only 3 hrs.—(*Keith Johnston*.)
- 1833 Nov. 8th, 7.10 a.m. A shock of earthquake.
- 1834 Sept. 7th, 1.30 a.m. A severe shock in Kingston; the worst since 1812.
Oct. 26th, 2.30 a.m. Two severe shocks in Kingston; at 3 a.m. another.
Oct. 27th, 10 a.m. A slight shock; at 7.10 p.m. another.
- 1837 Sept. 26th and 27th. A severe gale which drove three vessels from their moorings in Kingston harbour.—(*Jamaica Dispatch*.) It was part of the cyclone encountered by H.M. Sloop "Racer," of which an account and a chart are given by Colonel Reid in his *Law of Storms*, pp. 133-144; and must have been felt over the whole island.
- 1839 July 26th. A shock of earthquake about 6 a.m.
Nov. 5th. Another shock.
Nov. 12th. Great flood in Montego Bay which carried away several houses. Some lives were lost.
- 1840 Great drought this year.
- 1841 May 31st to June 5th. Heavy rains; floods in different parts of the Island.
- 1842 May 7th, 3.15 p.m. A shock of earthquake was felt throughout the Island. This shock came from Cape Haytien in Hayti where it destroyed the town and caused the death of 3,000 people.
Aug. 25th. Between 5 and 6 p.m. several shocks of earthquake.
- 1843 Mar. 6th, 3 a.m. Shock of earthquake, Kingston.
Mar. 7th, 3.30 a.m., Albion. A smart shock from SW. to NE.*
Mar. 11th, 10.30 p.m. Three shocks of earthquake, Kingston.
Mar. 13th. Between 1 and 5 a.m., another shock, Kingston.
Mar. 20th, 10 p.m. A severe shock causing much alarm, Kingston.
Mar. 21st, 11.30 p.m., Albion. A smart shock.
Mar. 22nd. A slight shock, Albion.
July 2nd. Between 8 and 9 p.m. a shock of earthquake, Kingston.
July 9th, 9.30 p.m., Albion. A slight shock.
July 14th, 12 p.m., Albion. A shock which lasted for about 20 secs.
July 15th, 2 p.m. Another shock, Kingston.
Aug. 26. Fire in Kingston.
Dec. 24th. A slight shock, Albion.
- 1844 Feb. 23rd, 12 p.m. A shock of earthquake, Kingston and Albion.
May 21st, 8.30 p.m. Two shocks, Kingston.
Sept. 21st, 1 a.m. A slight shock, Albion.
Oct. 5th. Stormy weather over the western half of the Island. At Montego Bay and Falmouth the sea rose very high and flooded the towns; at Black River three vessels were driven ashore.
Oct. 22nd, 6 a.m., Albion. A smart shock lasting about 20 secs.
Oct., 29th, 6 a.m. A shock of earthquake, chiefly felt at Montego Bay and Falmouth.
Nov. 3rd, 10.30 p.m., Albion. A slight shock.
- 1845 Severe drought this year.
- 1846 Mar. 4th, 5 p.m., Albion. Two slight shocks from W. to E., with an interval of 1 sec. between them; a rushing sound.
May 27th. A shock of earthquake between 12 and 1 a.m., Kingston.
- 1848 Heavy May rains which produced floods; a number of lives were lost and an immense amount of property destroyed.
May 11th, 3.30 p.m., Albion, two shocks.
- 1849 Aug. 30th, 5 p.m., Albion, two shocks separated by about 1 sec., lasting about 30 secs.
- 1852 July 7th, 6.55 a.m. A shock of earthquake lasting over 3 minutes. (?), Kingston.
- 1856 April. One night several water spouts passed along the foot of Long Mountain near Kingston. The ravine below Torrington bridge was cut and deepened to its "present dimensions" by that one night's rain.—Richard Hill, quoted in the *Victoria Quarterly*, Oct. 1892.
- 1859 Aug. 28th. The great display of the Aurora Borealis occurred this night. It was seen by many persons in Jamaica; and this fact was used by Loomis in his *Meteorology*, p. 184, in determining height of the Aurora above the surface of the earth. The connection between sun-spots, magnetic disturbance, and aurora was well shown on this occasion; and disturbance on the face of the sun was actually seen in England by Carrington and Hodgson a few days later.
- 1862 Heavy May rains.

