

A MISSISSIPPI TORNADO.

By S. C. EMERY, Local Forecast Official.

During the afternoon of March 28, 1902, a tornado of considerable violence passed through the northeast portion of Mississippi and northwest Alabama. Its course lay in a direct line from southwest to northeast, through the northern portion of Calhoun County, Miss., where it originated, diagonally across the counties of Pontotoc, Lee, and Itawamba, Miss., and Franklin County, Ala.

The total distance over which the storm traveled was about 118 miles, and its rate of progress averaged 33 miles an hour, the progressive motion being much greater toward the end than at the beginning. The width of the storm's track ranged from 300 to 400 yards. The cloud was generally reported as funnel shaped, and of a greenish yellow color. Hail fell at various places along the storm's track, and in several instances severe hail storms occurred a few miles to the north of the main storm. The hail stones were of unusual size and caused considerable damage in the way of killing sheep and young lambs, breaking windows, etc. Though a large number of dwellings were destroyed, only two people are reported killed.

The tornado formed about 1:30 p. m. at a point 12 miles east of the village of Banner, Calhoun County, Miss. From there it moved northeast into Pontotoc County, passing about 1½ miles south of Randolph, a small village in the southwest corner of that county, reaching that place about 2 p. m. The cloud is described by an eye witness at Randolph as being funnel shaped and very black, and accompanied by remarkably severe thunder and lightning and heavy rain mixed with hail, some of the hail being "as large as an inkstand." South of the storm the wind came from the southeast and on the north side from northeast. Everything within the path of the storm was destroyed, and quite a number of people injured. One child was taken into the air and deposited in a tree top, where it was afterwards found with all the clothing stripped from its body except its shoes.

From Randolph the storm continued its northeast course to the village of Algoma, which was almost entirely destroyed, then on past Plymouth which it skirted to the south, reaching Tupelo, Miss., at 2:40 p. m. The damage at Tupelo was considerable, 75 negro cabins being completely destroyed, and many substantial buildings wrecked. From Tupelo the storm continued through Itawamba County, Miss., and crossed the Alabama line at the southwest corner of Franklin County. The first town in Alabama lying within the storm track was Isbell, which it reached about 3:45 p. m. Two churches were blown down, several dwellings more or less wrecked, and a large number of negro cabins destroyed. A cedar tree about 12 inches in diameter, which stood a few feet from a warehouse, was twisted off about 5 feet from the ground, and hurled through the building to the opposite side of the street, while the building itself was practically uninjured. After leaving Isbell it appears to have either lost its tornadic character, or as is more probable, passed some distance above the surface. That the storm continued its northeast course is shown by the severe wind and hail storms that occurred at points in a direct line with the course over which it had hitherto moved, the most notable being at Newburg, Mount Hope, and Moulton.

The weather map of March 28 presented an oval shaped low, which extended from Texas to the central Mississippi Valley, with comparative highs over the Northwest and Southeast. The heavy and almost unprecedented downpours of rain that had prevailed for forty-eight hours over a greater portion of Tennessee, Alabama, and Mississippi were still in progress, and as a result many of the rivers were in a state of flood and a large section of country was covered more or less with water. Thunderstorms were generally reported in Texas, Louisiana, Arkansas, Tennessee, Missouri, and Illinois. The temperature

over the southeast quadrant of the low averaged about 70°, while in the far Northwest it was below freezing.

At Memphis on the day in question rains continued all day, with frequent heavy downpours. Dense fog formed in the west at intervals during the afternoon, and as it passed through the Arkansas forest the tree tops only could be seen, the trunks being hidden by the white cloud bank. Two or three of these cloud banks, which seemed to roll onward, passed over the station, indicating the presence of cold currents of air coming from above.

The following extracts relative to the excessive precipitation in Mississippi and Tennessee on March 26-28 are of interest in connection with the foregoing, and are taken from the section reports of these States:

The almost continuous rainfall from March 26 to 28, inclusive, over the central and northern portions of Mississippi was one of the most excessive and destructive on record for the State. In the northern two-thirds of the State the average rainfall for the three days was 7.72 inches; at twelve stations within this area the rainfall exceeded 8 inches, and at two stations, Agricultural College and Ripley, the amounts of precipitation for the three days were 10.78 and 11.76 inches, respectively. The following 24-hour rainfalls, which are the heaviest on record at the stations named, occurred as follows: Jackson, 6.28 inches; Lake, 6.12; Ripley, 8.56; University, 6.06; Vicksburg, 7.12, and Walnut Grove, 8.28.

