

GREAT DISASTERS

San Francisco Earthquake 1906

At five o'clock in the morning, even the busiest city can seem peaceful. The streets are quiet, the air is still, and most people are sleeping comfortably in their beds, safe and warm.

To be shaken unexpectedly from that sleep is bad enough, but what if it isn't a gentle hand on the shoulder that's shaking you, but the very ground beneath you?

On one April morning in 1906, that's exactly what happened to the people of San Francisco. Still befuddled by sleep, many found themselves in a waking nightmare, as the ground shook, and the walls and roofs of their houses crumbled around them.

The earthquake, awful as it was, would only be the beginning of this tragedy.

I'm Kari Fay, and this is Great Disasters.

"JOLT-jolt-jolt, sway-sway-sway, rattle-rattle-rattle over big, age-like tens of seconds with a deep diapason of rumbling, and then a great ugly, last BANG – to something like that, was the rousing from sleep at thirteen minutes past five in the morning of Wednesday, April 18th, 1906."

That's how William Ford Nichols, Episcopal Bishop of California, described the earthquake in an account written originally for his children.

It was the start of an extraordinary tragedy, one of the most destructive earthquakes in the history of the United States of America.

In 1906, San Francisco was still a young city. Its population had exploded during the California Gold Rush, growing from just a thousand people in 1848 to 25,000 the following year. The first cable cars arrived in 1873, and as the century turned it was the eighth largest city in America; by the time of the quake some 400,000 people called the city home.

Those early settlers perhaps didn't realise that they had built their city on unsteady ground, although earthquakes have always been a familiar phenomenon, and there had been plenty in the preceding decades. Most, however, were much smaller tremors, sufficient to shake the china and rattle the windows. This was an outlier, an extreme event which was felt from southern Oregon to south of Los Angeles and as far inland as Central Nevada.

The problem behind, or perhaps I should say beneath it all was, of course, the fact that the city was built straddling the San Andreas Fault.

On one side of the fault lies the Pacific continental plate, moving ever so slowly northwest, while on the other side the North American plate slides southeast. This movement is, on the whole, so gradual

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as to be practically imperceptible, but because rocks don't generally slide past each other with the greatest of ease, sometimes the plates get stuck. Pressure builds up until it reaches breaking point, and then the two plates snap past each other - causing an earthquake.

On this occasion, the resulting snap ruptured the San Andreas Fault for an astounding 296 miles. The largest offset at the surface was measured at around twenty feet, at Port Reyes, and it's estimated that at depth it could have been up to twenty-eight feet at the northern end of the rupture.

DeWitt C Baldwin was just eight years old at the time of the earthquake. In his description of events, over eighty years later, he said that he was not frightened by the tremor; rather his attitude was one of excitement and a desire to see and hear all he could - including the visible evidence of the earth's force.

"With boys my own age, I wandered as far as I dared to explore some destruction sites and get a view of local fires. In some places there were gaps on the ground. Some were about one foot to five feet wide narrowing toward the inner earth. They seemed anywhere from two feet to over twenty-five feet deep just like a crevice. Sometimes when I dared to peer down the fissure I would see fallen things inside. At times I couldn't see anything because the crack was frightfully deep and dark."

For most, however, these were events that evoked fear, not curiosity.

Emma M. Burke, wife of a San Francisco attorney, described the way the earthquake rattled their fourth-storey apartment near Golden Gate Park.

"We braced ourselves in the doorway, clinging to the casing... It grew constantly worse, the noise deafening; the crash of dishes, falling pictures, the rattle of the flat tin roof, bookcases being overturned, the piano hurled across the parlor, the groaning and straining of the building itself, broken glass and falling plaster, made such a roar that no one noise could be distinguished.

We never knew when the chimney came tearing through; we never knew when a great marine picture weighing one hundred and twenty-five pounds crashed down, not eight feet away from us; we were frequently shaken loose from our hold on the door, and only kept our feet by mutual help and our utmost efforts, the floor moved like short, choppy waves of the sea, crisscrossed by a tide as mighty as themselves. The ceiling responded to all the angles of the floor. I never expected to come out alive..

