



EPICENTER — Shock waves moved through the earth in concentric circles from the epicenter of Monday's earthquake near Morgan Hill. Geologists said the ground lurched along a six-mile portion of the Calaveras Fault east of

Coyote Reservoir. The Calaveras is a branch of the 600-mile long San Andreas Fault. Shocks were felt as far away as Sacramento and a series of aftershocks followed the main quake, according to the U.S. Geological Survey.

Yvonne Doerr — Mercury

Geological Survey explains

This was strike-slip quake, not damaging thrust type

By Karen Klinger
Staff Writer

The earthquake that jolted the Bay Area Monday was only the latest and biggest of a continuing series of earth movements along the Calaveras Fault, which extends from Hollister through Walnut Creek.

The Calaveras is a branch of the much more extensive San Andreas Fault. Unlike the San Andreas, which can store for decades energy that is released in one tremendous quake, the Calaveras seems to let off steam frequently and moderately.

"In terms of producing small earthquakes, it is extremely active," said Jerry Eaton, who is in charge of analyzing earthquakes in the central part of California for the U.S. Geological Survey in Menlo Park.

Eaton said moderate-to-major earthquakes like the one that struck near Morgan Hill may not be bad forces at all, if they cause relatively little damage.

As it does so, increasing strain results at the plate boundaries. The tension mounts, rocks become deformed and finally, there is a violent lurch.

"There is a sudden readjustment," Eaton explained. "The rocks on the west side jump forward to catch up with the rest of the plate and vice versa."

The earthquake on Monday, which extended into Earth an estimated five miles, was a "strike-slip" movement.

That means that the ground on either side of a six-mile portion of the Calaveras fault zone near the Coyote Reservoir moved against each other like the edges of two tables sliding back and forth and chafing against each other.

By contrast, the destructive 5.9 quake that hit Santa Barbara last year moved in more of a thrusting motion across land that sloped in one direction.

"The ground movement tends to be stronger in a thrust fault," said Eaton. The Santa Barbara quake caused \$1.2 billion

more likely to sustain damage than those on bedrock.

According to figures released by the Geological Survey, earthquakes of a magnitude of 5.5 or greater have happened four times since 1900 on portions of the Calaveras fault within 20 miles of the epicenter of Tuesday's quake.

Earthquakes in 1903, 1939 and 1977 each measured 5.5 on the Richter scale. The biggest one of all time happened in 1911, with an estimated magnitude of 6.6.

Although the USGS has 20 seismographic instruments set up near where the latest Calaveras quake happened, the event was not expected.

Eaton said there were no obvious precursors, or at least none that anyone spotted. Signs that geologists look for include foreshocks, swarms of microquakes, changes in local magnetic fields, tilts of the ground and changes in water levels.

One person who did predict Monday's quake was Santa Clara County Geologist James



DAMAGE — Ron Sullivan's real estate office in Hollister was damaged as a result of the earthquake when a large ceiling beam ripped through light fixtures and paneling.

Jim Geiger — Mercury

provides information that may help geologists in their efforts to predict where and when a quake will occur.

In geologic terms, California is an area divided against itself. Most of the state is part of the North American plate, a chunk of the planet's crust that encompasses the United States.

One sliver of land on the western edge of California, however, is part of the Pacific plate. It is wedded to the Pacific Ocean and it literally grinds against its neighbor.

The area where the two plates are uneasily joined is known as the San Andreas zone. According to Eaton, it is a zone rife with earthquake faults, big and little.

To understand how the plates move, Eaton said it is only necessary to rub your hands against each other and note the friction.

The Pacific plate constantly inches in a northwest direction.

The earthquake in Santa Barbara measured 5.1 on the Richter scale, while the U.S. Geological Survey rated the quake near Morgan Hill at 6 points.

The Richter scale is a measure of the ground motion that is recorded on seismographs. Each increasing point means a tenfold rise in magnitude. Thus, an earthquake given a 6 rating is 10 times stronger than a 5.

An earthquake measuring 4 on the scale can cause moderate damage in the local area, a 5 can mean considerable damage and 6, severe damage. A 7 reading would mean "major" damage and an 8 is capable of tremendous damage. The 1906 San Francisco earthquake has been given an 8.3 rating.

Eaton said magnitude alone isn't always a good indicator of damage. A lot depends on population size and the kind of soil a building is located on. Buildings on fill are much

Using his "seismic window" theory, Berkland said it would occur just after midnight Tuesday. Because of the magnitude of the quake, he said he was "going to stretch my rules a bit and claim this one" as a successful prediction.

Since 1975, he said he has predicted when 22 quakes would occur and has been right 16 times.

His theory is that the relationships of the earth, moon and sun and tidal stresses caused by their alignment increase the chances of earthquakes. The "window" opens every time there is a new or full moon, when the moon passes close to Earth.

His theory has not been embraced enthusiastically by the scientific community, although he said "informally, a number of people have said, 'sure, it makes sense.'"

He has predicted another earthquake for Sept. 6.



NUISANCE — Sis Trapani, a checker at Cosentino's market at Bascom and Union avenues, picks up items that fell from shelves when the quake struck. Damage was minor.

Richard Wisdom — Mercury