On March 28 occurred the most disastrous floods in middle Tennessee of which there is any record. For twenty-five stations, in as many different adjoining counties, there was an average rainfall of 5 inches in less than twenty-four hours; for four stations, in adjoining counties, there was an average of 8.19 inches within twenty-four hours. The heaviest rainfall occurred over a territory stretching from Hardin County northeastward, and including Wayne, Lawrence, Lewis, Maury, Giles, Marshall, Williamson, Rutherford, Bedford, Coffee, Warren, White, Smith, Cumberland, Roane, and Morgan counties. The amount of rainfall at Lewisburg on the 28th, 9 inches in twenty-three hours, is the greatest recorded amount that has fallen in that length of time in this State since the records of this service began, twenty years ago; it is probably unprecedented in the history of middle Tennessee. On the same day, at Lynnville, 8.45 inches fell, at Iron City, 7.70, and at Palmetto, 7.60, indicating that the four counties, Lawrence, Giles, Marshall, and Bedford, comprised the area of heaviest rainfall in the flood-stricken territory.

A correspondent at Burnsville, Miss., near the northeast corner of the State, and about forty miles northwest of the path of the tornado, describes the rainfall at that place as the most terrific ever experienced. He says:

The most remarkable feature of the storm was the falling of what we suppose to be waterspouts along the range of hills west of Yellow Creek. Great holes were washed out of the sides of the hills, the dirt and rock being carried for considerable distances. Saplings and stumps and even trees were washed out of the ground, and in some instances carried from 50 to 100 yards from where they stood. * * * Nothing of the kind has ever occurred in this country before, as the surface would surely reveal it if it had occurred within the last 100 years."

Results such as described above are often produced by the excessive rains, called "cloud bursts." The creeks and drainage courses that ordinarily suffice to carry off the rainfall, overflow, and new passages are cut by the swift flowing water. Waterspouts form only over the sea and could not have occurred at Burnsville as suggested by our correspondent.

The floods that resulted from this storm are described under the heading Rivers and Floods, in the March and April numbers of the REVIEW.—H. H. K.

RECENT PAPERS BEARING ON METEOROLOGY.

W. F. R. PHILLIPS, in charge of Library, etc.

The subjoined titles have been selected from the contents of the periodicals and serials recently received in the library of the Weather Bureau. The titles selected are of papers or other communications bearing on meteorology or cognate branches of science. This is not a complete index of the meteorological contents of all the journals from which it has been compiled; it shows only the articles that appear to the compiler likely to be of particular interest in connection with the work of the Weather Bureau:

