

most peculiar coincidences:—(1) Renewal of eruption of Mont Pelée on morning of May 28; peculiar atmospheric disturbance at the Cape, simultaneous with earthquake shock there. (2) Renewal of irregularities in pressure curve on May 29 and 31 and early morning of June 1, there being renewed volcanic disturbances in West Indies on or about these same dates. The curve for these last two days is remarkable, resembling closely a series of ripples and suggesting "interference" effects.

Which was cause and which effect, or is there any correlation whatever?

CHARLES STEWART.

Meteorological Commission, Cape Town, July 16.

#### A Tripartite Stroke of Lightning.

AT about 6.50 p.m. on August 7, after two or three preliminary low thunder rumblings, which by no means prepared us for what was to come, a most tremendous crash of combined thunder, lightning and electric discharge burst right over my residence here.

My butler, who was looking in the direction of our front gate, 80 yards to the north of our front door, saw a burst of smoke, mingled with a shower of leaves, rise into the air out of the adjoining shrubbery.

My coachman, who was sitting just within the open door of the lodge, close to the front gate, was dazed by a vivid burst of flame at his feet which seemed to leap into the doorway.

My neighbour's gardener, looking out of the lodge opposite, saw a nearly horizontal flash of fire enter the shrubbery close to my front gate.

A subsequent examination of the surroundings of the front gate and my coachman's lodge has revealed:—

(1) A tearing up of the ground close to the massive iron post of the front gate, the splitting of a large flint at its foot, and a litter of ivy leaves on the gravel.

(2) The clean cutting in two of an oak post, 35 yards distant to the north-east, from which an iron hand-gate was hanging.

(3) The scorching of the outside foliage of a horse-chestnut some 15 yards still further off, in a direct line with the other two objects struck.

In thirty years' experience of thunderstorms, which are rather frequent here, I have never observed the simultaneous striking of three different points by the electric discharge. A death-like stillness succeeded the crash, the storm appearing to have exhausted itself in a single tremendous explosion. Heavy rain was falling when the crash occurred. I have measured an inch and a half of rain-fall within the last three days.

Six Mile Bottom, Cambs., August 8. W. H. HALL.

#### Colours between Clouds at Sunset.

ABOUT sunset on the evening of Sunday, July 13, being at Ripon with my son, our attention was arrested by an unusual appearance, which I will briefly describe. Two large clouds, covering a considerable portion of the western sky, and separated by an interval leading generally towards the west, were each bordered along this interval by a bright and well-marked double spectrum. The two spectra forming this were together of the width of about one and a half times the diameter of the sun; they followed the foldings of the edge of the clouds, and, which suggests a partial explanation, were at right angles to a fringe of nebulous striæ, which bordered the clouds, so that, except that the spectral colours were parallel instead of consecutive, the phenomenon had in some degree the appearance of the reflection from a grating.

Our observation lasted about twenty minutes, and it was especially noticeable that when, through the fading light, the more refrangible colours had disappeared, the two red lines on the rim of each cloud remained clearly marked to the last.

Never having previously seen or even heard of such an appearance, any information on the subject would be much appreciated. I might also report that on the evening of July 17 the pink streamers mentioned by some of your correspondents could be well observed, and had they been less stable, and had they radiated from the north instead of from the position of the setting sun, the appearance would have much resembled the Aurora Borealis.

JOHN BADDELEY.

Adswold, Bury New Road, Higher Broughton, Manchester.

#### Retention of Leaves by Deciduous Trees.

ONE of the proofs in favour of this being caused by early frost is that frequently on exposed beech and other deciduous trees only the leaves near the ground are affected and remain brown on the trees until the spring. Leaves higher up escape the frost and fall normally, as these early frosts are usually confined to the strata of air near the ground.

W. R. FISHER.

Coopers Hill, Englefield Green, Surrey, August 8.

#### THE WEST INDIAN ERUPTIONS.

AMONGST the last contributions to our knowledge of the eruptions which so recently devastated portions of the West Indies are five preliminary reports to the National Geographic Society. These, with excellent illustrations, appear in the July magazine of the Society.

In the following notes upon these reports attention is drawn to those portions of their contents which are not generally known, and to these are added a few observations made by witnesses, particularly those made by Captain E. W. Freeman, of the s.s. *Roddam*, whose experiences, although he was interviewed by members of the American expedition, have as yet received but slight consideration.

The first report is by Mr. Robert T. Hill, of the U.S. Geological Survey, who, with other scientific investigators, accompanied a relief expedition in the U.S. steamer *Dixie*, which sailed from Brooklyn Dock on May 14.

Notwithstanding the ill-advised introduction of matters foreign to the object of a scientific expedition, the bulk of Mr. Hill's report is well worth consideration. La Montagne Pelée, which has been introduced to our notice as the goddess of Hawaii and as the mountain which is bare or "naked," is now referred to as the "shovelfull," an allusion possibly to its form. In May, 1901, we are told that a picnic party discovered on its summit a small fume rising at one corner of its crater lake. On April 23 three distinct shocks were felt in St. Pierre, and everybody saw a great cloud of smoke rising from the summit crater. Two days later the lower Soufrière was in eruption, and from this date until May 5 the showers of ashes steadily increased. The succeeding sequence of events has already been published in these columns, whilst the observations of April 23 bring us nearer to the seismic disturbances of April 19, which, although they originated in Central America, there are strong reasons to suspect were the primary cause of disturbances in the Antillean fold.

As the introduction to the account of the catastrophe Mr. Hill mentions his witnesses, and here we find for the first and last time in these reports the name of Captain Freeman. Certainly there is a reference to his vessel. According to engineer Evans, of the *Roraima*, which was burned, the *Roddam* was lifted on a wave "so that her anchor chain broke and she was enabled to escape," which is not correct. Now at the time the great and fatal blast swept across St. Pierre and its roadstead, Captain Freeman was on the deck of his vessel—then about three ships' lengths from the shore—and for some time at least could see what occurred, whilst other witnesses whose testimony is referred to had sought refuge in engine-rooms or down below. Captain Freeman says that although there were many minor puffs of clouds from Pelée there was only *one* great eruption, and this came from the side of the mountain. There were no detonations or loud reports, and from his point of view there was no sheet of flame accompanying or following the blast. The force of this, which came with the wind, was so great that he believes it was the cause of the s.s. *Grappler* turning turtle. There was no return blast, neither was there any absence of air. The difficulty in breathing was due to the quantity of fine ash with which the atmosphere was charged and the fetid gases with which it was mixed.