* The shocks at Albion, St. Ann, between 1843 and 1873, were recorded by the late Mr. E. C. Barrett.

- 1865 Oct. 31st, 7 a.m. Shock of earthquake at Albion.
- 1867 Mar. 17th, 8.15 a.m. Slight shock, Albion.
Mar. 26th, 1 a.m. do. do.
Nov. 11th, 11.45 a.m. do. do.
- 1870 Feb. 21st, night. Smart shock, Albion.
Heavy rains in Oct., Nov., and Dec.
- 1871 April 27th, 1.30 p.m. Slight shock at Albion.
- 1872 April 25th, 4.15 p.m. do.
Aug. 1st, 7.10 p.m. do.
Dec. 7th, 8 p.m. Shock felt over the west end of the Island.
- 1873 June 14th, 2 p.m. Slight shock at Albion.
June 29th, 11.30 p.m. Two smart shocks at Albion.
Sept. 26th. Shock at Albion.
- 1874 Oct. 31st to Nov. 2nd. A hurricane swept over the eastern half of the Island doing a great deal of damage; the centre of the cyclone passed over St. Ann's Bay, where the wind veered from NE. to SW.
- 1876 Magnetic variation $3^{\circ} 45'$ E at Port Royal.—(Capt. Green, U.S.N., *Navig. of the Carribean Sea*, Vol. I.)
- 1879 Oct. 8th to 13th. Heavy rains which caused the loss of life and property near Kingston.
- 1880 Aug. 18th. Hurricane. Two cyclones devastated the eastern half of the Island, destroying a number of Churches, Chapels, and other buildings. (*Jamaica Weather Reports*, Vol. I.)
Dec. 30th, 11.58 p.m. No. IV. shock at Port Antonio; felt throughout whole Island except extreme W.
- 1886 June 3rd, 7.7 p.m. No. IV. shock at Boston; felt throughout whole Island except extreme W.
June 27th. Storm: a small cyclone passed along Jamaica from E end to Montego Bay.—(W.R. No. 67.)
Aug. 19th and 20th. A hurricane which followed nearly the same course.—(W.R. No. 69.)
- 1903 Aug. 11th. A great hurricane. The centre of the cyclone moved from Morant Point to Montego Bay at the high rate of 21 miles an hour, reaching the latter place at 9.30 a.m. The diameter of the destructive central area was about 40 miles. All along the north coast from Manchional to Falmouth the wind was tremendous, and there was considerable loss of life among the falling trees and houses. In many low-lying places the wind drove the sea ashore; and there is reason to suppose that had the centre been moving slowly instead of at a high rate, there would have been appalling loss of life from the invading sea. An enormous amount of damage was done within the storm area: all the large plantations of cocoa palms along the north side and at the east end were destroyed; all banana cultivations, where ever situated, were ruined for a time; and throughout the length and breadth of the Island a large proportion of fruit, pimento, and coffee trees were damaged or destroyed.—(W.R. Vol. IV., Introd.)
- 1904 June 13th. Storm near Montego Bay: the river came down in flood and carried away the mason-work bridge.—(W.R. Vol. IV. Introd.)
- 1906 April 3rd, 9 to 11 p.m. A curious smoke having a lurid appearance in the moonlight suddenly came over Falmouth and Montego Bay, and the intervening country. It had a sulphurous smell which greatly disturbed the people in the towns; in the country they thought that the smoke smelt like that from cane trash, and they wondered on what estate the fire had occurred. It was followed by a gale from the ENE.
- Two years later the same phenomenon occurred in Cuba, but on a smaller scale. It happened 1908, May 14th at Francisco, Camaguey, when a cloud of smoke was seen approaching from the NE, accompanied by strong winds. The cloud passed along leaving a large quantity of smoke which darkened the atmosphere and left a strong odour of burnt hay.
- 1906 Dec., to 1908, May inclusive. Great drought.
- 1907 Jan. 14th. The great earthquake of Kingston. An account of this earthquake was given in a special Weather Report, No. 337; it was most severely felt along a line from Port Royal to Bull Bay, but it appeared that the chief epicentre was below the sea a few miles south of Bull Bay. This was confirmed by the extraordinary condition in which the W.I. & P. submarine cable was subsequently found. (W.R. No. 365). About 15 miles south of Bull Bay the cable had been dragged a mile from where it had been laid; it had then been broken in two, and the two ends had been carried a mile apart. But for all particulars reference must be made to the two special reports.
- April 13th, 7.8 a.m. Among the large numbers of "aftershocks" the greatest, No. IV on the Jamaica earthquake scale, occurred at this date and hour. It was most useful in helping to determine the period of the "aftershocks" from the chief epicentre, H.
- May 18th, 10 a.m. An aerolite fell into the harbour at Montego Bay. It appeared as a ball of fire which rushed through the bright sky, leaving a long white trail behind it; it came from the SE, with respect to azimuth, but with respect to altitude the information was uncertain, perhaps it was 45° . When it plunged into the sea the water hissed and bubbled from its heat; it fell near a boat at anchor, and the people on the boat, and indeed those on shore, were much alarmed. Another aerolite fell at Cayman Brae, the same day and almost at the same hour, according to *The New Century* newspaper.
- 1908 Jan. 2nd, 8.9 a.m. No. IV shock: Sloah and whole Island.
July 23rd. Magnetic variation in Kingston $1^{\circ} 30'$ E.
- 1909 July 2nd., 11.9 a.m. No. IV shock: Mt. Holstein and the north-east of the Island.
Nov. 4th, to 11th. Heavy flood rains over the Blue and Port Royal Mountains. During these eight days 135 inches of rain fell at Silver Hill Plantation, and 114 inches fell at Farm Hill Plantation. At Radnor as much as 130 inches probably fell, but the gauge overflowed once or twice so that the actual measure was lost. Among the coffee properties, Radnor, Farm Hill and Whitfield Hall suffered most—(W.R. No. 372.)
- 1912 Nov. 18th. Great hurricanes. One cyclone (A) passed south of Jamaica on the 17th doing no harm whatever; but it could not continue the usual WNW course on account of high bar. pressure in Cuba; it increased in violence; and turning eastward, it wrecked Lucea early in the morning of the 18th, having