Stand in front of your clock and count off forty-eight seconds, and imagine this scene to have continued for that length of time, and you can get some idea of what one could suffer during that period."

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Once the shaking stopped, Mrs Burke and her family dressed quickly and went outside, where she said, "The electric poles stood in the most inebricated attitudes the length of our street. Chimneys on roofs, chimneys in the street, bricks and broken glass everywhere, stone steps gaping apart, wooden ones splintered, and buildings themselves at strange angles!"

Everywhere, people were on the move, and not all had taken the time to dress. Arnold Genthe, a local photographer who took one of the most famous images of the aftermath, wrote,

"The streets presented a weird appearance, mothers and children in their nightgowns, men in pajamas and dinner coat, women scantily dressed with evening wraps hastily thrown over them. Many ludicrous sights met the eye: an old lady carrying a large bird cage with four kittens inside, while the original occupant, the parrot, perched on her hand; a man tenderly holding a pot of calla lilies, muttering to himself; a scrub woman, in one hand a new broom and in the other a large black hat with ostrich plumes; a man in an old-fashioned nightshirt and swallow tails, being startled when a friendly policeman spoke to him, "Say, Mister, I guess you better put on some pants."..."

Genthe made his way to the St Francis Hotel, which had not been damaged and which he found offering breakfast free of charge for as long as their supplies lasted.

"The lobby and the dining room were crowded. Near the entrance we saw Enrico Caruso with a fur coat over his pajamas, smoking a cigarette and muttering, " 'Ell of a place! 'Ell of a place!" He had been through many earthquakes in his native Italy but this one was too much for him. It appeared that when he was awakened by the shock, he had tried his vocal cords without success. 'Ell of a place! I never come back here." And he never did."

Caruso had been in San Francisco for a performance of Carmen the previous night. Genthe's account was not the only one to mention the famous tenor, who was moved to write his own account to set certain facts straight.

"Some of the papers said that I was terribly frightened, that I went half crazy with fear, that I dragged my valise out of the hotel into the square and sat upon it and wept; but all this is untrue. I was frightened, as many others were, but I did not lose my head."

Breakfast at the St Francis may have been free that day, but in other places it came with a heavy cost. One woman on Hayes Street set about making breakfast, unaware that her chimney was blocked. The wall caught light, and fire spread to neighbouring buildings. Under ordinary circumstances, this blaze may have been contained, but the earthquake had ruptured both gas and water mains lines; there was little water available for fire crews to use against the fire, and plenty of gas leaking out to fuel the flames. This blaze spread, and became known as the Ham and Eggs fire, but it was not

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the only one. Around the city, various fires started, spread and joined together, becoming in a terrifyingly short time one great inferno. This blaze would quickly spread across the city, destroying many buildings that had escaped the earthquake unscathed.

Thomas Jefferson Chase, a Ferry Building ticket clerk, described the scene on Mission Street. "The street was like looking in the door of a furnace. Flames and smoke rolled with the draught created by the intense heat, rolling up the street with a roar, then up hundreds of feet. It was an awful sight."

Businessman Charles Kendrick encountered the inferno as he crossed the city to check on his parents, describing various scenes in his memoir.

"As we stood there the Grand Hotel, across from the Palace, burst into flames from the intense heat; and lower Market Street, which I had traversed two hours earlier, was now a veritable inferno. We were so intent in watching this terrible yet fascinating spectacle that not until he had gone by us and was turning into Market Street did we notice a drunken man leading a white fox terrier by a rope. We all shouted to him to turn back, but apparently the noise prevented his hearing, and he moved on. As he did so, the North side of Market Street exploded into flame, engulfing the poor fellow and his dog, and we ... ran for our lives down Montgomery Street. As we did so, clouds of black smoke billowed down upon us until it was dark as midnight... By now the fire had reached the tall buildings in the Financial District and the intense heat, creating a cyclone-like vacuum, tore the chimneys and sheet iron from the rooftops and sent them crashing down to the street."

