

# SAN FRANCISCO

(the Present)

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## THE DAY CALIFORNIA RAN OUT OF LUCK

It was an ordinary October weekday late in the dry season, hot and windy and fogless as it can be at that time of year. Earthquake weather, some would later say, but that was hindsight.

The time was 2:14 P.M. Small children played in elementary-school yards, older students studied in high schools or universities, and adults labored in downtown high-rises. The rush-hour traffic was just beginning to build on the Bay Area's numerous bridges and elevated freeways.

A technical writer stood in a window of an office building overlooking Market Street. She stared uncomprehendingly at a small wave that moved down the broad commercial corridor, lifting and then depositing everything in its path. Nothing was disturbed. A moment later the destructive wave hit.

An emergency planner for a large corporation ascended from the Bay Area Rapid Transit station. He heard a deep rumbling noise that seemed to come from underneath the city. Almost instantaneously the first shock struck him at the top of the stairs. He clutched the handrail and looked across Market Street. Like a vertical snake making its way across the azure sky, there were three bows in the undulating Crown Zellerbach Building.

Earthquake, he thought. He ran, then crawled through a shower of

concrete and glass to the doorway of a rapidly disintegrating forty-story building whose steel welds had been cracked in the 1989 quake.

For the two German couples in the rental car, there was no warning in the small coastal village of Point Reyes Station thirty miles to the north of the city. The car windows were closed. The air conditioner and radio were on, although the light rock music had just turned to static. The car's shocks absorbed the first minor blows.

The driver parked across the street from a restaurant in the shade of an abandoned two-story brick building. The heavy Spanish roof tiles and red bricks buried the four tourists in an avalanche of debris loosened by a force that was the equivalent of a large underground nuclear explosion.

Twenty miles to the south of San Francisco the afternoon wind ruffled the surface of Lower Crystal Springs Reservoir. A keen observer would have noticed the crosshatched pattern of the waves that overlay the fault line. The fish jumped clear of the water's disturbed surface, as if their natural habitat had become a hot frying pan.

As the ground began to sway, the suburban strollers and joggers on Sawyer Camp Trail, which parallels the eastern shoreline of the reservoir, felt nauseous and staggered. They were knocked to the ground when the earth shook with a motion akin to riding an out-of-control subway train without the benefit of support. They curled protectively into fetuslike shapes on the vibrating asphalt pavement of the trail. Some lay as they were; others attempted unsuccessfully to rise as the earth shuddered violently for one minute and twenty-three seconds.

The worst was yet to come for these huddled figures.

The powerful earthquake was centered under the San Andreas Reservoir, just upstream from Lower Crystal Springs Reservoir. The long fault derived its name from the San Andreas Valley that had lain submerged for 130 years beneath the reservoirs.

Most of the casualties occurred shortly after the earthquake, when two dams collapsed and fires erupted throughout the region.

The San Andreas Dam, completed in 1869, barely survived the 1906 San Francisco earthquake. It was no match for the magnitude 8 event whose shallow source lay underneath the old earth-filled structure.

The west side of the dam was jerked twelve feet northward. The face

crumpled. From slow motion to fast forward and accompanied by a roaring sound resembling multiple jet engines, the water cascaded downstream toward Crystal Springs Dam, engulfing the stunned suburbanites on the trail.

The second dam, a concrete-block structure, was built in 1890 and had been designated a California Historic Civil Engineering Landmark. Crystal Springs Dam lay just three miles west of downtown San Mateo. Earthquakes in 1906 and 1989 did not budge the 154-foot-high structure. The old waterworks, however, needed an extensive overhaul in a time of declining budgets; none had been forthcoming.

The earthquake opened existing cracks in the old dam and the outlet towers and dislodged the rickety bridge that spanned the dam. It fell on top of the structure, blocking the spillway. With the rapid inundation of the floodwaters from San Andreas Dam, the tottering structure collapsed.

The massive tragedy that unfolded below the dam fulfilled a water official's prophecy that, should such a disaster occur, "We would be retrieving San Mateo, Hillsborough, and Foster City from San Francisco Bay."

The initial discharge approaching one million cubic feet per second generated enough erosive force to reduce all human and natural artifacts to bare earth. A wall of water cresting at a height of 112 feet set up an additional vibration in the earth as it raced down the narrow canyon carrying house-sized chunks of concrete and whatever flotsam it could claim along the way. The cascading wave lessened in speed and size as it flared out onto the crowded San Mateo County shoreline.

While crushing structures and overwhelming people in its froth, the surging water also extinguished the many fires ignited by the earthquake.

