

Earthquakes raise questions about safety preparedness

BERKELEY, Calif — Sensible citizens consider modern life altogether too full of incident, and they may become cross with Professor Bruce Bolt because he says the earth is going to heave beneath our feet. In fact, were our

make a squiggle on seismographs here and elsewhere. The problem is that California has chosen, improbably, to sit on two plates of the earth's crust, one of which is moving south while the other heads for Alaska at a rate of 2 inches a year.

George Will

feet sufficiently sensitive — and thank God they are not — we would, he says, feel it heaving constantly.

Bolt is a seismologist. His science is of intense interest in California, and in New Madrid, Mo., the site, around New Year's, 1811-12, of several of America's most severe quakes. They temporarily reversed the flow of the Mississippi, altered its course and caused church bells to ring in Boston.

Today about a million people live in the zone of maximum vulnerability. Quakes of the 1811-12 scale would damage St. Louis, Little Rock, Nashville and parts of seven states. Because quakes are rarer there than in California, building codes are less strict. The rarity is ominous. Geological tensions are building in that zone and a sudden adjustment may be overdue.

The New Madrid quakes were approximately 8 on the Richter scale. The Alaska quake of Good Friday, 1964, was 8.4. The 1906 San Francisco quake was 8.3. The scale is logarithmic: The San Francisco quake was 900 times more powerful than the 6.5 quake that in 1983 left 30 percent of the houses in Coalinga, Calif., uninhabitable. The Coalinga quake resulted from some faults not previously mapped, raising the question of how many more unknown faults in California could cause quakes of 6 severity.

There are 2,500 to 10,000 measurable quakes a day, worldwide. In California there are about 30 a day strong enough to

For several days after a serious quake there might be no effective civil authority to allocate medical and rescue resources. So there are large stakes in the scientists' search for patterns of premonitory events. Bolt knows that by predicting where and how much the earth may move, measures can be taken (concerning the architecture of schools, distribution systems for water and power, dams, bridges and other matters) that will mean that when the pieces are picked up, there will be fewer pieces than there might have been.

The Lisbon earthquake on All Saints Day, 1755, was an important event in the history of the European mind. It killed thousands of persons in churches, and thousands more who, fleeing to the seashore, were drowned by a tidal wave.

Seventeen days later, in Boston, a quake stopped clocks and killed fish in the harbor. Clearly, seismology, with its predictive potential, is a practical matter. But Bolt, a dry and laconic Australian, is relaxed. One must be when the stakes of one's investigations are large, but the events one is investigating are beyond control and, pending the accumulation and sifting of vast quantities of evidence, are unpredictable.

Bolt has, as a good scientist is apt to, a philosophic turn of mind, and his work has potentially cosmic reverberations. Earthquake waves bouncing around the earth's interior reveal much about the planet's structure, and hence are suggestive about its origins. Thus seismology serves cosmology by producing clues about the "big bang" or whatever it was that produced the universe, and all matter, including the small quaking fragment on which we travel.

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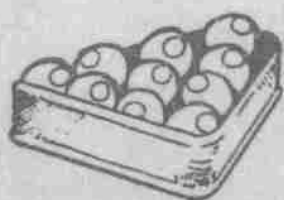
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