A wooden-framed, four-storey lodging house had stood on the corner of Eighth and Market. Now, Kendrick saw that it had collapsed like a house of cards, the roof ending up only about eight feet above the ground. Moans and cries could be heard from the people trapped inside, and he joined with a dozen others in an attempted rescue. They were forced to give up as the fire drew closer.

A week afterwards, Kendrick passed by that street corner. The building had been entirely consumed. "The poor souls," he said, "must have died agonizing deaths."

From the top of Nob Hill, there was a clear view of the terrible scene.

"The entire city – from Kearny Street to the Bay, and North and South as far as the eye could see – was one solid mass of fire, with the big buildings of the Financial District shooting flames high into the heavens. The whole scene was terrifying, yet majestic and awesome beyond the power of words– a great city vanishing in flame."

Desperate measures were invoked to try and halt the spread of the flames. In an attempt to create fire breaks, houses were dynamited; expensive mansions demolished as the flames encroached. This was, in

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some places, merely ineffective; in others it is said to have helped to spread the fire.

Part of the problem was that one of the earliest casualties of the earthquake was the man who should have been in charge, Fire Chief Engineer Dennis T. Sullivan; a chimney had crashed through the roof of the fire station where he lived, and he was mortally wounded, leaving the fire department leaderless in its hour of need. Responsibility was passed to the military.

While the Navy successfully mobilised tugboats to save the waterfront, Brigadier General Frederick Funston took charge of the soldiers creating the firebreaks. With hindsight, this may not have been ideal. It is said that when one is used to wielding a hammer, every problem looks like a nail, and the military man pursued the idea of fighting fire with explosions ruthlessly. Despite the natural resistance of civilian authorities to allow the demolitions and the inexperience of the soldiers handling them, he is said to have been so set on this course of action that he seized and diverted some of those tugboats from the waterfront effort, sending them away to fetch more dynamite.

Novelist Jack London lived outside San Francisco at the time, and travelled into the city to see what had happened there. He is said to have told his wife that he would never write about it; "What use trying? Only could one string big words together and curse the futility of them."

However, his mind was changed by an offer from Collier's magazine of 25 cents per word - he was in serious debt and that was the most he was ever paid for his writing - and so we do have his account of the devastation.

"San Francisco is gone," he wrote. "Nothing remains of it but memories and a fringe of dwelling-houses on its outskirts. Its industrial section is wiped out. Its business section is wiped out. Its social and residential section is wiped out. The factories and warehouses, the great stores and newspaper buildings, the hotels and the palaces of the nabobs, are all gone."

He wasn't happy with the article, but said it was the best he could make at an impossible thing.

For many who lived through it, the earthquake was actually little more than a footnote; notable only for the fact that it had triggered the devastating fires which followed. For the scientific community, however, it was a seminal turning point. Little was understood about earthquakes at the time; they didn't know anything about plate tectonics, a theory which wouldn't be developed for decades, and had little information to work from, since the first seismographs in the US had only been installed in 1887.

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Now, however, scientists had an abundance of data. Governor George C. Pardee ordered that a State Earthquake Investigation Commission be appointed to ensure a unified approach. Professor Andrew C. Lawson, chairman of the geology department at the University of California, Berkeley, led the commission and within a few years produced the Lawson Report.

The detailed surveys included in the report allowed scientists to make great leaps in their understanding. Previously, it had not been understood that the San Andreas Fault was a cause - or even a symptom - of earthquakes. However, the ripples along its length now made this abundantly clear.

