BOOKS: SCIENCE AND SOCIETY

The Public and the Quake That Wasn't

Seth Stein

Almost any discussion among geologists about the puzzling great earthquakes that struck the central United States in 1811 and 1812 eventually turns to the events of December 1990. That month, much of the Midwest was preparing for an expected large earthquake. In many areas officials closed schools, held preparedness drills, and parked fire trucks outside. Businesses closed or made special preparations. Many people left the area or stocked up on emergency supplies. Homeowners wasted millions of dollars on unneeded earthquake insurance.

Earthquake Fears, Predictions, and Preparations in Mid-America
by John E. Farley
Southern Illinois University Press, Carbondale, IL, 1998. 216 pp. $50. ISBN 0-8093-2177-7. Paper, $21.95. ISBN 0-8093-2201-3.

This silliness resulted from a claim by the late Iben Browning, an eccentric business consultant with a degree in zoology but no seismological experience. He maintained that there was a 50% chance of a magnitude 7 earthquake on the New Madrid fault system within a few days of 3 December 1990. This claim was debunked by seismologists, who pointed out that there was no higher risk of an earthquake on that date than on any other day in the next thousand years. In fact, best estimates placed the probability of a magnitude 7 earthquake by the year 2035 as only about 50%. Geologists were thus amazed at the "prediction's" major impact.

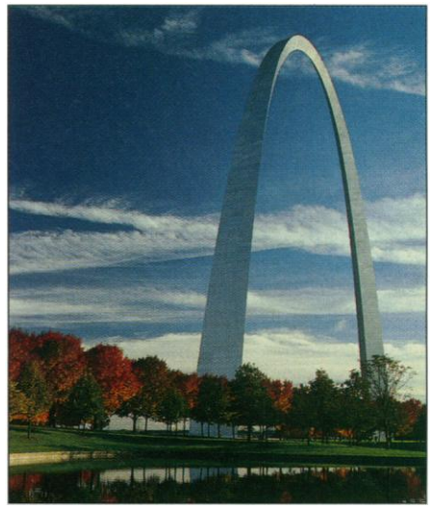
Earthquake Fears, Predictions, and Preparations in Mid-America, by sociologist John E. Farley, explores why the public took the prediction seriously. The book is based on a series of telephone surveys in three areas of Missouri (St. Louis, Cape Girardeau, and Sikeston) that could be affected by an earthquake on the New Madrid system. Although the analysis is presented somewhat dryly (largely by tabulating the responses to the survey), both the results and their sociological interpretation will interest anyone concerned with issues related to public understanding of science.

Farley treats what occurred as a "pseudodisaster, a situation in which the public incorrectly believes that a disaster is either under way or imminent." He shows that the public belief was widespread: approximately 20% of those surveyed perceived that an earthquake around 3 December was "very likely," and about 40% regarded this event as "somewhat likely." Despite scientists' best efforts, only about 15% regarded an earthquake as "very unlikely." The public planned to react accordingly: in St. Louis (furthest from the presumed earthquake) 25% of those surveyed reported planning to change their schedule near 3 December, whereas in Sikeston (closest to the presumed earthquake), 52% did! In St. Louis, 5% said they planned to leave the area on the dreaded day; in Sikeston, 20%. Although not everyone was taken in by Browning (some joked that the real threat was sewer flooding on 4 December when residents would dump the bottled water they had hoarded), many people were.

Farley's analysis of why Browning was believed offers a cautionary note for scientists, who instinctively assume that presenting a careful analysis of a situation will debunk nonsense. In that spirit, a committee of seismologists examined Browning's argument that the earthquake would be triggered by tidal forces, showed that these forces were too small to trigger earthquakes, and found that seismicity during the periods Browning claimed were risky was no greater than expected purely by chance. Moreover, Browning's claimed prediction of the previous year's Loma Prieta earthquake was actually a vague statement that around the date in question magnitude 6 earthquakes would occur somewhere in the world—a trivial prediction, as one occurs every few days.

The reason that careful analysis had little effect on the public's thinking, in Farley's view, is that "many people viewed Browning as a scientist, and viewed the disagreement between him and his critics as a legitimate scientific dispute." When respondents were asked to describe Browning, about 40% said "scientist" and about 20% said "weatherman." Hence 7% of those surveyed felt scientists generally agreed that an earthquake was likely, 41% felt scientists disagreed, and only 50% knew that scientists regarded an earthquake as unlikely. Farley believes that Browning came out ahead with the public because he "could offer simple answers about earthquakes, with specific dates and places—which scientists could not do."

The book also examines the crucial role of the media, which often reported Browning's ideas "uncritically." The *St. Louis Post-Dispatch*, for example, editorialized "Mr. Browning has a good record of accurate predictions." In fact, these predictions (available on tapes selling for $100 each) included one that in 1992 tidal forces would cause the United States to undergo its worst depression, leading to the collapse of the government. Similarly, readers were often not reminded that Browning claimed tidal forces and volcanic eruptions triggered the French and Indian War, the American Revolution, the Civil War, social unrest in the United States beginning in 1961, and the collapse of communism in Eastern Europe.



Still standing. The St. Louis arch after the "event."

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Unfortunately, those of us who tried to convince the media to present the facts found that some journalists and editors acted for reasons beyond simple naïveté. The crucial few weeks before the predicted earthquake turned out to be a "sweeps" period, when television stations compete to maximize audience share. Hence newscasters like Bill Kurtis, whose station was famed for its sensational "if it bleeds, it leads" style, promoted Browning's claims and warned of possible impending disaster. When colleagues and I tried to convince television stations to explain that the prediction was baseless, we learned that most felt no obligation to present scientists' views.

In summary, *Earthquake Fears* makes interesting reading for anyone interested in the tricky interface between scientists and the public. Farley points out some features of the relationship that make science hard to communicate to society. These features are not what most of us want to hear—but the book is all the more important for that reason.

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