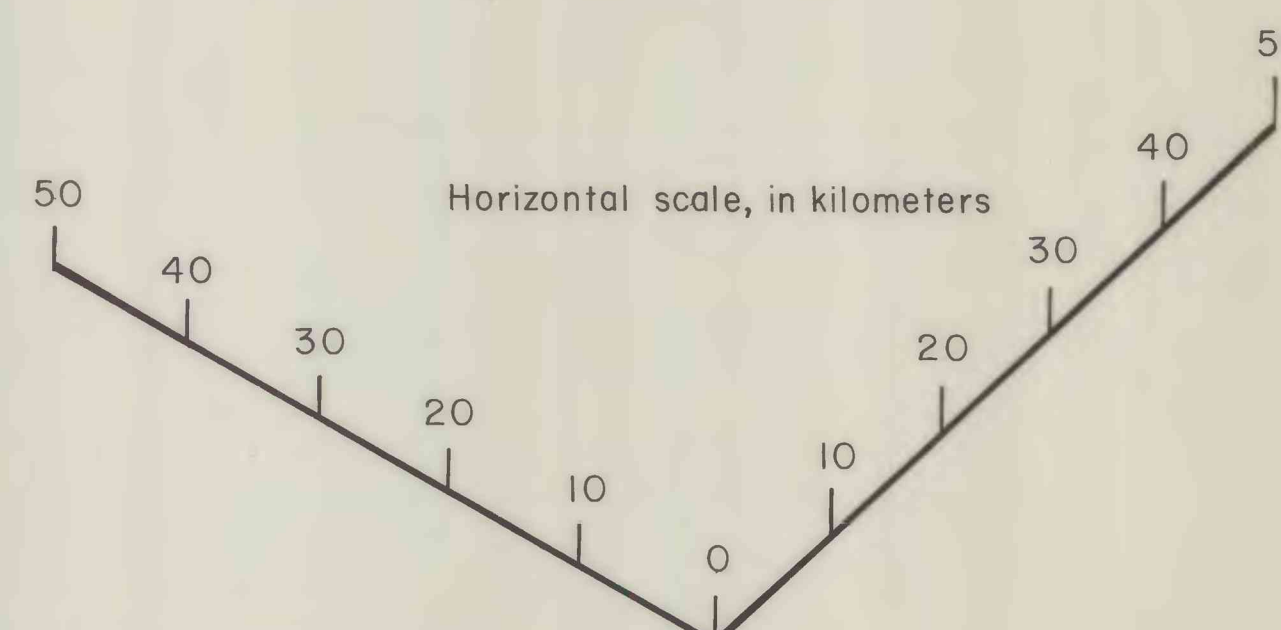
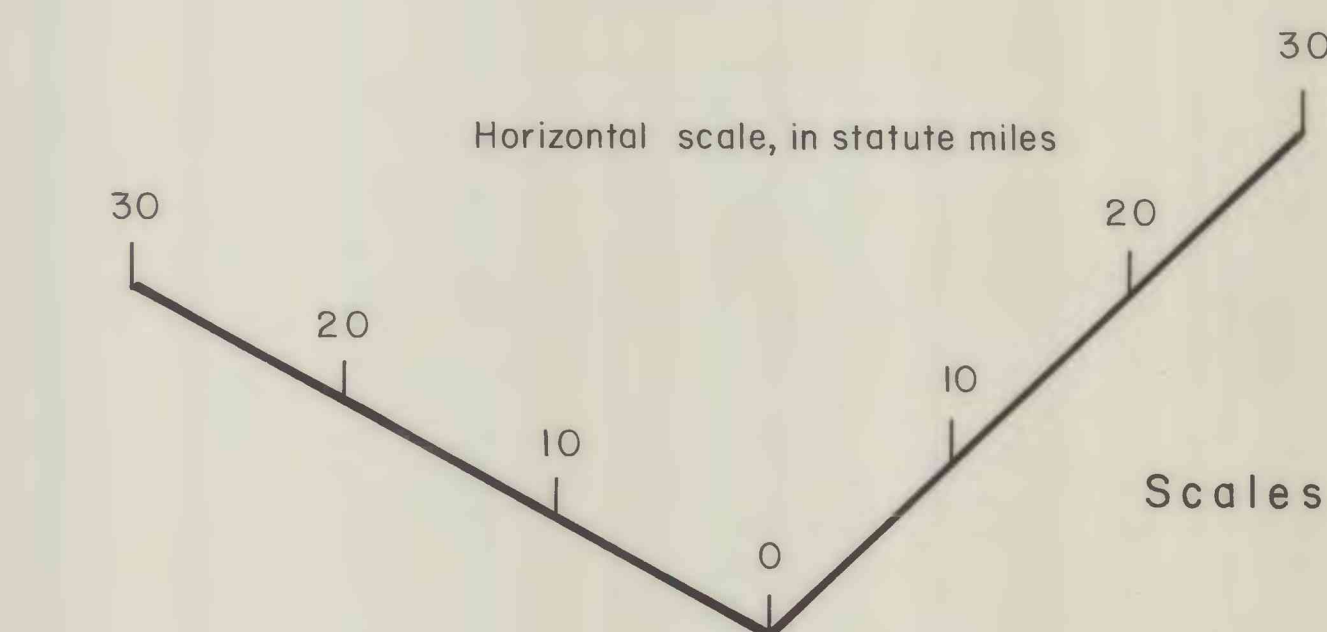