- London, Edinburgh, and Dublin Philosophical Magazine. London. 6th Ser. Vol. 3.*
Lewis, Percival. The Role of Water Vapour in Gaseous Conduction. Pp. 512-515.
Beattie, J. C. The Magnetic Elements at the Cape of Good Hope from 1605 to 1900. Pp. 532-541.
Townsend, John S. The Conductivity produced in Gases by the Aid of Ultra-violet Light. Pp. 557-576.
- Symons's Meteorological Magazine. London. Vol. 37.*
 — Probable Weather of the Last Week in June. Pp. 65-68.
Curtis, R. H. The West Indian Volcanic Eruptions and Atmospheric Phenomena. Pp. 68-70.
- Proceedings of the Royal Society of London. London. Vol. 69.*
Armstrong, Henry E. The Conditions determinative of Chemical Change and of Electrical Conduction in Gases, and on the phenomena of Luminosity. Pp. 99-109.
- Quarterly Journal of the Royal Meteorological Society. London. Vol. 28.*
Hepworth, M. W. Campbell. Atmospheric Dust. P. 68.
Shaw, W. N. "La Lune mange les Nuages." A Note on the Thermal Relations of Floating Clouds. Pp. 95-100.
Dines, W. H. The Element of Chance applied to various Meteorological Problems. Pp. 53-68.
Mawley, E. Report on the Phenological Observations for 1901. Pp. 69-94.
- Journal of the Franklin Institute. Philadelphia. Vol. 153.*
Keller, H. F. The Gases of the Atmosphere. Pp. 419-430.
- Nature. London. Vol. 66.*
Cole, Grenville A. J. Sun-pillar and Parhelion. P. 32.
L., W. J. S. Dust-falls and their origins. Pp. 41-42.
Herschel, W. J. Sun Pillar. P. 77.
Mac Dowall, Alex. B. Brückner's Cycle and the Variation of Temperature in Europe. Pp. 77-78.
Dewar, James. Thermal Expansions at Low Temperatures. Pp. 88-90.
Clayton, Henry Helm. Volcanic Eruption in Java, Brilliant Sunset Glows in 1901, and probable Glows from the Eruption in Martinique. Pp. 101-102.
Omond, R. T. A Solar Halo. P. 103.
 — Sea Temperature and Shore Climate. P. 116.
 — Evidence of a "Seiche" on a Scottish loch. Pp. 162-163.
- Scientific American Supplement. New York. Vol. 53.*
 — Dust-Falls and their origin. P. 22111.
 — D'Arsonval on Liquid Air. Pp. 22117-22118.
Marconi, Guglielmo. The Practicability of Wireless Telegraphy. Pp. 22150-22151.
- Science. New York. Vol. 15.*
Clayton, Henry Helm. The Volcanic Eruption in Martinique, and possibly coming Brilliant Sky Glows. Pp. 791-792.
Abbe, Cleveland. Indian Summer. [Note on article by Albert Matthews.] P. 793.
Verrill, A. E. The Mud Shower. P. 872.
Abbe, Cleveland. Meteorology in Argentina. P. 875-876.
Ward, R. DeC. [Note on] Monthly Weather Review. Pp. 914-915.
Ward, R. DeC. Some Physiological and other effects of Sunshine and Shade. [Note on paper by M. Lugeon.] P. 915.
Ward, R. DeC. [Note on] Meteorological Annual of the Royal Belgian Observatory. P. 915.
Diller, J. S., and Steiger, George. Volcanic Dust and Sand from St. Vincent caught at Sea and the Barbados. Pp. 947-950.
- Comptes Rendus de l'Académie des Sciences. Paris. Tome 134.*
Branly, Edouard. Récepteur de télégraphie sans fil. Pp. 1197-1199.
Féry, Ch. Sur la température de l'arc électrique. Pp. 1201-1204.
Nordmann, Charles. Sur la constitution des nébuleuses. Pp. 1282-1285.
Deslandres, H. Rapprochements entre les épreuves de la couronne solaire de l'éclipse totale du 18 mai 1901 et les photographies de la chromosphère entière du soleil, obtenues le même jour à Meudon. Pp. 1285-1288.
Curie, Jacques, et Compan, P. Sur le pouvoir inducteur spécifique des diélectriques aux basses températures. Pp. 1295-1298.
Décombe, L. Sur les variations de la lumière zodiacale. Pp. 1352-3.
- La Nature. Paris. 30me Année.*
Espitallier, G. Le ballon dirigeable Severo.
Plumondon, J. R. La durée des chutes de grêle. Pp. 406-408.
Lecornu, J. Les ascensions en cerf-volant. Pp. 410-412.
- L'Aérophile. Paris. 10me Année.*
Besancon, Georges. La catastrophe du "Pax." Pp. 97-113.
- Archives des Sciences Physiques et Naturelles. Genève. 4me Période. Tome 13.*
Gautier, R. Observations météorologiques faites aux fortifications de Saint-Maurice pendant l'année 1901. Pp. 462-490.
- Annales de Chimie et de Physique. Paris. 7me Série. Tome 26.*