Nor had scientists understood the mechanics by which the local geology decided which buildings might stand and which should fall in a quake. By studying maps of the apparent intensity of the shaking, it could easily be seen that areas of soft soil such as the China Basin and the Marine District suffered the strongest shaking and resultant damages. We now understand the process which was at work here; it's called liquefaction, and it does exactly what it sounds like; the ground started to behave like a liquid.

A lot of San Francisco was built on "made land", reclaimed from marshes by filling them in with large amounts of sand, debris and other sediment. When this wet, loosely-packed soil was shaken by the earthquake, it lost its strength, turning into a kind of quicksand which just couldn't support the weight of the buildings above, so they sank and collapsed. One notable instance was the Valencia Street Hotel. A few lucky customers who had been in the all-night coffee shop on the ground floor ran outside when the earthquake struck. They watched as the four-storey building lurched forwards and down, sinking until only the top floor remained above ground. Many of those trapped inside were drowned by a burst water main; rescuers tore the top of the building apart to try and save them, but as in so many other places, were driven away by the fire.

This new knowledge wasn't just academic; knowing which areas would experience the worst movement in a future quake was vitally important to those now rebuilding on that very ground. And they were rebuilding, undeterred; indeed, some business owners were negotiating for new leases even as they retreated from the fires which had consumed their previous premises, writing to correspondents that regardless of their ordeals they would "STICK WITH FRISCO!"

This spirit of endurance may have led to a little creative accounting when it comes to the casualty numbers; many of those mentioned at the time seem suspiciously low. Some estimates at the time went as low as 375 deaths, but many fatalities in Chinatown went completely unnoticed. A contemporary report of US Army relief operations recorded 498 deaths in San Francisco, alongside 64 in Santa Rosa and 102 in or near San Jose. In 1972, a report by the

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National Oceanic and Atmospheric Administration suggested that seven or eight hundred would be a reasonable estimate.

Today, it is thought that some three or even four thousand were killed in the quake and fire; nearly 250,000 left homeless as a result of 28,000 buildings destroyed and many more damaged. Tent cities rose up nearby to house them; they would remain for more than two years. The estimated cost of the property damage in the city was more than 400 million dollars; that would be something like ten billion dollars today. Of that total, only 80 million - less than a quarter- was attributed to the earthquake alone. However, that may have been in part because insurance policies would often pay out for fire damage, but exclude quake damage.

Still, the city rose from the ashes, and changed its face a little as it did so. The rich looked away from Nob Hill, where their mansions had once stood, and chose to move westward instead for better views (and perhaps the convenience of rebuilding without having to clear out rubble first). Meanwhile, some of the residents tried to relocate Chinatown to a more southerly location, even going so far as to create a Subcommittee on Relocating the Chinese because they thought the land they occupied was too valuable for the immigrant population. Those plans failed and Chinatown was rebuilt where it was to become a modern tourist attraction.

There was also an unexpected, and unofficial, benefit of the earthquake for the Chinese population. Immigration laws at the time banned most Chinese people from coming to the States, but if they were born there they could get in. Since public records of birth had been destroyed, it was now possible for many to claim that they had actually been born in San Francisco, some even going so far as to buy "slots" from other families and become "paper" sons and daughters.

Plans to redesign the city were mooted, briefly considered and then discarded, with the city rising up along much the same street plan that it had previously had.

The new San Francisco adopted the Phoenix as a fitting emblem; by 1915 it was hosting the Panama Pacific International Exposition, a thinly disguised excuse to show off to the world how well they had recovered.

Today, San Francisco is the fourth-largest city in California, a popular tourist destination known worldwide for its cosmopolitan attitude and stunning vistas, home to major companies and cultural institutions. Building codes have been updated to take account of seismic activity, and modern infrastructure is designed to be as earthquake-proof as possible.

But it still stands on uncertain ground. Every so often, the San Andreas Fault system sends ripples through the area, reminders of what it can do. The last major quake in the area happened in 1989, and scientists continue to study the fault, keeping a close eye on

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it and always trying to work out how to predict The Next Big One in time, but all they can say is, it may be coming soon.

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