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**The**

**Resources of California**

**Comprising the  
Society, Climate, Salubrity  
Scenery, Commerce and Industry  
of the State.**

**By**

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**"The History of San Francisco," "A Brief History of Culture," etc.**

**Seventh Edition**

**With a Map**

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**§ 98. Earthquakes.**

Earthquakes belong, on scientific considerations, in the chapter in geology; but practically they

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come within the domain of salubrity, for many persons in the Eastern States object to California as a place of residence, because of the danger from those convulsions of the globe. There is a possibility of death from them, but the possibility is so remote that it does not disturb the enjoyment of life here. In twenty years, about forty deaths have been recorded in the State, and not one of these occurred in a strong house. The majority of the victims lived in walls of adobe, or dried mud, ready to topple over at a slight shock. In San Francisco, several thousand brick houses, many of them three, and some four stories high, have stood for fifteen years, or more, not only without coming down, but without showing any mark of injury, beyond slight cracks in the plastering. The deaths from earthquakes have been about two annually, or at the rate of one in a quarter of a million; while, in the Eastern States, lightning, sunstroke, and hurricanes, which kill nobody here, have each slain three times as many relatively.

Most of the earthquakes of California are confined to very small districts. Thus, not more than one in ten of those felt in San Francisco is perceived in Sacramento. Many shocks are slight, and observed only by a few

people. The question is frequently asked in San Francisco, "Was there an earthquake last night?" Somebody felt a slight tremor in the house; perhaps it was caused by an earthquake—perhaps by a heavy wagon passing through the street. Tourists occasionally express great disappointment because a shock came, and was so slight that they did not feel it, either because they were asleep, or were walking. Many persons in the street, when the shock of October 21st, 1868, occurred, did not feel it, and when they saw the people rushing out of the houses, wondered at the excitement.

We frequently hear San Franciscans say, this is "earthquake weather," when it is sultry, but there has been nothing in experience to justify such language. No peculiar condition of the temperature of the sky, or of the barometer, has uniformly,

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or generally, preceded the shocks, nor is there any rule by which we can predict their occurrence, nor have we any instrument by which we measure precisely their duration, violence, or the course of their vibrations.

## § 99. Their Frequency.

Earthquakes are common in some parts of California, and especially at San Francisco, Los Angeles, and near the Tejon Pass, at the southern junction of the Sierra Nevada and Coast Mountains. They are rare at Sacramento, Marysville, Vallejo, and Napa. As a general rule, they are less frequent and less severe in the northern than in the southern part of the State. The vicinity of Humboldt is more often shaken than any other place north of the Bay of San Francisco. About a dozen earthquakes are felt in a year at different places in the State; not so many at one place. Most of the shocks are so slight as to pass unnoticed by a great majority of the people; and there are persons who have resided six or eight years in San Francisco, and many who have resided ten years in other parts of the State, and say they have never felt an earthquake. No strongly-built house has been injured, by an earthquake in California, north of latitude 35°, since the American conquest. Several brick walls have been cracked in San Francisco, but they were weak structures, built on "made ground," and would, perhaps, have cracked by settling, of their own weight. Large four-story houses have been so much shaken, that the inmates have run out in great alarm; but, on examination, it was found that the buildings were uninjured, even in the slightest perceptible manner.

On one such occasion, a gentleman, who thought his life in great danger, and ran to save it, observed, before he left his room, that the water was splashed out of his basin by the movement of the house. The basin was of earthen-ware, about fifteen inches in diameter at the top, six inches deep, half full of water, and it stood on an ordinary wash-stand. He supposed that, with another such a shock or two, the building must be in ruins; and he was very much astonished to find

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that there was not the slightest crack in the walls or plastering. His room was in the fourth story of a brick hotel. It seems that the whole building had moved together.

The fear of earthquakes prevents the erection of high structures for show; and, for this reason, there are few tall steeples in San Francisco. Several churches have been commenced on such a plan that they might be crowned with lofty spires, but it was thought more prudent to leave them with low towers. The same motive induces many wealthy families to reside in wooden houses, which are considered better fitted to resist the shocks of earthquakes. These wooden houses, it must be kept in mind, are not "framed" with mortices and tenons, as large wooden houses are usually erected in the Atlantic States, but are "Chicago frames," held together with nails. This style of building, though introduced solely because of its cheapness and simplicity, is considered, by far, the most secure against earthquakes.

Few earthquakes felt at San Francisco since 1846 have been more severe than one which visited Buffalo, New York, in 1857, as described in the *American Journal of Science and Art* for September, 1858.

## § 100. List of Earthquakes.

The following is a list of the most notable earthquakes observed in California.

On the 11th October, 1800, six severe shocks were felt at San Juan Bautista, and every house was shattered and rendered uninhabitable. The same earthquake was felt with much severity at San José.

On the 21st of June, 1808, twenty-one shocks were felt at San Francisco, and the few houses then existing were seriously injured.

