

Namazu and Earthquake Prediction

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How can earthquake prediction get back into the main stream of seismological research? From the beginning of history, people curious about the phenomena that surrounded them wanted to understand them. Based on minimal observations, it was standard to invent some story to explain the otherwise mysterious. In Japan, a God pinned down a giant catfish, which nevertheless managed on occasion to wiggle, generating an earthquake. The more colorful the story, the more it was accepted. Applying logic to explain observed phenomena, Greek philosophers around 500BC proposed that gases escaping under pressure cause earthquakes. This seems correct for some earthquakes near volcanoes. The light of logic was severely dimmed during the Middle Ages and the Renaissance in Europe, where Christian doctrine dictated views regarding everything in the Namazu style: Invented stories. People using logic to understand the Universe, like Giordano Bruno, were burned at the stake, in this particular case on the public square by the beautiful name of Campo de' Fiori. The M8+ earthquake in 1755 destroyed Lisbon with tens of thousands fatalities of worshipers in churches, celebrating the religious holiday Good Friday. The reactions varied: The King of Portugal lived in a tent city henceforth, the Marquis de Pombal re-built the city, Voltaire denounced Christian doctrine and ushered in science based on logic, and Mitchel (a British pastor) proposed that earthquakes are caused by rock movements, with shaking due to the propagation of elastic waves within the Earth. Concerning the question of earthquake prediction today there is still a struggle between the Namazu approach and that of scientific method. As a reaction to the numerous baseless and even demonstratively wrong claims of earthquake prediction, mainstream seismologists have abandoned "prediction", and if they pursue something close to it, they call it "forecast". This is too bad because some earthquakes clearly caused anomalies before they happen. In the history of seismology the notion of continental drift proposed by Wegener (1929) was at first ridiculed as impossible. Today the details of this process are well understood. Careless and bogus claims of earthquake precursors throw their shadows over well substantiated and believable ones. Scientific search for high quality precursors has lost respect, funding has been orphaned, yet some strong cases of earthquake precursors have been documented. Mindful of the incorrect rejection by the seismological establishment of Wegener's 1929 proposal of continental drift, we should carefully examine proposals of earthquake prediction. However, such proposals must be based on high standards of scientific rigor. Immense damage has been done to the endeavor to predict earthquakes by careless and incorrect claims. To repair this damage to the reputation of prediction,

meticulous work on data and theory is needed. It is worthwhile to continue the struggle to find solid earthquake precursors, but data and theory must be presented on a solid basis to get earthquake prediction efforts back into the fold of reputable science.