

Civilization on a Fault Line

By DEBORAH BLUM

I USED to be a science writer for a California newspaper, where I learned to think of the ground beneath my feet as something alive. It crawled and shivered, stretched and quaked. It was the thin, wrinkled skin of an A.D.D. planet, whose muscles and bones constantly twitched beneath it.

In California — as opposed to the relatively placid terrain of Wisconsin, where I now live — it's impossible to miss that reality. The great San Andreas fault, where the Pacific and North American plates meet, slowly rumbles its way along the western edge of the state. The fault slides and catches, builds up pressure and then releases that pressure along smaller adjacent faults. Residents and scientists alike play a waiting game in California, uneasily trying to foretell when the big fault itself will go, setting off another geologic convulsion like the one that destroyed San Francisco in 1906.

At one meeting of seismologists I attended, the organizers strung a banner across the front of the conference room with a quotation attributed to the historian Will Durant: "Civilization exists by geological consent, subject to change without notice." I've always liked that line — its rebuttal of our natural hubris, our assumption that we inevitably lord over this small sphere in one of our galaxy's lesser solar systems.

Durant, writing with his wife, Ariel, came back to this point again in "The Lessons of History," drawing this time on a Biblical analogy: "To the geologic eye all the surface of the earth is a fluid form, and man moves upon it as insecurely as Peter walking on the waves to Christ." Again, the Durants hit the right note because a crushing earthquake — like the one that devastated Haiti on Tuesday — brings with it a Biblical, a Homeric, epic sense of the world gone wrong.

Surely, you think, we should be able to rely on rock. A country like Haiti, already battered enough by circumstance, should be able to find safety in solid ground. Somehow it should be so, even though our planet proves that wrong again and again. Remember the 2008 earthquake in Sichuan Province in China, which left more than 88,000 people dead or missing? The Indonesian earthquake of 2006, which killed more than 6,000 people?

Haiti is situated along a strike-slip fault between two great plates of the earth's crust, just like the San Andreas of California. The word fault does not imply a mistake. Nor does it suggest a stationary crack in the earth's crust. In geology, the word "fault" implies motion. Beneath the thin outer skin on which we stake our lives, our planet flexes its muscles. The hot magma that lies below, the liquid minerals and metals that swirl around the earth's core, conspire to keep the surface moving. The crustal plates, which

cover the planet's surface like a great rocky jigsaw puzzle, push against, under and over one another. All with the slowness, and the inevitability, of geologic time.

The great continental and oceanic plates of crust are always moving, rubbing, rearranging the bedrock of our lives. The motion is too slow to catch our attention except when it becomes erratic. Strike-slip faults tend to get stuck as they slide against each other, one jagged section catching on another. They grind slowly onward though, moved relentlessly by that underground current, eventually breaking the hold, setting off the reverberations of a quake. It's been more than 100 years since the San Andreas broke in a spectacular way, more than 200 since the Enriquillo-Plantain Garden Fault, the one adjacent to Haiti, did so. It takes time for even the earth to build up to a catastrophe.

Although we have used that time to learn the mechanics of earthquakes, we are still a long way from being able to predict them. The territory is too large, the hidden influences buried too deep. The United States Geological Survey, for instance, has long focused prediction research on an earthquake-prone section of the San Andreas, [near the central California town of Parkfield](#). From 1857 to 1966, moderate earthquakes rattled Parkfield every 20 to 30 years. The survey forecast the next to occur before 1993. It came in 2004, a tremor registering 6.0. Geologists have been watching the fault region for 25 years now. More than 175 papers have been published on observations at Parkfield. When I read through them, they seem to all reach the same conclusion: we live on a very tricky planet, unstable, restless and, yes, still unpredictable.

But they also offer insights into the subterranean world that — we hope — will move us a little closer to predicting danger. We do know how to engineer buildings with a greater degree of earthquake safety. But that takes money, commitment and a rigorous standard of government regulation and inspection. It shouldn't be surprising that a state like California has imposed safety measures while Haiti, long an impoverished and disorganized country, has struggled. I'm always heartened by international rescue efforts, like those in Haiti at the moment. But it would be even better if they were less necessary. Eventually, I hope, we will figure out a way to build an international coalition on building standards with some money behind it, able to invest in proactive safety measures.

After all, we're together here, all of us clinging to the skin of this perilously active planet. At our best, we confront the risks as a global community. As Will Durant also pointed out, "Man, not the earth, makes civilization."

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