The seismic shaking had broken natural-gas mains and severed connections to individual homes. Petroleum products leaked from tank farms and either ignited or flowed into the bay, where they were joined by other toxic materials and raw sewage that poisoned wildlife. From the Inverness Ridge to the north, Mount Diablo in the east, and the Santa Cruz Mountains to the south, wildfires fanned by strong afternoon winds and feeding on the dry vegetation escalated rapidly, igniting rural propane tanks along the way.

The sun was a sickly red disk behind the roiling clouds of dust, smoke, and sulfurous fumes. The sky darkened early that afternoon. There was no

electricity in the entire Bay Area to ease the blackness—just the flames that danced like guttering candles in the rolling terrain. The flickering landscape popped and cracked.

Within the city the largest fire spread rapidly eastward from the outer Sunset District near the ocean. No firewalls separated the abutting wood-frame homes that stood in units of twenty-four with a combined floor space of over thirty thousand square feet. A former San Francisco fire chief, estimating damage in a future quake, had said: “Under major fire conditions this fire load [meaning one unit] would tax the best efforts of an entire metropolitan fire department. There are, unfortunately, thousands of such houses across the city.”

They fell like flaming dominoes. There were no operable phones to report the conflagration that soon coalesced into a raging firestorm, feeding upon itself and consuming everything in its downwind path toward the stilled commercial heart of the city. The red fire-alarm boxes on street corners were useless because of damage to underground conduits.

Had engine companies been sent—assuming there was an operable dispatch center—they could not have gotten far. Streets were littered with debris and glass that hindered passage and cut tires. There would have been little or no water once they arrived. Not only had the reservoirs been emptied, but also distribution lines within the city were severed, as was the Hetch Hetchy Aqueduct, which carried water from the Sierra Nevada to many Bay Area communities.

Fires, beyond any human’s ability to control, raged throughout the city and the hinterlands. All that could be done was to let them burn and pray for diminishing winds and the return of the fog.

Other than on foot, it was impossible to flee or enter the city. Freeways and side streets were buckled, overpasses were down, landslides covered roadways, and either the spans of all five bay bridges or their approaches had snapped or sunk into the jellied soil. Motorists panicked. There were numerous accidents at intersections where no traffic lights functioned.

Bay Area airports, located on susceptible foundations, were a shambles. The answer for the frantic media, it appeared, was to land in Sacramento or Los Angeles, strap mountain bikes onto rented sports utility vehicles, and then descend into this blazing, waterless hell that had once been a functioning city beloved by all.

The consultant and planner, the German tourists, and the suburbanites perished along with 28,000 others in northern California. It was the greatest domestic tragedy in this country's history, excluding the Civil War. The magnitude 8 earthquake was approximately the same size as the 1906 event. The difference was that at the start of the century there were 660,000 people living in the Bay Area, and now there were more than 6,000,000. Some of the structures had been made more earthquake-resistant; others hadn't.

As darkness fell that first night, there was an eerie human silence and the sound of crackling flames. A French newspaper declared that San Francisco had ceased to exist, but that was not the case. Once again, with much fanfare and denial, it would be rebuilt.

Is this fiction or fact?

All incidents and suppositions are either extrapolations from smaller earthquakes or scenarios concocted by federal and state authorities for a 1906-type event. The quotes come from documents and people. I have simply blended them into a reasonable, if somewhat horrific, narrative account.

Quantification of such a disaster is a crapshoot. The variables are immense and many are unknown. Twenty-eight thousand deaths is a conservative figure. A 1981 study estimated 22,000 to 33,000 deaths from the single dam I use in my example. Population has increased since then, and additional dams could fail. The estimates of deaths, not counting those from dam failures, have ranged upward to 12,000. Conceivably, the death toll on paper could be 45,000.

The approximate ratio of deaths to injuries is three hospitalized and thirty nonhospital injuries per death. Given my estimate, this would mean 90,000 serious injuries. Factor in off-duty personnel who could not get to hospitals and medical facilities that would be destroyed or badly damaged, and it seems likely that many would suffer. The slightly injured and homeless might run to over a half million people.

The most recent damage estimate for such a quake, again not taking a dam failure into account, ranges from \$170 billion to \$225 billion. The present record for earthquake damages in this country is \$20 billion to \$40 billion from the more moderate 1994 Los Angeles quake, which purportedly emptied insurance company coffers. Obviously there would be considerable

national and international impact, considering damage to Silicon Valley and trade with Pacific Rim countries alone.

I realize this account is difficult to accept, but history demonstrates that it will occur in a similar form and place in the near future. No one can know with any degree of certainty when or where such a catastrophe will strike.