In September, 1812, on a Sunday, an earthquake threw down the Mission Church at San Juan Capistrano, in latitude 33° 20', and thirty persons were killed. The church at Santa Inez, in Santa Barbara County, was thrown down on the same day; but the shock, according to report, was an hour later than at

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San Juan Capistrano, and there was nobody in the church when it fell. At the same time the sea receded a long distance from the ordinary place of the water's edge, on the beach of Santa Barbara; and the people there, knowing that it would soon rush upon the shore, fled to the higher ground, and by that means alone saved their lives.

The old Mission Church at Santa Clara was thrown down by an earthquake in 1818.

On the 15th of May, 1851, a severe shock was felt in San Francisco. Windows were broken; merchandise was thrown down from shelves in stores; and vessels in the harbor rolled heavily.

A severe shock of an earthquake was felt at Fort Yuma and vicinity on the 29th of November, 1852. The low grounds near the Colorado cracked open with long, wide fissures, from which water, sand, and mud, spouted up. The fissures were in some places so large, that they turned the river from its course; and the change was so sudden, that great multitudes of fish were left to die in the mud. At the same time, the mud-volcanoes of Lower California, distant forty-five miles southwestward from Fort Yuma, resumed their activity; for, although there is no record of their previous action, yet they probably existed before. A pool of hot, sulphurous water had been observed at the place by Americans since 1849. Immediately after the shock of 1852, the officers at Fort Yuma saw a great body of steam shoot up at least one thousand feet in the desert to the southwest; and when, soon afterward, some of them went out to examine into the cause of it, they found the mud-volcanoes on the site of the old pool, throwing up steam, boiling water, and mud, very much like the *salses* farther north.

On the 10th of July, 1855, an earthquake cracked the walls of twenty-six houses in Los Angeles; but no wall was thrown down, nor was any person injured.

The earthquake of January 9th, 1857, shook the earth from Fort Yuma to Sacramento, a distance of five hundred miles,

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being most severe at Fort Tejon, about half-way between these two points. Loud noises, either rumbling or like explosions, were heard to accompany the shock at Tejon, San Bernardino, Visalia, and in the Mojave Valley. The waters of the Mokelumne River were thrown upon the banks so as to almost leave the bed bare in one place. The current of Kern River was turned up-stream, and the water ran four feet deep over the bank. The water of Tulare Lake was thrown upon its shores; and the Los Angeles River was flung out of its bed. In Santa Clara Valley the artesian wells were much affected. Some ceased to run, and others had an increased supply of water. Near San Fernando, a large stream of water was found running from the mountains, where there was no water before. In San Diego, and at San Fernando, several houses were thrown down; and at San Buenaventura the roof of the Mission Church fell in. Several new springs were formed near Santa Barbara by the shock. In the San Gabriel Valley, the earth opened in a gap several miles long; and in one place the river deserted its ancient bed, and followed this new opening. In the valley of the Santa Clara River there were large cracks in

the earth. A large fissure was made in the western part of the town of San Bernardino. At Fort Tejon the shock threw down nearly all the buildings, snapped off large trees close to the ground, and overthrew others, tearing them up by the roots, and tore the earth apart in a fissure twenty feet wide and forty miles long, the sides of which rent then came together with so much violence that the earth was forced up in a ridge ten feet wide and several feet high. At Reed's Ranch, not far from Fort Tejon, a house was thrown down, and a woman in it killed.

On the 26th of November, 1858, nearly every brick building in San José was injured by an earthquake.

On the 3d of July, 1861, Amador Valley, in Alameda County, was severely shaken. Adobe houses were seriously injured, chimneys toppled down, furniture was flung from side

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to side of the houses and much broken, and men in the fields were thrown down.

On Sunday, October 8th, 1865, at 12.45 P. M., a severe shock visited the coast valleys, from San Luis Obispo to Humboldt Bay. In San Francisco, weak brick buildings were shattered, cornices were thrown down, and several persons were seriously injured by falling bricks, and by injuries received in jumping out of windows.

The earthquake which destroyed many towns and killed many people in Peru, on the 13th of August, 1868, was not felt in California, but its tidal waves were observed here the next day. The sea ebbed and flowed in a remarkable manner from San Francisco to San Diego, from daylight till dark, the tides reaching heights not observed before, but doing no damage.

The severest earthquake observed in San Francisco since 1846, came on the 21st of October, 1868, about eight A. M. A dozen brick buildings on made ground were shattered so as to be untenable, the cornices of two dozen were thrown down, many walls were cracked, much window glass was broken, and five persons were killed by falling bricks, and as many more had bones broken by jumping out of windows.

On the 26th of March, 1872, the southern part of the State was shaken up, the shock being most severe in Owen Valley, 275 miles southeast of San Francisco, and beyond the Sierra Nevada. Two hundred buildings, most of them cheap structures of adobes, were thrown down, and thirty-five persons were killed by the falling of the walls and roofs. Cracks opened several feet wide, and then came together with so much force that ridges were thrown up. Springs disappeared in some places, and appeared in others. The level of Owen Lake raised four feet, or the ground on one side seemed to have sunk as much.