



## Evening Telegram

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### Earthquakes and Their Causes.

"Earthquakes, or earth tremors are believed to be due to some form of fracture caused by the breakage of the Earth's substance under a growing strain, when that strain has passed the breaking point. This gives rise to waves which are propagated through the solid substance to distant parts of the Earth, and vertically upwards to the surface, sometimes with disastrous effects. The point where the fracture occurs and the earthquake originates is called the seismic centre, or origin or focus. That part of the Earth which is vertically above this centre is called the epicentre. The waves transmitted through the Earth may come to the surface hundreds, or even thousands of miles from the epicentre, and the times of arrival are recorded. The first indications on the seismograph are made by longitudinal waves, which are followed, after an interval, by direct transverse waves in approximately the same path. From the length of the interval between the appearance of these waves, the distance of the origin is inferred." The seismograph referred to in the above explanation of the origin of earthquakes is an apparatus designed to register the shocks and undulatory motions of earth tremors. It was invented by Mallet about the year 1850, improved upon by Professor J. Milne from 1875, further perfected by Dr. E. Richter about the year 1890, and by Messrs. Vincentini and Vacher, 1890-1899. Its name is derived from the Greek seismos—earthquake and graphos—a writing—a treatise.

The exact information of seismic phenomena, says encyclopaedias on this subject, dates only from the middle of the 19th century. Very little is to be gleaned from the early writings on such occurrences. The first work of any consequence in England is "A Discourse on Earthquakes" by Robert Hook. The great earthquake of Lisbon (1755) led John Michell, professor of mineralogy at Cambridge, to this (then) abstruse subject and in 1760 he published a work entitled "Philosophical Researches, this being a remarkable essay on the cause and effect of earthquakes." In 1846 Robert Mallet, of seismograph fame, read a paper on this subject to the Royal Irish Academy, and in 1857 continued his investigations in connection with the great disaster at Naples (Italy). Since then Professor John Milne (1880), Major Dutton (1886), R. D. Oldham (1897) and an elaborated report by Professor A. C. Lawson (1908) have done much toward the further investigation of seismology. Earthquakes in super equatorial latitudes are of very rare occurrence, and these are only of a slight nature in comparison with sub-equatorial countries, as witness the destruction of Chile reported in yesterday's Canadian Press despatches. Seismographic history records the following visitations, the complete list of which may be of more than passing interest to the student of to-day.

England 1669; Lincolnshire 1449; the greatest experienced in Britain 1812; London 1860; again in 1750; N. W. of England 1871; Eastern Counties 1884; all over Scotland 1888-9; West and South West of England 1892; South Wales and North Cornwall 1893; Cornwall 1902; Derbyshire villages, 1903; Argyllshire, 1904; Northern English Counties, 1905; South Wales, 1906. The most disastrous earthquakes recorded have occurred at Peloponessus 378 B.C.; Durras, in Greece 345 B.C.; Ephesus and other cities destroyed 17 A.D.; Antioch destroyed 115 A.D., and again in 1114 and also suffered in 1872. In 1808, 1809, 1810, 1811, 1812, 1813, 1814, 1815, 1816, 1817, 1818, 1819, 1820, 1821, 1822, 1823, 1824, 1825, 1826, 1827, 1828, 1829, 1830, 1831, 1832, 1833, 1834, 1835, 1836, 1837, 1838, 1839, 1840, 1841, 1842, 1843, 1844, 1845, 1846, 1847, 1848, 1849, 1850, 1851, 1852, 1853, 1854, 1855, 1856, 1857, 1858, 1859, 1860, 1861, 1862, 1863, 1864, 1865, 1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 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