Stassano. Sur la nature et la constitution du spectre des aurores polaires. 7me Série. Tome 26.
Ciel et Terre. Bruxelles. 2me Année.
De Heen, P. La Périodicité de l'activité solaire, la production des "Novæ" et l'état fragmentaire des uranolithes, interprétés par l'iodynamisme. Pp. 172-175.
- Geographische Zeitschrift. Leipzig. 8 Jahrgang.*
 — Ueber die Höhen der verschiedenen Wolkenformen. P. 289.
Lindeman, Moritz. Die neueren Reisen zur Erforschung der Nordpolarregion. Pp. 305-322.
- Das Wetter. Berlin. 19 Jahrgang.*
Grohmann, —. Die klimatischen Verhältnisse des Königreiches Sachsen in ihrer Abhängigkeit von Luftdruck und Windursprung. Pp. 97-108.
 — Uebersicht über die Witterung in Central-Europa im März 1902. Pp. 109-110.
Meinardus, M. Die Temperaturverhältnisse im März 1902 unter etwa 50° N. Br. P. 110.
Brückner, Ed. Der Ursprung des Regens. Pp. 110-117.
- Gaea. Leipzig. 33 Jahrgang.*
Klein, H. J. Lowells neue Untersuchungen über die klimatischen Verhältnisse auf dem Planeten Mars. Pp. 326-330.
 — Der grosse Staubfall vom 9 bis 12 März 1901 in Nordafrika, Süd und Mitteleuropa. Pp. 330-336.
Fényi, J. Der Gewitterregistrator. Konstruiert von Johann Schreiber. Pp. 405-416.
 — Die deutsche Südpolar-Expedition. Pp. 421-426.
 — Die Mengen der neuentdeckten Gase in der Atmosphäre. P. 435.
 — Höhen der verschiedenen Wolkenformen. Pp. 437-438.
- Annalen der Physik. Vierte Folge. Band 8.*
Korn, A., and Stoeckl, K. Studien zur Theorie der Lichterscheinungen. Pp. 312-326.
- Physikalische Zeitschrift. Leipzig. 3 Jahrgang. Pp. 338-339.*
Ebert, H. Galvanometrische Messung des elektrischen Ausgleichs zwischen den Ionenladungen der Atmosphäre und der Ladung der Erdoberfläche. Pp. 338-339.
Lemström, S. Ueber die Messung der elektrischen Ströme der Atmosphäre durch Spitzenapparate. Pp. 396-397.
Perner, J. M. Meteorologische Optik. P. 398.
Börnstein, R. Bemerkung über die Messung der luftelektrischen Zerstrouung bei Ballonfahrten. Pp. 408-409.
Nippoldt, A. Theoretische Betrachtungen über die Ergebnisse der wissenschaftlichen Luftfahrten des deutschen Vereins zur Förderung der Luftschifffahrt in Berlin. [Note on article by W. v. Bezold.] Pp. 422-423.
- Meteorologische Zeitschrift. Wien. Band 19.*
Wolfer, A. Die Wolf'schen Tafeln der Sonnenfleckenhäufigkeit. P. 193-200.
Exner, F. M. Langley's neuere Untersuchungen der ultrarothenen Sonnenstrahlung. Pp. 200-205.
Bührer, W. Ueber den Einfluss der Schneedecke auf die Temperatur der Erdoberfläche. Pp. 205-211.
Hergesell, H. Vorläufiger Bericht über die internationale Ballonfahrt am 6 Februar 1902. Pp. 211-212.
 — Sonnenschein zu Kimberley. Pp. 212-213.
 — Meteorologische Beobachtungen zu Swakopmund, tropische Westküste von Südafrika. Pp. 213-214.
 — Magnetische Landesaufnahme der Vereinigten Staaten. Pp. 214-215.
 — Die nördlichste Station des Canadischen Beobachtungsnetzes. Pp. 215-216.
 — Rauch als Schutzmittel gegen Spätfröste. P. 216.
 — Wärmestrahlung von Arktur, Vega, Jupiter und Saturn. Pp. 216-217.
Folgheraiter, G. Ueber die Richtung der elektrischen Strömung in Blitzen. P. 217.
Hann, J. Klima von Rosario und Fisherton. Pp. 217-219.
Liznar, J. Ueber die Beziehung zwischen dem Temperatur- und Induktions-Koeffizienten eines Magnetstabes und seinem magnetischen Momente. P. 220.
 — Dauer des Sonnenscheins auf Mauritius. Pp. 223-224.
Rona, S. Betrachtungen zu der täglichen Periode des Nieder-schlages. Pp. 224-230.
Kesslitz, W. Stürmische Bora in der Nord-Adria am 31 Januar und 1 Februar 1902. Pp. 230-233.
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Treitschke, Friedrich. Beiträge zur Klimatologie von Thüringen. Pp. 233-237.
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Liznar, J. Ueber eine 33 jährige Periode der Sonnenflecken. P. 237.
 — Februarkälte in England. Pp. 238-239.
Mac Dowall, Alex. B. Einfluss des Mondes auf den Regenfall. P. 239.
 — Pilot Charts. P. 239.
Fényi, J. Ueber einen Gewitter-Signalapparat. Pp. 240-241.
Erzherzog Leopold Ferdinand. Besonders farbenprächtiger Sonnenuntergang. Pp. 241-242.