previously encountered the SS. "Prinz Sigismund" off the NW Point about midnight. Another cyclone (B) developed between the island of Old Providence and the mainland, and did not even attempt a WNW course but made straight for Sav-la-Mar, wrecking that town during the morning of the 18th. A third cyclone (C) developed in Jamaica and moved along the middle of the Island on the 16th and 17th; and breaking the wires on the 16th, it cut off telegraphic communication between the east and west ends of the Island. In the three parishes of Westmoreland, Hanover and St. James, 19,000 houses were totally destroyed or badly damaged; no doubt many poorly built huts were included in that number, but as the wind got up to 120 miles an hour, a house had to be well constructed to withstand the pressure—(W.R. No. 411.)

1914 Aug. 3rd, 6.25 a.m. No. V shock in the Blue Mountains, No. IV in Kingston, and either No. II or I at the west end. This was the worst shock since 1907, Jan. 14th: the reinforced concrete buildings in Kingston stood it very well.—(W.R. No. 433.)

Oct. 14th, 2.18 a.m. No. IV shock, the Blue Mts. and the whole Island.—(W.R. No. 435.)

Dec. 24th, 10.45 p.m. No. IV shock, Kingston and the whole Island.

1915 Aug. 12th and 13th. Hurricane—The centre of the cyclone passed along the north of Jamaica on a WNW course at the high rate of 19 miles an hour, and the remark made with respect to the 1903 hurricane may be here repeated:—there is reason to suppose that had the centre been moving slowly instead of at a high rate there would have been appalling loss of life from the invading sea. The railway track, and all the roads from Manchioncal to Falmouth were greatly damaged. The centre passed through the Cayman Islands, and wrecked Galveston on the 16th.—(W.R. No. 446.)

Sept. 25th and 26th. A storm whose centre passed along the south of Jamaica on a NW course; but it was 150 miles away and it did little or no damage. Continuing its course it reached New Orleans at 6 p.m., on the 29th and caused great loss of life, and great damage to houses and property.—(W.R. No. 447.)