Oblique map of the north half of the Loma Prieta, California, earthquake rupture zone and environs

by
Tau Rho Alpha, John C. Lahr, and Robert A. Page
1989

This map is preliminary and has not been edited or reviewed for conformity with U.S. Geological Survey editorial standards. Any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

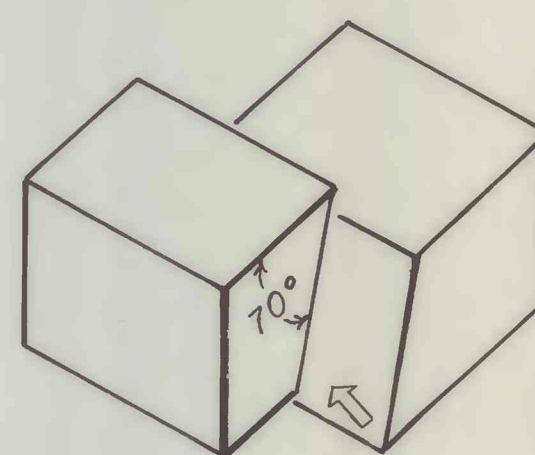


Vertical exaggeration
of the physiography X10

Discussion

This oblique map depicts the physiography of the San Francisco Bay region from San Francisco and Oakland in the background to Santa Cruz in the foreground. All of the San Francisco Peninsula, most of the Santa Cruz Mountains, and part of the Diablo Range are portrayed. In this region, the boundary between the Pacific and North American plates comprises three principal fault zones, the Calaveras, the Hayward, and the San Andreas. The Loma Prieta earthquake of October 17, 1989, (named for the prominent peak near the earthquake epicenter) ruptured a buried portion of the San Andreas fault that dips 70° to the southwest. The earthquake was a consequence of oblique right-lateral reverse slip on the fault (see inset) that began at about 18 km (11 mi) depth beneath Loma Prieta, which is located 13 km (8 mi) SE of Los Gatos. Movement continued upward to within about 6 km (4 mi) of the surface and laterally along the fault for about 25 km (15 mi) to the northwest and 25 km to the southeast. During the earthquake the Pacific plate moved approximately 1.7 m (6 ft) to the northwest and 1.2 m (4 ft) upward with respect to the North American plate. The amount of relative motion between the Pacific and North American plates during this earthquake is greatly exaggerated in the oblique map. Although primary rupture did not extend to the surface, en echelon cracks, depicted by fissures along the fault zone, were found. These cracks are thought to be a consequence of deformation and flexure of the surface layers overlying the buried fault.

This brief description of the earthquake mechanism is based on the preliminary interpretations of many USGS geologists and geophysicists who are currently studying this earthquake. This oblique map was compiled with the help of Sue Mayfield, Glenn Schumacher, and Steve Scott.



Block diagram of oblique right-lateral reverse fault displacement.