— Zum Klima von Abessinien. P. 242.
Eklholm, Nils. Die Extinktion des Lichtes im Weltall. Pp. 242-244.
Annalen der Hydrographie und Maritimen Meteorologie. Hamburg. 13 Jahrgang.
Darwin, George Howard. Ebbe und Flut sowie verwandte

Erscheinungen im Sonnensystem. Pp. 278-282.
 — Bericht der Deutschen Seewarte über Ergebnisse der magnetischen Beobachtungen in den deutschen Küstengebiete und in den deutschen Schutzgebieten während des Jahres 1901. Pp. 295-299.
 — Magnetische Beobachtungen an Bord der "Valdivia" während der deutschen Tiefsee-Expedition 1898-99. Pp. 299-304.

NOTES AND EXTRACTS.

METEOROLOGICAL CONDITIONS FOLLOWING THE ST. VINCENT AND MARTINIQUE ERUPTIONS.

The two nearest stations of the United States Weather Bureau to Martinique are Bridgetown, Barbados, latitude $13^{\circ} 4'$ north, longitude $59^{\circ} 37'$ west, and Basseterre, St. Kitts, latitude $17^{\circ} 18'$ north, longitude $62^{\circ} 48'$ west. St. Pierre, Martinique, is at about latitude $14^{\circ} 45'$, longitude $61^{\circ} 10'$, or 150 miles northwest of Barbados and 200 miles south-southeast of Basseterre. St. Vincent is about 100 miles west of Barbados and nearly 300 miles south-southeast of Basseterre. The observer at Bridgetown, Mr. J. J. O'Donnell, was thus considerably nearer the scene of the eruption than the observer at Basseterre.

In response to a letter sent out by the Chief of Bureau, Mr. O'Donnell forwarded extracts from his daily journal, as follows:

May 7, 1902.—Cloudy; varying conditions of cloudiness overcast the sky in the early morning, upper clouds moving from the west, lower clouds from the east; toward noon the upper clouds began to increase in density, while taking on a somewhat hazy appearance, which at 1 p. m. had a decidedly lurid hue. The cumuli from the east became more compact, and at 1:30 p. m. had assumed a thick and firmly-set mammillated shape, with a decidedly ashen hue. From a point on the western horizon there radiated a conical beam of a greenish or phosphorescent tint, about 50° in length and 20° wide at the base, north and south of which the lurid hue of the cirro-stratus emitted a diffused reddish light. At 2 p. m. the mammillated cumuli had reached the zenith and descended upon and over-spread the conical beam, while the sun's disc was overcast only by a dense haze. Beneath the conical beam and generally toward the west the water of the Caribbean Sea presented a calm, quiet, and gently swelling surface of a gruesome, sickly, greenish tint.

Pressure and temperature normal, with light and steady southeast wind after 8:35 a. m.

The unusual phenomena had attracted many persons to the roofs of the houses in the city and several visitors to the Weather Bureau office. At 1:47 p. m. a terrific explosion was heard, followed eight seconds later by another of at least equal intensity, while on the roof at 2:06 p. m. a peculiar rumbling sound, closely resembling the noise of a tornado, was heard, and it seemed to rush close to or through the surface of the ground, rather than through the air. Darkness was rapidly setting in; the air had a strong sulphurous odor, and all persons on the roof of the Weather Bureau office were observing the fishermen yet off the horizon rapidly scudding home to port. At 3 p. m. it was necessary to light lamps in the office, the hotel, and in all business offices not already closed; 3 p. m. being the hour at which all business is usually discontinued for the day. At 3:45 p. m. thunder was heard moving from the west, accompanied by lightning, from 4:15 to 6 p. m.; the thunder was one continuous roar, while the occasional lightning emanated as from a disc about 20 inches in diameter on the western horizon and was at all times of an incandescent character, resembling an electric arc or search light of immense intensity or candle power and always disappearing or vanishing in a purple glow. From 6 to 8 p. m. the thunder was at intervals of eight to ten minutes, but much louder and of a detonating character, but not always preceded by the lightning or electric flash. After 8 p. m. the thunder continued at intervals of fifteen to twenty minutes and did not decrease in intensity, while the brilliancy of the incandescent lightning continued until past midnight.

