

## SCIENCE:

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## THE JAPANESE EARTHQUAKE.

ON the 22d of October I left Japan, and on arrival in Victoria, B.C., found that six days later there had occurred the most disastrous earthquake of recent years. Previous to my departure shocks had been increasing in frequency, and several severe ones had been reported from the southern provinces. A sharp shock was felt in Yokohama about 6.30 of the 22d, which perceptibly swayed my brother's house, and caused things therein to move and rattle freely, the tremors lasting two or three seconds. During the summer I had made the ascent of Fuji, Asama, and other mountains, and had visited all the places of importance along the Inland Sea. I spent several days in Kobe, Osaka, Kyoto, Nara, Nagoya, etc., and in other districts which have suffered so severely from the earthquake of the 28th of October. At this time there were no signs of the impending destruction. By the last mail I received from my brother papers up to the 18th of November containing very interesting accounts of the disasters and phenomena at the various places. Some details of the event have been already given in your columns, but a few additional items may not be without interest. In Yokohama the damage was inconsiderable and confined chiefly to chimneys and windows, with no loss of life or limb. The chimney of the Electric Light Works fell, and caused a stoppage of light. At Kobe a slight shock was felt at about 4 A.M., but this was only the precursor of the severer one which came at 6 h. 34 m. 35 s., and which lasted thirty six seconds. A large number of chimneys were thrown down, crashing in many instances through the roofs, and buildings were badly twisted and strained. In some of the curio shops there was a large breakage of valuable goods. The centre of the disturbance was, however, more to the eastward, and the prefectures of Gifu and Aichi (in which is Nagoya) suffered most excessively. The great city of Osaka, second only in population to Tokio, sustained serious damage. The shock occurred at 6.39 A.M., and about twenty

followed during the forenoon. Many lives were lost by the collapse of some of the spinning factories. The Naniwa mill, a brick three story building, had a span of 120 feet, and the walls, apparently not properly tied together, separated so as to allow the roof to fall in, and many of the employees were killed or wounded. In the foreign settlement (Kawaguchi) nearly all the houses lost their chimneys and suffered more or less damage otherwise. The bridge across the Yodagawa at this point was also broken by one of the piers sinking several feet. The veneral Bishop of Exeter and his son, Bishop Bickersteth of Japan, were guests of Venerable Archdeacon Warren and narrowly escaped injury from the chimney falling through the house. The arsenal and mint sustained loss through the distortion and breakage of chimneys, etc., but there appears to have been no loss of life in these more substantial buildings.

In the town of Gifu the destruction was widespread, and the number of killed and wounded very great, while fires broke out, which were not finally extinguished until the 30th, and added to the loss of property. The Tokaido Railway through this region suffered severely by the destruction of stations and bridges, and the loss has been stated at \$500,000. All the villages along the line were disturbed, and some almost totally destroyed.

Nagoya, a fine city of nearly 200,000 inhabitants, received great injuries, and the loss of life and property was terrible there. The shock is reported to have occurred at 6.30 A.M., and 200 shocks to have been felt during the forenoon. All the brick buildings in the city except two, that of the Electric Light Company and the railway freight shed, were wrecked. The roof of the post-office fell in and four of the employees were killed, and the prison was destroyed and many of the inmates killed or wounded. An early morning service was being held in the Methodist chapel, and four of the native Christians were killed, and Mr. and Mrs. Van Dyke and several natives badly wounded. The embankments of the Kiso River were broken, and several villages were swept away and many people drowned by the escaping flood.

The foregoing are but a few of the details of this fearful catastrophe; the mere list of the places which suffered (Shizuoka, Hamamatsu, and other important towns included) would alone take up too much space. At Nagoya the vertical movement is said to have been eight and a half inches, and an Osaka correspondent describes the houses as literally dancing, and the trees swaying to and fro as if in a gale. Mount Asama (only smoking heavily when I was on it in September) was started into greater activity and was sending forth flames and ashes, and Mount Ibuki (between Gifu and Lake Biwa) was also in eruption. The sea is said to have been violently disturbed in various places, even far from land, and the captain of the "China," which left Hongkong on the 31st of October, reported in Yokohama: "Nov. 3, at 6 45 P.M., passed Suwusima twelve miles off. The volcano on the island was in eruption, shooting flames to the height of about 800 feet, at intervals of about thirty seconds."

Shocks continued at frequent intervals for several days after the first destructive one, but were diminishing in number and strength. The following are the latest figures for the prefectures of Aichi, Gifu, Fukui, and Mikawa, the most of the loss having been suffered by the two first named: Killed, 7,260; injured, 11,716; buildings (temples, dwellings, warehouses, etc.) destroyed, 111,566, and damaged, 53,683. The greatest loss of life appears to have been due to modern brick buildings and to the early hour, when people had not left their houses.

W. HAGUE HARRINGTON.