At 2:15 p. m. some grains of coarse dust, resembling No. 3 gunpowder, fell at the office; from 3:40 to 4 p. m. similar dust fell sparingly and intermittently; from 4 p. m. until past midnight it fell thick and fast without interruption. Impenetrable darkness prevailed from 4:30 p. m., or from one hour before sunset. East winds prevailed until 8:35 a. m. and from 10:50 p. m. until past midnight; southeast winds the rest of the day; maximum velocity, 13 miles per hour.

The shower of dust and the explosion heard at 1:47 p. m. are believed to have been caused by the eruption of the Soufrière on the island of St. Vincent, 100 miles due west from Barbados, and which was reported to have occurred at 12:30 p. m. through the public telegrams received at 2:30 p. m.; the barograph trace indicates a decided jar at 2 and 3 p. m.

Remarks.—Several persons report having heard between 2 and 3 p. m. as many as seven explosions in groups of three, two, and two; many report having heard only four explosions in groups of two and two, and others say they heard only two explosions, and those the last; all agree in saying that the last two were the loudest.

The ordinary height of spring tides is 3 feet; new moon occurred at 6:47 p. m.; the tide was high at 3 p. m. At 3:10 p. m. the water suddenly rose 2.5 feet in two minutes and as rapidly fell after one minute; about three minutes later it rose 1.25 feet in three minutes, and as rapidly fell, then rose about 0.8 foot in two minutes and again rapidly fell. The water rose and fell three times in fifteen or twenty minutes, the rise each time being about one-half what it was before. These measurements were made by Mr. C. B. Sidney, timekeeper for the superintendent of public works, and Mr. Walter C. Ashby, engineer in charge of repairing the wharf destroyed by the hurricane of 1898.

May 8.—Cloudy; the fall of volcanic dust ceased at 5:10 a. m., total depth one-quarter of an inch. Thunder was heard from 1 to 4 a. m. Strato-cumulus, stratus, and scud overcast the sky all day; the atmosphere was muggy, close, and sultry, with dense haze until 3 p. m.

Remarks.—No explosion or thunder was heard during the forenoon, and no change occurred in the water level in the harbor.

May 11.—An exceedingly brilliant orange tinted glow lighted up the whole western sky from 5:30 till 6:45 p. m., which afterwards slowly dissipated, the moon's disc meantime presenting a beautiful ultra-marine blue color.

May 14.—From 5 to 6:30 p. m. the west and northwest sky presented a brilliant orange tinted hue, diminishing in luster and entirely dissipating at 7:10 p. m.

May 20. *Remarks.*—Some persons report having heard two loud explosions in the north at 4:43 a. m. [local time]. The barograph trace shows a decided jar at about that time.

Mr. O'Donnell adds in his letter:

It may be remarked that the explosion that preceded the eruption of Soufrière, on the island of St. Vincent on the 7th was as loud, if not louder, than any explosion from Mount Pelee, especially that on the 8th, when St. Pierre was destroyed.

Mr. E. H. Hobbs, Observer in charge at Basseterre, St. Kitts, forwards traces from the Richard barograph, and reports as follows:

The copies of the barograph traces fail to show the smaller fluctuations that are visible on the originals. There have been numerous squalls throughout the month and each has left its trace on the barograph record, but besides these there are many variations that were the effect of the volcanic explosions. Many more explosions were heard in the mountains than were noticed in town, but the actual times are unobtainable, owing to variations in the local clocks.

On the 7th I noticed several slight tremors but attributed them to the moving of goods in the store below and took no especial notice of them until I was told of the explosions heard in the mountains and in the other islands. They were not like our usual earthquake shocks, which are vibratory and last for several seconds, but were short and more like a sudden jar. These occurred at the time the cables were broken.

On the 8th similar noises, but not so loud and without the tremors, were heard in the early morning and were described as the discharge of distant cannon.

On the nights of these two days, the tops of thunder heads were seen far to the southeast and south and the reflection of distant lightning was observed; since that time the southern horizon has been too obscure to see the reflections farther away than thunder could be heard. Every day some persons have claimed they heard explosions, while others have said that it was a thunderstorm, so that it is impossible to separate the two phenomena.

On the 7th and 8th I made special inquiry and observations of my own in regard to a tidal wave or a change in level of the sea, but none was observed and I am positive there was none on this side of the island, and none was reported from the other side. The sea was comparatively

¹The Weather Bureau observers invariably employ seventy-fifth meridian time in recording their own observations, but local times are given in these remarks as quoted from other sources.